



**Republic of Albania
Ministry of Environment,
Forest & Water
Administration**



**United Nations
Development Programme**

NATIONAL STRATEGY FOR IMPROVEMENT OF THE NATIONAL GHG INVENTORY

ALBANIA

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Outline of the strategy

1. Background and context.....	5
2. Baseline for Albania’s GHG inventory	7
2.1. Availability of Albania’s GHG inventory	7
2.2 Scope of the inventory	7
2.3 The methodological approach.....	8
2.4. Data sources.....	8
2.5 Base year and time series.....	8
2.6 Quality indicators of Albania’s GHG inventory.....	9
2.6.1 <i>Completeness</i>	9
2.6.2 <i>Accuracy of inventory</i>	9
2.6.3 <i>Transparency of inventory</i>	9
2.7 Main highlights from Albania’s first GHG emissions inventory, 1994.....	10
2.8 Key sources.....	11
3. Challenges that have faced the GHG inventory preparation process	11
3.1 Technical constraints	11
3.1.1 <i>Lack of disaggregated activity data or inconsistency with IPCC format</i>	11
3.1.2 <i>Most of emission factors do not reflect Albanian situation</i>	13
3.2 Methodological constraints.....	13
3.3 Institutional and administrative constraints	13
3.4 Resources	14
3.5 Public awareness.....	14
4. Scenarios for the quality of inventory	15
5. Business – as - usual scenario for the inventory quality	15
6. Optimistic scenario for inventory quality	16
7. The Strategy	17
7.1 Objectives of the GHG improvement strategy	17
7.2. Timeline of the strategy	17
7.2.1 <i>The short-term strategy</i>	17
7.2.2 <i>The medium-term strategy</i>	18
7.2.3 <i>The long-term strategy</i>	19
7.3 Action plan for implementation of the GHG improvement strategy	19
7.4 Reviewing and updating of the strategy	20
References.....	21
Annex I.....	22
Annex II	23

Acronyms

BAU	Business-as-usual
CCU	Climate Change Unit
CDM	Clean Development Mechanism
CoP	Conference of the Parties
EF	Emission Factor
EU	European Union
FNC	First National Communication
GEF	Global Environmental Facility
GHG	Greenhouse Gas
INSTAT	National Institute of Statistics
IPCC	Intergovernmental Panel on Climate Change
IPCC GPG	Intergovernmental Panel on Climate Change Good Practice Guidance
LUCF	Land Use Change and Forestry
MDGs	Millennium Development Goals
MoE	Ministry of Environment
NAE	National Agency of Energy
NCSA	National Capacity Self - Assessment
NCSP	National Communication Support Program
NSSSED	National Strategy for Socio – Economic Development
PSC	Project Steering Committee
QA/QC	Quality Assurance/Quality Control
SNC	Second National Communication
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change

1. Background and context

An emissions and removals inventory is a comprehensive listing, by source, of specific emissions and sinks, and covers a specific geographic area for a specific time interval. On a larger scale, the inventory may estimate all Greenhouse gas (GHG) emissions for the country for a certain number of years. GHG emissions and removals by sinks inventory is a data intensive exercise.

At international level a GHG inventory is necessary for the reporting to the United Nations Framework Convention of Climate Change (UNFCCC). At national level it is needed for the purpose of developing strategies GHG mitigation. More accurate inventories enable countries to identify major sources and sinks of GHGs with greater confidence, and thus to make more informed policy decisions with respect to appropriate response measures. National GHG inventories can have uses beyond Convention reporting obligations. For example, the Land Use Change and Forestry (LUCF) sector is closely linked to the issue of sustainable development of natural resources. Developing goals for sustainable development of natural resources requires information about the current state of the resource, trajectories of possible future changes in the resource, and potential ways to manage the resource to reach a desired outcome. A national GHG inventory can provide data on the current resource, as well as information to identify activities that are reducing or increasing carbon stocks and thus degrading or enhancing the state of resources. Producing a GHG inventory for the LUCF sector also provides information for developing baselines and helps in developing appropriate land management practices and indicators (e.g. changes in carbon stocks on land)

An national emission inventory could contain but is not limited to the following information:

1. Tables of emission estimates by source category with emissions expressed in mass/year;
2. Background information including the reasons for compiling the inventory;
3. Geographic area covered by the inventory (e.g., certain regions or the entire country, in the case of a national GHG inventory prepared for a country's National Communication);
4. Base year of calculations and/or time interval represented by the emissions inventory;
5. Activity data (for example, fuel consumption, human or animal population, industrial, agricultural, or economic data) used to estimate and allocate emissions;
6. Emission factors;
7. Energy balance;
8. Other background data (e.g., a factor that expresses the CH₄ content of the coal);
9. Methodology used for calculations (e.g revised 1996 Intergovernmental Panel on Climate Change (IPCC), IPCC Good Practice Guidance, CORINAIR);
10. Key sources of emissions;
11. Information on data gaps;
12. Level of uncertainty;
13. A thorough documentation of the inventory that is provided to the reader;
14. Additional text that is not provided to the reader (as an Annex).

In its most basic form, an emission or removal estimate of a specific source is calculated as follows:

$$\text{Emission estimate [Gigagrams GHG/year]} = \text{Activity data} \times \text{Emission factor}$$

An emission estimate may be further refined using other factor(s), such as a factor to express the CH₄ content of the coal, or a conversion factor.

In reporting on national GHG inventory, it is important to recall the relevant provisions of the UNFCCC Convention and decisions of its Conference of Parties (CoP) as a background and to set the

scene for the provision of inventory information. Article 4, paragraph 1, and Article 12, paragraph 1, of the Convention, are relevant to reporting of national GHG inventory information.

The CoP adopted the guidelines for the preparation of initial national communications at its second session, by decision 10/CP.2. These guidelines were used by 106 non-Annex I Parties to prepare their initial national communications. At its fifth session, the CoP initiated a process to revise those guidelines. The UNFCCC guidelines, as adopted by the CoP, at its eighth session, by decision 17/CP.8, are the outcome of that process (see Annex I).

According to the 17/CP8, *Paragraph 6*, each non-Annex I Party shall, in accordance with Article 4, paragraph 1 (a), and Article 12, paragraph 1(a) of the Convention, communicate to the CoP a national inventory of anthropogenic emissions by sources and removals by sinks of all GHG not controlled by the Montreal Protocol, to the extent its capacities permit, following the provisions in these guidelines.

According to the 17/CP8, *Paragraph 7*: Non-Annex I Parties shall estimate national GHG inventories for the year 1994 for the initial national communication or alternatively may provide data for the year 1990. For the second national communication (SNC), non-Annex I Parties shall estimate national GHG inventories for the year 2000. The least developed country Parties could estimate their national GHG inventories for years at their discretion. According to the 17/CP8 non-Annex I Parties should use the *Revised 1996 IPCC Guidelines for National GHG Inventories* (IPCC 1996 Revised Guidelines) for estimating and reporting their national GHG inventories.

Non-Annex I Parties are encouraged to apply the *IPCC Good Practice Guidance (IPCC GPG) and Uncertainty Management in National GHG Inventories* to improve transparency, consistency, comparability, completeness and accuracy in their GHG inventories. Non-Annex I Parties are also encouraged, to the extent possible, to undertake any *key source* analysis as indicated in the IPCC GPG to assist in developing inventories that better reflect their national circumstances and to improve inventories in the most cost-effective manner.

