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# Regional Environmental Network for Accession (RENA)

## *INTERIM REPORT THE NATIONAL SYSTEMS FOR GHG REPORTING UNDER THE MMD DECISION*

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## Monitoring mechanism Decision (280/2004/EC) and its implementing provision

RENA Sub-activity 2.2: Building knowledge in the RENA beneficiary countries to improve the GHG emissions inventories in the framework of the MMD

### Interim Report

The National Systems for GHG Reporting under the MMD Decision

June 2012, Zagreb, Croatia

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Report prepared by:  
Ivana **Mijatovic Cernos**/Davor **Vesligaj**/Imre **Csikós**

Expert on Climate Change and Nature/  
Team Leader Climate Component (Working Group 2)  
Team Leader Cross Border Nature Component (Working Group 3 – Nature)

Tel: +31 30 234 02 21  
Mob: +31 6 222 37 882  
Fax: +31 84 745 11 93  
e-mail: [imre@renanetwork.org](mailto:imre@renanetwork.org)  
skype: imre.csikos



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RENA Secretariat: Hulla & Co. Human Dynamics KG; Lothringer Strasse 16, 1030 Vienna (Wien), Austria  
Tel: +43 1 402 50 21 12; Fax: +43 1 402 50 20 20; email: [rena.secretariat@renanetwork.org](mailto:rena.secretariat@renanetwork.org)  
Website: [www.renanetwork.org](http://www.renanetwork.org)

# 1. Introduction

## 1.1 Background

In June 30- July 1, 2011, a regional RENA workshop was held in Skopje on the Monitoring Mechanism Decision 280/2004/EC and its implementing provisions. (Hereafter MMD). The main objective was twofold:

- 1) to provide RENA countries with an overview of reporting requirements under the EU's MMD and its implementing provisions
- 2) to exchange experiences regarding the role of national systems too ensuring the transparency, accuracy, comparability, consistency and completeness of greenhouse gas inventories following IPCC and UNFCCC Guidelines

From the workshop it was concluded that there is a need to start learning with the tools and requirements of the MMD. In particular, it would be beneficial for the countries to develop skills and training on filling in the CRF tables for a selected sector (i.e. Combustion fuel sector).

On 17 and 18 November 2012 a follow-up regional RENA MMD workshop was held in Tirana which concentrated its efforts on methods to collect and interpret data and submission through the Common Reporting Format (CRF) Reporter tool of the UNFCCC and its use in compiling data for the GHG Registries. The MMD itself establishes a mechanism for monitoring all anthropogenic emissions by sources and removals by sinks of GHGs. It enables the implementation of the UNFCCC and the Kyoto Protocol as regards national programmes, GHG inventories, national systems and inventories of the Community and its Member States (MS). Additionally, it ensures the timeliness, completeness, accuracy, consistency, comparability and transparency of reporting by the Community and its MS to the UNFCCC. The training successfully provided:

- *Introduction to the CRF Reporter tool*
- *Overview of Annex I countries experience in using the CRF Reporter (Austria, Croatia, Germany, Romania)*
- *Overview of RENA country state of play regarding GHG emission inventories*
- *How to use IPCC methods to estimate emissions from fuel combustion and fugitive emissions*
- *How to compile national GHG inventory by using the CRF Reporter tool*

The participants were also given two “real-life-medium-difficulty emission estimation” tasks: 1) fuel combustion sectoral approach and 2) fuel combustions reference approach which were successfully accomplished with the assistance of RENA experts.

A key outcome from both workshops was the requirement to develop further and/or improve the national systems in order to ensure the quality of activity data, emission factors and emission estimates in national greenhouse gas inventories. As explained during the workshop, the quality of a GHG inventory depends on a well functioning national system during the planning phase, preparation and management. These would include, among others, the allocation of responsibilities between Ministries and national Agencies; ensuring sufficient capacity for collecting activity data and emission factors as well as for estimating emissions; and, the establishment of a QA/QC Plan.

## 1.2 RENA MMD exercise

In follow-up to the two previous meetings, it has been decided to start a RENA exercise aiming at developing better knowledge and capacity as to gradually improve/increase the technical and institutional ability of the RENA countries to prepare submissions of National Inventory Reports in the framework of the MMD.

As such, the exercise should be seen as a first step that should lead to the following concrete results:

- Result 1: Identified gaps (data quality and availability with focus on institutional and legal aspects)
- Result 2: Gap filling requirements to establish a sound framework for data flow
- Result 3: Recommendations to translate the above into potential national or regional IPA project fiches to address identified gaps

It is expected that the above exercise's focus (until summer 2012) should concentrate more on **improving the process** of the preparation of sound inventories towards a full and harmonised combustion fuel sector GHG inventory using appropriate guidelines and tools. The focus will be on the combustion fuel sector 1A.

In addition to the above the exercise will also include as a result:

- Result 4: Draft list of activities of Annex 1 of the revised ETS Directive (2009/20/EC) in the respective RENA countries.

For each RENA country two Junior Short Term Experts have been appointed in the period between February – September 2012 for maximum 120 working days each to complete below described tasks.

Work started with a kick of workshop in Zagreb to confirm the above. The workshop report is available on the RENA website at [http://www.renanetwork.org/index.php?view=wgroup&groups=wgroups&id\\_group=2](http://www.renanetwork.org/index.php?view=wgroup&groups=wgroups&id_group=2).

The identified and approved experts **should work closely with the respective RENA Climate Coordinators and the National Compilers (UNFCCC NFPs, if applicable)** of the countries. Experts and the RENA countries will indicate to the RENA secretariat a schedule of meetings with the RENA Climate coordinators during the assignment period. This should be done **by 17 February 2012**.

During the assignment, the experts are required to report on progress on **the last date of every month** to the RENA Climate Coordinators and the RENA Secretariat in Vienna ([imre.csikos@renanetwork.org](mailto:imre.csikos@renanetwork.org)).

The UNFCCC NFP/RENA Coordinators have sent official letters to the UNFCCC Secretariat requesting access codes for the CRF Reporter tool, for the training purposes. As soon as this was obtained the experts started preparing the data. It was agreed that Mr Davor Vesligaj will serve as a helpdesk person to assist with all the issues and provide help when required.

### **1.3 The Monitoring and Mechanism Decision (280/2004/EC) and its implementing provisions (2005/166/EC)**

**Decision 280/2004/EC** of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol and Commission Decision of 10 February 2005 laying down rules implementing Decision 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol (Commission Decision 2005/166/EC) set out the details for reporting of anthropogenic greenhouse gas emissions by sources and removals by sinks and for providing information as regards national programmes to reduce emissions, greenhouse gas emission projections and policies and measures in accordance with the provisions under the UNFCCC.

The Monitoring Mechanism Decision (MMD Decision) and the implementing provisions to the MMD (IP) establish a mechanism for:

- (a) Monitoring all anthropogenic emissions by sources and removals by sinks of greenhouse gases not controlled by the Montreal Protocol on substances that deplete the ozone layer in the Member States;
- (b) Evaluating progress towards meeting commitments in respect of these emissions by sources and removals by sinks;
- (c) Implementing the UNFCCC and the Kyoto Protocol, as regards national programmes, greenhouse gas inventories, national systems and registries of the Community and its Member States, and the relevant procedures under the Kyoto Protocol; and
- (d) Ensuring the timeliness, completeness, accuracy, consistency, comparability and transparency of reporting by the Community and its Member States to the UNFCCC Secretariat.

This is done via legal (MMD/IP) and institutional arrangements (national systems).

Article 3 of the MMD Decision indicates the reporting requirements by the Member States:

- Carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>) [TS 1990-t-2]
- Carbon monoxide (CO), sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC) [TS 1990-t-2]
- GHG emissions by sources and removals of carbon dioxide by sinks resulting from land-use, land-use change and forestry (LULUCF) [TS 1990-t-2]
- Information on MS' QA/QC plan, general uncertainty evaluation, general assessment of completeness, and information on recalculations performed

Article 4 of the MMD Decision establishes the Community Inventory System

- The Commission shall adopt by 30/06/06, a Community inventory system to ensure the accuracy, comparability, consistency, completeness and timeliness of MS GHG inventories
- This system shall provide for:
  - a) A QA/QC Programme including quality objectives and a QA/QC Plan
  - b) A procedure for the estimation of data missing from a national inventory
- The European Environment Agency (EEA) shall provide assistance to the Commission for the implementation of the above

Article 8 and 9 of the MMD Decision establishes a mechanism of coordination between EU and Member States:

- Member States and the Community shall ensure full and effective cooperation and coordination with each other in relation to obligations under this Decision concerning:
  - a) The compilation of the EU GHG inventory and inventory report
  - b) The review and compliance procedures under the Kyoto Protocol
  - c) any adjustments under the UNFCCC review process
- The Commission shall be assisted by a 'Climate Change Committee' (WG1)
- MS shall submit national inventories to UNFCCC by 15/04 each year containing information identical to that submitted under the MMD

Commission Decision 2005/166/EC (the Implementing Provisions to the MMD) establishes rules to implement the MMD Decision as regards:

- a) The reporting of information referred to in Article 3.1 of the MMD
- b) The establishment of a Community inventory system in accordance with Article 4.2 of the MMD
- c) The procedures and timescales for the cooperation and coordination of the obligations listed in Article 8.1 of the MMD

## 1.4 CRF Reporter Tool

In an effort to improve the transparency, completeness, comparability, consistency and accuracy of greenhouse gas (GHG) inventories required under the United Nations Framework Convention on Climate Change (UNFCCC), the Conference of the Parties (COP) has adopted reporting guidelines for annual GHG inventories for Annex I Parties. The objectives of the reporting guidelines are to assist Parties in meeting their commitments under the Convention and to facilitate the process of consideration of inventories, including verification, technical assessment and expert review of inventory information. Based on these objectives and in order to continue to improve reporting, the COP adopted the Common Reporting Format. (CRF) as an integral part of the reporting guidelines in October 1999 for a trial period of two years, and adopted revised reporting guidelines including a revised CRF at its eighth session in October 2002 (amended with revised LULUCF section at its ninth session at the end of 2003). Initially, the reporting was facilitated by an Excel-based CRF application. COP 8 requested the secretariat to develop new software for reporting GHG inventories in the CRF as included in the reporting guidelines in order to facilitate Parties reporting of their required annual inventory submissions. In response, the CRF Reporter software was developed.

The CRF Reporter provides Parties with the ability to compile, validate and report GHG emission inventories in a user-friendly and efficient manner, while providing a stable and secure mechanism for electronic and printable GHG emission inventory submissions to the UNFCCC in accordance with the reporting guidelines. It allows Parties (users) to enter and manipulate GHG inventory data in an intuitive manner, by providing a dynamic and partially user-defined interface, while ensuring core data structure and reporting requirements are met. The CRF Reporter is designed to facilitate the generation of CRF tables but not the actual estimation of the GHG emissions. The CRF Reporter can be downloaded at: <http://ghg.unfccc.int/download/crfreporter>. Also, all answers to the frequently asked questions can be found at:

[http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/reporting\\_requirements/items/3901.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/reporting_requirements/items/3901.php).

*A general note for the installation: CRF Reporter 3.5.2 does not support any 64-bit versions of Windows operating systems. Due to a bug in MS Excel 2010, this version of Excel is not supported at the moment.*

The RENA Secretariat has agreed with the UNFCCC that, for the training purposes, the UNFCCC will release a new version of CRF Reporter tool at the end of February 2012 and will send the country access codes, to the UNFCCC National Focal Points (NFP)/RENA WG 2 Climate Change Coordinators.

## 1.5 Main Activities to be carried out in the framework of the RENA

- **Activity 1. RENA Countries shall identify an inventory team for Sector 1A (Combustion fuels)**  
Each RENA country sent the RENA Secretariat CVs of two experts, for which the EU CV template was provided with the note that these experts should not, according to the IPA rules, be civil servants.

Experts will be working on the CFR reporter for Combustion Sector and will also be employed to work on identifying installations/activity as per the ETS Annex I. The work should start from 10 February and would last until 30 September 2012. ToR for experts was prepared in December 2011 by the RENA Secretariat.

The identified and approved experts **should work closely with the respective RENA Climate Coordinators/UNFCCC NFPs** of the countries (see Annex 4). During the assignment, the experts are required to report on progress on the last date of every month to the RENA Climate Coordinators and the RENA Secretariat in Vienna ([imre.csikos@renanetwork.org](mailto:imre.csikos@renanetwork.org)).

The experts and the RENA countries will indicate to the RENA secretariat, a schedule of meetings with the RENA Climate coordinators during the assignment period.

