PROMITHEAS – 4

Albania

Mapping national procedures, sources, available data and information

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1. General information

1.1. Government structure

Conventional long form: Republic of Albania; **conventional short form**: Albania; **local long form**: Republika e Shqiperise ; **local short form**: Shqiperia ; **former**: People's Socialist Republic of Albania ; **Government type** : Parliamentary democracy; **Capital city** is Tirana ; **Administrative divisions** : 12 counties (qarqe) Berat, Diber, Durres, Elbasan, Fier, Gjirokaster, Korce, Kukes, Lezhe, Shkoder, Tirane, Vlore.

Legal System : has a civil law system ; has not accepted compulsory ICJ jurisdiction; has accepted jurisdiction of the International Criminal Court for its citizens.

Executive branch: Chief of State (President of Republic); Head of Government (Prime Minister); Council of Ministers proposed by the prime minister, nominated by the president, and approved by parliament.

International organization participation: Albania is participating in many international organizations like UN, NATO, WTO etc.

1.2. Mapping national procedures

Legislation

In the face of the formidable social and economic challenges, Albania has begun to develop a framework for addressing the environmental problems that have arisen during last decade. One of the priorities of the Environmental Strategy and National Environmental Action Plan has been establishment of the respective legal framework, as an important instrument for the application of the environmental policies in the country. From this viewpoint, this issue has had the serious commitment of the Government and the Assembly of the Republic of Albania. In the period 1998 - 2008, major legal documents such as the Constitution and the amendments of the law on "Environmental Protection" (No. 8934, date 05.09.2002) were developed.

The adoption of the Constitution of the Republic of Albania in September 1998 represents the most important legislative step in the realization of an environmental legal framework. Specific articles of the Constitution, sanction the aims of the state for a " healthy and ecologically suitable environment for the present and future generations", for the "rational exploitation of forests, waters, pastures as well as other natural resources, based on the sustainable development principle", as well as the right of everyone ",to be informed on the environmental situation and its protection".

The Law on Environmental Protection addresses the full spectrum of environmental policy issues. It also requires the publication of the State of the Environment Report (SoE). The first official SoE report was published in 1992. Up to 2008, eight SoE reports have been published. During 2000 - 2008, other laws

and by-laws were adopted to assist in a more effective work for environmental protection and administration.

Key Environmental Laws

- Law on environmental protection (No. 8934, date 05.09.2002, amended in 2008)

- Law on forests and the forest service (No. 9385, date 04.05.2005, amended in 2006, 2007, 2008);

- Law on city planning (1993, amended in 1998,2008);

- Law on hunting and wildlife protection (1994, amended in 2004 & 2008);

- Law on fishing and aquaculture (No.7908, date 05.04.1995 , amended in 2002, 2008);

- Law on pastures fund (1997, amended in 2007, 2008);

- Law on water resources (1996, amended in 1998,2000,2001);

- Law on water supply and sanitation regulation (1996);

- Law on urban planning (1998, amended in 1999 & 2003);

- Law on civil emergencies (2001);

- Law on protected areas (No. 8897, date 16.05.2002, amended in 2008);

- Law on air protection from pollution (No. 8897, date 16.05.2002);

- Law on protection of marine environment from pollution and damage (No.8905, date 06.06.2002);

- Law on the protection of Trans boundary Lakes (No. 9103, date 10.07.2003);

- Law on Environmental Impact Assessment (No. 9010, date 13.02.2003, amended in 2008);

- Law on chemical substances and preparations (No. 9108, date 17.07.2003);

- Law on environmental treatment of solid waste (No. 9010, date 13.02.2003);

- Law on environmental treatment of polluted waters (No. 9115, date 24.07.2003);

- Law on protection of biodiversity (No.9587, date 20.07.2006)

- Law on administration of hazards waste (No. 9537, date 18.05.2006);

- Law on environmental noise assessment and administration (No. 9774, date 12.07.2007);

- Law on environmental protection from trans boundary impacts (No. 9700, date 26.03.2007).

1.2.1. Key categories according to IPCC.

The IPCC guide (2006) recommended, during the greenhouse gas analysis it would be good practice to make identification of key categories in appropriate manner, by performing a quantitative analysis for each category's emissions and removals and total national greenhouse gas emissions and removals.

In Albanian case the key categories have been identified by using the pre determined cumulative emissions threshold. As the cited guide determined, the key categories are those that, when summed together in descending order of magnitude, add up to 95% of the total level of Albanian greenhouse gas emissions.

In the following table (table 1), there are given the Albanian key categories, according to IPCC classification.

Key categories	The amount by year			
	1990	1995	2000	2010
Energy	3107.08	3248.19	4528.29	11000
Industrial Processes	209.87	303.79	264.92	450
Solvent and Other Product Use	0.00	0.00	0.00	0.00
Agriculture	880.33	1011.80	1362.75	1361.2
LUCF	3493.05	1565.85	903.39	- 4000
Waste	143.74	317.83	560.56	514
Total	7834.07	6398.46	7619.90	9325.2

Table 1. *Anthropogenic greenhouse gas emissions in Albania,(Gg)* [1]

The key categories for Albania are given in the following table (table 2).

A	B	C	D	E	F	G
IPCC category code	IPCC category	Greenhouse gas	2000's estimation (kton CO_2 equivalent)	Absolute value	Level assessment	Cumulative Value
1A	**Energy**	**CO_2**	**11000**	**11000**	**0.635**	**0.635**
3	**LUCF**	**CO_2**	**-4000**	**4000**	**0.230**	**0.865**
3	**Agricult.**	**CO_2**	**1362.75**	**1362.75**	**0.079**	**0.944**
4A,4B,4C 4D,4	**Waste**	**CO_2**	**514**	**514**	**0.030**	**0.974**
2A,2B,2C 2D,2E,2F 2	Industrial process	CO_2	450	450	0.026	1

Table 2. Spreadsheet for the Albanian key categories analysis – level assessment (2010) [1]

1.2.2. Methodology for retrieving key-category data

There are two Albanian National Communication regarding greenhouse gas emissions:

- first GHG emission inventory for the year 1994 by sources and sinks, was performed during the period 1998-2002.
- second national GHG inventory considered three direct GHG-s (CO_2, CH_4 and N_2O) and indirect GHG-s (CO, NO_x, SO_x and NMVOC). In addition, estimates of HFCs, PFCs and SF_6 have been included. This report was concluded in 2009.

As for the other activities, the data for the Albanian greenhouse gas inventory have had their difficulties. First, we can say that all activity data concerning each sector were national. The main activity data source has been the INSTAT (http://www.instat.gov.al) although it did not provide activity data for GHG inventory purposes according to the IPCC guidelines. Other data sources have been:

- AKB (http://www.akbn.gov.al
- Ministry of Environment (http://www.moe.gov.al)
- Ministry of Energy and Industry (http://www.mete.gov.al)
- Ministry of Transport (http://www/mot.gov.al)

- Ministry of Finance (http://wwww.mof.gov.al)

Default emission factors from IPCC 1996 Revised Guidelines were used.

The problem of data gaps is most important for key sources: mobile combustion, enteric fermentation, fuel combustion in industry, fuel wood burned for energy purposes and solid waste treatment.

Various methodologies have been used to fill the gaps under the Second National Communication. The most important are:

1. *Correlation;*
2. *Interpolation;*
3. *Extrapolation; and*
4. *Surveys*

High uncertainty was identified for the data on **traditional biomass burned for energy purposes**, where a large share represents illegal cutting by farmers to fulfill their energy needs. The overall uncertainty estimated for the GHG Inventory of 1994 (performed under the FNC) was 17.03% out of which the CO_2 eq emissions from fuel wood category contributed 79.23 %.

The data provided by the survey were used to estimate emissions from respective sectors under the Second National Communication for the year 2000 together with the time series 1990 – 2000. By using those data, the uncertainty of activity data regarding the fuel wood consumption in the year 2000 has been reduced from 79.23% to maximum 15.42% [1].

1.2.3. Responsible authorities and contact persons

The main responsible institution for climate change issues is the Ministry of Environment, Forests and Water Administration (MOEFWA) established in 2005, a successor of Ministry of Environment which was established for the first time in 2001. Contact person is Mrs. Laureta Dibra with tel. number 00355 682096849. The Mission of MOEFWA is to draft and propose policies, strategies and action plans for the protection and administration of the environment, forests, waters and fisheries in order to achieve sustainable development, and to improve the quality of life and enable the country to join the European Union. The accomplishment of this mission is carried out through participation, initiation and coordination of the activities that lead to long term developments and wellbeing, by protecting nature and raising the awareness of the public opinion.

The MOEFWA's main tasks include:

- Implementing relevant national policies;

- Defining priority environmental and forestry investments;

- Development of national research programs in the environmental field; and

- Coordinating environmental protection-related activities of the other ministries and local authorities.

The MOEFWA may propose measures for the protection and preservation of the environment, forestry and water resources and is responsible for the implementation of water policy and forestry policy.

Several other governmental entities have significant environmental policy roles: Ministry of Agriculture, Food and Consumer Protection; Ministry of Public Work, Transport and Telecommunications, Ministry of Economy, Trade and Energy, Ministry of Health, National Environmental Agency; National Water Council, Public Health Institute, Institute of Water, Energy and Environment; Council on Territorial Adjustment, etc.

1.2.4. Procedures to address climate-change issues

The Ministry of Environment   Forests and Water Administration (MEFWA) is the national authority responsible for climate change issues. MEFWA   is responsible for ensuring the implementation of the environmental protection related strategies, policies and legislation, including climate change. According to the current environmental regulation, almost all ministries have to implement environmental protection (including climate change) measures in their sectoral policies; therefore, these ministries are part of the institutional framework in the field of climate change

1.3.   Population

1.3.1.   Demographic characteristics

Actually the Albanian population in 2011 comprises 2831741 inhabitants (without those who live or are seeking job abroad), however the official population is 3.19 million. The Albanian population is largely ethnically homogenous. The largest minority are Greeks with around 40,000. Although Albania remains a largely agrarian economy (over 55% of the population still live in rural areas and more than half of GDP is generated by agriculture), in the last half century its demography has been transformed.

Especially, during 1991-1998, Albania experienced demographic changes dominated by the negative rate of population increase, migration from the villages towards the towns and from the remote areas towards the capital, the massive emigration and the decrease of births. The re-urbanization and the overpopulation are the main existing problems at local level in Albania. Emigration of Albanians abroad is higher than the other countries of Central and Eastern Europe. A clear vision of the share of population between urban and rural zone, is given in Table 3.