A key source category is one that is prioritized within the national inventory system because its estimate has a significant influence on a country's total inventory of direct greenhouse gases in terms of absolute level of emissions or trends in emissions, or both.

Inventory work can be viewed as cyclical, where the same procedures are basically repeated, while regularly being reviewed and updated, if required, and more recent activity data are entered. The fundamental principle for improvement of GHG Inventory is the cyclical nature and is shown in Figure 1.

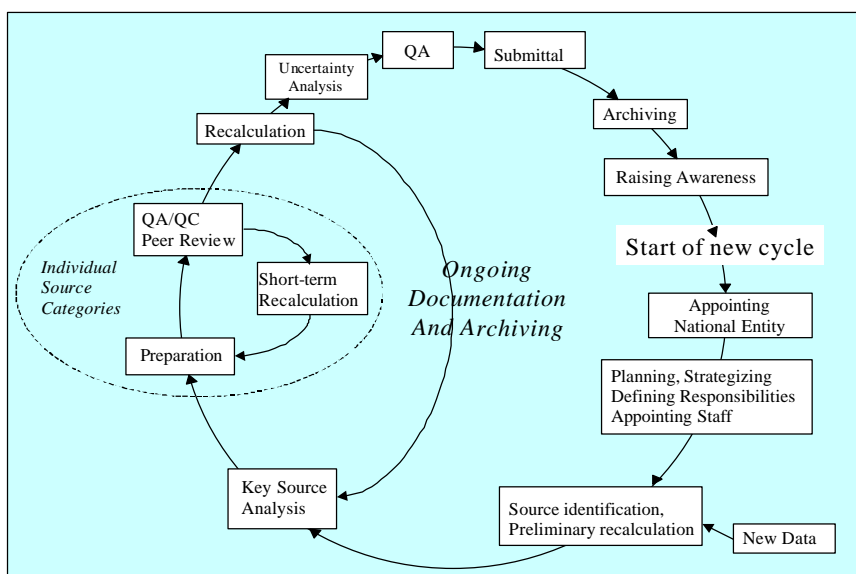


Figure 1: Nature of Inventory Process

One of the expected outputs of the regional project on: “Building capacities to improve the quality of the GHG inventories in East Europe and CIS” is the development of the National Strategy for the Improvement of the GHG Inventory”. Information on the baseline situation for Albania’s inventory is provided before moving to the strategy as following:

2. Baseline for Albania’s GHG inventory

2.1. Availability of Albania’s GHG inventory

The first national GHG emission inventory by sources and sinks for Albania is performed in the frame of the UNDP-GEF project namely “Enabling Albania to prepare its First National Communication (FNC) as a response to its commitment to the UNFCCC”. It is part of the Albania’s FNC and remains as a key component of it. The preparation of the Albania’s first GHG inventory started in early 1999. The first draft of it was available in 2000 and the final draft was available in 2001.

UNDP-GEF has funded a regional project, namely “Building capacities to improve the quality of the GHG inventories in East Europe and CIS”. The project involves 12 participating countries where Albania is one of them. The project started in mid 2003 and its duration is 3 years. The project is using a regional programmatic approach developed to build capacity for improving the quality of data inputs to national GHG inventories, using the IPCC GPG for cost-effectiveness. The project will build on the expertise gained during the preparation of the initial National Communication. By strengthening institutional capacity to prepare inventories and establishing a trained, sustainable inventory team, the project will help countries to reduce uncertainties and improve the quality of inventories for subsequent National Communications. This, in turn, will allow countries to improve national strategies for reducing GHG emissions.

GEF has provided funding to undertake a stocktaking exercise on climate change activities carried out in Albania with the main purpose to design the project proposal for the SNC to the UNFCCC. After the successful completion of a stakeholder consultation process, which ended up with the submission, and approval of the project proposal from UNDP-GEF, in March 2005 Albania started the Project on the SNC to UNFCCC. An inventory of GHG emissions and removals by sinks will be estimated under this project. The inventory base year will be the year 2000 as indicated in the new guidelines 17/CP8. Times series 1990-2000 will be developed under the SNC.

2.2 Scope of the inventory

Albania’s first GHG inventory covers all sources and sinks as well as all gases as mandated by 10/CP2. Albania’s first GHG inventory considers five main modules such as *energy, industrial processes, agriculture, waste, LUCF*, as guided by IPCC revised 1996. It considers *Solvents* category as well. The national inventory considers three direct GHGs such as: CO₂, CH₄ and N₂O and three indirect GHGs such as: CO, NO, and *NMVOG*. Estimates of *key sources* are provided as well. Also aggregated GHG emissions and removals expressed in CO₂ equivalent are provided. In addition, indicators such as *CO₂/GDP* and *CO₂/Capita* are estimated mainly for comparability purposes.

Albania’s GHG inventory reports on: methodological approach used; data sources; data gaps; quantitative assessment of the uncertainty level; constraints and problems that have faced this exercise as well.

2.3 The methodological approach

The GHG Inventory is reported according to the UNFCCC guidelines (decision 10/CP2) for National Communications from Parties not included in Annex I of the Convention. Also new guidelines, which were at draft form at that time, are taken into consideration in most cases. The estimates of GHG emissions and sinks are developed according to the 1996 revised IPCC Guidelines. In addition the IPCC GPG is used for the uncertainty assessment and key source estimates. Also CORINAIR is referred for the solvent category.

Methods elaborated for Albania's GHG inventory are "Tier 1" and "Tier 2". Emissions of *carbon dioxide* released from energy & transport, are estimated by using of two approaches: *top-down* and *bottom-up* approach. According to the first approach, CO₂ emissions are estimated for each fuel type, based on the total national consumption¹, and then the values are summarized (top-down). According to the second approach, emissions for each sub-sector and source category are estimated, and then emissions are also summarized (bottom-up). Through the application of both approaches the team was able to judge on the fuel spectrum of the carbon dioxide emissions (top-down), and the distribution according to the economic sectors (bottom-up).

2.4. Data sources

All *activity data* for Albania concerning each sector are national. The main data sources were INSTAT², line Ministries, Research Institutions, Academia, prior and ongoing activities at that time. Notably they are: National Agency of Energy, Ministry of Environment, Ministry of energy and Economy, Ministry of Transport, the National Directorate of Forestry, Taxation Department, Costumer Offices and different data bases, surveys and studies prepared by International organizations (like the World Bank, UNDP, EBRD, EIB and etc), Universities and different NGOs.

Although INSTAT is the main data producer and disseminator unfortunately it has not been provided with the status and resources to influence other data producers.

Inventory estimates are not based in any calculated method (based in other countries estimates), but they are real figures collected by GHG inventory team. Data include also *emission factors*, which most of the cases are default factors provided by IPCC 1996 Revised Guidelines. Exception is made in one case only. This is a national emission factor already used for fuel burned in small industrial boilers.

2.5 Base year and time series

According to the UNFCCC Decision 17/CP.8 "non-Annex I Parties shall estimate national GHG inventories for the *base year* 1994 for the initial national communication or alternatively may provide data for the year 1990. For the SNC, non-Annex I Parties shall estimate national GHG inventories for the year 2000.