- **Activity 2. Data collection (February – June 2012)**

This part of exercise will focus on the energy balance of each of the RENA countries. Additionally, the experts would focus on identifying the relevant data suppliers/institutions (activity data and emissions factors are required). The work would also concentrate on establishing the framework for data flow. A template will be prepared by RENA on organisational, legislative and institutional framework of the national system and data flow and provided for experts. The description of the national system and data flow would then be submitted to RENA by 29 **February 2012**.

**This has been successfully done.**

- **Activity 3. Installation of CRF Reporter**

In cooperation with the UNFCCC, the countries will obtain a copy of the CRF Reporter for the training purposes. This process will be coordinated between the countries UNFCCC national focal points and the RENA Secretariat for optimum results. The countries will be provided with one copy of the National Compiler software and several copies of the Sectoral Expert software to fill in combustion fuel sector.

**During the February and March 2012, most of the countries have successfully installed the software. Installation of the CRF Reporter tool hasn't been successful for Albania and Kosovo so far, but this problem will be tackled in the coming days and the resolution will be found.**

- **Activity 4. First data imported in the CRF Reporter**

The first draft should be ready by **30 April 2012**, while the data would be exported by CRF tables to the RENA experts for verification purposes and assistance.

**The import of the first data is in progress in all countries.**

- **Activity 5. 2<sup>nd</sup> Meeting in Zagreb to discuss progress** (14 June 2012)

2<sup>nd</sup> meeting will be organised in Zagreb on **14 June** to discuss progress, perform mini review of the data, provide recommendations and identify tasks that still need to be completed.

**The meeting was held.**

- **Activity 6. Completion of work (CRF filled for Sector 1a) by 15 July 2012**

- **Activity 7. Participate in the Regional RENA Workshop in September 2012 (preliminary dates 13-14 September) to present results and identify follow up:**

- a. Presentation of results
- b. Identification of gaps (data quality and availability, institutional, legal)
- c. Gap filling requirements to establish a framework for dataflow
- d. Possibility to translate the above into a regional IPA project fiche

- **Activity 8. Identify list of installations/activities that fall in the scope of ETS (February–September 2012)**

**RENA** will provide the template to be fulfilled for the list of installations for the Phase 3 EU ETS cycle. The list will exclude aviation.

- **Activity 9. Assist in the preparation of IPA Fiches with the RENA assistance (September–November 2012)**

Three guideline documents are essential for the above exercise:

- **Good Practice Guidance** (<http://www.ipcc-nggip.iges.or.jp/public/gp/english/>)
- **UNFCCC CRF Reporter 3.3 User Manual** (<http://ghg.unfccc.int/download/CRFReporter/CRFReporter-v3.3-User-Manual.pdf>)
- **Guidance on Interpretation of Annex 1 of the EU ETS Directive** ([http://ec.europa.eu/clima/policies/ets/docs/guidance\\_interpretation\\_en.pdf](http://ec.europa.eu/clima/policies/ets/docs/guidance_interpretation_en.pdf)).

## 1.6 This report

This report covers the results the description of the national system and data flow which was submitted on **29 February 2012**. (See Activity 2 in paragraph 1.5)

## 2. The Review of National Systems for GHG Reporting

### 2.1 General

Definition of National system, MMD (280/2004/EC):

A national system includes all institutional, legal and procedural arrangements made within a Party for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information.

Parties shall establish, operate and seek to continually improve National system to estimate emission by sources and removals by sinks of all greenhouse gases and to ensure timeliness, transparency, accuracy, consistency and completeness of their greenhouse gas inventory

#### **I. Institutional arrangements**

A brief description of institutions (ministries, agencies, statistical offices) or other entities (public or private) which are responsible for energy data collection, compilation and publication.

#### **II Legal arrangements**

A brief description of the existing and/or planned legislation within the Party related to energy data collection, compilation and publication.

#### **III Procedural arrangements**

A more detailed description on how the energy data are collected and compiled (bottom-up from individual entities, top-down from governmental institutions). This should also provide information on whether the system is centralized (one entity is responsible for all energy data) or decentralized (different institutions and teams are responsible for carrying out work on different subset of energy data). Also, information should be provided whether the system is out-sourced to private consultants, research institutes, academic institutions, etc. Additionally, the procedures for quality control and assurance should be mentioned, as well

as existing capacities for collecting data for regular reporting. The energy data should be publicly accessible or published, which needs to be mentioned.

## **2.2 Overview of National Systems for GHG Reporting**

### **1. Overview of country's national system**

#### **a. Albania**

The key institutions involved in collection of activity data for energy balance are: Albanian Institute of Statistics (INSTAT) and relevant ministries responsible for energy, industry and trade. Other institutions which are involved in activity data collection are: Central Technical Inspectorate (CTI), Energy Regulatory Entity (ERE) and Albanian Power Corporation (KESH).

National energy balance is prepared by the National Agency of Natural Resources (AKNB) and the Ministry of Economy, Trade and Energy (METE).

There are several legal documents that in general stipulate energy statistics in terms of energy data collection and reporting, however none of them at the moment define the methodology and exact procedure for preparation of national energy balance. In this regard, competent authorities are developing new regulation which shall stipulate a mandatory reporting system on the energy data and authorise AKNB as authorised institution for the preparation of energy balance.

#### Conclusion

Energy data reporting is at the moment a combination of voluntary and mandatory approach with some significant gaps in energy sub-sectors (residential, commercial, transport, fuel consumption in industry) and fuel types. National energy balance could be prepared annually but efforts are still needed to achieve completeness and time series consistency. There is need for a more streamlined and formalised activity data flow between the institutions and nomination of the inventory agency.

#### **b. Bosnia and Herzegovina**

In general, environmental issues in B-H are under responsibility of both entity governments, i.e. the Federation of Bosnia and Herzegovina (FB-H) and the Republic of Srpska (RS) due to the decentralised political and administrative structure.

The relevant authority for environmental issues at the state and international level is the Ministry of Foreign Trade and Economic Relations (MOFTER). The Ministry of Physical Planning, Civil Engineering and Ecology of the RS is the B-H national focal point for the UNFCCC and is formally responsible for the inventory submission to the UNFCCC.

In B-H there are no regulations in force which specifically stipulate preparation of energy balance as well as the GHG emissions inventory. Due to country's political and administrative structure it is very challenging to prepare a systematic overview of existing and planned regulation regarding the energy data collection and reporting. It is stated that the Air Protection Law stipulates preparation of the annual air pollution emission inventory which includes some greenhouse gases.

Procedural arrangements and protocols for the activity data collection, processing and exchange have not yet been established mainly due to the administrative setup and lack of knowledge on the GHG inventory preparation requirements.

## Conclusion

As it is stated in the country report, there are significant institutional, legal and procedural gaps related to the activity data collection and reporting as well preparation of the GHG inventory in a sustainable manner. National energy balance could be prepared annually but efforts are still needed to achieve completeness and time series consistency. It is clear that administrative structure of B-H is the most challenging one in comparison to the other RENA countries and that proper procedural arrangement between entities is highly desirable.

### **c. Croatia**

Institutional arrangement for inventory preparation in Croatia is regulated by the Part II of the Regulation on Greenhouse Gas Emissions Monitoring in the Republic of Croatia, entitled National system for the estimation and reporting of anthropogenic greenhouse gas emissions by sources and removals by sinks. Institutional arrangements for the inventory management and preparation in Croatia could be characterised as decentralised and out-sourced with clear tasks breakdown between the participating institutions including the Ministry of Environmental Protection, Physical Planning and Nature Protection, the Croatian Environment Agency (CEA) and the competent governmental bodies responsible for providing the activity data. The preparation of inventory itself is entrusted to an Authorised Institution which is selected for three-year period through public tendering. Preparation of energy balance is under the responsibility of the Ministry of Economy.

The activity data collection is under responsibility of the CEA which represents a hub between the governmental and public institutions responsible for providing the activity data and an Authorized Institution responsible for the inventory preparation. The scope and due dates for delivering the activity data to the CEA are prescribed by the Regulation. It should be emphasized that activity data collection is organized in such a manner that for each sector there are designated competent state administrative bodies, state administration organisations and/or public institutions which are responsible for collecting and providing the official data which are consistent with data provided for other international organisations (e.g. IEA, FAO). In that regard the Ministry of Environmental Protection, Physical Planning and Nature Protection had organised a series of meetings with the representatives of competent bodies and institutions to further explain the importance of providing accurate, complete and consistent data for the inventory preparation. The Central Bureau of Statistics agreed to introduce additional searches in their official programme to enable implementation of higher tier methodology for the emissions estimation. In addition several operators from the energy and industrial sector are directly approached by the CEA and an Authorized Institution for a more detailed activity data in cases when higher tier methods are recommended.

## Conclusion

Although there are still needs for improvement it could be stated that Croatian national system continues to perform its functions as it is required under the Kyoto Protocol and is able to produce the annual GHG inventories to the UNFCCC and the Kyoto Protocol in a sustainable manner.

#### **d. Former Yugoslav Republic of Macedonia**

There are several institutions involved in the preparation of energy balance, the including Ministry of Economy, the Energy Agency and the National Statistical Office.

Preparation of energy balance is stipulated by the Rulebook of Energy Balances and Energy Statistics. The Law on Environment provides a legal framework for development of the national inventory which is prepared every third year.

Procedural arrangements include: distribution of reporting forms by the Ministry of Economy to a large number of entities (full list is provided in the country report), data collection and reporting back to the Ministry of Economy and to the Energy Agency which publishes energy balance on its web site.

The Research Centre for Energy, Informatics and Materials of the Macedonian Academy of Sciences and Arts (ICEIM-MANU) is a key national institution capable for preparation of the GHG inventory. It should be pointed out that inventory preparation is a project based and at the moment there is a lack of resources to become annually based.

#### Conclusion

FyROM has established some important building blocks of the national system, however there is a need for strategic assessment which will transform project based inventory preparation to an annual based and which will propose the most appropriate inventory system to be put in place, taking into account national circumstances (the institutional and legal settings, level of experiences and capacities), as well good practice, the EC and the UN reporting requirements, and also the related financial implications. Furthermore, the analytical efforts should be accompanied with a tailor-made capacity building and training programs for the involved stakeholders.

#### **e. Kosovo<sup>1</sup>**

Kosovo is not a party to the UNFCCC and the Kyoto protocol but its government considers the climate change as one of the priority fields. Preparation of the national GHG inventory will start in summer 2012. The Statistical Office of Kosovo (SOK) is the main activity data source provider for the entire GHG inventory but the energy balance is under responsibility of the Ministry of Economic Development.

The Law on Energy is the main legal document which gives authority to the Ministry of Economic Development and the Ministry of Environment and Spatial Planning to request the activity data for energy balance from both public and private companies.

There is a technical assistance project for the Ministry of Environment and Spatial Planning run by Czech Hydrometeorological Institute to build capacities for the GHG inventory preparation which will start in summer 2012.

#### Conclusion

The national energy balance could be prepared annually but efforts are still needed to achieve completeness and time series consistency for all the sub-sector categories. It is expected that

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<sup>1</sup> "This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence."

MMD exercise will be an initiation of a more sustainable inventory preparation process and that procedural arrangements will be improved.

#### **f. Montenegro**

Institutional arrangements for the GHG inventory preparation in Montenegro are regulated by the Law on Ambient Air Protection. The national system for estimation and reporting of anthropogenic greenhouse gas emissions by sources and removals by sinks will be established by the Regulation on greenhouse gas emissions monitoring (planned for 2013). Institutional arrangements for the GHG inventory management and preparation in Montenegro will be decentralised and out-sourced with clear tasks breakdown between the participating institutions including the Ministry of Sustainable Development and Tourism, the Montenegrin Environment Agency and competent governmental bodies responsible for providing the activity data. The preparation of GHG inventory itself is entrusted to the Montenegrin Environment Agency. Preparation of Energy balance is under the responsibility of the Ministry of Economy and the Statistical Office of Montenegro. A new IT solution is under development which will streamline the energy data reporting and publication.

#### Conclusion

The legal framework for preparation of energy balance is mostly complete and the regulation for greenhouse gas monitoring is under development which suggests that Montenegro has a good basis for development of the GHG inventory in a sustainable way but there is a need for capacity building in both human resources and knowledge in order to achieve this goal.

#### **g. Serbia**

The Ministry of Energy and Infrastructure and the Statistical Office of the Republic of Serbia are responsible institutions for the preparation of national energy balance. The Serbian Environmental protection agency (SEPA), within the Ministry of Environment, Mining and Spatial Planning is authorised institution for the preparation of GHG inventory.

The Regulation on Methodology of Collection of Data for the National GHG Inventory prescribes the methodology for activity data collection. This regulation transposed some of the elements of the EC Monitoring Mechanisms Decision.