ANNUAL AVERAGE POPULATION('000)						
Year	Total	Urban	%	Rural	%	Density (capita/km^2)
1990	3196.8	1154.0	36.1	2042.7	63.0	111.2
1995	3037.1	1173.6	38.6	1863.5	61.4	105.6
2000	3055.5	1259.6	41.2	1798.9	58.8	106.4
2001	3063.3	1277.1	41.7	1786.2	58.2	106.6
2005	3135.0	1396.0	44.5	1739.0	55.5	109.1
2006	3149.1	1513.3	48.1	1635.8	52.0	109.5
2007	3152.6	1544.5	49.0	1608.1	51.0	109.7
2008	3170.1	1541.5	49.8	1628.6	50.2	110.3
2009	3193.9	1557.3	48.8	1636.6	51.2	111.1
2010	3195	1589.6	49.8	1605.4	50.2	111.14

Table 3. Annual average population ('000) [2]

The immediate change of the political structure in Albania in the beginning of the 90's, brought about a great change of the social-economic structure of the country. Many people started leaving the village, aiming at finding work in the city. The free and uncontrolled movement of the population has had an impact on the change of the proportion between the urban and rural population. The phenomenon of urbanization growth, though it is a natural tendency, creates a dilemma for Albania. Under the conditions of a democratic society, people have the right and freedom of movement, but on the other hand, there is also impossibility for accommodating these movements economically and socially. Thus, the phenomenon of re-urbanization or overpopulation is the main problem faced by the local authorities today in Albania. The massive migration and the redistribution of the population changed the structure of the population of working age, changing the balance in the job market, often by increasing unemployment. But at the same time, the internal migration brought an urbanization or overpopulation of several regions of the country, which caused big social, economic and environmental changes of these areas. Population migration has proved to be very disorganized and uncontrolled, concerning not only the real movement level but also the calculation of the new living areas. An outcome of the lack of control has been the widespread of abusive construction of new buildings, in most of the cases within the towns or in the suburbs, increasing their surface, which of course is not supported by respective infrastructure.

1.3.2. Development indicators

Health

Albania has a predominately public health system, where the state provides the majority of services. The diagnostic and curative health care service is organized into primary, secondary, and tertiary hospital services, which are provided by public and private institutions. The public health care and counseling services are provided in the framework of primary health and are supported and monitored by the

Institute of Public Health. The level indicators of life expectancy, mortality, and chronic diseases in Albania are comparable with those of the developed countries, whereas others such as infant mortality and maternal mortality are comparable with developing countries. However, the situation of public health remains a concern and most indicators concerning health care results fall short of the levels reported in other SEE countries and are under the EU average. The magnitude of changes that has occurred in Albania over the last fifteen years has contributed to the rapid demographic and epidemiological transition. The public primary health care institutions aim at providing very good living conditions in compliance with the objectives of the World Health Organization (WHO) "health for everyone". Owing to the restructuring process, Health Care centers at Primary Health Care Level are given a substantial managerial and financial autonomy; As a result, the performance is better and measured more adequately. The number and the distribution of Health Centers in the country are conditioned by demographic and epidemiologic changes. The private sector is encouraged, aiming to be complimentary to the public sector (Table 4). In hospitals, the indicators of hospital service related to disease, epidemic, death, and human resources are analyzed. The hospital reform started in 2009, by financing hospital services through the Health Insurance Institute. It is considered essential the reconfiguration of the hospitals (number, distribution, package of services) concentrating them at regional level. Statistics show that a relatively high number of deaths and diseases in Albania are result of smoking, alcohol, imprudence in the streets, use of illegal drugs, food and stress as the new modern phenomenon of the society. Sedentary lifestyle is a risk factor as it presents a potential problem for hypertension, heart diseases, strokes etc.

PATIENT HEALTH CARE INDICATORS				
Year	Hospitals	Medical centers without beds		
		Health centers	Ambulances	Policlinics
1999	51	567	1,62.4	51
2000	50	580	1,505	50
2001	50	577	1,421	50
2002	50	571	1,375	50
2003	50	582	1,501	50
2004	50	688	1,779	50
2005	50	671	1,675	50
2006	49	682	1,690	50
2007	48	605	1,673	50

TABLE 4. PATIENT HEALTH CARE INDICATORS [2]

Education [3]

Education is central to the government's priority policies and was marked by significant achievements during recent years. Education indicators were improved as a result of several implemented reforms concerning strengthening of policy-making, managing and decision-making capacities, qualitative improvement of the teaching process, capacity building and development of human resources, and strengthening and expanding of vocational education. During recent years, the work has been focused

on adapting the new secondary education structure reform after the compulsory 9-year education structure. In 2006, projects for equipment of all schools in the pre-university system with computer laboratories, capacity building, and training for teaching and maintenance personnel started the implementation at a large scale. Furthermore, 2006 saw the application for the first time of the "State Matura"2, which ensures results of high school students are externally evaluated countrywide, a new process for acceptance to higher public education institutions. For the academic year 2007-2008, the secondary net enrolment rate for both full-time and part-time system was at the level of 57 .6%, Thus, this indicator has increased by 2.5% compared to the level of 55% of the prior academic year 2006-2007. This also follows a higher than 2% growth rate from the academic year 2005-2006 (53%) to the academic year 2006-2007 (55%). In recent years 31% of students have studied in social, economic and law sciences. Another positive trend in tertiary education in Albania is that a number of private institutions has quickly increased. More than ten of private institutions have opened so far. Tertiary education still suffers problems of modernization and liberalization in its efforts to achieve acceptance and evaluation of Albanian University Diplomas as well as implementation of Bologna Process. In 2005-06, 769.6 thousand children pupils and students were enrolled and attended in all levels of education. The gross enrolment rate for all levels of education is age group of people.

1.4. *Geographic profile* [4]

1.4.1. Geomorphologic characteristics

The Republic of Albania is situated in southeastern Europe, in the western part of Balkan Peninsula facing the Adriatic Sea (sandy shore) and the Ionian Sea (rocky shore). Its coordinates are 39° 38' E (Konispol) and 42° 39' N (Vermosh) and 19° 16' E (Sazan Island) and 21 ° 40' N (Vermik village, Korça). Albania has a surface area of 28,745 km^2. Its terrain is mountainous, where hilly and mountainous areas represent 77% of the country's territory and the average altitude of 708 meters is double the European average. It is administratively divided into 12 prefectures, 36 districts, 315 communes and 2,900 villages. The total length of the state border is 1,093 km, out of which 657km is land border, 316 km sea border, 48 km river border and 72 km lake border. To the northwest Albania borders with Montenegro, northeast with Kosovo, east with Macedonia, while south and southeast with Greece. Owing to the rugged relief of the land, rivers are torrential with high erosive power. Rivers Buna, Drini, Mati, Ishmi, Erzen, Shkumbin, Seman and Vjosa flow into the Adriatic Sea, Bistrica flows into the Ionian Sea. The rivers that flow into the Adriatic Sea form a number of coastal lagoons and swamps. The rivers of Albania are an important source of hydro power. The most important of them, are listed in the following Table 5.

THE MOST IMPORTANT ALBANIAN RIVERS			
River	Length in Albanian territory (in km)	Area (in km^2)	Average altitude (in m)
Drini	285	14.173	971
Semani	281	5.649	863
Vjosa	272	6.706	855
Shkumbini	181	2.444	753
Mati	115	2.441	746
Erzeni	109	0.760	435

Table 5. The most important Albanian Rivers [2]

The lakes are of varying origin: glacial lakes in the highlands, carstic lakes in the hills, and tectonic lakes (Shkodra, Ohri and Prespa). The lakes in hills and highlands are important, in terms of tourist ecosystems. They are used for irrigation purposes. Moreover, they are very important regarding fisheries, especially those of the wetland type, which are large fishing reserves.

1.4.2. Ecosystems

Albania is well known for its high diversity of ecosystems and habitats. Within its territory there are maritime ecosystems, coastal zones, lakes, rivers, evergreen and broadleaf bushes, broadleaf forests, pine forests, alpine and sub-alpine pastures and meadows, and high mountain ecosystems. Albania is rich in forest and pasture resources. The forests cover 1,030,000 ha or 36% of the country's territory, and the pastures about 400,000 ha or 15%. Approximately 60% (244,000 ha) of the pastures are alpine and sub-alpine pastures and meadows. The forests and the pastures have a diversity of types, formations, and plant and animal communities.
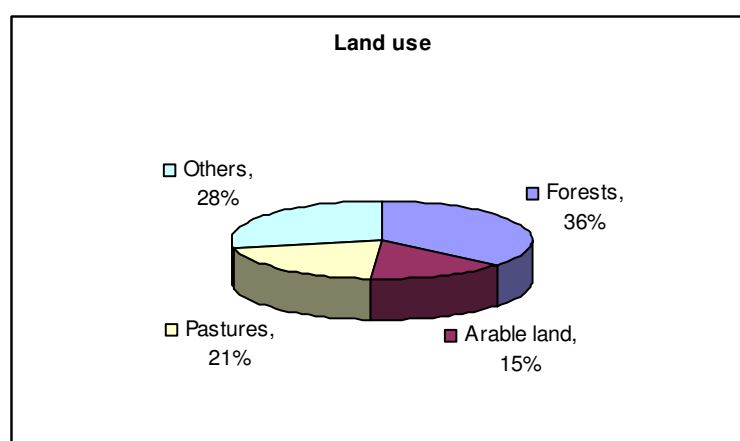

Figure 1. Arable land use [5]

Along the coastline of the country there are many ecosystems of significance in the Mediterranean region such as lagoons, wetlands, sand dunes, river deltas, hydrophil and hygrophil forests. Littoral and infralittoral communities of Mediterranean origin along the rocky coast are quite diverse and well

preserved. The lakes and rivers are also important for the biological and landscape diversity of the country. The hydrographic basin of Albania is divided into six river basins as follows:

1.The Drini basin, which includes that part of Drini i Zi catchment which is inside the Albanian territory, the catchment of main Drini (downstream of the confluence of Drini Zi and Drini i Bardhe), the Albanian part of Buna catchment and the minor part of the Danube catchment which is in Albania.