Estimates for Albania's first national GHG inventory are made for the base year 1994. *Time series* (1990-1994) are used for the category of CO₂ emissions from fuel combustion as a very significant one.

¹ The data on national consumption are taken from the national energy balance

² National Institute of Statistics

2.6 Quality indicators of Albania's GHG inventory

2.6.1 Completeness

Albania's first GHG inventory covers all sources and sinks, all gases and sectors as guided by 10/CP.2 and indicated into the Revised 1996 IPCC Guidelines for National GHG Inventories.

2.6.2 Accuracy of inventory

Accuracy is a relative measure of the exactness of an emission / removal estimate. Usage of both *top-down* and *bottom-up* approaches for CO₂ emissions from energy and transport enabled the inventory team to estimate the difference between two approaches. Estimates show the difference between the two approaches is about 3.01%.

The overall *uncertainty* estimated for the Albania's first GHG inventory is 19.24% where the CO₂ equivalent emissions from *fuel wood* category contribute with 80%. This comes especially from the large degree of uncertainty of activity data for this subcategory.

The most significant share of the combined uncertainty for CO₂ emission belongs to LUCF with 13.50% followed by transport with 4.39%, and stationary fuel combustion, energy industries, manufacturing industries and construction which makes 3.79%. Other sectors have much lower contributions, because also their contribution in CO₂ emission is relatively small compared to CO₂ emission of above-mentioned groups. Estimates show a total uncertainty of 15.10% for CO₂.

The uncertainty for CH₄ emissions comes mainly from sector of enteric fermentation with a share of 42.88% against the total of 52.13%. However CH₄ emissions have low impact to the overall national uncertainty because of its very small value.

The main sources of uncertainty for N₂O are respectively the categories of stationary fuel combustion, energy industries, manufacturing industries and construction with a value of 353.59% of the combined uncertainty. However estimates show that N₂O emissions have very low impact to overall national uncertainty because of its very small value.

A technical *peer review* of the Albania's GHG emission inventory is made available thanks to the UNDP-GEF National Communication Support Program (NCSP). The feedback received from the review even though very positive has improved its quality too much.

2.6.3 Transparency of inventory

Transparency means that methodologies, assumptions, data, emissions factors, used for inventory estimates should be clearly explained and documented in order that users of GHG inventory report can evaluate the information, re-make calculations and get the same results.

The Albania's first GHG inventory includes significant information in methodologies, assumptions used, sources of activity data, emission factors, data gaps, level of uncertainty and key sources. Inventory excel sheets are not included in the report but are archived. A detailed GHG inventory report, which includes the manual of procedures, is also being developed under the UNDP-GEF regional project: "Building capacities to improve the quality of the GHG inventories in East Europe and CIS". A more detailed archiving of the documented activity data sources and emissions factors and their sources is under the development process.

2.7 Main highlights from Albania's first GHG emissions inventory, 1994

A relatively low level of GHG emissions is highlighted [7,061.45 Gg]. The main reason of that low level of emissions is explained due to the fact that 94 % of electric power is generated by hydro sources. Also a relatively low level of CO₂ emissions per capita (1.97 ton/capita) and high level of emissions per GDP is found (2,437 ton/Million USD).

Estimates show that the main source category of GHG emissions in Albania for 1994 is energy sector, which accounts for 44% of the total. (see figure 5). This category does not include forestry (fuel wood), which is found to be also a source of emissions, due to the bad management of forests, contributing by 21% to the total. Also the estimations indicate that in 1994 the CO₂ was the main GHG in Albania, with the share of 65.33%. The share of CH₄ and N₂O are respectively 30.49 % and 4.18 %. Total CO₂ equivalent for the year 1994 was 7061.45 Gg. The most significant source of GHG emissions in Albania is CO₂ from fuel combustion. (See figure 2, 3 & 4). For the year 2000, the above figures are expected to change from the quantitative point of view (most probably to be increased) but there are not expected qualitative changes (i.e. there are expected likely the shares).