A major problem in the preparation of energy balance has been the lack of adequate energy statistics within the Statistical Office of the Republic of Serbia, which is the responsible institution for statistical research. On the other hand the Ministry doesn't have the capacity to implement all the necessary statistical surveys to fulfil data gaps. This problem is primarily related to the lack of data on energy consumption and energy sources. Since 2009 Serbia made a significant improvement in the field of energy statistics that in turn improved the energy balance preparation.

#### Conclusion

Serbia has established some important building blocks of the national system in terms of legal and institutional arrangements, but there is a need for capacity building both in human resources and knowledge at the responsible institutions and gap filling in order to prepare the complete and timely consistent energy balance.

## **h. Turkey**

Turkey does not have any specifically designated legislation or regulation for the collection of the greenhouse gas inventory data. The Ministry of Energy and Natural Resources is the competent authority responsible for the preparation of energy balance.

Data on combustion fuels is gathered both from public and private energy industries. Data gathered from institutions operating in the energy sector are compared for consistency and accuracy by the Ministry against the reports of energy industries (power plants cement and sugar producers, residential users etc.).

As it is stated in the country report the capacity to collect energy data is limited to the assigned staff and resources of the Ministry of Energy and Natural Resources and it is considered insufficient especially considering the need for establishment and operation of the QA/QC management system and the treatment of confidentiality issues. However, except resource data of the fuel balance table, the national energy balance, the national inventory reports and statistics derived from the energy data are publicly accessible and published regularly.

It is noted in the country report that the information provided was compiled by means of desktop study and should be verified with the national focal point.

### Conclusion

National system of Turkey is capable to produce the national energy balance and the GHG inventory report on a regular basis but it is clear that improvements are needed to become the fully-fledged system containing complete, consistent and accurate data as it is required under the Kyoto Protocol and the new international agreement. Due to its size and technical capacities it is believed that potential of human resources should not be an issue but more effort is needed in procedural and organisational arrangements as well as bringing new inventory experts onboard.

## **2.3 Key findings and recommendations**

As it was stated before a national system includes all institutional, legal and procedural arrangements made within a Party for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information.

Parties shall establish, operate and seek to continually improve national system to estimate emission by sources and removals by sinks of all greenhouse gases and to ensure timeliness, transparency, accuracy, consistency and completeness of their greenhouse gas inventory.

National system should be designed to take into account national circumstances and reporting requirements at the same time which means that it is subject to continual improvement in order to be sustainable.

It is clear from country reports that a significant effort is needed in all countries to establish national system as it is required under decision 19/CMP.1 and EC Monitoring Mechanisms Decision.

It is also clear that all countries have started to develop capacities for inventory preparation and that the level of knowledge and understanding of general and specific requirements as well as the IPCC methodology among country experts is on a satisfactory level.

Development of the national system should be tailor-made and depends on level of awareness of key stakeholders and decision makers in each country. Good or better practice could be transferred between countries in order to avoid mistakes and „wrong turns“.

In most of the countries emissions from energy sector accounts for almost 80-85 per cent of the total emissions and therefore complete, consistent and accurate energy balance is the most important starting tool to develop the GHG inventory and lots of efforts should be allocated to this task.

Countries should perform a strategic assessment with gap analysis of their national system as a priority task in order to define short-, medium- and long-term objectives regarding the inventory improvement, capacity building and QA/QC system. One of the main recommendations is to start to develop a mandatory reporting system which has strong legal foundations in order to remove barriers in data flow between the relevant institutions.

*Annex 1: Albania*



## 2. Methodology used for GHG Inventory

The IPCC Guidelines of 1996 are taken as the methodological basis for estimation of GHG emissions and removal by sinks while conducting the national GHG inventory. In some cases original methodologies or methodology slightly different from that of the IPCC are applied (for estimating the carbon dioxide absorption by forests). The GHG inventory for Albania was developed according to the IPCC Guidelines of 1996 (revised). The National Greenhouse Gases Inventory of Albania considers five main modules of the IPCC Guidelines. These are: "Energy", "Industrial Processes", "Agriculture", "Land Use Change and Forestry" and "Waste". Since IPCC does not provide methodology for "Solvent Use" the estimations are based on methodology provided by International Consultant who provided training for national team of GHG Inventory. Inventory of GHG was prepared for anthropogenic greenhouse gases emissions and removals by sinks in Albania for the base years 1994 & 2000, as well as a brief description of the methodologies used to estimate them and the associated uncertainties. The national GHG inventory represents emission data for three gases with a direct greenhouse effect: carbon dioxide, methane and nitrous oxide; and for three gases with an indirect greenhouse effect: carbon monoxide, oxides of nitrogen and non-methane volatile organic compounds (NMVOC). The last ones are not GHG but indirectly contribute to the GWP.

In order to estimate emissions of *carbon dioxide*, the most significant greenhouse gas two approaches were used. According to the first approach, CO<sub>2</sub> emissions are estimated for each fuel type, based on the total national consumption, and then the values were summarized (top down). According to the second approach, emissions for separate sectors and source categories are estimated, and then emissions were also summarized (bottom up). Usage of these two approaches in the Albania's inventory allows us to judge on the fuel spectrum of the carbon dioxide emissions (top-down), and in the second one –on the sector distribution (bottom-up). In both approaches, the default IPCC emission factors for each fuel type are used. Preliminary estimation shows that difference between the two approaches was about 3.5%. Also a very detail analyses is done concerning CO<sub>2</sub> emissions from other economic sectors.

*Methane* emissions coming from the Fuel Industry, Waste, and Land Use Change & Forestry and for Agriculture are calculated. To evaluate the amount of emissions from coal mining and hydrocarbon fuel extraction the amount of extracted fuel is multiplied by the emission factor, which depends upon the type of coal mining or upon the stage of fuel processing in the oil and gas sector. Methane emissions from livestock are evaluated by multiplying the livestock population (cattle, sheep, etc.) by the corresponding emissions coefficients.

*Nitrous oxide* emissions from fossil fuel combustion are obtained by multiplying the energy content of coal, oil products, and gas consumed by the corresponding emission factors, as given in the IPCC Guidelines. Also emissions of indirect greenhouse gases such as *carbon monoxide* and *nitrogen oxides* are calculated according to the IPCC Methodology. It was possible that *NMVOC* emissions to be estimated not only for internal combustion engines for the base year 1994 but also for Solvent Use, Agriculture, Land Use Change and Forestry. They were based on the activity data provided by the Institute of Statistics (INSTAT), Ministry of Transport and for solvent use on the activity data provided by Customer Offices of Albania.

In its basic form, an emission inventory estimation has the following elements:

***Emission estimate (Gigagrams GHG/year) = Activity data × Emission factor × Other Factor(s),***

where:

- Activity (e.g., tons of diesel consumption in 1994, 2000 (data for those two years have been collected under F&SNC) and through RENA data will be collected for years 2008 and 2009),
- Emission factor (e.g., m<sup>3</sup> CH<sub>4</sub> per ton of diesel)
- Other factor(s) (e.g., factor expressing diesel gassiness, or conversion factors)

Usually, there are different ways or methods to estimate the emissions, depending on the desired degree of detail and the available activity data and emission factors. For example, to calculate the CO<sub>2</sub> emissions from cars, one could use data on the number of cars sold; the amount of gasoline or diesel sold; or the number of kilometers traveled per driver, related to the total number of drivers and the gasoline consumption per kilometer. Each method would have its own appropriate emission factor and other factor(s). This exercise can be done for the country as a whole, or for each region after which the regional estimates are added up. In IPCC terminology, the most simple method is "Tier 1," while more elaborate method are "Tier 2" or "Tier 3." Higher Tiers may recommend making use of country-specific emission factors that are based on measurements.

For each source, estimation methods will differ, depending on the type and detail of available activity data and the model used for emission factor evaluation. Especially for higher Tiers there may be more than one emission factor and a term to correct for e.g. abatement (controls). The quality of GHG inventories depends substantially on the completeness of activity data and reliable emission factors.

Obtaining complete and detailed activity data is usually time-consuming and expensive. Concentrating efforts on gases and sources of higher priority allows the preparation of an inventory that is almost complete at substantially reduced costs. In practice, most emissions can be estimated with a reasonable accuracy applying IPCC default emission factors (the least resource-demanding method). However, if there is an indication that a sector may be a major key source, efforts should be taken to obtain a more country-specific activity data or emission factor for this specific key factor.

### **3. National Inventory system in Albania**

An emission and removals inventory is a current, comprehensive listing, by source, of specific emissions and sinks, and covers a specific geographic area for a specific time interval. For example, Albanian GHG inventories could consist of a list of CO<sub>2</sub>, CH<sub>4</sub> and NO<sub>2</sub> emissions from all sectors for 1994 & 2000 (for RENA project analysis will be done for years 2008 and 2009) plus explanatory text. Or, on a larger scale, the inventory may estimate all GHG emissions for Albania for a certain number of years. An emission inventory contains the following information:

1. Tabular summary of emission estimates by source category for each sector.
2. Background information including the reasons for compiling the inventory;
3. Geographic area covered by the inventory (e.g., certain regions or entire Albania);
4. Time interval represented by the emissions inventory (e.g, for the whole year 1994 & 2000 for RENA analysis will be done for years 2008 and 2009) with emissions expressed in mass/year);
5. Activity data, which are human or animal population, industrial, or economic data used to estimate and allocate emissions (in our example, this would be the sum of tons of oil and coal produced at each well and mine);
6. Emission factors;
7. Other factors (e.g., a factor that expresses the gassiness or CH<sub>4</sub> content of the oil and coal);
8. Additional supporting text that is provided.

All activity data used for GHG inventory under F&SNCs have been provided by: The Ministry of Industry and Energy (actually Ministry of Economy, Trade and Energy), Dr. Besim Islami - Thesis "Forecast of Energy and Electricity Demand and Financial Evaluation of Expansion Power Sector for Albania", Institute of Statistics, Ministry of Economy (activity data for industry), and Ministry of Agriculture and Food (activity data for agriculture), Scientific Research Institute of Veterinary (activity data for agriculture), Institute of Soils and Forestry (activity data for land use change and forestry), National Committee of Energy (later up to 2007 - National Agency of Energy and nowadays National Agency of National Resources), Committee of Environmental Protection (now days Agency of Environment and Forestry) provided data used in the initial GHG emissions (and for RENA analysis will be done for years 2008 and 2009). Later on, the results of the inventory were refined. The activity data for the solvents use was provided by both information's: the information by the Institute of Statistics (INSTAT) and was double-checked with information by Customer Offices. Additionally, certain differences in the degree of the initial data comprehensiveness, differences in the information sources, as well as structural reorganization of the economy, that occurred from 1990 through 2000.

#### 4. Sources of data (AD, CF and EF<sup>2</sup>) used for the years 1994 and 2000

##### 2.5 4.1 General Background about data collection in Albania

Up to now there is not any “statistical office” for data collection with pure purpose to evaluate GHG emissions. But concerning data activity from all sectors there exist a statistical offices named INSTAT (Albanian Institute of Statistics) and different ministries and specialized institutes related with activity data needed for GHG Inventory. Concerning the statistical services in Albania (including statistics of all economic sectors) during the centralized economy period, they were provided conform the Decision of Council of Ministers (No. 83, dated 05.04.1984) by the Statistical Directory in the State’s Plan Commission. As a basic methodology for the collection and elaboration on one side and analysing and publishing of economic and statistic indicators on the other one, has served the Statistical Program compulsory for application by all state subjects. The organigram of the statistical system organization has functioned as is shown in the figure 2.