2.The Mati basin, covering the Mati catchment. Procedures to address climate-change issues

3.The Ishmi and Erzeni basin, covering the Ishmi and Erzeni catchment.4.The Shkumbini basin, covering the Shkumbini catchment.5.The Semani basin, which covers the Semani catchment (including both main tributaries Devolli and Osumi) and the small area that drains into the lakes Ohrid, Large Prespa and Small Prespa.5.The Vjosa basin, which includes that part of Vjosa catchment that is inside the Albanian territory, the catchment of Kalasa, Bistrica and Pavlla rivers and the southern coastal zone 6.The Semani basin, which covers the Semani catchment (including both main tributaries Devolli and Osumi) and the small area that drains into the lakes Ohrid, Large Prespa and Small Prespa.There is a diversity of landscapes in Albania due to its natural characteristics and long history of population and human activities. Traditional agriculture and stockbreeding developed in the countryside, in accordance with natural conditions, have been the major factors determining the Albanian landscape, where indigenous elements are not missing.

1.4.3. Land use, land-use change and forestry

Albanian forests cover 36 % of the territory. They consist of the high stem forests (45.7 %) and coppice (54.3 %).The single species forests occupy 72.3 % and the mixed species forests 27.7 %. According to their functions forests may be classified as production forests (86.0 %) and protection forests (14.0 %) Also, one may distinguish 91.2% natural forests and 8.8% man made forests or plantations. About 83% of forest area is covered by semi natural forests originating from natural regeneration, conserving the main species composition. Then there are around 8.2% or 84,841 ha of virgin / primeval forests, mainly located in the northern part of Albania. The rest (8.8 %) is covered by man-made forests, an area that has been increasing up to 1990 and after that it was suspended due to lack of investments.

The forests in Albania play both production and protection roles, to meet the needs of consumers for logs (wood industry, construction, etc.), and firewood, and to perform other functions (erosion control, biodiversity conservation, relaxation, tourism, hunting, sports, etc.). The broadleaf species compose 83.3 % of forest area; the most important are oak species 32.2 % followed by beech 19.2 %, eastern hornbeam 8,8 % and so on; the conifers (16,7 %), are represented, mainly by black pine 10.4 %, Mediterranean pines (Aleppo pine, Stone pine, Seaside pine) 3.3 %, silver fir 1.6 %, etc. Albania has a hill mountainous relief, where three-quarters of which are hills and mountains and only one quarter is flat.

During the last 50 years the following phenomena have been noticed:

- The arable land up to 1990, has increased and after that decreased, resulting in an area of approximately 120,000 ha abandoned arable land. Farmers have refused the abandoned arable land as inappropriate land to be cultivated with crops;

- The share of forests has decreased in the past 50 years owing to the deforestation process aiming at having more arable land, much less reforestation and due to changes on forest definition (much more forest area is included in pastures);

- The pasture area has decreased up to 1990 and after this year it has increased;

- The other area (water, stone, etc.) has decreased until 1990 by drainage of the inland water area and on the other hand it has increased by construction of artificial lakes used for irrigation or for energy generation purposes. The drying of a considerable inland water area has increased organic soils with considerable CO_2 reserves.

- The present situation of the forests in Albania is a consequence of the continuous over-exploitation during 60 years, and especially during the last 17 years. It reached a peak in 1997, when more than 550,000 m^3 of timber were cut.

Fires that in the majority of cases were intentional have caused considerable damage to forests and grasslands in recent years. The lack of investments and organizational measures for silvicultural work, for new forestations or reforestation, for combating pests, maintaining forest roads, for fire protection, etc., has caused the loss and degradation of the habitats of many plant and animal forest species. Recently forest protection is better organized through the creation of communal forests around the rural areas, which are managed by the communities. The pace of the creation of private forests should be accelerated.

1.5. Climatic profile

1.5.1. Precipitation

The mean annual precipitation total over Albania is about 1485 mm/year. Nevertheless, the spatial distribution varies within quite wide limits. The southeast part of the country receives the smaller amount of precipitation (annual value reaches up to 600 mm), followed by the Myzeqeja field, that receives about 1000 mm/year. The highest precipitation is recorded in the Albanian Alps, where the values reach up to 2800-3000 mm/year. Another center with abundant rainfall is also the mountainous southwest zone, with a precipitation total up to 2200 mm. Precipitation displays a clear annual course with the maximum in winter and the minimum in summer. The highest total precipitation (about 70 %) is recorded during the cold months (October-March). The richest month in precipitation over the whole territory is November, while the poorest are July-August. Snow is characteristic for inland mountainous regions, i.e. the Albanian Alps, and the central and southern mountainous regions. It is a rare phenomenon in the West Plain lowlands, in particular in the southwestern part of the Albanian coast [6].

The precipitation total and regime is a key factor in national electricity production, since the country produces majority of its electricity from hydropower plants. It is also very important for agriculture which is still the most important economic activity.

1.5.2. Temperature

Climate of Albania is typically Mediterranean. It is characterized by mild winters with abundant precipitation and hot, dry summers. Temperature values vary from 7° C over the highest zones up to 15° C on the coastal zone; in the south- west the temperatures even reach up to 16° C. Along the lowland, an almost stable distribution of annual mean temperature (12-14°C) is observed. Annual mean maximum air temperature varies from 11.3 °C in the mountainous zones up to 21.8 °C in the low and coastal zones while annual mean minimum varies from - 0.1°C up to 14.6 °C, respectively [6].

1.5.3. Other climatic characteristics

Average monthly rainfall and temperature for Albania from 1990-2009 can be founded at [7]. Other phenomena observed in Albania include:

The warmest average max/high temperature is 31^0 C (88^0 F) in July & August. The coolest average min\low temperature is 2^0 C (36^0 C F) in January and February [8].

- On balance there are 128 days annually on which greater than 0.1 mm (0.004 in) of precipitation (rain, sleet, snow or hail) occurs or 11 days with a quantity of rain, sleet, snow etc. per month [8].
- The driest weather is in July when on balance 28 mm (1.1in) of rainfall (precipitation) occurs 5 days [8].
- The month with the wettest weather is October when on balance 157 mm (6.2 in) of rainfall (precipitation) occurs across 9 days [8].
- Mean relative humidity for an average year is recorded as 52.1% and on a monthly basis it ranges from 39% in August to 63% in November & December [8].
- Hours of sunshine range between 3.0 hours per day in December and 11.4 hours per day in July. There is average of 2526 hours of sunshine per year with an average of 6.9 sunlight hours for each day [8].

1.6. Economic profile

1.6.1. General

Albania, a formerly closed, centrally-planned state, is making the difficult transition to a more modern open-market economy. Macroeconomic growth averaged around 6% between 2004-2008, but declined to about 3% in 2009-2010. Inflation is low and stable.

The government has taken measures to curb violent crime, and recently adopted a fiscal reform package aimed at reducing the large gray economy and attracting foreign investment. Remittances, a significant

catalyst for economic growth have declined from 12-15% of GDP to 9% of GDP in 2009, mostly from Albanians residing in Greece and Italy; this helps offset the towering trade deficit.

The agricultural sector, which accounts for almost half of employment but only about one-fifth of GDP, is limited primarily to small family operations and subsistence farming because of lack of modern equipment, unclear property rights, and the prevalence of small, inefficient plots of land. Energy shortages because of a reliance on hydropower, and antiquated and inadequate infrastructure contribute to Albania's poor business environment and lack of success in attracting new foreign investment needed to expand the country's export base.

FDI is among the lowest in the region, but the government has embarked on an ambitious program to improve the business climate through fiscal and legislative reforms. The completion of a new thermal power plant near Vlore has helped diversify generation capacity, and plans to upgrade transmission lines between Albania and Montenegro and Kosovo would help relieve the energy shortages. Also, with help from EU funds, the government is taking steps to improve the poor national road and rail network, a long-standing barrier to sustained economic growth.

Below there is some piece of information for the economic profile of Albania.

Nr.	Indicators	Value	Note
1	GDP (purchasing power parity) In million EUR. (2008/2009est/2010est)	8870.4 /8714.7/9016.8	
2	GDP (official exchange rate) in million EUR	8740.7 (2010 est)	
3	GDP-real growth rate (%) (2008/2009est/2010est)	7.5/3.3/3.9	
4	GDP-per capita (PPP), In EUR/cap (2008/2009est/2010est)	2788/2728/2816	
5	GDP-composition by sector (%) (2008/2009 est/2010 est) Agriculture Industry Construction Services	16.7/16.8 /18.2 8.7/8.9 /10.2 13.4/12.7/10.3 50.6/51.2 / 51.7	
6	Labor force. (in million) (2008/2009/2010)	1.114/1.041/1.06	
7	Labor force-by occupation (%). Agriculture Non agriculture Statale	58.37/ 55.18/55.26 24.53/26.34/26.64 17.10/18.49/18.10	
8	Unemployment rate (%). (2008/2009/2010)	12.5/13.6/13.6	

9	Total family protection funds (%GDP). (2008/2009/2010)	0.34/0.345/na	
10	Annual income (EUR 2007) per: Household Capita	3662 1045	
11	Distribution of family income –Gini index (2005).	0.29	Source: MPCSSHB
12	Domestic investment (%GDP). (2008/2009/2010)	8.2/8.13/6.9	
13	Budget (in million EUR, 2010). Revenues Expenditures Deficit	2353 2628.6 -275.6	
14	Public debt (% GDP). (2009 est/2010 est)	59.7/59.3	
15	Inflation rate (%, consumer price) (2008/2009/2010)	3.4/3.5/3.4	Source. MF
16	Agriculture –products:	Wheat, corn, potatoes, vegetables, fruits, sugar beets, grapes, meat, dairy products.	
17	Industries.	Food processing, textiles and clothing, lumber, oil, cement, chemicals, mining, basic metals, hydropower.	
18	Industrial production growth rate (% 2010 est).	3	
19	Electricity –production (in GWh). (2008/2009/2010)	3848.9/5229.6/7714	
20	Electricity-consumption (in GWh). (2008/2009/2010)	6608.5/7194.1/7714.5	
21	Electricity-exports (in GWh). (2008/2009/2010)	293.4/536.4/1905.5	
22	Electricity –imports.(in GWh). (2008/2009/2010)	2758.6/1864.5/1004.5	
23	Oil-production (in million toe) (2008/2009/2010)	0.578 /0.577 0.744	Source: NANR
24	Oil-consumption. (in million toe) (2008/2009/2010)	1.03 /0.974 /0.953	Source: NANR
25	Oil-exports.(in million toe) (2008/2009/2010)	na	Source: NANR
26	Oil-imports (in million toe) (2008/2009/2010)	1.08 /1.09 /1.08	Source: NANR
27	Oil-proved reserves. (in million toe, 2008)	386.4	Source: NANR
28	Natural gas-production (in million toe) (2008/2009/2010)	0.008/0.0082/0.013	Source: NANR