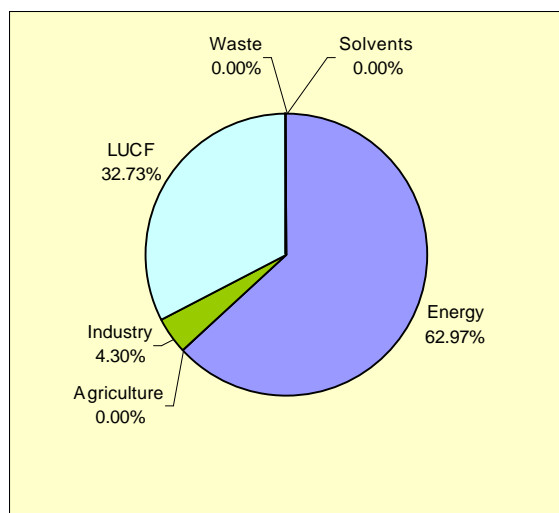


Figure 2: CO₂ emissions from economic sectors [4604.84 Gg], 1994

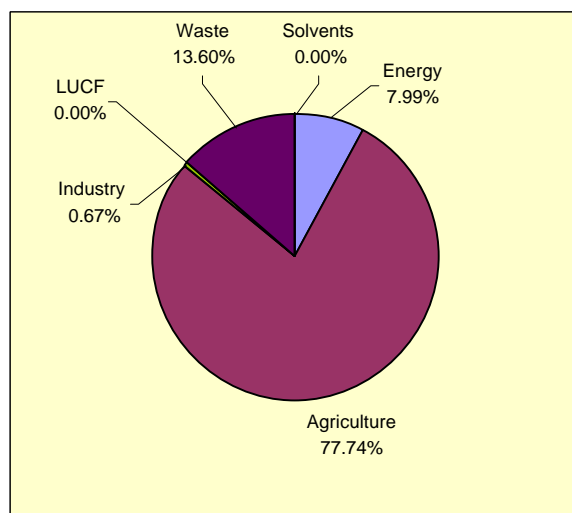


Figure 3: CH₄ emissions from economic sectors [102.492 Gg], 1994

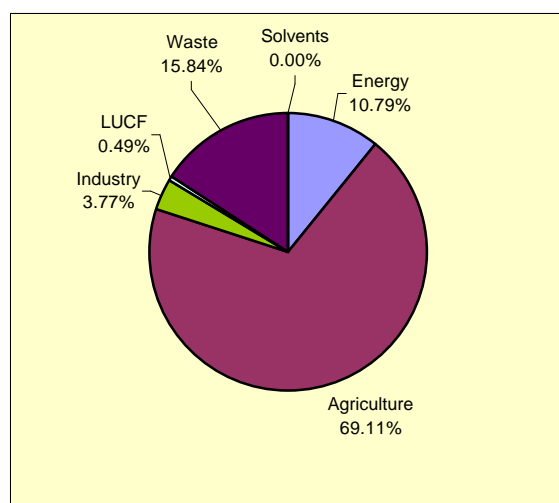


Figure 4: N₂O emissions from economic sectors [0.9538 Gg], 1994

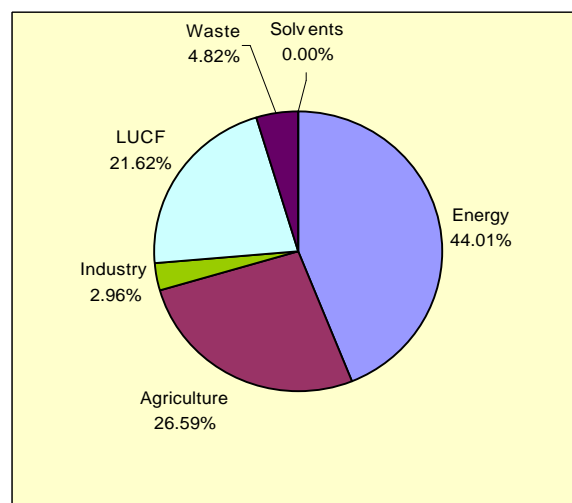


Figure 5: CO₂ (eqv.) emissions from economic sectors [7054.855 Gg], 1994

2.8 Key sources

Based on IPCC GPG and Uncertainty Management in National GHG Inventories, key sources of Albania's first GHG emissions inventory for 1994 are estimated. In the course of preparation of the national GHG inventory, this method, which prioritizes quantitatively the key sectors according to their contribution to the global warming, was made available through the PDF B of the regional UNDP-GEF project: "Building capacities to improve the quality of the GHG inventories (East Europe and CIS)". The *main key sources* for the base year –1994 ([see Annex II](#)), are the following:

1. CH₄ -- from enteric fermentation -- 22.49 %;
2. CO₂ -- from woody biomass burned for energy -- 21.40 %;
3. CO₂ -- from fuel combustion in industry -- 14.24 %;
4. CO₂ -- from mobile combustion -- 11.24 %.

The first, third and fourth key sources are addressed in the frame of the regional project: "Building capacities to improve the quality of the GHG inventories (East Europe and CIS)".

3. Challenges that have faced the GHG inventory preparation process

Preparing Albania's GHG inventory for the first time was a complicated and lengthy task. Being learning-by-doing exercise, this process involved many experts, stakeholders, and fundamental decisions about methodologies, assumptions, conversion factors, activity data and emission factors. It also involved a network of contacts to collect and review activity data, as well as a framework for its management, quality assurance, technical peer review, documentation, and archiving. Being the first inventory where the output was not known it has been passing through several major short-term iterations that have not just involve data improvements, but also the removal or addition of entire source categories that were previously over- or under estimated.

A significant number of constraints/problems have faced the inventory development process for Albania is also identified. They are of technical, methodological, institutional, and resources nature and remain as areas of future interventions and improvement. There is also a constraint that is cross cutting the process such as public awareness.

3.1 Technical constraints

As per the technical constraints, the *activity data gaps* due to (availability, variability, reliability) are highlighted. The technical problems and constraints identified relate to the availability, reliability and variability of activity data and emission factors. Specifically, they are identified as follows:

3.1.1 Lack of disaggregated activity data or inconsistency with IPCC format

In many cases, activity data reported for different sectors/sub sectors are very aggregated or inconsistent with the IPCC format, which makes the estimation of the emissions very difficult. This becomes a significant problem when source categories to which disaggregated data could not be obtained are identified as key ones. The following are the problems identified regarding the data gaps:

- *Activity data for the category of mobile combustion (Energy /Transport)*. This category is identified as key source of regional significance. Activity data for this sector are characterized from variability among 90's. Activity data for this sector exist in the form of total figures for the sector as a whole. After 1990, the transport sector is characterized by a rapid development. In terms of fuel consumption this sector has the biggest share. Activity data exists in aggregation form for the sector as a whole but there is a need for disaggregating them according to the modes of transport such as road (cars, buses, trucks, motorbikes), rail, sea and air for the years other than 1994. The source of the above activity data is Albanian Energy Balance prepared from the National Agency of Energy. Concerning activity data for the year 2000 in transport sector there exist only total figure of fuel consumption from transport sector. Activity data for the sub-sectors like road, rail, water navigation and air does not exist. The same situation almost exist for fuel

division between road transport modes like: cars, light duty trucks, heavy duty trucks, buses and motorcycles, due to the big changes occurred in the transition period in the transport sector.

- *Activity data for fuel consumption the industry sector (Energy).* The data exist for 1994. These activity data had been provided from Albanian Energy Balance prepared from the National Agency of Energy. There is a need for activity data on this category for years other than 1994, because the activity data for 1994 do not reflect the drastic structural changes among industrial sub-sectors. With regard to activity data for the industry sector (fuel consumption), for years other than 1994, only the total figures for the sector as a whole exist, but no divisions as per sub-sectors.
- *Activity data for CH₄ emissions released from coal mining (Energy).* These emissions are primarily a function of coal rank and depth, as well as other factors such as moisture. If two coal seams have the same rank, the deeper seam will hold larger amounts of CH₄ because the pressure is greater at lower depths, all other things being equal. As a result, most CH₄ released to the atmosphere from coal mining is assumed to come from underground rather than surface mining. Almost all-Albanian coal mining is underground ones. Coal production was reported in energy balance of 1994. But for the year 2000, since Albanian coal industry is privatized coal production almost is not reported along with other activities like coal enrichment plants. Therefore, it is very important to get new ways for gathering or estimating coal production for the year 2000 from underground and surface mining.
- *Activity data for emissions from oil and natural associated gas production (Energy).* This category was reported in energy balance of 1994. It remains a problem for the year 2000, since Albanian oil and gas industry is undergoing its depletion period, therefore a big number of wells are out of working and oil and natural gas transportation pipelines are amortized.
- *Activity data for emissions released from fuel wood burned for energy purposes. (LUCF).* This category comprises the most significant share [79.23%] to the overall uncertainty estimated for the GHG inventory (the total value of uncertainty is estimated to be 17,03%). There are no official data on fuel wood consumption for years other than 1994. For other years what is already known is that the historic strong position of fuel wood even though reduced compared with the year 1994, is still prevailing, especially in rural areas where a large source of fuel wood is provided by illegal cuttings but not yet reported officially.
- *Activity data for the category enteric fermentation (Agriculture)* – This category is identified as key source of regional significance. In addition it is in the top of the key sources by (22.49 %). Activity data for this category are very fragmented because after 90's following the destruction of the state livestock farms, agriculture cooperatives and afterwards their privatization, the livestock breeding shifted from intensive to extensive.
- *Activity data for solid waste treatment (Waste)* – This category is identified as key source of regional significance. Albania has a unique system for handling wastes. No proper management like land filling or wastewater treatment is made up to date. Solid wastes are only deposited in open dumps without any prior treatment and division according to their composition. Activity data for such a category are fragmented because municipalities do not report frequently. Also disaggregating of activity data for wastes is needed according to IPCC nominations for this sector according to their composition and net calorific value. For the year 1994 National Waste Management Plan for Albania was used as activity data source. For the other years, including the year 2000, it is very important to check registers of all main municipalities and as well as others studies. Also evaluation of the shares for each component is very important.
- *Activity data gaps for industry sector (Industry).* They are related with data on lime production especially for the years after 1994, when this industry is totally privatized and due to increase of big number of small lime production enterprises. In Business Register and NACE for the classification for lime production are missing data concerning informal economy even in this industry branch.