*Figure 2 Statistical system organization up to the year 1991*

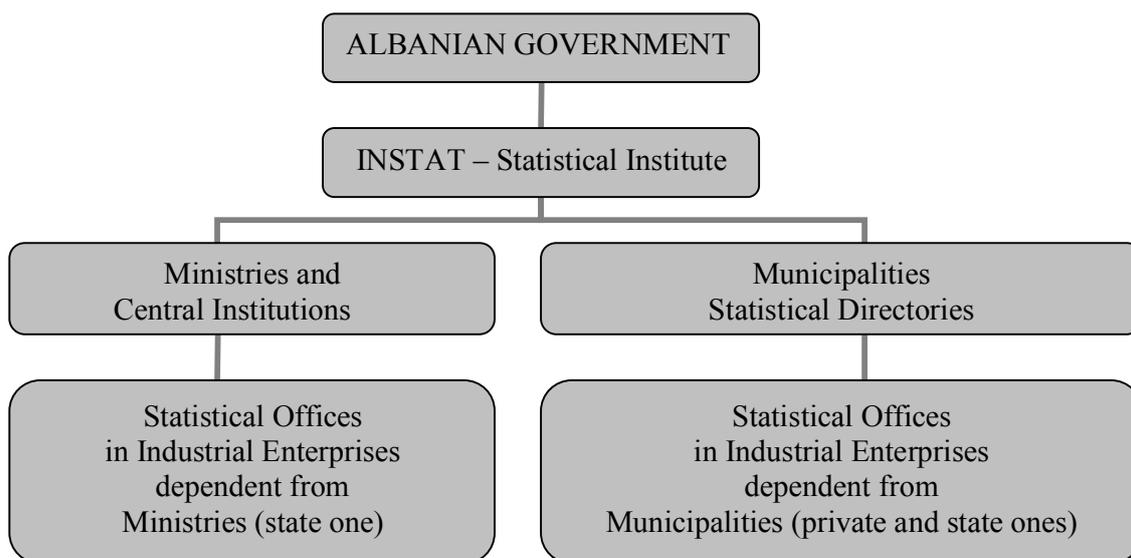
The Statistical Program compiled and approved by the Statistical Directorate, in cooperation with the ministries and



other central institutions, has been operating up to 1993. After the approval of the Law No.7687 dated 16.03.1993 “On Statistics”, this role was taken by the Institute of Statistics (INSTAT) which is the unique central institution in the country under the Council of Ministers, which approves the National Statistical Program, the criteria of the evidences as well as methodological ones, nominations and classifications for production of unique national statistics underlying the obligations of economic subjects, be they private and public ones. The new structure according to this Scheme is shown on Figure 3.

On the year 1994 was set up the **Business Register** of economic enterprises on the bases of the activity and number of employees, according to the European methodological criteria. On 1995 based on the Decision of the Council of Ministers, Nr.327, dt.18.07.1994 was legalised and started the application of **Nomenclature of Economic Activities Classification**, NACE, Rev.1, for the collection, classification and publication of the official data concerning the enterprises in the Business Register. These two documents (Business Register and NACE classification) are the basic **statistical tools** that make possible the organisation of the **unique statistical service** for the enterprises and **harmonised with the European and international requirements**.

AD=Activity Data, CF=Conversion Factor, EF=Emission Factor



*Figure 3: The Statistical System Organization in Albania.*

In the following are given source of activity data, conversion factor and emission factors for Energy and Transport Sector (according to IPCC Methodology), which are used in analysing of GHG Inventory for the years 1994 & 2000 under F&SNCs.

## 2.6

### 2.7 4.2 Energy and Transport

Based in IPCC Methodology activity data for Energy and Transport Sectors are related with two big subcategories: fuel combustion as well as fugitive fuel emissions. All activity data concerning Fuel Combustion are gathered from National Balance of Energy prepared by the ex-National Agency of Energy and ex-Ministry of Industry and Energy (actually as it was mentioned above they are nominated National Agency of Natural Resources and Ministry of Economy, Trade and Energy). In the following is given a short description of main institutions dealing with collection of energy statistics.

All activity data for each sector were national. Although Instat was the main activity data source provider for the entire SNC, it did not provide activity data for the GHG inventory. Rather, data was gathered from the ex-National Agency of Energy, Ministry of Environment, Forestry, and Water Administration, Ministry of Economy, Trade and Energy, Ministry of Public Works, Transport and Telecommunications, the General Directorate of Forestry, Taxation Department, Customer Offices and different data bases, surveys and studies prepared by international organizations (including the World Bank, UNDP, EBRD, EIB etc), universities and NGOs. Default emission factors from IPCC 1996 Revised Guidelines were used.

**Ministry of Economy, Trade and Energy (METE)** is the highest state authority in drafting policies and strategies in the energy sector. Missions of METE in the energy sector are development policies to ensure a normal supply with energy of the consumers, to guarantee a sustainable growth of country's economy and a social and cultural development of the population. It determines the policies at national level for developing different kinds of energies, policies in the field of energy efficiency and measures for implementing these energies. METE has the authority of supervising the activity of companies with state owned capital and it has the power to appoint all the members of the Supervisory Councils of these companies.

**National Agency of Natural Resources – NANR (Agjencia Kombetare e Burimeve Natyrore - AKBN)** has been established in accordance with Council of Ministers Decision No. 547, dated 09.08.2006, "Establishment of National Agency of Natural Resources", (Official Journal No. 93, Page 3903; Publication Date 25.08.2006), as the outcome from the former National Agency of Petroleum and the Institute for Extraction and Processing of Minerals merge. Based on CMD No. 202, dated 11.04.2007, "Few supplements and changes in CMD No. 547, dated 9.8.2006, "Establishment of National Agency of Natural Resources" (Official Journal No. 50, Page 1324; Publication Date 02.05.2007), the former National Agency of Energy was abolished as an institution and it merged with NANR. NANR is an institution depending directly from responsible Minister on energy. It serves as a specialized body for drafting the strategy in this field, monitors its implementation, plans the needs for energy in the future, issues

recommendations, as well as implements policies of the Government in the field of minerals, petroleum and hydro-energy.

**Central Technical Inspectorate (CTI)** has been established based on Law No. 9595, dated 27.7.2006, “Establishment of Central Technical Inspectorate”, (Official Journal: Year 2006, No. 84, Page 2871; Publication Date: 09-08-2006), as a merge of State Inspectorate of the Oil and Gas Control, Inspectorate of Containers under Pressure and Inspectorate of Electrical Equipment and Installations. This inspectorate is responsible to exercise control with all public or private entities that have to meet requirements, norms and standards determined for the petroleum products, under pressure equipments and electrical equipments.

**Energy Regulatory Entity (ERE)** is an independent institution, based on Law No. 9072, dated 22.5.2003, “On power sector”, amended, Official Journal No. 53, Page 2120; Publication Date 03.07.2003), and Law No. 9946, dated 30.06.2008, “Natural gas sector”, (Official Journal No. 114, Page 5015; Publication Date 22.07.2008), with closely associated responsibilities with energy markets. Its mandate includes licensing electricity and gas companies, setting wholesale and retail tariffs, protecting consumers’ interests, settling disputes between licensees and consumers, promoting competition and approving market rules and grid codes.

**Albanian Power Corporation (KESH sh.a.)** is responsible for production of electricity and maintaining and developing the generation assets (Drin River Cascade 1350 MW, Mat River Cascade 50 MW, Bistrica Cascade 27.5 MW, Selita HPP 5 MW, Fieri TPP 159 MW (out of functioning) and new Vlora TPP 97 MW. KESH has also the license as Wholesale Public Supplier of electricity for the tariff customer and could play the role of the supplier of last resort for the Eligible Customers;

Both the SNC and the stakeholder consultations identified data availability and quality as a key barrier to the development of a more accurate GHG emission inventory. As the SNC noted, data gaps existed for mobile combustion, enteric fermentation, fuel combustion in industry, fuel wood burned for energy, and solid waste treatment. The main contributor to uncertainty was the amount of CO<sub>2</sub> emissions from fuel wood, which was 35.32 % of the total value. The main source of uncertainty was an estimate of the quantity of self-collected fuel wood in rural areas.

The SNC did not include information on the system for collecting data. Analysis done under this report indicated that this was considered a serious gap because information had to be obtained informally and/or by non-professionals. As a result, this often resulted in data errors or insufficient data. In addition, the SNC lacked information on technologies and models utilized during the inventory process.

All the information required to produce the national emissions inventory was documented and archived, including the assumptions and criteria for the selection of activity data and emission factors, emission factors used, activity data, information on the uncertainty associated with activity data and emission factors; rationale for the choice of methods; methods used, changes in data inputs or methods from previous years, identification of and information on individuals providing expert judgment for uncertainty estimates, details of electronic databases or software used, worksheets and interim calculations, final inventory report and any analysis of trends from previous years, QA/QC plans and outcomes of QA/QC procedures.

Analysis of all activities of F&SNC shows that there has been a critical mass of institutional capacity developed through the process of updating the inventory for the SNC and it is important to note that the GHG inventory team that was assembled for the SNC has been kept intact and is now poised to undertake the GHG inventory update for the TNC. This institutional memory represents important familiarity with the limitation, obstacles, and challenges associated with inventory development. The team’s detailed experience with past efforts will also help to ensure coherence, continuity, stakeholder participation, and the exploitation of pertinent synergies.

In the following are described in detail institutions that are used to get all data sources and emission factor for fulfilling the Module 1 “Energy and Transport” of GHG Inventory.

A. The main categories which are included in **fuel combustion** are as following:

***I. Energy and Transformation of fuels Industries:***

- Electricity and Heat Production.
- Petroleum Refining: all combustion activities supporting the refining of petroleum products
- Other energy industries: emissions from own energy use in coal mining & oil and gas production.

Activity data concerning this category are gathered for the year 1994&2000 from National Energy Balance (year 1994&2000) prepared from the ex-National Agency of Energy (now days AKBN) and special figures like fuel

consumption for electricity and heat production are collected from contacting each electricity and heat plant. Also the figures concerning each refinery are gathered by contacting three refineries which were operating those years in Albania.

The Fier refinery was built in the 1960s based on Russian technology. The design capacity is 0.5 MTA and is kind of a crude topping unit separating lights and fuel oils from bitumen. The refinery in Fier currently works at about 20% utilisation rate, producing mainly fuel oil (LFO & HFO) for Fier TEC (TPP) as well as some bitumen and naphtha.

The Ballsh refinery was commissioned in 1978 based on Chinese technology and has a design capacity of 1 MTA. The Ballsh refinery is a "tailor made" plant for the indigenous oil production and therefore not able to refine - if available - imported crudes. The current utilisation rate of the refinery is about 50% and even less, due to several reasons, such as lack of feedstock, shutdown of process trains and lack of spare parts. The production at Ballsh is also intermittent due to non-continuous supply with crudes, which leads to bad efficiencies.

There are several laws in Albania which address and help develop the energy statistics and energy balance. The Law on Statistics (mentioned above) is relevant for energy statistics as it defines a methodological concept of gathering, systematization and analyses of detailed data which concern different areas. The Institute of Statistics (INSTAT) provides and systematizes general and detailed data in various areas and publishes them in its own publication formats. INSTAT does not have any obligation related to the gathering of energy data specifically. On the other hand, according to the Decision of Council of Ministers nr. 202, date 1.04.2007, the National Agency for Natural Resources (AKBN of NANR) is defined as the institution in charge of assembling and processing energy data on both supply and demand side. Based on that, AKBN is responsible for making analyses of trends of different energy sources by year and for preparing the annual national energy balances, making the energy planning and preparing the energy strategy.

Legislation relevant for energy reporting to the regulatory authority includes the Law on Power Sector (9072/2003), the Law on Refining, Transportation and Trading of Oil, Gas and their By-products" (8450/1999), the Petroleum Law (Exploration-Production) (7746/1993) with secondary legislation and the Energy Efficiency Law (April 26, 2005).

According to Article 8 of the Law no. 8450/1999 (on refining, transportation and trading of oil, gas and their by-products), the Ministry responsible for oil and gas sector is responsible for elaboration and publication of information, defining the form, terms and manner. Also, the rules on maintaining and management of the emergency stock of oil, gas and their products are determined by this Law.

The Energy Efficiency Law clearly defines the procedure for reporting energy data for the purpose of supporting, developing and monitoring the national energy efficiency program. As defined in this Law, fuel and electricity suppliers are obliged to submit every sixth months reports on amount of energy supplied to the customers. Consumers who consume more energy than it is defined by the Law need to report the data on their energy consumption for the last year. All data should be filled in according to the format requested by AKBN. Not always, the requested data are provided upon the request. In major cases, AKBN needs to process the data, especially those related to demand side for each sector and by commodities. Consumers with annual consumption of any type of energy lower than the defined level are obliged to submit their actual energy consumption only if requested. For household, agriculture and transport sectors AKBN should undertake survey on data collection on energy consumption. The Council of Ministers should adopt a regulation on the content and manner of submitting data report by fuels and energy suppliers and energy consumers. But, this Law faced severe difficulties in the implementation as the secondary legislation was not prepared.

There is no legislation defining the methodology and procedure for the development of energy balance. Now, amendments to the Law on Power Sector are under preparation. The Energy Efficiency Law has taken into consideration a chapter on provision of energy data from different actors and energy consumers (traders, buildings owners, energy consumers, public and private sector, etc.).

The Council of Ministers should prepare the relevant decree and decisions defining the roles and responsibilities of INSTAT and AKBN. This decree should oblige AKBN to prepare energy database and submit annual energy balance. AKBN prepares energy database for supply and demand sides, transformation process and losses, and compiles energy balances annually. AKBN makes the reports focusing on trends for a period of time horizon and uses these data in different studies for energy planning.

The main problem of the decree is that it does not oblige other institutions, companies or enterprises to submit and present their data, so AKBN encounters serious difficulties with private sector, depending on their will to participate and compile AKBN's questionnaires. AKBN developed its own methodology for primary data collection.