29	Natural gas –consumption (in million toe) (2008/2009/2010)	0.008 /0.0082 /0.013	Source: NANR
30	Natural gas –exports.	0	Source: NANR
31	Natural gas- imports.	0	Source: NANR
32	Natural gas-proved reserves. (in million m^3, 2005)	3630	Source: NANR
33	Current account balance (in million EUR) (2008/2009/2010)	-456/-593/-276	Source: MF
34	Exports (in million EUR). (2008/2009/2010)	852.8/764.8/1166 .4	
35	Exports-commodities.	Textiles and footwear, asphalt, metals and metallic ores, crude oil, vegetables, fruits, tobacco.	
36	Exports-partners (2010, %).	Italy 51, Kosovo 6.2, Turkey 5.7, Greece 5.5 , Asia 6.6	
37	Imports (in million EUR). (2008/2009/2010)	3325/3193.4/3322	
38	Imports-commodities	Machinery and equipment, foodstuffs, textiles, chemicals.	
39	Imports-partners (2010, %).	Italy 28.6, Greece 13.1, Asia 13.8, Turkey 5.6, Germany 5.5	

Table 6. Main Economic Indicators [2]

1.6.2. Primary sector

Agriculture continues to be one of the most important sectors of the national economy. Its contribution has been decreasing over years (Table 7). Rural families continue to dominate the national economy, more than 50 percent of the population lives in the rural areas, and agriculture is the main working alternative for people living in these areas. The real mean increasing rate of agriculture production during the last five years is estimated to about 3 percent per year.

SHARE OF VALUE ADDED TO GDP (%)					
Year	Sector				
	Industry	Agriculture	Construction	Transport	Others
1996	9.7	36.1	5	na	49.2[1]
2000	7.6	25.2	8.1	na	58.8
2002	10.8	26.3	7.9	11.2	25.6
2003	8.7	23.5	13.7	10.7	23.3
2004	10.0	22.3	13.9	9.0	23.2
2005	10.6	20.6	13.8	9.4	24.1
2006	11.0	19.5	14.2	9.2	25.4

Table 7. Share of value added to GDP [9]

Since the privatization of land started, agricultural production has risen every year. A rapid growth and recovery during the early stages of the transition resulted mostly from the ability of farmers to quickly

adapt to the changes brought about through the privatization by modifying their production structures. During the period 1990-2004, 564,000 ha of agricultural land or 98.9 % of planned land for distribution was privatized, resulting in creation of about 450,000 private farms of an average size of about 1,3 ha. There are no longer any state agriculture enterprises and no large private agriculture enterprises. Production is predominantly subsistence farming, generally involving a mixture of annual crops (e.g. wheat, alfalfa, and vegetables), some cattle and poultry and perhaps a few fruit trees. Most farmers operate as individuals, and progress towards farm amalgamation or even inter-farm cooperation with joint buying and marketing seems very slow.

Agriculture is still the backbone of Albania's economy; nearly half of the working force is employed in agriculture and a considerable part of the GDP is generated in this sector. Although the overall contribution to the country economy is decreasing due to rapid development of new emerging sectors of economy (commerce and services), the national economy will continue to be dominated by agricultural activity. Income increase from crop production, livestock, agro-industries, and fishery and forestry sectors remains crucial for the economic and social development of the country.

The size of an average agricultural household is 4.8 persons. The rural population is dominated by young people. About 26% are less than 15 years old, 67% are between 15 and 65 years old and only 8.6% are older than 65 years. About 52% of farm operators are 25-54 years old. About one third of the population lives in the mountainous areas. The agricultural farm is a main source of employment. 73 %, of the working force is employed in agriculture, 6 % in non-agricultural businesses, 6 % in agro-industrial activities and 3 % in other jobs. Only 50 % of young people work on the farm, mainly because of the low income level offered.

The growth rate of the agriculture sector is below the mean national rate due to migration from rural areas, land ownership issues and the very limited size of agriculture farms, poorly organized marketing of products, lack of irrigation and drainage systems, low level of technologies in use, weak organization of farmers, low level of development of agro - processing, etc. The consequence is lack of motivation and low interest of larger investors for agriculture oriented activities.

1.6.3. Secondary sector

Industry

The level of industrial activity is considerably lower than in the previous decades. Industry has accounted for a steady 11 % of GDP. Albanian's historical dependence on mineral extraction is owed to substantial commercially exploitable reserves. Chrome, copper, and nickel deposits have long been opened up, but equipment and mining methods are now antiquated and many workings have fallen into desuetude.

During the communist era, the state policy assured each of the 26 administrative districts some development. All of them had food processing industries and most of them produced building materials. Districts with forests also developed timber and wood products industries. However, the bulk of

industrial output came from six main districts that contained large plants, some of them capable of exporting.

In Albania two main companies, ALPETROL and Albanian Power Cooperation (KESH), represent the majority of industrial production. Since 2001 the production of crude oil has increased 17 %; production of electricity has increased 17 % and production of electricity has increased 34 %. Productions of cement and rolled steel, which are privately owned, have increased by respectively 1.6 % and 21 % compare with 2002. The most important industries contributing to climate change are cement production, chromium production and iron and steel production [10].

Cement Production

Cement production facilities are installed in Tirana, Shkodra, Fushe- Kruje, Elbasan and Vlora, all of them were working with their full capacity until 1990. Today only cement factories of Fushe Kruja and Vlora are working, only Vlora has a cement kiln running for production of clinker. Fushe Kruja imports clinker that is only ground and packed. Annually the factories produce approx. 900,000 tons of Portland cement, approx. 200,000 tons are exported. Large quantities of white cement, hydraulic cement, etc. are imported for special purposes [10].

Lime Production

Lime production has been growing annually since 1994, reaching the production of 120,000 tons of lime per year. The kilns are small and scattered, using outdated technology and low quality fuel: the only exception being the Metallurgical Complex of Elbasan [10].

Chromium Production

Albania is among the top world producers and exporters of chromium. Approx. 1 million tons of cromite ore is exported annually. The mines and processing plants, constructed in 1970s were privatized, currently the operator is Albanian Chrome ACR (former DARFO) [10].

Iron and Steel

Steel has been produced in the Metallurgy Plant of Elbasan from 1976. Since 1994 the primary raw material has been scrap iron. Since 2000 the plant has been operated by a Turkish company KURUM, that is expanding production [10].

1.6.4. Tertiary sector

Tourism

In many countries in the world, tourist activity is considered even more important than productive activity in economic and social activity. Tourism develops in the areas where there is strong demand for natural benefits like climate, natural beauties, environment and where the tourism sector is supported by transport and communications.

During the two last years, tourism has experienced significant growth and the tourist infrastructure has been remarkably improved. Both the number of accommodation units and services standard has been increased. Due attention was paid to investments in road infrastructure, particularly in tourist areas. In 2007, the number of foreign night-stay visitors was 966,900 persons and the number of daily visitors was 131,800 persons (without including Albanian immigrants, who are also considered "tourists" according to the World Organization of Tourism definition).The Tourism Strategy has set as objective to attract 1.25 million visitors by 2012 and raise the contribution of tourism to the GDP by 15% of the GDP. The Government of Albania's objective is to develop special interest tourism, e.g. cultural and environmental tourism, as well as beach and business tourism. To ensure long-term, sustainable tourism development, tourism sector policies are oriented toward the integrated management of cultural and natural heritage [11].

Livestock

Livestock constitutes more than half of the total value of agricultural production. Although development of animal husbandry has not been encouraged, the number of cattle and of small ruminants has increased rapidly in the past but it is decreasing in recent years. The number of pigs and poultry is increasing, though the total quantity of animals expressed as animal unit equivalents is decreasing. The density of live stock per hectare of land is still very high. An overview of the state of the livestock, their number and production are given in Table 8.

NUMBER OF LIVESTOCK								
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Cattle	728	708	690	684	654	655	634	577
Pigs	103	106	114	132	143	147	152	147
Sheep	1,939	1,906	1,844	1,903	1,794	1,760	1,830	1,853
Goats	1,104	1,027	929	1,015	944	941	940	876
Poultry	5,291	5,422	5,826	6,104	6,275	6,432	6,200	7,135

Table 8. Number of Livestock [12]

Fishery

The fishery sector is a poorly developed sector of the Albanian economy. Consumption of fish products is relatively low, about 3.3 kg per capita annually, compared to the average of Mediterranean countries at 15.1 kg per capita. The maritime fleet is dominated by submerging ships (68 %), pelagic fishing boats are 6% of the fleet, the rest engage in selective fishing with hooks. Fishing in sea lagoons (of surface area of 10,000 ha) is frequent, yields are varying from 42 to 97 kg per hectare. 750 fishermen currently work in three main lakes of Albania (Shkodra Lake, Pogradec Lake & Prespa Lake) [13].

The fish processing industry is expanding. The fishery sector is negatively affected by illegal and non-reported fishing activity. The total catch is very low compared to the activities of the other countries of the Adriatic and Ionian Sea, and thus not a significant environmental issue.

1.6.5. Future prospects for the country's economy and development

There are same indicators for the future Albania profile economy (Table 9).

Economic Indicator/Year	Unit	2008	2009	2010	2011	2012*	2013*	2014*
GDP[1]	Mio Euro	8870	8694	8872	9366	10031	10762	11547
Exports[2]	Mio Euro	2605	2522	2922	3153	3627	3991	4454
	% of GDP	29.4%	29.0%	32.9%	34.8%	36.2%	37.1%	38.6%
Import[2]	Mio Euro	-4967	-4652	-4773	-5260	-5420	-5821	-6249
	% of GDP	-56.0%	-53.5%	-53.8%	-54.0%	-54.0%	-54.1%	-54.1%
Current Account[2]	Mio Euro	-1381	-1330	-1019	-1145	-984	-986	-925
	% of GDP	-15.6%	-15.3%	-11.5%	-10.9%	-9.8%	-9.2%	-8.0%
Exchange Rate	ALL/Euro	122.80	132.06	137.79	140.33			
	ALL/US$	83.89	94.98	103.94	100.90			
Inflation[3]	%	2.16	3.73	3.37	1.68	2.9	2.9	3.0
Unemployment[3]	%	12.54	13.61	13.50	13.30			

Table 9. Forecast of Albania's main economic indicators [14]

* 2012-2014 data are IMF projections.
1/ GDP data for 2008-2010 are from the official national accounts. GDP data for 2011-2014 are IMF projections.
2/ Exports and Imports include services. GDP percentages of Exports, Imports and Current Account for the period 2011-2014 are IMF projections.
3/ Inflation and Unemployment data for 2008-2011 are from INSTAT.