3.1.2 Most of emission factors do not reflect Albanian situation

There is a growing consensus among Albanian experts that default emission factors used for emission estimation do not represent the Albanian actual situation. Except of two cases when country specific emission factors are used, in all other cases the default factors are utilized. There is a need to generate at least regional emission factors.

They are identified for sectors like *transport* (lack of disaggregated activity data according to the modes of transport), *industry* (activity data for fuel consumption for years other than 1994 – due to their variability among '90), *traditional biomass burned for energy purposes* (mainly data which falls under rural area –fuel wood self-collection). A relatively low level of climate change related awareness remains as a concern as well.

3.2 Methodological constraints

Methodological constraints mainly consist on the following:

- Discrepancy of the national classification of forests versus to that of IPCC³;
- IPCC do not reflect the case of burning waste or open dump (Albania case);
- IPCC do not provide any methodology for solvents category⁴.

3.3 Institutional and administrative constraints

The above-identified technical problems are related with *lack of institutionalization* and *legal framework* to enforce relevant state and especially private sector for data provision. Some branches of economy in Albania have been privatized since 1992. Multiplex forms of ownership of economy, the reduction of state intervention to inner life of enterprises, braking into small pieces of biggest enterprises to be ready for privatization process, made impossible the data collection by the old way (exhaustive). The transition period was accompanied with a decline of centralized statistical information received from public sector, as well as with the distortion of some centralized structures of the statistical system and the missing of data from private sector. As described above it, is very important to have a legislative framework in order to force private entities to regularly report data on their activities.

Due to the lack of institutionalization of this process, *a weak cooperation* with national institutions for getting the necessary data is identified. Sometimes it was difficult to get the necessary data, free of charge from relevant institutions.

Another constrains remains the *lack of permanent staff* for inventory preparation. The lead agency⁵ responsible for the GHG inventory preparation is the Climate Change Unit/Program, which relies upon the responsibility of the Ministry of Environment of Albania. The Unit/Program is established since 1998 when the GEF provided the funds for the FNC. Having the capacity of the UNFCCC Focal Point, this Unit is responsible for the implementation of the UNFCCC. Up to date, the Unit/Program has mainly worked in project-based approach⁶.

Albania's FNC, funded by UNDP-GEF is the first accomplishment of the Climate Change Unit/Program. The Technology Needs Assessment is another UNDP-GEF funded project already completed and followed by the Stocktaking exercise for the preparation of the project proposal for the SNC. The Unit/Program is chaired by the Manger of the Climate Change Enabling Activities who will also supervise the regional project for GHG inventories at the national level and will ensure the

³ A national nomination is designed for such category (fruit trees are included).

⁴ CORINAR classifications are utilized for such a category.

⁵ The designation "lead agency" implies that the agency has overall responsibility for the inventory and that the agency carried out most, or all, of the following duties: co-ordination/compilation of national inventory; archiving of relevant national data; periodic updating of the inventory; documentation of selection process for national activity data, emission factors, and other conversion factors; documentation of methods and assumptions used; validation of conversion units and other data; verification of inventory estimates; compilation of the inventory report; and reporting to international bodies.

⁶ For more information visit the national climate change homepage: [http://: www.ccalb.org](http://www.ccalb.org).

coherence, continuity of the process, use of synergies with other ongoing activities, ensure different stakeholder participation, and makes resource mobilization. A national inventory team leader is appointed. He is responsible for the GHG inventory technical tasks. The organizational chart for the implementation of national communication where GHG inventory is a key component is shown in Annex I. To ensure the country ownership of the climate change activities, a National Project Steering Committee, made of senior officials, is established.

The Climate Change Unit is not funded by the Government funds. It is funded by the UNDP-GEF climate change projects. Government has provided the in-kind contribution for such a Unit like office space, equipment, telephone etc. This constrain relates to the financial ones as the GHG inventories are developed through GEF projects so far.

3.4 Resources

Lack of resources that are identified to be of technical and financial nature is another constrains that have faced the Albania's first GHG inventory exercise. Lack of technical resource in the start of this exercise was significant. It consists on the lack of *previous experience* on preparation of GHG inventories and therefore lack of a trained national team. As per the financial resources, lack of appropriate *financial resources* for development of methodologies to fill data gaps, which does not exist or when exist in aggregate form, is another constraint.

3.5 Public awareness

Public awareness is a constraints that crosscut all other constrains identifies and analyzed. Despite the increasing public awareness regarding environmental issues in general, the issue of climate change in Albania is still relatively dormant, even the level of policy makers does not have a very good understanding of the climate changes and related issues.

The preparation of the Albanian's FNC to the CoP of UNFCCC is the first step in the fulfillment of the country's commitments under the UNFCCC. These comprehensive results of the conducted work under the frame of this document show that raising awareness and the level of education and training on that issue is very important, in order to expect effective implementation of the Climate Change Action Plan and meeting obligations to the convention.

Prior to the start up of the GEF project on National Communication not any public awareness activities have been organized in Albania. Although the raising of public awareness is not the immediate objective of the GEF project on National Communication the process for the preparation of the FNC has positively contributed to awareness among all stakeholders.

The preparation process of the FNC has also contributed to the enhancement of general awareness and knowledge on climate change -related issues in Albania; strengthening of the dialogue, information exchange and cooperation among all relevant stakeholders including governmental, non-governmental, and academic and private sectors; and building national capacities. The project has provided a permanent mechanism and trained national staff to regularly update different elements of the project, especially the emission inventory.

The project Steering Committee meetings and joint efforts of ensuring the support from the governmental institutions for the project, have served as a way of raising awareness among policy makers who represent different climate change institutions. These policy makers are expected to also provide support for the adoption and implementation of the National Climate Change Action Plan. The workshops organized in the frame of the GEF project on Climate Change have contributed to the same purpose of awareness raising, namely: the project initiation workshop held in March 1999 in Tirana, Albania and the workshop for finalization of the FNC, held in April 2002.

While working with UNDP Albania as the implementing agency for the climate change projects funded by GEF, all climate change project activities were put in align with the UNDP country office policy and mission which consists on reaching the MDGs (Millennium Development Goals) and

responds to other national priorities through the human development approach. Albania is a pioneer country in the preparation of a national MDGs monitoring report in Europe. As a consequence of a participatory process, the GHG reporting is integrated as a part of the MDG reporting system - the main GHG inventory indicators are integrated into the MDGs monitoring indicators, making the MDGs targets and indicators more country specific and measurable. Also the majority of the MDGs are used as a tool /criteria for prioritization of technology needs for GHG mitigation. The Government of Albania is now for the first time including the MDGs into national planning monitoring and evaluating system. In this context, the climate change strategy and related indicators are successfully addressed in the newly adopted National Energy Strategy, which is a part of the NSSED (National Strategy for Socio-Economic Development). This progress came also as a consequence of a broad participatory process and stakeholder consultation. The main lesson learnt from this process is that working with UNDP to mainstream MDGs can help countries to mainstream the GHG inventory and climate change issues under the national planning.

The publication of the main results and findings of the Albania's FNC in the recent Status of Environment Report and inclusion of the Climate Change Action Plan into the revised National Environmental Action Plan are other indicators of a higher level of awareness among the environmental policy makers. The establishment of the National Climate Change Web Page has played an effective role in awareness rising about climate change.