The following important institution is the national regulatory authority (ERE), which only provides information on electricity generation. The data provided to ERE can be provided to AKBN as well.

There is a need for either changes of the existing laws or for the development of new ones in order to appoint AKBN the bearer of the energy balance development, and to define obligations of the suppliers and particular consumer

branches to submit reports to AKBN on supply and consumption of energy, by sources and commodities. At the following is presented the main laws and sub laws related with energy statistics in Albania.

Title	Subject matter and scope
The Law on Statistics	This law is relevant for energy statistics as it defines a methodological concept of gathering, systematization and analyses of detailed data which concern different areas.
Decision of Council of Ministers nr. 202, date 1.04.2007, the National Agency for Natural Resources (AKBN of NANR)	According this law is defined as the institution in charge of assembling and processing energy data on both supply and demand side.
Law on Power Sector (9072/2003),	According this law, provides the data related TPP
Law on Refining, Transportation and Trading of Oil, Gas and their By-products” (8450/1999)	According this law, the Ministry responsible for oil and gas sector is responsible for elaboration and publication of information, defining the form, terms and manner. Also, the rules on maintaining and management of the emergency stock of oil, gas and their products are determined by this Law.
the Petroleum Law (Exploration-Production) (7746/1993)	According this law, provides the data related Oil and Gas exploration
Law Energy Efficiency (2005)	This law, clearly defines the procedure for reporting energy data for the purpose of supporting, developing and monitoring the national energy efficiency program. As defined in this Law, fuel and electricity suppliers are obliged to submit every sixth months reports on amount of energy supplied to the customers.

In Albania, Importers of oil products are private companies. There are currently about 48 wholesale companies mainly for gas oil, gasoline and heavy fuel oil, 30 wholesale companies only for LPG, 7 for fuel and gasoline for aviation. According to the Law on Refining, Transportation and Trading of Oil, Gas and their By-products” (8450/1999) these companies are obliged to report to METE. The reports are composed according to the Order of Minister, nr. 135, of 04th May 2005, for the information and data given by the operators of refining, transportation and trade of oil, gas and their by-products (Council of Ministers Decree nr.808, 5 November 2004).

**II. Industry: GHG from final consumption of fuels in industry (not for transportation in enterprises):**

- Iron & Steel;
- Non ferrous metals;
- Chemicals;
- Pulp, Paper & Print;
- Food Processing , Beverages & Tobacco;
- Other.

Activity data concerning this category are gathered for the year 1994 and 2000 from National Energy Balance (year 1994&2000) prepared from the ex-National Agency of Energy (now days should be get from AKBN). The main problem here was concerning with energy commodities consumption for each sub-sector. This division was done based in analytic analyses and industrial energy survey which was carried out under Phare Multi Country Energy Program under EUROSTAT Format.

**III. Transport: GHG from combustion and evaporation of fuels for all transport activities, as by sub-sectors:**

- Civil aviation (International and Domestic aviation);
- Road Transportation: Cars, Light Duty Trucks, Heavy Duty Trucks & Buses, Motorcycles;
- Railways;
- Navigation (International Marine and Internal Marine - except fishing);
- Other Transportation.

Activity data concerning transport category are gathered for the year 1994 from National Energy Balance (years 1994 & 2000) prepared from the ex-National Agency of Energy. The main problem here was concerning with energy commodities consumption for each sub-sector.

For the years 1994&2000 there exists activity data division between fuel consumption in road, rail, water navigation and air transport. These activity data had been gathered from Albanian Energy Balance prepared from the ex-National Agency of Energy (now should be get under AKBN). Concerning activity data for the year 2008 and 2009 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 don't exist. The same situation almost exist for fuel division between road transport modes like: cars, light duty trucks, heavy duty trucks, buses and motorcycles are very poor, due to the big changes occurred in the transition period in the transport sector. In order to overcome this activity data gap, we propose to carry out a pilot survey.

Concerning statistical data for the Road Transportation sub-sector, because of the big changes that have occurred during the transition period, there exist very poor figures for the division - Cars, Light Duty Trucks, Heavy Duty Trucks & Buses, and Motorcycles. Probably, to overcome this statistical gap with the IPCC Methodology, will be good to propose a pilot survey.

#### ***IV. Small Combustion: Emissions from fuel combustion in the following sectors:***

- Commercial/Institutional Buildings
- Residential Buildings
- Agriculture/ Forestry/ Fishing
- Other

Activity data concerning small combustion category are gathered for the year 1994 from National Energy Balance (year 1994) prepared from the National Agency of Energy. The main problem here was concerning with energy commodities consumption for each sub-sector and their division between Households (Residential), Public Building, Commercial Building, Agriculture, Forestry and Fishing. This division was done based in analytic analyses and simple surveys based on each from sub sectors mentioned above. For the year 2008 and 2009 will be very difficult to get such data and we have started immediately to work for this task in order to buy time to have all data ready by middle of May 2012.

#### ***V. Other: All remaining emissions from non-specified fuel combustion except for wood. Also here should be included emissions from military fuel use.***

Activity data for military fuel use are gathered from Ministry of Defense and reported under the road transport.

#### ***VI. Traditional biomass burned for energy purposes: emissions of CO<sub>2</sub>, CH<sub>4</sub>, CO, N<sub>2</sub>O, NO<sub>x</sub> and NMVOC from the burning of wood.***

Activity data concerning wood consumption are gathered for the years 1994&2000 from National Energy Balance (years 1994&2000) prepared from the National Agency of Energy (actually AKBN) based on the Yearly Report of Forestry Directorate. The main problem here was concerning with wood self collection and illegal cutting from forestry areas which is not registered. For the year 2008 and 2009 will be very difficult to get such data and we have started immediately to work for this task in order to buy time to have all data ready by middle of May 2012.

**B.** In this category are included **Fugitive emissions from fuels** like:

##### ***I. Solid Fuels***

- Coal mining: total emissions (CH<sub>4</sub>) from underground & surface mining and post mining activities;
- Solid Fuel Transformation: Fugitive emissions arising during the manufacture of secondary & tertiary products from solid fuels: coke, etc.
- Other: other not elsewhere specified.

Coal contribution in the Albanian energy market has declined due to the following reasons:

- Coal extraction technology is very old,
- Our domestic coals are of lignite type with low calorific values, high content of sulphur, humidity and ashes,
- The characteristic of indigenous coal sources is that they are extracted from 200 m depth with a lower thickness of layer of 70 –100 cm,
- Extraction and enrichment costs are very high,

- High content of sulphur and ashes would need environmental protection plants that mean a bigger pollution and a higher cost for a generated energy unit.

Activity data concerning coal mining, enrichment coal post mining, coal transformation for coke production are gathered from expert team based in capacity of each coal mine and capacity of each coal enrichment plant. For the year 2008 and 2009 will be difficult to get such data since most of the mines are privatized and we have start to work for this task to get contacts on METE for each subject in order to bay time to have all data ready by middle of May 2012.

## **II. Oil & Natural Gas**

- Production of crude oil only,
- Transport: loading & unloading of crude oil from tankers,
- Refining/storage of crude oil and oil by products,
- Distribution of oil products,
- Production/processing of natural and associated gas,
- Transmission/distribution of natural and associated gas,
- Other leakage: release of natural and associated gas at point of use.

According to available information, the geological oil reserves in Albania are estimated at 440 MT of which about 43 MT have been extracted meanwhile. The remaining recoverable reserves are given with 32 MT (by conventional method), but using enhanced oil recovery measures (EOR) this amount can be increased considerably.

Currently, the Marinza Patos field is the largest oil field. It is being redeveloped in co-operation with Premier Oil of UK, applying enhanced oil recovery (EOR) measures to boost production rates. As regards the quality of Albanian crude, the production ranges from heavy oils to condensates but mainly heavy oils are produced. The API gravity varies from 5 to 30 grades. Production shows that gravity depends on field characteristics and increases with depth. In addition, the Albanian crudes are characterised by a relatively high sulphur content ranging up to 9%. For the year 2008 and 2009 will be difficult to get such data and we have start to work to collect all data needed from all oil production enterprises of Kucova, Cakran,Marines, Shekishte, Visoke, Ballsh and Gorishte.

## **III. Venting & Flaring:** the release and/or combustion of excess gas at facilities for the production of oil or gas and for the processing of gas.

Activity data concerning gas venting & flaring release are gathered from contacting ALBPETROL and ARMO Companies. Coal and natural gas were the “big losers” since the economic changes forced many industrial consumers to close down. Supply and use of coal has declined a lot since 1990. The same trend was followed by natural gas which production declined a lot since 1990. Contribution of natural gas declined, due to a number of factors:

- Existing natural gas fields are in their last production period,
- Researches for new resources have not been successful so far.

For the year 2008 and 2009 will be very difficult to get such data and we have started to work for this task “securing data for the release and/or combustion of excess gas at facilities for the production of oil or gas and for the processing of gas” in order to bay time to have all data ready by middle of May 2012.

*Annex 2: Bosnia and Herzegovina*

## I Institutional arrangements

The Constitution of Bosnia and Herzegovina (B&H), which was an integral part of the Dayton Agreement in 1995, created a state comprised of two entities: the Federation of Bosnia and Herzegovina (FB&H) and Republic of Srpska (RS). Under this constitutional construction, Bosnia and Herzegovina is a sovereign state with a decentralized political and administrative structure. Since the Dayton Agreement, environmental issues in B&H have been the responsibility of entity governments. The corresponding authorities are the Federal Ministry for Tourism and Environment in FB&H, the Ministry for Physical Planning, Civil Engineering and Ecology in RS, and the Department for Communal Works in Brcko District. The work of both entity ministries and the BD department is governed by the following set of environmental laws:

- Law on Environment Protection,
- Law on Air Protection,
- Law on Nature Protection,
- Law on Waste,
- Law on Water Protection, and
- Law on Environment Funds.

This set of laws was prepared with the financial and technical assistance of the European Commission PHARE Programme with the intention of developing laws that would be in accordance with the relevant European Union Directives and that would be harmonized for both entities and BD. The laws were adopted in RS in 2002 (Official Gazette of RS no. 50, 51 and 53/02), in FB&H in 2003 (Official Gazette of FB&H. 33/03), and in BD in 2004 (Official Gazette of BD no. 24/04). In December 2005, the Ministry for Physical Planning, Civil Engineering and Ecology in RS prepared amendments to the Law on Environmental Protection that were published in Official Gazette of RS no. 109/05.

With the adoption of a body of environmental law, B&H has unified all legal aspects of environmental protection. Previously, regulations related to the environment were spread out across different acts, laws, rules, decrees and decisions. Environmental laws mandate the adoption a number of sub-laws and define the responsibilities of different bodies.

The Government of B&H is a party to a number of international environmental agreements and conventions, and it is fully committed to meeting the requirements stipulated in these agreements. Although not directly involved, statistical institutes also play a key role in environmental monitoring.

Various ministries are responsible for several aspects of environment-related activities. Their authority is defined by different laws.

As defined by the Law on Ministries, the relevant authority for environmental issues at the state level is the Ministry of Foreign Trade and Economic Relations (MOFTER). More specifically, MOFTER is responsible for carrying out tasks related to defining policies and basic principles, coordinating activities, and the harmonizing plans of the entity authorities and bodies at the international level for environmental protection, development and the use of natural resources.

The Ministry of Physical Planning, Construction and Ecology of RS is responsible for the overall protection of environmental quality and its improvement through research, planning, management and protection measures, including the protection of assets of general interest, natural resources, and natural and cultural heritage.

The Ministry for Tourism and Environment of FB&H is responsible for the preparation of geological maps for urban planning; air, water and soil protection; the preparation of environmental strategy and policy; quality standards for air, water and soil; ecological monitoring; and quality control of air, water and soil.

In accordance with the Law on meteorological and hydrological activities of RS (Official Gazette of the Republic of Srpska, 20/2000), the Republic Hydrometeorological Institute of RS is the government organization responsible for climate change monitoring, climate data exchange and database management, applied research, and climate forecasts in the framework of the various scientific and technical programs of the World Meteorological Organization (WMO).

The FB&H Institute for Meteorology is an independent agency responsible for administrative and professional duties related to meteorology, seismology, hydrology, and water resources, as well as for monitoring environmental quality,

including air, water and soil quality. Furthermore, it is responsible for the collection, processing and publishing of data related to these activities. The Law on hydrometeorological affairs, which was inherited from the Republic of Bosnia and Herzegovina/SFRY (RBosnia and Herzegovina 10/76), also applies to the institute and forms a legal basis for its work. This law details the tasks of the institute in the field of hydrology and meteorology. The institute is an active partner in communication with the WMO (B&H is a member), and it follows various WMO guidelines in its work in the field of meteorology and hydrology.