1.7. *Transportation*

1.7.1. Road transport

Road transport is the main mode for transporting goods and passengers. Growing investments (level of budgetary investments for new roads has increased from 45 million EUR in 2002 to around 246 million EUR in 2008 and even more are planned for 2009) in road building and rehabilitation as part of the road network, alongside the major priority project of the construction of Corridor Durres- Morine (170 km with 5.6 km of tunnel) are the main characteristic of road infrastructure sector in recent years. Beside development of the national road network, investments are focused on road building in tourist areas and in sections interconnecting border crossings. Construction of high-standard roads with 4-lane carriageways, tunnels, and massive civil works is a main feature of this period. Concurrently, during the

past years, a total of 89.4 km road with 2-lane carriageways were built and 169 km of road were improved and asphalted [15].

Rapid development of the road network in recent years has contributed to an increase in the number of motor vehicles   and consequently increased traffic and congestion throughout the road network. Traffic signaling is still inadequate and not respected.

Urban Public Transport

Urban public transport is organized in larger cities and as a regional service. The quality of service is low with outdated vehicles, though it is still used by many passengers who do not use private vehicles.

1.7.2. Shipping

There are two major sea ports, both being refurbished. The larger of these ports is at Durres, which has roll-on / roll-off ferry facilities. The smaller one, in Vlore, is a ferry and naval port. The port of Saranda in the far south (passenger and light-freight services to Greece and Italy) is being constructed with UN and Italian funds. The port of Shengjin in the north has not yet been improved.

1.7.3. Railways

There are 447 km of mainline railway, of which 424 km is currently operated. The system was built primarily for freight traffic and, apart from the Tirana - Durres line, has only ever carried a very basic passenger service. The physical infrastructure of the railways is in very poor condition aggravated mostly in the mountainous areas by soil instability: train crossing points out of use, major crossings without communication links, and derelict condition of the permanent way across the whole system, continuous safety hazard, severe lack of maintenance and bad drainage of bridges or viaducts, ineffectual track drainage systems, etc. This has lead to the imposition of system - wide speed restrictions, causing extended journey times and reducing the attraction of rail travel. Plans, currently waiting for finance, exist for track rehabilitation on the Pogradec and Shkoder routes. The sections most requiring early attention are between Plaza and Rrogozhine, and between Elbasan and Pogradec [16].

1.7.4. Air transport

The only civil airport currently operating in Albania is "Mother Teresa" International Airport, located about 25 km by road (16 km by air) North-west of the city of Tirana. By the end of 2007, when the construction of new terminal of passengers of this airport was completed (March 2007), the investments made by TIA (Tirana International Airport) amounted to 50 million EUR. As a result, the airport processed a throughput of 1,107,323 passengers by the end of 2007. Additionally, the enhancement of safety standards and high level of airport services has led to an increase in the throughput of passengers and a significant increase in number of airline companies operating in the airport.

During the period 2006-2007, prestigious companies started their operations and currently 13 airline companies offer flights connecting Tirana with 33 destinations in other countries; Development of the Management System of Air Surveillance has guaranteed safe, rapid, and effective movement through the

services carried out by the National Agency of Air Traffic. As a result, there is a significant increase in revenues for operating companies and further development of standards in the air transport.

There are no regular air services within the Albania at the moment. This is partly due to limited market with relatively short distances, but also due to the condition of airfields. There is some potential for domestic services mostly in Saranda - Delvina, Korça, Vlora - Fier and Kukes. This would most likely be a long-term development since purchasing power of most Albanians is still far from a level that would sustain this expensive mode of travel. Another limiting factor is also travelling distance from Tirana downtown to "Mother Teresa" airport for these short flights [17].

1.8. Energy

The energy sector is a priority sector of government policies bearing in mind that its development is not at a sustainable level as evidenced by the electricity crises of 2002 and 2007. Albania is endowed with a wide variety of energy resources ranging from oil and gas, coal and other fossil fuels, to hydropower, natural forest biomass and other renewable energy. The role of coal and natural gas has gradually decreased since the beginning of the 90's while the oil sector remains stable thanks to imported petroleum products as well as the domestic production. The electricity sector is the most important energy sub-sector. Hydro-energy accounts for 90 % of generated electricity. Only 30% of hydro resources are exploited. The energy sector contributes to approx. 10 % of the GDP and employs approx. 17,000 employees, the majority of which work in the two biggest energy companies, KESH and the Albanian Petroleum Corporation (APC). The governmental policy is focused in stimulation of the generation sources, first of all in RES [18].

1.8.1. Energy supply

The energy sector has historically played an important role in the Albanian economy. Albania was largely self - sufficient in energy resources and generally until 1989 has been a net exporter of electricity and refinery oil by products. Albania was rich in energy resources such as oil, gas, coal, fuel wood, peat, and hydro, which contribute in different ways to meet energy demands in the country. Inadequate technology, over-used equipment and poor operating performance have resulted in increasing costs and declining yields in coal, oil and gas production and led to frequent disruptions of electricity supply [19].

Since 1990 there have been major structural changes as regards the shares of energy sources on the supply side. Domestically produced coal and gas have been the "big losers" since the economic turmoil caused many industrial consumers to shut down. In the figure 2-4 has been laid out the supply with primary energy resources during the period 1990-2005, where it shown that supply has fallen after the year 1990 to 2.75 Mtoe to reach a minimum of 1.49 Mtoe in 1992. Subsequently, the supply with primary resources has recognized a normal increase reaching the value of 2.3 Mtoe until 2005. Although the situation of supply with primary products is constantly increasing, the market of our country has been under-performing in supplying electrical power, hydrocarbons and not connected to the international network of natural gas [19].

Owing to the lack of domestic generating capacity, Albania has become a net importer of electricity and this will continue during a number of years until the domestic generating capacity has been expanded (more in detail will be discuss in the following sections).The generation of electricity is dominated by hydropower output, which has increased from 2,800 GWh in 1990 to 5,459 GWh in 2006 whereas the thermal based generation has remained stable around 200 GWh per year. Since 2009 the thermal based generation has terminated, because the thermal Albanian power plant was closed. Owing to the high growth in the transport sector's demand for diesel and gasoline, the import of liquid fuel has increased in recent years [19].

Production of electrical power from the hydro resources has increased in the recent years mostly due to higher precipitation. Owing to the increase in demand import of electrical energy has increased considerably and this is going to continue until new power stations are constructed in Albania. Data on the electricity supply and consumption in Albania are given in Table 10.

1.8.2. Energy consumption

The consumption of energy resources for all the economy sectors in our country has increased from year to year and an exception in this context is the period 1990-1992, in which there was a fall in consumption from 2.26 Mtoe in 1990 to 1.22 Mtoe in 1992, as a consequence of closing down many industrial consumers. Subsequently, the situation in Albania changed deeply; intensity of energy was reduced by approximately 50 %, although the consumption per capita of the energy is still at low levels. In 2005, with regard to these two indicators, there is an increase of the energy consumption per capita by 11.7 % and with a small increase of the energy intensity by 23 %. The consumption of energy resources at this year is at the value of 1.996 Mtoe. For 2005, we highlight that the household sector had the biggest share in the consumption of electrical power by 54 %, second comes the services sector by 23 %, third is the industry sector by 18.8 % and followed by agriculture 6 % [19].

Table 10: DATA ON THE ELECTRICITY SUPPLY AND CONSUMPTION (GWh)								
	2000	2001	2002	2003	2004	2005	2006	2007
Total supply	5,962.1	5,511.4	5,458.6	6,145.6	6,361.4	6,707.4	6,793.5	5,881.3
Domestic Production	4,738.2	3,692.1	3,179.5	4,903.7	5,492.6	5,492.6	5,551.2	2,946.7
Thermo power plants	143.6	136.9	106.7	81.3	76.0	76.9	92.6	72.4
Hydropower plants	4,594.6	3,555.2	3,072.8	4,822.4	5,416.6	5,376.9	5,458.6	2,874.4
Import *	1,223.9	1,819.3	2,279.1	1,241.9	868.8	1,253.5	1,242.3	2,934.5
Total consumption	5,962.1	5,511.4	5,458.6	6,145.6	6,361.4	6,707.4	6,793.5	5,881.3
Export	221.8	69.3	52.6	326.2	390.3	729.5	637.2	106.6
Network losses	2,479.4	2,058.4	1,886.0	2,254.5	2,193.9	2,404.6	2,481.2	2,085.2
Consumption by users , of which	3,192.8	3,350.6	3,462.9	3,490.9	3,677.1	3,473.6	3,572.7	3,590.1
Industry	546	581	582.2	649.2	743	687.5	626.9	584

Agriculture	40.7	50.6	29.2	28.2	43.1	189.7	35.6	46.5
Household	1, 663.9	1,997.6	2,041.2	2,219.8	2,2534.2	2,007.5	2,124.6	2,079
Other non specified	942.3	721.7	810.3	593.7	656.7	589	785.7	880.6

Table 10. Data on the electricity supply and Consumption (GWh) [19]

After 2000, there was a decrease of electrical power consumption, not because the economy would consume less, but because the electrical power system was not able to supply electricity to many consumers. This has urged several enterprises and services to install reserve generators of electrical power. The sector that has been constantly growing was transport. In 1990, it consumed 6% of total energy, while in 2005 this sector consumed 44.3%, households sector 26.5%, industrial sector 12.4%, services sector 10.4% and agriculture 4.5% [19].

Petroleum products have increased their share in the final consumption of energy from 48% in 1995 to 63.1% in 2005. This has happened owing to decreased consumption of firewood, coal and natural gas on one hand, and a large increase of transport on the other. The average annual rate of petroleum product consumption growth during this period is 6.2%, while the sector of transport registered an increase of 8.8% and services 9.1% [19].

1.9.   Waste disposal

1.9.1.   Solid waste disposal

The Albanian economy is going through rapid transition and society is experiencing population growth. Both factors encourage the generation of higher quantities of waste. Combined with population migration from rural to urban area, waste management has become one of the major challenges for cities. Solid waste from households, public administration, the construction sector and other production and services is collected without separation. Household hazardous waste is also part of a common waste stream. Waste collection is done in the municipal collection centers through direct discharge or through special bags.