4. Scenarios for the quality of inventory

Given the above constraints that affect the quality of GHG inventory, the improvement of its quality remains a challenge. With the purpose of forecasting the quality trend of the GHG inventory in Albania two scenarios have been developed for the quality of inventory, namely *business – as – usual* scenario (*BAU*) or (passive scenario) and *optimistic* scenario or (active scenario). The BAU scenario forecasts the quality of inventory under the condition of no rigorous and additional actions and measures to improve the quality of inventory will be taken. The optimistic scenario forecasts the quality of inventory under the condition that rigorous and needed measures to improve its quality will be taken.

Both scenarios have been developed in a qualitative manner by taking into consideration extensive discussions with inventory experts in different forums (national, regional and international).

Some *assumptions* have been made for development of both scenarios. The assumptions made are as following:

1. UNDP-GEF regional project on '*Building capacities to improving the quality of GHG inventory for Europe and CIS*' is under implementation;
2. UNP-GEF project on: "Enabling Albania to prepare its Second National Communication to the CoP of UNFCCC" is under implementation;
3. The Climate Change Unit established under the Ministry of Environment of Albania is the National Authority or Lead Institution responsible for preparation of GHG inventory exercise;
4. Albania will continue to have the status of Non Annex I Party under the UNFCCC.

5. Business – as - usual scenario for the inventory quality

According to the BAU scenario the next inventory will be the inventory to be developed under the SNC project that has started on March 2005. Referring to the Decision 17/CP8 of the CoP of the UNFCCC that provides new Guidelines for preparation of the National Communication from Non-Annex I the new inventory would be compiled for one year, notably year 2000, decided as base year.

The BAU forecasts the *same quality* of the inventory under the SNC as under the FNC. More specifically, the data gaps already identified under the FNC exercise will be still present. Uncertainty

level will stands at same values also. Estimates and data might be somewhere but not documented and archived.

From the point of view of *technical capacities* the team of experts, spread out after the completion of the FNC might not exist anymore. It might be needed to hire new experts and train from the beginning i.e available funds might be needed to train experts again for GHG inventory estimates which is a task that have previously been done under the FNC as well.

Level of awareness on climate change is expected not to be at satisfied levels. That in turn will affect the awareness on the importance of the GHG inventory, which would below as well.

As per the completeness the new inventory will cover all gases. Additional to this would be the group of fluorinated gases as guided by 17/CP8.

6. Optimistic scenario for inventory quality

According to the optimistic scenario the next inventory that will be developed under the SNC Project will have a higher quality. A GHG inventory for more than one year would be developed (1994-2000). The new inventory will contain less data gaps and a lower level of uncertainty. Estimates will be documented and archived along with data and assumptions made. The scope of inventory (gases covered) will be wider as indicated in the 17/CP8. New fluorinated gases would be part of the estimates.

Technical capacities for developing the GHG inventory will be maintained. They will be trained on IPCC GPG and better perform the tasks. A higher level of awareness is expected under this scenario, as it will help on sustainability of this exercise.

The trends below under the figure 6 provide both scenarios “pathways” built in a qualitative way but based on expert judgments, discussions and validations.

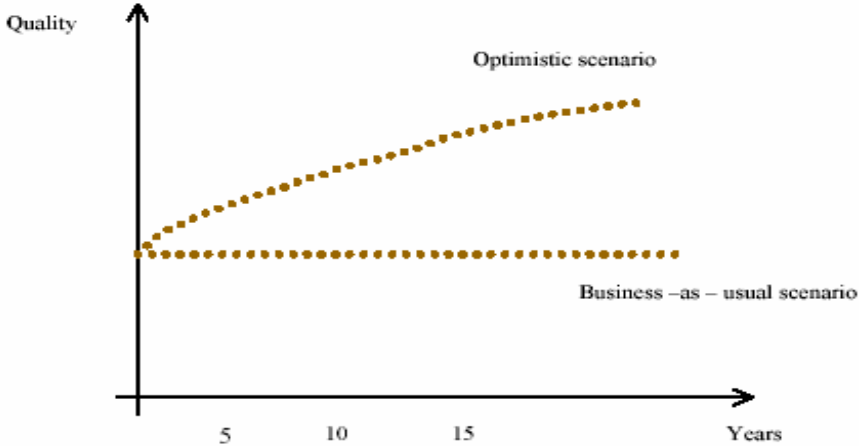


Figure 6: BAU scenario and Optimistic scenario

7. The Strategy

7.1 Objectives of the GHG improvement strategy

The strategy proposed is a manner on how we will improve the quality of GHG inventory, by when and with what resources. The strategy consists of its main objectives and a prioritized list of tasks (action plan) for improving the inventory over the short, medium and long term.

The **main objective** of strategy for GHG inventory improvement is to enhance the quality of national GHG inventory by reducing uncertainties, strengthening institutional capacity to prepare inventories and establishing a trained, sustainable inventory team. This, in turn, will allow the climate change team to develop more accurate national strategies for reducing greenhouse gas emissions. In the heart of the strategy stands the *key sources* approach that enables putting of all efforts in the most significant source categories in a cost effective manner.

Specific objectives of this strategy will be:

1. Strengthening of institutional arrangements for compiling, archiving, updating, and managing GHG inventories;
2. Developing and improving methodologies to fill data gaps;
3. Creation of a sustainable inventory process;
4. Enhancing of technical capacity for preparing national inventories;
5. Raising awareness among stakeholders on climate change, which in turn will facilitate enhancing of awareness on GHG inventory importance.

Upon the achievement of such objectives the project will help at the improvement of the overall quality of reporting to the UNFCCC through the National Communication. An improved GHG inventory would bring more accurate mitigation scenarios and furthermore more accurate strategies for GHG mitigation. This will help in turn the CDM process as well.

7.2. Timeline of the strategy

The *short-term* strategy for Albania for improvement of the GHG emissions inventory consist essentially to the work plan developed under the regional project: “*Building national capacities to improve the quality of the GHG inventories*”, and should consider the weaknesses of the initial GHG inventory. The timeline addressed by this strategy is **2004-2006**.

The *medium-term improvement strategy* for future versions of the inventory include consideration of implementation of methodologies and structures developed and proposed under the regional project. The medium term strategy for improvement of inventory for Albania consists mainly to the SNC project work plan developed for inventory exercise. The timeline addressed by this strategy would be **2006 – 2009**. Also the NCSA project is expected to have a significant impact in implementation of this strategy.

Long –term forecasts, **from 2009 to 2020** has some uncertainties. These uncertainties are mainly related to the frequency of submission of the GHG inventories from Parties not included in Annex I, which is an issue to be decided by the CoP of the UNFCCC to come. This is mainly related to the cost of such quality improvements, which remains a key barrier for non-Annex I Parties. Despite of this general policy action will be addressed in order to keep the process of inventory sustained and the quality at high levels.

7.2.1 The short-term strategy

The goal of the *short-term strategy (2004-2006)* is to build upon the inventory work undertaken for first National Communication and rely upon the results / outputs of the regional project on improvement of GHG inventors that is ongoing and expected to finalize its activities by mid 2006.