The Bosnia and Herzegovina Agency for Statistics is responsible for producing and publishing (after review) aggregated statistics for Bosnia and Herzegovina in accordance with internationally accepted methodology. These aggregated statistics are based on data submitted by the entity-level statistical institutes. The agency is also responsible for coordinating the work of the entity-level statistical institutes and for fostering closer cooperation.

The RS Institute for Statistics and the FB&H Institute for Statistics are the authorized bodies responsible for performing work in the field of statistics. Their activities focus on the production of statistics: the collection, storage, processing, analysis, and distribution of data. In practice, the production of statistical data is conducted by other relevant ministries and organizations in their respective areas of responsibility, and the data are then submitted to the institutes. In particular, the RS Hydro-meteorological Institute and the FB&H Meteorological Institute, the entity Ministries of Internal Affairs, and the Ministries of Energy, Mining and Industry organize and conduct statistical research.

In B&H, there is no generic system of environment monitoring and data collection, which is the reason for non-existence of environment information system. Currently, different data are gathered in different institutions without coordination and unified database. There is neither data exchange and information system among institutions gathering data and higher government authorities, nor existing information data. Certain number of environment status data exists; however, those data are out-of-date (prewar), never updated or insufficient and unusable. Existing environment data as well as general statistical data at entities levels are not shared so that it is difficult to create clear picture about developing activities and environment status connection, so called indicators that are basis for decision making process at B&H level.

In the following table below are given institutions for each key source-sector and for each function

	Energy <sup>1</sup>	Industrial processes	Agriculture	LUCF <sup>2</sup>	Waste
a) Institutions involved in activity data collection.	SIRS SIFB&H EC MPPCEERS FMTEFB&H TPP GODB FMIB&H	SIRS SIFB&H MPPCEERS FMTEFB&H PAPC GODB RMORS CMOFB&H FMIB&H	SIRS SIFB&H MFAFAWR GODB AFUOS FMTEFB&H RMORS CMOFB&H	SIRS SIFB&H IFUORS MFAFAWR GODB FMTEFB&H	SIRS SIFB&H IFUORS FMTEFB&H GODB MCS
b) Institutions involved in calculating emission factors	UORS UOFB&H FMIB&H CETEOR	FMIB&H CETEOR	FMIB&H		FMIB&H CETEOR
c) Institutions involved in preparing the inventory emission estimates.	IFUORS FMIB&H CETEOR	IFUORS FMIB&H CETEOR	IFUORS FMIB&H	IFUORS FMIB&H	IFUORS FMIB&H CETEOR
d) Institutions involved in reporting the inventory emission estimates.	COMB&H EESCB&H MPPCEERS as NFPUNFCCC FMTEFB&H	COMB&H EESCB&H MPPCEERS as NFPUNFCCC  FMTEFB&H	COMB&H EESCB&H MPPCEERS as NFPUNFCCC  FMTEFB&H	COMB&H EESCB&H MPPCEERS as NFPUNFCCC  FMTEFB&H	COMB&H EESCB&H MPPCEERS as NFPUNFCCC  FMTEFB&H
<sup>1</sup> Emissions from stationary and mobile fuel combustions, including "fugitive" fuels emissions. <sup>2</sup> Land Use Change and Forestry.					

## List of Abbreviations

ACFESD - Administrative Committee for the Environment and Sustainable Development of B&H
AFUOS - Agricultural Faculty University of Sarajevo
CEPRES - Center for Ecology and Natural Resources
CETEOB - Center for Environmental and Technological Development
CMOFB&H - Cantonal Ministry of FB&H
COMB&H - Council of Ministers B&H
EC - Electric Company
EESCB&H –Inter-entitiy Environmental Steering Committee
FB&H - Federation of Bosnia and Herzegovina
FMIB&H - Federal Meteorological Institute of FB&H
FMTEFB&H - Federal Ministry for Tourism and Environment of Federation of Bosnia and Herzegovina
GODB - Government of District Brcko
IFUORS - Institute for urbanism of Republic of Srpska a.d. Banja Luka
MCS - Municipality Communal Services
MFAFAWR - Ministry for Agriculture, Forestry and Water Resources
MOFTERB&H - Ministry of Foreign Trade and Economic Relations of B&H
MPPCEERS - Ministry of Physical Planning, Civil Engineering and Ecology of Republic of Srpska
NFPUNFCCC - National Focal Point B&H to the UNFCCC
PAPC - Public and Private Company
RMORS - Regional Ministry of RS;
RS – Republic of Srpska
SIFB&H - Statistical Institute of Federation of B&H
SIRS - Statistical Institute of Republic of Srpska;
SSCCCB&H - State Steering Climate Change Committee of B&H
TPP - Thermal Power Plants
UNFCCC - United Nations Framework Convention on Climate Change
UOFB&H - Universities in FB&H
UORS - Universities in Republic of Srpska

## II. Legal arrangements

Legal regulations being enacted in 2003, are decisive, but so far emission inventory has not been passed or approved. We do not have any experience related to that, but certainly there will be problem until this system will be established or become operational.

Better coordination and synchronization of activities and responsibilities in making decisions related to environment issues/ energy data by Ministries of Physical Planning and Environment both in Federation and Republic of Srpska along with other relevant Ministries (i.e., first of all, with Ministry for Agriculture, Forestry and Water Management, Ministry of Health, Ministry of Energy, Mining and Industry, Ministry of Education, Culture and Sport, Ministry for Traffic and Communications) on one side, and specialized organizations e.g., Statistical Institutes, Meteorological Institutes, Geodetic Survey Institutes, etc. on the other side, which are authorized to participate directly or indirectly, partially or fully either in environment protection or their activities are overlapping with this field, will unavoidably lead to organizational restructuring of authorities per sectors and administrative bodies both in FB&H and RS. It will be necessary to institutionally reinforce proficiency and capabilities of existing resource ministries (more space, equipment and employees), and clearly define competences and authorities related to environment issues, as well as improve compatibility and coordination of relevant bodies in assigning or even overlapping responsibilities

Upon passing relevant sub-legal acts being defined under above-mentioned laws into force, better enforcement of those laws is expected, that would improve law-governing procedures, in general.

Actually, these laws are synchronized with EU legislation, which will improve policy implementation and proficiency in domain of responsibilities in accordance with UNFCCC.

At this moment, having in mind specific political situation in Bosnia and Herzegovina and different conditions in each entity, it is very difficult to list all existing and/or planned legislation within the Party related to energy data collection, compilation and publication.

### III. Procedural arrangements

We have to point out that, at the level of Bosnia and Herzegovina, there is no institution to be responsible for specific data collection “activity data” necessary for inventory emission assessment in accordance with UNFCCC. Particular problem is the fact that Bosnia and Herzegovina consists of two entities - FB&H and RS and District Brcko, and these activities are carried out on the entity level, so that there is no cooperation in that field so far.

Although Statistics Agency does exist at B&H level, it does not yet dispose of even small amount of required data, which could be used for inventory emission assessment. Similar situation is with entities institutes for statistics. They just have a small portion of data for inventory assessment available.

Huge energetic plants – mainly thermal power plants maintain data on fossil fuels consumption. Some thermal power plants have also emission monitoring systems built-in, but those systems maintenance is irregular and the data can be used only for checking out calculated emission.

Electric companies in both entities certainly dispose of data on fossil fuels consumption in thermal power plants, and those data can be considered as valid.

Bigger energy and heating plants in the cities have the data available as well ( “activity data”).

Emission, i.e. “activity data” out of mobile sources can be obtained through the statistics institutes within entities. Determination of sorts and age of certain categories of mobile sources, as well as annual fuel consumption need to be assessed, and we are of the opinion that it is not a problem.

However, problems occur when we are searching for total annual liquid fuels consumption on both entities and B&H levels. Here, the evidence is very poor due to differences in calculation compared with consumption data for post-war period. The issue is in inaccurate inventory of liquid fuels being imported through border crossings in B&H without taking evidence in statistical reports.

Additional problem are certainly “activity data” for industrial processes due to inadequate data presence in publications and official information. In post-war Bosnia and Herzegovina, industry is of decreased manufacturing capacity, which is mostly caused by destroyed industrial facilities during the past war, as well as inactive production both in existing and time barred technological facilities.

Similar situation is with “activity data” for agriculture, changes on the land and in forests caused by exploitation (Land Use Change and Forestry- LUCF) and waste.

With regard to institutional responsibility for data collection, the situation is quite unclear. Although, for each field there are several institutions dealing with concerning issues, certainly responsibilities and data scope are not clearly defined for any of them. The problem is in unclear defined reporting instructions on “activity data” at entities levels.

Of course, the problem is in the fact that responsible entities managements and most of institutions represented in the report are not informed enough on UNFCCC and Kyoto Protocol obligations.

In relation to that, relevant changes are expected, because effective laws imposed requests on reporting, inventory development and “activity data” collection.

The laws prescribed that in general, but this year sub-legal regulations are expected to be passed, which will, for sure, introduce order in this field. However, it will be long-term process until all of that is completed. Actually, it is necessary to educate the whole pyramid of responsible cadre in the data collection system.

To summarize all of that, we can say that:

- There is no legally responsible institution for data collection.
- There is incompliance between existing data and data requested by IPCC methodology.
- There is insufficiency in adequate equipment for data collection.
- There are gaps in data processing.
- There is no legislation on type and scope of required data to be collected.
- There is no adequate education.

The status of the development of emissions inventories in Bosnia and Herzegovina is primarily specified by the air protection laws for FB&H and RS that are currently in effect. The following should be emphasized in these laws:

- The Federal Ministry for Tourism and Environment of FB&H and the Ministry for Physical Planning, Civil Engineering and Ecology of RS each release the Report on Air Pollution Emission Inventories for their respective entities in January of each year for the year two years prior;
- Cantons in FB&H release Air Pollution Emissions Inventories Emission in April of each year (including dissemination from natural resources) for the year two years prior.

The inter-entity environment body releases a joint Report on Emission Inventories each April for the year two years prior based on information submitted by entity ministries. This joint report is submitted to the Council of Ministers in B&H to be forwarded to the authorized agencies for international agreements of which Bosnia and Herzegovina is a member (however, this procedure is only regulated by FB&H law).

The reports have to be prepared in compliance with reporting requirements determined by the international agreements to which Bosnia and Herzegovina is a party. Emission inventories must be prepared for the following substances: SO<sub>2</sub>, N<sub>2</sub>O, CO<sub>2</sub>, CO, NH<sub>3</sub>, NO<sub>x</sub>, CH<sub>4</sub>, NMVOCs, C<sub>6</sub>H<sub>6</sub>, and PM-10. The emission inventory registry is maintained by fields of activity. Emission assessments are performed in accordance with internationally approved methods and guidance. Polluters, specialized institutions, and authorized bodies are responsible for submitting the data required for dissemination, assessment, and/or monitoring to the ministries.

In order to consider the status of inventory emission development more precisely, we will primarily specify valid legal regulation in this field, articulated in the air protection laws for FB&H and RS.

- Federal Ministry for Tourism and Environment of FB&H and Ministry for Physical Planning, Civil Engineering and Ecology of RS announce, in January every year, Report on Air Pollution Inventory Emission for the year next before last for Federation of Bosnia and Herzegovina and Republic of Srpska.
- Cantons in FB&H, in April every year, announce Air Pollution Inventories Emission (including dissemination from natural resources) for the year next before last for the territory of each canton.
- Inter-entity environment organ unifies, in April every year, Report on Emission Inventories for the year next before last, based on information submitted by entities ministries. Unified report is submitted to the Council of Ministers in B&H to be forwarded to the authorized agencies for international agreements whose member is Bosnia and Herzegovina (this procedure regulated only by FB&H law) .
- Reports have to be prepared in compliance with requirements for reporting determined by international agreements whose member is Bosnia and Herzegovina.
- Emission inventories should be prepared at least for the following air pollution substances: sulfur-dioxide, nitro-oxide, carbon-dioxide, carbon-monoxide, ammoniac, nitro-oxide, methane, non-methane carbon-hydrogen, petrol and solid particles above ten micrometers (PM-10).
- Emission inventory register is maintained per fields of activities.
- Emission assessments are performed in accordance with internationally approved methods and guidance being developed in practice.
- Polluters, specialized institutions and authorized organs are responsible for submitting the data required for dissemination assessment or control to the ministries.

The Ministry for Physical Planning, Civil Engineering and Ecology of Republic Srpska, acting as a B&H National Focal Point to UNFCCC is responsible for B&H reporting the GHG inventory emission in accordance with Article 12 of the Convention.