Waste collection is a responsibility of local governments. It is performed only in urban areas, the rural area population resorting to dumping waste by the roads and open –air burning.

The actual level of waste generation per capita in not known since most collection and disposal services are not equipped with weighing equipment. However, the production of inert and solid urban waste are estimated on average 550 kg per capita per annum for urban areas and 170 kg per capita per annum for rural areas. The total production of urban waste for 2007 reached an approximate amount of 722,731 tons, with Tirana ranking ahead of other regions (228,190 tons). Biodegradable materials compose 40-60% management in Albania is at a low level. Systems for the collection of urban solid waste are provided in most cities and towns. Very little recycling of waste is undertaken. The main method of disposal is landfill. There are no properly engineered landfill sites in the country. There are no collection

systems in rural areas and small towns. Most waste from these areas is disposed of by dumping in ditches, ravines or at the side of roads where it is washed and blown onto other land and ultimately into water courses. The transportation of the waste to dump sites does not have the right frequency and quality, so it happens that, owing to the ling disposal time of the waste in these places, they become fermented; therefore the problem gets worse and increase the risk of diseases in the city. The problem gets even worse during summer time. As far as the dumpsites are concerned, the main environmental problems are related to the burning of the waste, creating a very important source of air pollution and the possible penetration of the leakage into the underground waters [20].

1.9.2. Wastewater treatment

Albania's urban water supply system is plagued by problems. In addition, infiltration from parallel severs lines causes periodic cross contaminations of the water supply. Monitoring is conducted for some fifteen physical and chemical parameters. The first National Water strategy was formulated in 1996,a law for water resources was adopted in the same year, establishing a number of regulatory instruments, including effluent charges, drinking water fees and non-compliance fees. Despite this law, only drinking – water fees are in place today, and at very low levels [20].

2. The national GHG inventory

2.1.   Development of a national system for the GHG inventory

The following chapter provides an inventory of greenhouse gas emissions & removals by sinks for Albania, calculated for the whole period 1990-2000. The following Greenhouse Gas Inventory is the second inventory for Albania, which is developed in the framework of the GEF funded project "Enabling Albania to prepare its Second National Commitments to UNFCCC".

2.1.1. Government ministries/agencies responsible for collecting and inventorying data

The first GHG emission inventory for the year 1994 by sources and sinks for Albania was performed under Albania's FNC project during the period 1998-2002.Attempts to improve the quality of GHG inventory have been made the GEF regional project named 'Building capacity to improve the quality of the GHG inventories in the East Europe and CIS'' which has used key-sources and the IPCC Good Practice Guidance as cost-effective approaches for improving the quality of data inputs.

Albania's second national GHG inventory considers three direct GHGs (CO_2, CH_4 and N_2O) and indirect GHG_s (CO, NO_x, SO_x and NMVOC). In addition, estimates of HFC_s, PFC_s and SF_6 have been included they (they were not reported under the Albanian's FNC). Estimates for SNC regarding the GHG inventory include the year 2000 and the whole time period 1990-2000.

Re-estimates for the year 1994 are made as well.

All activity data concerning each sector are national. The main activity data source/provider has been the INSTAT although it did not provide activity data for GHG inventory purposes according to the IPCC guidelines.

2.1.2. Supporting institutions

Other data providers/sources have been the ex-National agency of energy, Ministry of Environment, Forestry and Water Administration, Ministry of Economy, Trade and Energy (METE), Ministry of Public Works, Transport and Telecommunications, the general Directorate of Forestry, taxation Department, Costumer Offices and Different data bases, surveys and studies prepared by International organizations (including the World bank, UNDP, EBRD, EIB etc), Universities and different NGO_s. Default emission factors from IPCC 1996 Revised Guidelines are used. Most of activity data are characterized for their variability after the 90's – the time when the country started to develop rapidly.

2.1.3. Measurement methodology and data sources

The problem of data gaps is most important for key sources: mobile combustion, enteric fermentation, fuel combustion in industry, fuel woods burned for energy purposes and solid waste treatment. Various

methodologies have been used to fill the gaps under Second National Communication; the most important are:

1. Correlation;

2. Interpolation;

3. Extrapolation; and

4. Survey

High uncertainty was identified for the data on traditional biomass burned for energy purposes, where a large share represents illegal cutting by farmers to fulfill their energy needs. The overall uncertainty estimated for the GHG inventory of 1994 (performed under the FNC) was 17.03% out of which the CO_2 eq emissions from fuel wood category contributed 79.23%.in 2008, an energy survey was carried out regarding fuel wood consumption in households, service and small industries. The purpose was mainly to reduce the uncertainty of activity data for this subcategory (especially from fuel wood self-collected from rural areas).The result of the survey is shown in Table 11.

YEARS	SECTOR				TOTAL
	RESIDENTIAL	SERVICES& COMMERCIAL	INDUSTRY	AGRICULTURE	
1990	284.00	238.00	178.00	89.00	789.00
1991	243.67	330.00	160.00	64.33	798.00
1992	203.33	82.00	142.00	39.67	467.00
1993	163.00	56.00	124.00	15.00	358.00
1994	151.77	136.83	114.82	16.88	419.70
1995	139.35	96.26	105.64	18.76	360.00
1996	127.52	99.39	96.45	20.64	344.00
1997	115.70	86.51	87.27	22.52	312.00
1998	103.87	60.64	78.09	24.40	267.00
1999	92.04	39.38	68.91	26.28	226.61
2000	94.03	37.65	59.06	27.46	218.21

Table 11. Fuel wood consumption according to the energy Survey performed in 2008 (in ktoe) [21]

The data provided by the survey were used by both Energy and LUCF teams to estimate emissions from respective sectors under the Second National Communication for the year 2000 together with the time series 1990-2000. By using those data, the uncertainty of activity data regarding the fuel wood consumption in the year 2000 has been reduced from 79.23% to maximum 15.42% [21].

2.1.4. Activity data

The following table presents the main data sources used for activity data

Sector	Data sources

Energy	• INSTAT • Albanian Ministry of Economy Trade and Energy • INEWE • NANR
Transport	• INSTAT • DPAC - Albanian Civil Aviation Authority • Albanian Transport and Public Work Ministry • Direct information from transport operators
Industry	• INSTAT • Albanian Ministry of Economy Trade and Energy • Direct information from industry operators
Agriculture	• National Institute for Statistics • Albanian Agriculture Ministry
LULUCF	• INSTAT • Albanian Ministry of Agriculture • MEFWA
Waste	• INSTAT • Ministry of Environment, Forests and Water Administration • Public Health Institute • Food and Agriculture Organization • Landfill operators /Regional Environmental Protection Agencies

Table 12. Data sources for activity data

2.1.5. Conformity with data exchange standards

The responsible for Conformity with data exchange standards is the Agency of Environment and Forestry (**AEF**) . The duties and scope of activities of the AEF are stipulated in Albania's environmental legislation. The AEF is envisaged to act as the central focus for environmental monitoring and to provide high quality reference and general laboratory services.

The Environmental legal framework in Albania defines a set of duties for MEFWA, and is going through a process of approximation to EU legislation.

On page 194 of the national environmental strategy is defined in conformity with procedures of verification and inspection data. This procedure is in accordance with the recommendation of the European Parliament and European Council of 4 April 2001 (2001/331/KE) [22] [23].

2.2.   Systematic observations

2.2.1. Measurements of meteorological parameters and instrumentation deployed

The key institution that conducts systemic observation of weather and climate is the Institute of Hydrometeorology Albania (today merged into the Institute of water, Energy and Environment of the

Polytechnic University of Tirana), that maintains a national monitoring network (150 stations) and a hydrological network (92 stations)

The institute of Water, Energy and Environment of the Polytechnic University of Tirana is the main research institution that is regularly conducting basic and applied scientific studies related to climate change. Currently their main activities are vulnerability and adaptation to climate change.

Climate change related research is also conducted at the faculty of Natural Science of the University in Tirana and at some other Academia related centers.

One of main responsibilities of INEWE (Institute of Energy, Water and Environment) is the collection, processing and management of marine, hydrological and meteorological data for which are responsible Department of Water and Climate & Environment respectively.
Actually, these data are mainly manual ones and are mailed by the observers in INEWE. In addition, data are processed statistically and saved in digital formats.

2.2.2. Oceanic observations

Hydrological network:

92 river stations (7 with auto registers and 5 transmitting in distance- 2 DCP from MED-HYCOS programme),

- 7 in water springs, 131 wells and 8 maritime stations.

water quality: expedition measurements in 30 fixed points on rivers,6 points on lakes and 8 on coast.

2.2.3. Terrestrial observations

The Institute of Water, Energy and Environment of the Polytechnic University of Tirana is the main research for terrestrial observations.

Its activities include, among others:

a) Fundamental and applied research regarding:

- earthquake monitoring;
- seismic source physics;
- seismic hazard assessment and prediction of earthquakes;
- seismological engineering.

b) Standards development in the following fields:

- seismic zoning (seismic hazard map for Albania);

Seismic zoning of densely populated areas (local seismic hazard maps). Parts of this Institute are the following departments:

Department of Water Economy

Department of Geophysics and Georisks

Department of Georesources and Geoengineering

Department of Climate and Environmental

Department of Seismology

Department of Energy Technology

Department of Geo information and Technologies

2.2.4. Air-quality monitoring

Monitoring System in Albania

Monitoring of urban air quality carried out in five main cities of Albania (Tirana, Durres, Fier, Elbasan, Shkodra). This monitoring is performed by the three institutions that are:

1. Public Health Institut

2. Environment and Forest Agency

3. Applied Physic Institute.

Installation of automatic digital equipment in 4 stations (2 in Tirana and 2 in Elbasan) has increased the frequency of measurements, quality and reliability of data. The data of NO_2 and O_3 measured every 30 minutes and SO2 data every 5 minutes.

In accordance with WMO standards, geographical and economical conditions, there are in Albania

- 150 meteorological stations

6 principal (Synoptic), 28 climatologic, 101 thermo-pluviometric and 15 pluviometric

- 15 phenological stations.

3. Reporting

3.1 The GHG inventory, emissions per sector

Direct Greenhouse Gas Emissions

This section provides an overview of the greenhouse gases inventory for Albania for the period 1990-2000 (The Albania's Second National Communication, 2009) to the Conference of parties under the united National Framework Convention on Climate Change, Publisher Ministry of Environment, Forestry and water Administration, Tirana on 2009 [24]. This report gives the total emissions of CO_2, CH_4, and N_2O expressed as CO_2 eq by six main categories, recommended by the IPCC: Energy Activities (including all types of activity related to extraction, transportation, processing and combustion of fossil fuels), Industrial Processes, Solvent use and Other Products, Agriculture, Land Use Change & Forestry and Waste.