The short-term strategy is mainly focuses on activity data collection and identification of methods/approaches for reducing the gaps. A data gaps filling plan that can be put into place for SNC is developed. It consists on the development of a soft methodology for filling the gaps that would be implemented during the SNC preparation. The methodology developed under the regional project for filling the gaps consist on the utilization of the following tools:

- *Survey*. This is the most common way to fill the gaps related with activity data for different sectors when they do not exist; Questionnaires will be designed for each source category where a survey will be carried out;
- *Interpolation and extrapolation*, to be used for filling different data gaps when it is possible and gives trusted results. This will be especially used for filling the gaps for time series 1994-2000;
- *Data and inventories* produced under *other internal and international projects* (studies) in the frame of other international agreements where Albania is a Party in the field of environmental protection as well as in the field of energy/transport, agriculture, LUCF, industry and solvents;
- *Other countries experiences* and methodologies proposed under the regional project that is more developed in the field of statistical data related with different sector.

The short-term strategy will also focus on strengthening national arrangements for *compiling, documenting, archiving, updating and managing* GHG inventories. A draft manual, archives of estimates and new improved data will be elaborated under this term. Data for developing time series (1990-2000) will also be collected in order to feed up the SNC exercise for a better and clearer picture of GHG emission trends. Technical and institutional capacity will be sustained and enhanced. Through training activities on IPCC GPG planned under the regional project, the number of GHG inventory experts will grow up at least twice. As a result of this regional inventory project, GHG inventories prepared under enabling activities for subsequent National Communications will be of a higher quality than those prepared under the FNC. A QA/QC plan will be drafted with the purpose of improving the accuracy and quality of the GHG inventory.

In order to keep the momentum created under the regional project, given the eligibility of Albania for GEF funding for preparation of the SNC many of the issues addressed under the regional project will be addressed under the SNC one and deliverables produced will be updated and reviewed. In addition, soft methodology developed under the regional project will be utilized under the SNC. A QA/QC plan will be drafted with the purpose of improving the accuracy and quality of the GHG inventory.

7.2.2 The medium-term strategy

The goal of the *medium-term strategy (2006-2009)* is to build upon the work undertaken under the regional project outputs of the regional project: “Building national capacities to improve the quality of the GHG inventories” in preparation for SNC. The medium –term strategy will be focused on the utilization of resources and capacities developed and generated under the regional project. Additional resources will be utilized in such regard under the project: “Enabling Albania to prepare its SNC to the CoP of the UNFCCC”. To keep the momentum created under the regional project, given the eligibility of Albania for GEF funding for preparation of the SNC, many of the issues addressed under the regional project will be addressed under the SNC and deliverables produced (manual of procedures and archives) will be updated and reviewed.

In addition, *soft methodology* developed under the regional project will be utilized under the SNC. The soft methodology developed under the regional project (short –term strategy) will be utilized under the medium term. Surveys will be carried out for those categories, whose activity data does not exist in disaggregated form and still remain as key sources such as: (i) CO₂ from mobile sources; (ii) CO₂ from fuel-wood; (iii) CH₄ from enteric fermentation. Utilization of data gathered (time series) and improved (through surveys) under the regional project is another action to be undertaken.

The *QA/QC plan* drafted under the short-term strategy (regional project) will be implemented under the SNC exercise. Internal and external peer review will be carried out under the QA/QC process. A

more accurate and improved GHG inventory for the period 1990-2000 will be developed under the SNC at the end.

Efforts to *mainstreaming* climate change into national planning agenda and policy and raising awareness activities under the SNC phase will help to enhance the sustainability of the GHG inventory process. National Communication process in Albania has not only been considered as a tool for reporting to the UNFCCC but also for mainstreaming to national planning process and programming through mobilization of new resources. Due to such efforts the National Energy Strategy has already integrated many findings and outputs from Albania's FNC. Implementation of such strategy anticipates among other measures improvement of the national energy balance and flow of data from regional level to the national one. This will facilitate the energy activity data flow and acquisition for future GHG inventories.

7.2.3 The long-term strategy

In the long term, the process will be mainly focused on institutionalizing of the GHG inventory process. As long as Albania will hold the status of Non-Annex I the GHG inventory would be carried out with the assistance of GEF. The CoP has not yet decided the frequency of submission.

However, with the accession of Albania to EU, the legislation approximation to that of EU will be part of EU integration commitments, among other ones. In this context, Albania's environmental legislation and institutions would intend to be approximated to those of EU. Furthermore GHG inventory related legislation will be part of the climate change related one.

7.3 Action plan for implementation of the GHG improvement strategy

The following matrixes summarize the overall actions needed to implement the GHG improvement strategy. Box 1 shows the actions to implement the strategy in the short term. Time frame, responsible institutions, cost of implementation and monitoring indicators are part of it as well.

Box 1					
Objectives	Activities	Time Frame	Respons. Institution	Cost of Impl. (\$)	Monitoring Indicators
Short-term actions (2004-2006)					
Strengthened national arrangements for compiling, archiving, updating, and managing GHG inventories	Reduce and fill data gaps	'04-'05	CCU/MoE ⁷	25,000	*Time series ('90-'00); *Soft methodology; *Key source inventory
	Document inventory system	'04-'05	CCU/MoE	10,000	*Manual; Archives
	Exchange information within the region	'04-'06	CCU; Regional Project Office; NCSU.	2,000	*Access to regional project website; *Participation to regional workshops
Sustainable inventory process created	Raise awareness on climate change issues and the importance of GHG inventory	'04-'06	CCU, PSC ⁸	2,000	* Outreach materials
Enhanced technical capacity for preparing national inventories	Train of trainers on IPCC Good Practice Guidance	'04-'06	CCU, MoE, NAE	3,000	*Training workshops reports; *Workshops agendas and list of participants *Number of trained experts
	Apply Good Practice Guidance	'04-'06	CCU; Regional Project Office	20,000	* Strategy of GHG improvement; *QA/QC *Peer review of Key sources inventory
Improved Emission Factors (EF)	Test the methodology and EF developed within the region.	'05-'06	CCU	0,000	*Archive of EF

⁷ Ministry of Environment

⁸ Project Steering Committee

	Cost total⁹ \$ 62,000
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Box 2 shows actions to be undertaken under the medium term along with time lines, responsible institutions, the necessary cost and the indicators that would monitor their implementation.

Box 2					
Objectives	Activities	Time Frame	Respons. Institution	Cost of Impl.	Monitoring Indicators
Medium-term actions (2006-2009)					
Improved and documented inventory compiled	Utilize new and improved data (Activity data and Emission factors)	'06-'07	CCU/MoE	55,000	*Survey report *Inventory: '90-'00 *Key sources inventory *Uncertainty reduced
	Document new inventory estimates and data if available	'06-'08	CCU/MoE	10,000	*Updated manual; * *Updated archives
	Exchange information within the region and globally	'06-'08	CCU; Regional Project Office; NCSU	10,000	*Participation to regional/global workshops
	Review of the GHG inventory		CCU; NCSU	10,000	*Internal review report *Peer review report
Sustained inventory process maintained	Enhance awareness on climate change issues and the importance of GHG inventory	'04-'06	CCU, PSC	5,000	* Outreach materials
Enhanced technical capacity for preparing national inventories	Train new experts on IPCC Good Practice Guidance	06	CCU, MoE, NAE	10,000	*Training workshops reports *Training materials *Number of experts increased
				Cost total¹⁰ \$ 100,000	

7.4 Reviewing and updating of the strategy

The above strategy will be subject of revision and update according to the developments at national and international level that affect the climate change issues in general and GHG inventory exercise in particular.