UNFCCC and IPCC recommendations emphasis the data quality control (QC). This is, in fact, a system of certain technical activities, estimations and quality control of the emission inventory. QC includes careful verification of the accuracy of collected data, emission factors and uncertainty estimation.

Quality Assurance (QA) activities include a planned system of review procedures conducted by personnel not directly involved in the inventory development process. UNFCCC recommends that the inventory of emissions should be reviewed by an independent team of experts. Bosnia and Herzegovina as an economy in transition will avail itself, in accordance with the decisions of the Convention bodies, of the possibility of inventory review by a group of international experts formed for that purpose by the UNFCCC Secretariat. Uncertainty estimations regarding the inventory represent a crucial QC issue. It is impossible to give valid answers to these questions, only to state that some experience has been gained in working on the establishment of the emission inventory in accordance with the CORINAIR methodology.

Unfortunately, this is certainly not sufficient for full implementation of QA/QC in Bosnia and Herzegovina. It is expected that implementation of regulations concerning the preparation of the emission inventory, including the GHG emission inventory, will regulate this issue in more detail.

- It is expected that the quality of “activity data” will be the main problem in quality assurance.
- In order to properly address this issue, financial and expert assistance will be needed, as well as the permanent training of all the personnel participating in data collection, emission estimation, calculating emission factors, etc.

Potential actions at the state level of Bosnia and Herzegovina and the Entity level include:

- Inclusion of specific greenhouse gases in the data collection system;
- Increase in the number of personnel and the amount of financial resources for collection of basic data and emission data;
- Ensuring regular publication of national emission statistics;
- Delineation of institutional responsibility for systematic compilation of national GHG emission inventories;
- Expansion of financial resources for the training of personnel, calculating emissions and of emission factors, research and projections of national GHG emissions, establishment and implementation of national GHG emission inventory review system by an independent team of experts, and improvement of the quality of data archiving;
- Continued investment in hardware and training of personnel for data collection, measurements and management with the aim of improving the quality of data on emissions associated with natural gases, waste and industrial processes;
- Issuing authorizations for creation of individual emission databases in relevant institutions;
- Construction of a website for the national greenhouse gases inventory;
- Increased public awareness of problems associated with the protection of climate and potential consequences of climate change.

Bosnia and Herzegovina will, certainly, need some help in education and financing fields. It is obvious that so far, low priority has been given to the inventory development issues and related matters. So far, all information related to UNFCCC activities in Bosnia and Herzegovina are published at, not so well developed, web site [www.unfccc.ba](http://www.unfccc.ba)

*Annex 3: Croatia*

Institutional arrangement for inventory preparation in Croatia is regulated by the Part II of the Regulation on Greenhouse Gas Emissions Monitoring in the Republic of Croatia, entitled National system for the estimation and reporting of anthropogenic greenhouse gas emissions by sources and removals by sinks. Institutional arrangements for the inventory management and preparation in Croatia could be characterised as decentralised and out-sourced with clear tasks breakdown between the participating institutions including the Ministry of Environmental Protection, Physical Planning and Nature Protection, the Croatian Environment Agency (CEA) and the competent governmental bodies responsible for providing the activity data. The preparation of inventory itself is entrusted to an Authorised Institution which is selected for three-year period through public tendering. Preparation of energy balance is under the responsibility of the Ministry of Economy.

The activity data collection is under responsibility of the CEA which represents a hub between the governmental and public institutions responsible for providing the activity data and an Authorized Institution responsible for the inventory preparation. The scope and due dates for delivering the activity data to the CEA are prescribed by the Regulation. It should be emphasized that activity data collection is organized in such a manner that for each sector there are designated competent state administrative bodies, state administration organisations and/or public institutions which are responsible for collecting and providing the official data which are consistent with data provided for other international organisations (e.g. IEA, FAO). In that regard the Ministry of Environmental Protection, Physical Planning and Nature Protection had organised a series of meetings with the representatives of competent bodies and institutions to further explain the importance of providing accurate, complete and consistent data for the inventory preparation. The Central Bureau of Statistics agreed to introduce additional searches in their official programme to enable implementation of higher tier methodology for the emissions estimation. In addition several operators from the energy and industrial sector are directly approached by the CEA and an Authorized Institution for a more detailed activity data in cases when higher tier methods are recommended.

*Annex 4: Kosovo\**

*\* "This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence."*

## I GHG inventory for Kosovo

National greenhouse gas inventory systems represent an essential step in efforts to meeting the priorities of the United Nations in the field of climate protection. Kosovo as a newly country under UN administration intends to participate in this effort. Since August 2011, Ministry of Environment and Spatial Planning of Kosovo is assisted from a technical assistance to prepare for the first time GHG Inventory. The one-year project which has just started with the assistance of Czech Hydro-meteorological Institute and the Institute of Forest Ecosystem Research is to support the introduction of a national inventory system in Kosovo, similarly as in countries that have ratified the UN Framework Convention on Climate Change. Up to now under this project have been small training related with IPCC Methodology and actually consultants together with Ministry are working to collect the data for all sectors.

The guidelines that will be used will be “Revised 1996” IPCC Guidelines for National Greenhouse Gas Inventories <<http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.htm>> (COP Decisions 4/CP.1, 9/CP.2, 2/CP.3 & 17/CP.8), however for the non Annex I Parties the rule is “A national inventory of anthropogenic emissions by sources and removal by sinks of all greenhouse gases not controlled by the Montreal Protocol, to the extent its capacities permit, using comparable methodologies to be promoted and agreed upon by the Conference of the Parties. Normally inventory should cover all direct GHGs (CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFCs, PFCs and SF<sub>6</sub>) and indirect GHGs - precursors of troposphere ozone (SO<sub>x</sub>, NO<sub>x</sub>, CO and NMVOC).

Preparing a national inventory for First National Communication will start this summer 2012. The work involved in this process involved fundamental decisions about methodologies and emission factors which have to be used. It also involved setting up a network of contacts and sources to collect and review activity data, as well as a framework for management, quality assurance, technical peer review, documentation, and archiving. When the inventory is being done for the first time, the output is not known, and the inventory will likely have to go through several major short-term iterations that may not just involve data improvements, but also the removal or addition of entire source categories that were previously over-or under estimated.

The latest developments of the international climate change negotiations come from Cancun, Mexico, where in late 2010, the 16th Conference of the Parties (COP16) under the United Nations Framework Convention on Climate Change (UNFCCC) adopted the Cancun Agreement - a set of decisions that will lead to a new post-2012 climate change regime. Importantly from a development policy perspective, the Cancun package affirms “that addressing climate change requires a paradigm shift towards building a low-carbon society that offers substantial opportunities and ensures continued high growth and sustainable development.”

Kosovo is not a Party to the UNFCCC nor to its Kyoto Protocol, however Kosovo Government considers climate change as a priority area, and is dedicated to make its contribution to the solution of this global challenge. In 2009 the Ministry of Environment and Spatial Planning (MESP), in coordination with UNDP, organized a Climate Change Conference in Pristina. Attracting over 130 participants from Kosovo and beyond and created a momentum to push forward the climate change agenda in Kosovo.

### 5. Methodology used for GHG Inventory

The IPCC Guidelines of 1996 are taken as the methodological basis for estimation of GHG emissions and removal by sinks while conducting the Kosovar GHG Inventory. In some cases original methodologies or methodology slightly different from that of the IPCC are applied. The GHG inventory for Kosovo will be developed according to the IPCC Guidelines of 1996 (revised). The National Greenhouse Gases Inventory of Kosovo will consider five main modules of the IPCC Guidelines. These are: “Energy”, “Industrial Processes and Solvent Use”, “Agriculture”, “Land Use Change and Forestry ” and “Waste”. Inventory of GHG will be prepared for anthropogenic greenhouse gases emissions and removals by sinks in Kosovo for the base years, as well as a brief description of the methodologies will be used to estimate them and the associated uncertainties. The national GHG inventory represents emission data for three gases with a direct greenhouse effect: carbon dioxide, methane and nitrous oxide; and for three gases with an indirect greenhouse effect: carbon monoxide, oxides of nitrogen and non-methane volatile organic compounds (NMVOC). The last ones are not GHG but indirectly contribute to the GWP.

In order to estimate emissions of *carbon dioxide*, the most significant greenhouse gas two approaches will be used. According to the first approach, CO<sub>2</sub> emissions will be estimated for each fuel type, based on the total national consumption, and then the values will be summarized (top down). According to the second approach, emissions for separate sectors and source categories are estimated, and then emissions will be also summarized (bottom up). Usage of these two approaches in the Kosovo’s inventory allows us to judge on the fuel spectrum of the carbon dioxide

emissions (top-down), and in the second one –on the sector distribution (bottom-up). In both approaches, the default IPCC emission factors for each fuel type will be used.

**Methane** emissions coming from the Fuel Industry, Waste, and Land Use Change & Forestry and for Agriculture will be also calculated. To evaluate the amount of emissions from coal mining and hydrocarbon fuel extraction the amount of extracted fuel is multiplied by the emission factor, which depends upon the type of coal mining or upon the stage of fuel processing in the oil and gas sector. Methane emissions from livestock will be also evaluated by multiplying the livestock population (cattle, sheep, etc.) by the corresponding emissions coefficients.

**Nitrous oxide** emissions from fossil fuel combustion will be also obtained by multiplying the energy content of coal, oil products, and gas consumed by the corresponding emission factors, as given in the IPCC Guidelines. Also emissions of indirect greenhouse gases such as **carbon monoxide** and **nitrogen oxides** will be also calculated according to the IPCC Methodology. In its basic form, emission inventory estimation has the following elements:

**Emission estimate (Gigagrams GHG/year) = Activity data × Emission factor × Other Factor(s),**

where:

- Activity (e.g., tons of diesel consumption in base year (and through RENA data will be collected for years 2008 and 2009),
- Emission factor (e.g., m<sup>3</sup> CH<sub>4</sub> per ton of diesel)
- Other factor(s) (e.g., factor expressing diesel gassiness, or conversion factors)

Usually, there are different ways or methods to estimate the emissions, depending on the desired degree of detail and the available activity data and emission factors. For example, to calculate the CO<sub>2</sub> emissions from cars, one could use data on the number of cars sold; the amount of gasoline or diesel sold; or the number of kilometres travelled per driver, related to the total number of drivers and the gasoline consumption per kilometre. Each method would have its own appropriate emission factor and other factor(s). This exercise can be done for the country as a whole, or for each region after which the regional estimates are added up. In IPCC terminology, the simplest method is “Tier 1,” while more elaborate methods are “Tier 2” or “Tier 3.” Higher Tiers may recommend making use of country-specific emission factors that are based on measurements.

Obtaining complete and detailed activity data is usually time-consuming and expensive. Concentrating efforts on gases and sources of higher priority allows the preparation of an inventory that is almost complete at substantially reduced costs. In practice, most emissions can be estimated with a reasonable accuracy applying IPCC default emission factors (the least resource-demanding method). However, if there is an indication that a sector may be a major key source, efforts should be taken to obtain a more country-specific activity data or emission factor for this specific key factor. For each source, estimation methods will differ, depending on the type and detail of available activity data and the model used for emission factor evaluation. Especially for higher Tiers there may be more than one emission factor and a term to correct for e.g. abatement (controls). The quality of GHG inventories depends substantially on the completeness of activity data and reliable emission factors.

## 6. National Inventory system in Kosovo

An emission and removals inventory is a current, comprehensive listing, by source, of specific emissions and sinks, and covers a specific geographic area for a specific time interval. For example, Kosovo GHG inventory could consist of a list of CO<sub>2</sub>, CH<sub>4</sub> and NO<sub>2</sub> emissions for RENA project analysis will be done for years 2008 and 2009 plus explanatory text. Or, on a larger scale, the inventory may estimate all GHG emissions for Kosovo for a certain number of years. An emission inventory contains the following information:

9. Geographic area covered by the inventory (e.g., certain regions or entire Kosovo);
10. Background information including the reasons for compiling the inventory;
11. Time interval represented by the emissions inventory for RENA analysis will be done for years 2008 and 2009) with emissions expressed in mass/year;
12. Tabular summary of emission estimates by source category for each sector.
13. Other factors (e.g., a factor that expresses the gassiness or CH<sub>4</sub> content of the oil and coal);
14. Activity data, which are human or animal population, industrial, or economic data used to estimate and allocate emissions (in our example, this would be the sum of tons of oil and coal produced at each well and mine);
15. Emission factors;
16. Additional supporting text that is provided.

All activity data used for GHG inventory have been provided by different Kosovar Institutions already established.