According the above source, the main contributor of CO_2 is the energy sector (44-79%) owing to fuel combustion activities. The second contributor is Land Use Change and Forestry, which was contributing 32.73% in 1990 and has since reduced to 16% in 2000. Industrial Processes are contributing (2.6-4.90), the other sectors (waste, Solvents and agriculture) did not contribute significant emissions of CO_2 [24].

The main contributor of CH_4 emissions is the Agriculture sector (74-77)%, followed by Waste (8-22%) and Energy (408-20.4)% [24].

The main contributor of N_2O emissions is the waste sector (45-47%), followed by the energy. The total GHG emissions (expressed in CO_2 eq) arise mainly from Energy (44.00%), followed by Agriculture (27.12%) and Land Use Change Forestry (21.60%) [24].

CO_2 emissions from fuel wood are included in the Land Use Change and Forestry Sector according the IPCC requirements. Still, if their emissions would been reported under the Energy, the share of energy sector would be the almost 82% [24].

CO_2 was the main greenhouse gas in Albania for the whole period 1990-2000.(83.98% in 1990,73.12% in 2000).The share of CH_4 has increased from 14.79% in 1990 to 25.84% in 2000, mainly due to increased emissions from agriculture and waste sector[24].

3.2   The GHG inventory, emissions per type

In Website of MEFAW in the menu "Environmental Reports" there are 4 reports on the environmental situation in the years 2003/2004, 2005/2007, 2008 and 2009. In these reports reflected the state of GHG by type. Some data are presented below.

The data inventory of greenhouse gas (GHG) for the years 2005-2007, show that total net release of greenhouse gases (CO, CH_4 and N_2O_5) for the reporting period is about 8.5 million / ton / year of CO_2, the amount that ranks Albania in countries with low pollution compared to other European countries or in

other words, Albania has the lowest content of CO_2 per capita compared with all other European countries.

The main source of air pollution by SO_2 and NO_2 is especially transport sector, especially used cars without converters

According to data monitoring, urban air pollutants resulting pure from SO2 and NO_2, as in all monitored stations SO_2 and NO_2 are within norms for Standard Albanian.

Graphic shows average annual values that have no case exceeding the allowed values for SO_2. Content of SO_2 in urban air at 7 stations monitored is lower than the rate Albanian and WHO recommendation. Here are presenting some data for the years 2008 and 2009 [25].
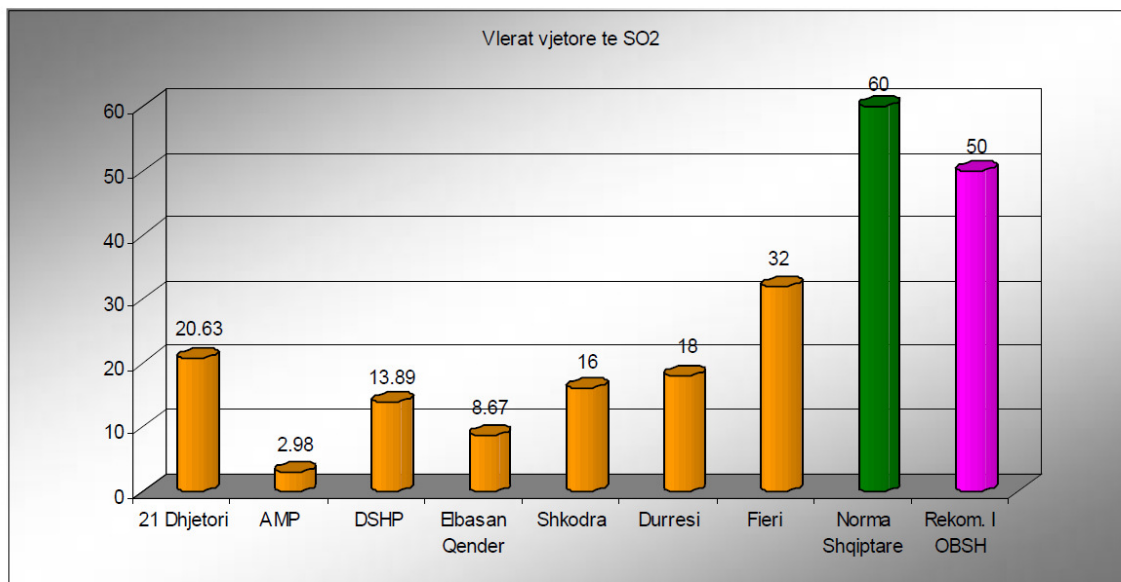

Fig 2. Annual average SO2 value for 2008 [25]

• Orange color indicates different places in Albania where measurements are made.

• The green color shows the Albanian

• The pink color indicates the rate of EU

Contents of nitrogen dioxide (NO_2) from 7 stations monitored in 6 of them not only not in any case exceed the allowed limits, but its content is lower than rates Albanian and WHO recommendation.

According to the year 2009, urban in all stations the contents of SO_2 and NO_2 are within the norms for Standard Albanian. Contents of nitrogen dioxide (NO_2) monitored at 7 stations in 6 of them in no case exceeded the allowed limits and its content is approximately 2 times less than the standard rate of

Albanian and EU, with the exception of Station "21 Dhjetori" where the annual value of NO_2 is in Albanian standard but the annual rate exceeding the EU standard, with approximately 12ug/m^3.

Content of sulfur dioxide (SO_2) at 7 stations monitored in any case not exceed the allowed limits, and its content is approximately 2-4 times lower than the rates of Albanian.

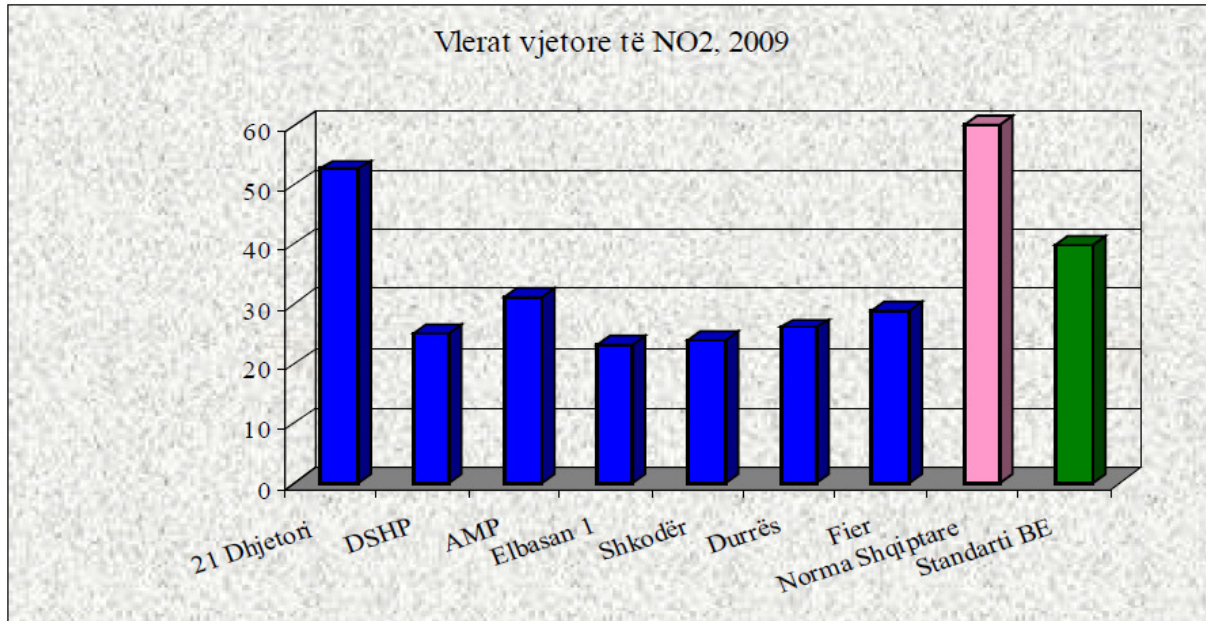For year 2009 data provided in the table below:

Fig 3. Annual Values (2009) of NO₂ compared with the rate of Albanian and EU standarts [25]

Blue color indicates the different places in Albania where measurements are made.

The pink color shows Albanian rate

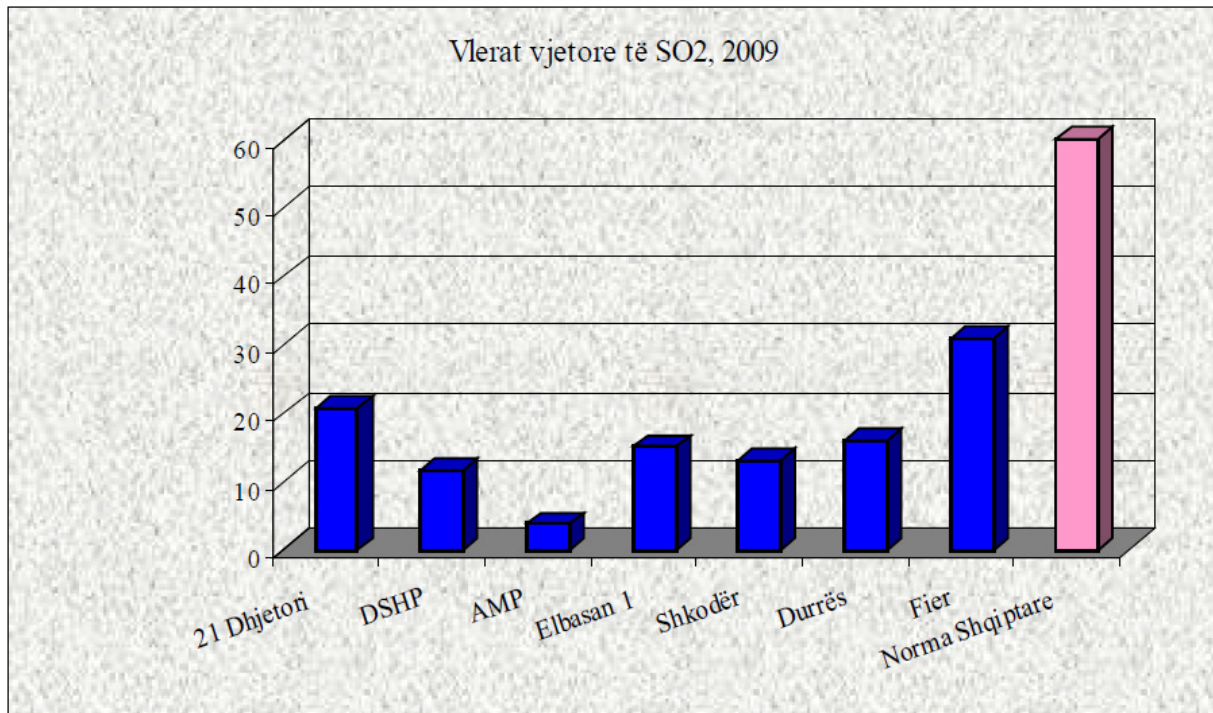The green color indicates the rate of EU.