There are some current developments that will affect the GHG inventory improvement process such as: (i) Ratification of Kyoto Protocol from Albania will bring more data and resources to improve the quality of GHG inventory; (ii) Adoption of energy efficiency law from Albania's parliament will bring other secondary laws (by-laws) that in turn will bring more accurate and disaggregated flow of energy data from regions to the central level due to establishment of regional energy agencies; (iii) EU legislation approximation project will bring a formal National Inventory system.

It is always important to stress the need for continuous mainstreaming of climate change issues into national planing and policy. Also raising awareness on climate change issues is critical to the implementation of the strategy. It is a crosscutting action that facilitates the overall GHG inventory preparation and improvement. Synergy with other relevant projects /programs will facilitate the awareness raising process and access into the new data, if available.

⁹ This is the overall funding for Albania under the regional project.

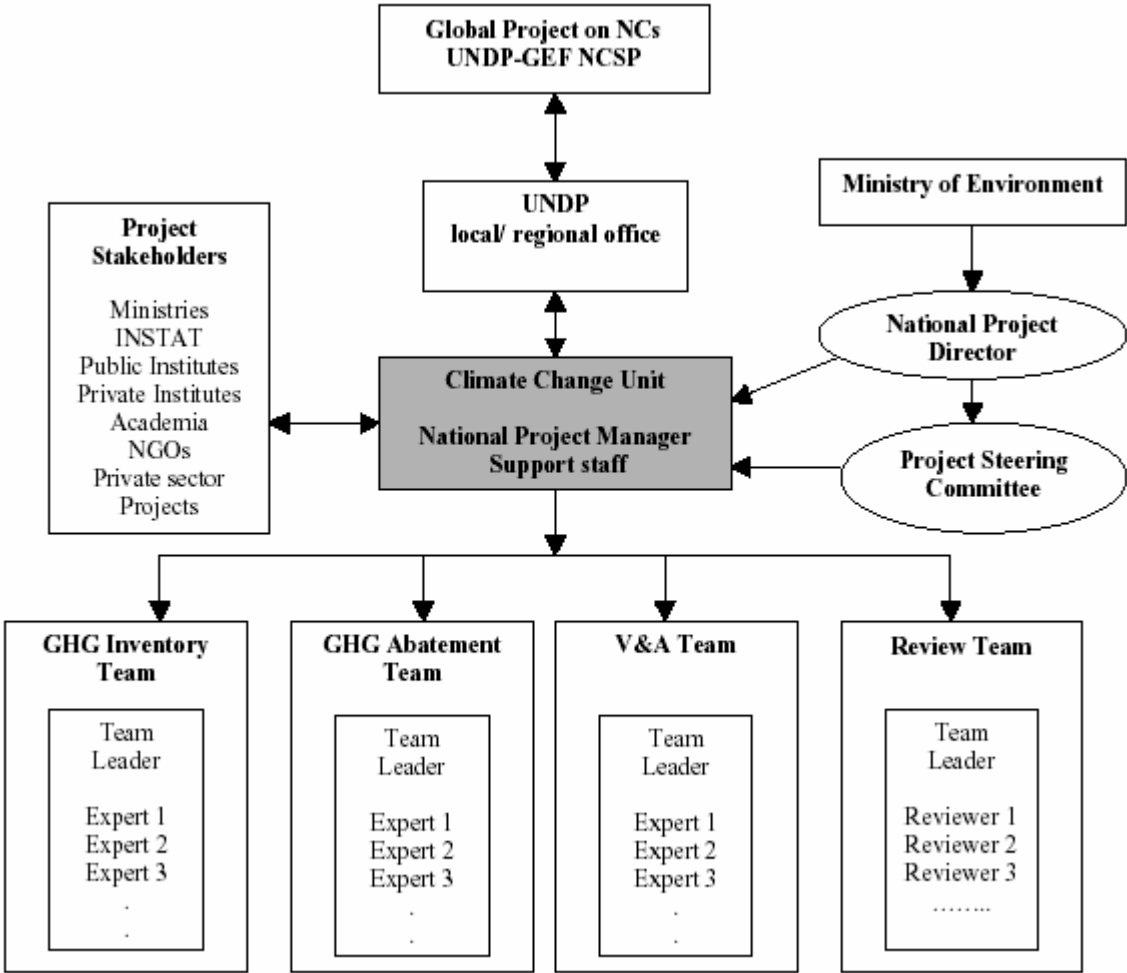
¹⁰ This is the funding available for the GHG inventory exercise to be carried out under the SNC project

References

1. Ministry of Environment of Albania. Climate Change Unit.(2002). Albania's First National Communication to the Conference of Parties of the UNFCCC. <http://unfccc.int/resource/docs/natc/albnc1.pdf> or <http://www.ccalb.org>
2. Ministry of Environment of Albania. Climate Change Unit. National Inventory Report (Draft). <http://www.ccalb.org>
3. Ministry of Environment of Albania. Climate Change Unit. (2003) National Work plan for the UNDP-GEF Project: "Building capacities for improvement of the quality of the GHG inventories, (Europe and CIS)". <http://www.ccalb.org>
4. UNDP-GEF National Communication Support Program Handbook (Final Draft). Managing the National Greenhouse Gas Inventory Process.
5. IPCC (1997). Intergovernmental Panel on Climate Change Revised 1996 Guidelines for National Greenhouse Gas Inventories: Volume 3 Reference Manual. J.T. Houghton et al., IPCC/OECD/IEA, Paris, France (<http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>)
6. IPCC (2000). Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories. Chapter 4. IPCC National Greenhouse Gas Inventories Programme Technical Support Unit, Kanagawa, Japan (<http://www.ipcc-nggip.iges.or.jp/public/gp/gpgaum.htm>)
7. UNFCCC (2002). Decision 17/CP.8. <http://unfccc.int/sessions/workshop/080403/documents/dec17-cp.pdf>
8. UNFCCC Secretariat.(2003) User's Manual for the guidelines on the preparation of the National Communications from Non-Annex I Parties. <http://www.unfccc.int>

Annex I

Institutional framework for National Communication exercise



Annex II

Key source categories, 1994

Box 3			
Key source categories, 1994		%	%
Nr.	Items	Level assessment CO₂ eqv.	Cumulative total CO₂ eqv.
1	CH ₄ -Enteric fermentation	22.49	22.49
2	CO ₂ -Woody biomass burned for energy	21.40	43.89
3	CO ₂ -Fuel combustion in industry	14.03	57.91
4	CO ₂ -Mobile combustion	11.24	69.16
5	CO ₂ -Fuel combustion energy and transformation industries	8.15	77.30
6	CH ₄ -Landfills	4.15	81.45
7	CO ₂ -Fuel combustion in agriculture / forestry / fishing	2.87	84.32
8	CO ₂ -Industrial processes	2.81	87.14
9	CO ₂ -Fuel combustion in commercial / institutional sector	2.61	89.75
10	N ₂ O-Use of nitric fertilizers	2.47	92.22
11	CO ₂ -Forests and grassland convention	2.27	94.48

Key source categories for GHG emissions (year 1994) - Albania