Fig 4.-The annual rate of SO$_2$ (2009) compared with Albanian and EU standard [25]

Total emissions scenario greenhouse gases (GHG)

Climate change policy is built through national communications by presenting separately mitigation and adaptation of greenhouse gases. For each of them and each sector is carried out analysis and development of scenarios and proposed measures for mitigating and adapting to expected climate changes. For all analyzed sectors two scenarios were constructed:

The base scenario. This scenario takes into account the development of sectors, regardless of the effect of climate change. The adaptation scenario takes into account the implementation of a series of priority measures, which aims to achieve by 2025, reducing emissions of greenhouse gases by 48% compared with base case(fig.5).
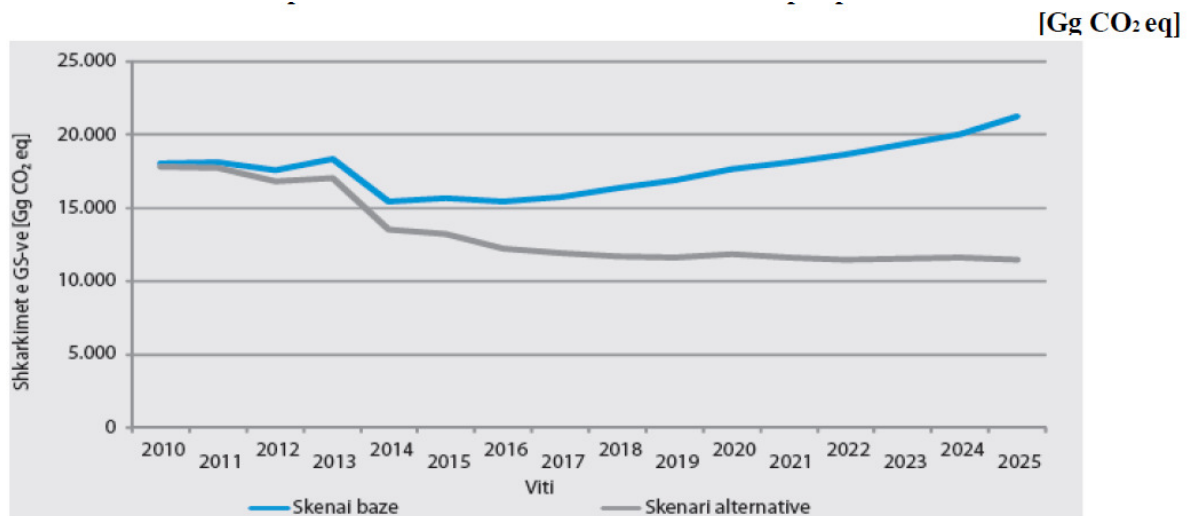
Fig 5. Emissions of GHG-s base scenario and alternative scenario for the period 2010-2025 [25]

Blue color is for base case.

Gray color is for the mitigation scenario

While the document "Albania's Second National Communication, 2009, pp. 54-56 provided data on Anthropogenic Emissions indirect greenhouse gas in Albania. These data are given for the years 1990 to 2000 [26].

3.3 Information publicly available

Requirements for availability of documentation official Albanian involved and them to Environment are defined in law Albanian 8503 date 30/06/1999. Ministry of Environment, Forestry and Water Management is in the process of the device to overcome the challenges of providing new and traditional types of information. It continues to publish reports on the state Environmental and other documents, but is simultaneously introduced a system of environmental management based on GIS information. This system will be supported, updated and maintained by the Agency for Environment and Forests. During system development will be important to ensure that information collected is reliable. This will require Institutions to:

1. Confirmation collect data and provide;

2. Using standardized definitions of data, and

3. Make references for all geographic data. The Agency of Environment and Forestry (AEF) is responsible for Information publicly available. Mission of AEF is to regenerate, improve and preserve the environment, while providing a sustainable development. AEF was established by the Decision of Council of Ministers No.579, dated 23.08.2006, in the framework of restructuring of Institute of Environment and Institute of Forestry and Pasture Researches. The Agency of Environment and Forestry is a legal,

public and budgetary institution under the Minister of Environment, Forest and Water Administration (MEFWA). AEF has started procedures for national accreditation of laboratory for water analysis according to ISO standards and established database on environmental hot-spots. Also AEF has prepared the draft State of Environment Report, 2005-2007, 2008 and 2009.

Information services

- Technical supports, services and consultation to the Ministry of Environment, Forest and Water Administration.
- Collecting, processing and public information on monitoring data related to environment and forestry field
- Monitoring activities:
  - Monitoring on air quality in Tirana and Elbasan cities for 6 main indicators of air quality, (TSP, PM10 , Pb, SO2 , NO2 , O3, Pb)
  - Monitoring on urban discharges in surface water for 8 city, pollution in downstream of Ishmi River and hazardous substances in surface water for 35 monitoring stations.
  - Monitoring on forestry health , forestry biodiversity, biomonuments, aromatic-medicinal plants and wild fauna
- Reporting to the European Environment Agency and EIONET of the data for the state of some environmental indicators of our country.
- Preparation and publication of State of Environment Reports [27], [28].

4. Verification

4.1.   Statistical methods for QA/QC analyses

When preparing the GHG inventory for the year 2000 in Albania , a quality assurance and quality control (QA/QC) plan was prepared and several activities performed to assure data quality.

The following activities were performed internally [29]:

• Check of methodological and data changes resulting in recalculations (temporal consistency of input data, consistency of method for calculation)

• Completeness checks.

• Check that assumptions and criteria for the selection of activity data and emision factors are documented.

• Check that transcription errors in data input and reference.

• Check that emissions are calculated correctly.

• Check that parameter and emission unit are correctly recorded that appropriate conversion factors are used.

• Check the integrity of database files.

• Check that the movement of inventory data among processing step sis correct.

• Check that uncertainties in emissions and removals are estimated or calculated correctly.

• Review of internal documentation.

• Check that uncertainties in emissions and removals are estimated or calculated correctly.

All information required to produce the national emissions inventory was documented and archived, including [29]:

1. Assumptions and criteria for selection of activity data emission factors.

2. Emission factors used, including references to the IPCC document for default factors or to published references or their documentation for emission factors used in higher tier methods.

3. Activity data or sufficient information to enable activity data to be traced to the referenced source.

4. Information on the uncertainty associated with activity data and emission factors.

5.   Rationale for choice of methods.

6.   Methods used, including those used to estimate uncertainty.

7.   Changes in data inputs or methods from previous years.

8.   Identification of individuals providing expert judgment for uncertainty estimates and their qualifications to do so.

9.   Details of electronic databases or software used in production of the inventory, including versions, operating manuals, hardware requirements and any other information required to enable their later use.

10.   Worksheets and interim calculations for source category estimates and aggregated estimates and any recalculations of previous estimates.

11.   Final inventory report and any analysis of trends from previous years.

12.   QA/QC plans and outcomes of QA/QC procedures.

The GHG inventory was peer-reviewed by Dr. Carlos Lopez, from the Institute of Meteorology of Cuba under the National Communications Support Program (NCSP).

4.2. Calculation of data-verification indices

Verification of data on environmental conditions is clearly defined in the national environmental strategy published by the Albanian government in November 2006. In this strategy are set out on pages 197-207 of verification methods for environmental data for each ministry. Under this strategy for each region of Albania are established regional agencies equipped with groups who have inspectors available to laboratories to analyze samples and to provide information necessary for the environment.

Verification activities are done separately for each sector. Several verification activities are performed by the NGHGI team, as follows [30]:

-    Industrial Processes - comparison of data sets used with data provided by the Ministry of Economy Trade and Energy/INSTAT
-    Agriculture - comparison of data sets used with relevant data on FAO/Eurostat;
-    Waste - comparison of data sets used with Eurostat data.

Comments:

1. In report there are lacks of data which are not available by the responsible institutions. I think this is a gap of Albanian institutions that have to quote in the final report.

2. In Website of MEFWA http://www.moe.gov.al in the menu "Environmental Reports " there are 4 reports on the environmental situation in the years 2003/2004, 2005/2007, 2008 and 2009. In these reports reflected the state of GHG by type. The information for GHG isn't complete. This happens for several reasons. The most important of this reasons are lack of equipment for the entire country; the lack of certified specialists, etc.

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Appendix

Abbreviation	The full name
ACR	Albanian Chrome Company
ALBPETROL	Albanian Petrol
APC	Albanian Petroleum Company
CIS	Computer Information System
CP	Climate Profile
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
EP	Economic Profile
EU	European Union
FNC	First National Communication – Albania
GDP	Gross Domestic Production
GEF	Global Environment Facility
GHG	Green House Gas
GHGS	Green House Gas Sector
IMF	International Monetar Found
GP	Geographic Profile
INEWE	Institute of Energy, Water and Environment
INSTAT	Institute of Statistics – www.instat.gov.al
IPCC	Intergovernmental Panel Climate Change
KESH	Albanian Power Corporate
ktoe	Kilo ton oil equivalent
LUCF	Land – Use Change and Forestry
MEFWA	Ministry of Environment Forests and Water Administration
METE	Ministry of Economy, Trade and Energy
MF	Ministry of Finance – www.minfin.gov.al
MPCSSHB	Ministry of Labour , Social and Parity Chance – www.mpsc.gov.al
Mtoe,	Million ton oil equivalent
NANR	National Agency for Natural Resources- www.akbn.gov.al
NGO	Non Governmental Organization
PP	Population Profile
RES	Renewable Energy Sources
SEE	South East Europe
SNC	Second National Communication - Albania
SO	Systematic Observations
SoE	State of Environment report
TIA	Tirana International Airport
UNDP	Unite Nations Development Program
UNFCCC	Unite Nations Framework Convention Climate Change
WHO	World Health Organization