## 7. Sources of data (AD, CF and EF<sup>3</sup>) used for the years 2008 and 2009

### 2.8 4.1 General Background about data collection in Kosovo

The Statistical Office of Kosovo (SOK) has operated as a professional office since 1948, and has passed through all historic phases of Kosovo. On August 2nd 1999, SOK restarted its work as an independent and professional institution of public administration in Kosovo. SOK is an executive agency under the Ministry of Public Services (MPS).

A statistical regulation (Regulation 2001/14) entered into force on 2 July 2001, and is currently being amended. The SOK mission is to fulfill the needs of users with objective statistical data and analysis in order to support the Kosovo Government and provide proper information for decision-makers and other users in Kosovo. The main objective of the SOK is statistical data collection, processing, analyzing and publishing. It also provides estimations and surveys on demographic, social and economic occurrences in the society of Kosovo. In order to achieve this objective, the SOK uses methodology, nomenclatures and classifications accepted by international statistical organizations.

The SOK is increasing its cooperation with EUROSTAT through implementation of their methodology and standards in order to establish a compatible statistical system with the EU countries. The cooperation with the statistical offices of Bosnia, Croatia, Albania, Macedonia, Sweden and Canada has been already established and the SOK is open towards further cooperation with statistical offices of other countries and international organizations. WB, UNFPA, IOM, FAO, UNDP, ILO, Sida, CIDA, UNICEF, EU/EAR etc. are already giving valuable contributions to further development of the Statistical Office of Kosovo. The SOK has also close and extensive contacts with other Ministries and departments and agencies in Kosovo.

Department composes of National Accounts, Price Statistics, External Trade Statistics, and the Business Statistics with the statistical business registers. The role of this department is to create reliable macroeconomic indices and its publications in monthly, quarterly and annual basis. All published indices are based on the Eurostat methodology and international recommendations; they are comparable with indices of other countries. The data collection and publishing is done in monthly basis for special publications, as are consumer price, export-import, production and the consumption of electricity, production of coal, data for transportation and of post-telecommunication, vehicle registration and hotel services. There are some other indices collected on quarterly and annual basis. These publications are: production price, import price, national accounts, government accounts and business structure survey. Compiles and designs questionnaires for the surveys, prepares instructions/guides, its distribution, data collection, data quality control, processing, analysis, tables, and other publications. This department also prepares the data entry and saving program. This department aims to follow international standards.

National Accounts - includes the estimation of the GDP by two approaches: production, expenditures and National Accounts. Until now are published GDP 2002 – 2004 by expenditure and production approach with the supply and use tables, National Accounts 2002, Government Accounts 2003, Social Enterprises Survey Data 2002, Government Accounts 2004-2007, GDP 2004 – 2006 by expenditure approach.

Price Statistics– includes the estimation of the indices of consumer prices, production, import and the purchasing power parity. Until now, the Consumer Price Index (CPI) has been published each month since September 2002; External Trade Statistics – publishes data on export and import of goods in Kosovo. External Trade Statistics started to be published in January 2001. At the beginning, publications were on semiannual basis until March 2005. Until now, External Trade Statistics (ETS), on monthly basis, are published each month since March 2005.

Businesses and business statistical registrars – at the beginning (2000) this section was designated for businesses by activities by the Nomenclature of the Economic Activities (NACE Rev. 1) and has set the unique identification number for registered business. Since January 2003, the Ministry of Trade and Industry (MTI) has taken the responsibility on Business Registration in Kosovo. This section has published Statistical Review for Registered Businesses in Kosovo. This section prepares and publishes indices on transportation, post-telecommunication,

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AD=Activity Data, CF=Conversion Factor, EF=Emission Factor

production and consumption of electricity, production of coal, and number of registered vehicles, number of new registered businesses - on monthly and quarterly basis. These data are available in the Quarterly Bulletin.

## 2.9 4.2 Energy and Transport

Based in IPCC Methodology activity data for Energy and Transport Sectors are related with two big subcategories: fuel combustion as well as fugitive fuel emissions. All activity data concerning Fuel Combustion are gathered from National Balance of Energy prepared by the ex-Ministry of Energy and Mining (actually as it was mentioned above is transform since March 2011 into Ministry of Economic Development). In the following is given a short description of main institutions dealing with collection of energy statistics in Kosovo.

All activity data for each sector were national. Although SOK will be the main activity data source provider for the entire GHG Inventory, it did not provide directly activity data for the GHG inventory. Rather, data will be gathered from the ex-MEM (actually MED), Ministry of Environment and Spatial Planning, Ministry of Agriculture and Forestry, Ministry of Industry and Trade, Ministry Transport and Telecommunications, the General Directorate of Forestry, Taxation Department, Customer Offices and different data bases, surveys and studies prepared by international organizations (including the World Bank, UNDP, USAID etc), universities and NGOs.

**Ministry of Economic Development (ex-Ministry of Energy and Mining-MEM) (MED)** is the highest state authority in drafting policies and strategies in the energy sector. Missions of MED in the energy sector are development policies to ensure a normal supply with energy of the consumers, to guarantee a sustainable growth of country's economy and a social and cultural development of the population. MED has the authority of supervising the activity of companies with state owned capital and it has the power to appoint all the members of the Supervisory Councils of these companies like KEK, KOSTT and other ones focused more in fuel oil derivatives supply. Energy Balance since 2003 has been prepared on monthly bases from this Ministry from Energy Department and his respective divisions.

**Statistical Office of Kosovo** is a professional institution which deals with collection, processing and publication of official statistical data in general and energy sector in particular. Since 12.12.2011 the Agency operates in the frames of the Prime Minister's Office. Office is funded by the Kosovo Consolidated Budget, but also by donors for specific projects and for technical professional support. Statistical Agency of Kosovo acts according to the Law No. 04/L-036 which entered into force on 12.12.2011. Statistical Agency of Kosovo completely covers the territory of Kosovo, based on the statistical structure of the enumeration areas as the basic unit and sole in the country from which it gets first hand information. All surveys conducted in the field use the extension of the samples in these enumeration areas but also a statistical methodology according to international recommendations.

**Ministry of Environment and Spatial Planning (MESP):** The mandate of the Ministry of Environment and Spatial Planning is defined by UNMIK Regulation No. 2002/5 and 2005/15. Within a frame of these regulations the responsibilities are related to the creation and implementation of legislation on general management in the field of Environment, Water, Planning and Construction of Housing. In order to do such of things, the Ministry has established the departments, institutes and the Environmental Protection Agency. Two following institutes, which are reporting as well as under MESP are: Hydrometeorology Institute of Kosovo and Institute for Spatial Planning, Inspectorate. One of the most important governmental Agency under this Ministry is the Agency of Environmental Protection, that have three divisions: Department of Environmental Information System, Department of Environmental Monitoring and Department of drafting the reports, plans and programs.

MESP is preparing the ground for analysis of GHG in Kosovo. They already have started an technical assistance (as it was mentioned above) for a project for preparation of GHG Inventory and they have included climate change issues under the Strategy of Environment of Kosovo. This is very important since generation of electricity and used of oil derivatives in all sectors result of the huge quantities of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) that are pumped into the atmosphere – demands Kosovo's attention.

South-eastern Europe and the Balkans are forecast to suffer more than other parts of Europe. Without determined action, Kosovo's attempts at development will be undermined by the impact of climate change on its weather, ecology, water supply, agriculture and economy. Kosovo will not only suffer the effects of climate change, but is also contributing to it, through three main means:

- **Lignite:** Lignite is Kosovo's primary resource and the likely driver of its future economic growth. However, its use in electricity generation releases an average of 5.8 million tons of CO<sub>2</sub> into the atmosphere annually from the existing two power plants. With the planned construction of a new power plant, it is possible that Kosovo could be responsible for annual CO<sub>2</sub> emissions as high as 10 million tons;

- **Vehicles:** The estimated 5.5 million tonnes of CO<sub>2</sub> produced by motor vehicles in Kosovo as a result of outdated emission reduction technologies; and
- **Deforestation:** Unregulated logging of Kosovo's forests is reducing the country's positive contribution to combating climate change through the absorption of CO<sub>2</sub>.

In comparison to neighbouring Albania, Serbia, Montenegro and Macedonia, Kosovo just has started strongly preparation to deal with climate change.

The climate change section as part of the Environmental Strategy includes the following aims:

#### ***Energy Sector***

- Reductions in CO<sub>2</sub> and GHG emissions primarily from lignite power plants (both existing and planned), but also from district heating plants and all other small combustion plants, which exists in different economical sectors;
- The implementation of clean coal technologies during the rehabilitation of the existing plants and building "Kosova Re" Thermal Power Plant based on the assistance of the WB;
- Developing alternative renewable energy resources (such as building almost 80 new SHPPs identified based on the studies carried out from the Ministry of Economic Development, wind farms or solar hot water systems) and tax breaks encouraging the private sector to develop appropriate systems;
- Increased energy efficiency according to National EE Action Plan already prepared and approved from the ex-MEM (actually MED) (November 2010); and
- Effective enforcement and implementation of legislation.

#### ***Transport***

- The development of facilities to monitor CO<sub>2</sub> emissions;
- Creating a tax regime encouraging citizens to drive less polluting vehicles; and
- Effective enforcement and implementation of legislation.

#### ***Deforestation***

- Raising political and public awareness of the importance of Kosovo's forests;
- To ensure effective forest management and the enforcement of legislation protecting forests;
- The development of replanting programmes and plans to reduce the use of firewood for heating and cooking.

**Ministry of Trade and Industry (MTI)** is part of the Government of Kosovo, is preparing the policies and respective action plans and they have been concentrated in creation of stimulating conditions for promoting private sector development, particularly for developing small and medium enterprises. In the policies and development strategies dominates tendency for the development of manufacturing sector, so that Kosovo, from a competitive society become a productive society. In accordance with Regulation 2001/19, duties and responsibilities of MTI were:

1. Creating systemic conditions for trade, industry and commerce;
2. Creating employment policies and implement legislation to support genuine competition.

Now, the Ministry of Trade and Industry has: 5 agencies: SME Support Agency of Kosova; Kosovo Standardization Agency; Business Registration Agency; Investment Promotion Agency and Kosovo Accreditation Directory. Ministry of Trade and Industry (MTI) has an very important role since they are Governmental body who are issuing the licences related with imports of oil derivatives. So, all the related with data collection for GHG Inventory related with import of oil derivatives from all private subjects in Kosovo are collected through this ministry.

The Energy Regulatory Office was established upon the promulgation by the Kosovo Assembly of the Energy Laws on June 30th, 2004. Law 2004/9 "On the Energy Regulator" establishes the independent energy regulator to set the regulatory framework for a transparent and non discriminatory energy market based on free market principles and promote competition. ERO regulates the Electricity, District Heating and Natural Gas sectors. To meet its responsibilities, ERO has the power to: grant, modify, suspend, transfer and withdraw licenses; supervise and control compliance with licenses; fix and approve tariffs and tariff methodologies for regulated energy services; grant permits for the construction and operation of new generation capacities and gas pipeline systems including direct pipelines and direct electricity lines; monitor the unbundling of the legal form, organization, decision making and accounts of energy enterprises; prescribe the general conditions for energy supply and the standards of service to be met by the licensees; enforce the provision of the Law on Energy Regulator and impose fines for violations; perform other duties assigned by the primary energy laws. Kosovo is a signatory party of the Energy Community Treaty and ERO is responsible for establishing a regulatory framework which is in compliance with Acquis Communautaire provisions on Energy including here also all aspects related with Kyoto Protocol. Carrying out all analysis related with cost, prices for electricity and heat, ERO has collected a lot of data which will serve as very well source for detail analysis of GHG inventory and later mitigation scenario preparation for Kosovo.

**Kosovo Energy Corporation** j.s.c (KEK) is the sole power corporation in Kosovo. KEK j.s.c is vertically integrated and was legally incorporated in the end of 2005 year.

In different periods of time KEK j.s.c went through a lot of changes. During this period of time energy production in Kosovo was concentrated in production of energy from a coal and small quantity from the water. During that period of time the supply with power was not only from Kosovo’s plants but also from the other sources of energy production in the other places of ex Yugoslavia. Now the core business of the Corporation is production of coal, energy production, and supply with energy, sales and customer care service. In accomplishing the above mentioned functions the KEK is organized into four main divisions: Mines, Generation, Distribution and Supply Divisions.

There are two open-cast mines, namely the Mirash mine and Bardh mine, two power plants, PP “Kosova A” and PP” Kosova B”, around 18.898km (from 0.4 kV voltage level to 35 kV) of distribution network covering the whole territory of Kosovo and the operation is finalized with supply activity, including the energy sale function . The functions of KEK are regulated according the politics of Energy Regulatory Office of Kosovo. Carrying out all analysis related with cost, prices for electricity and heat, ERO has collected a lot of data which will serve as very well source for detail analysis of GHG inventory and later mitigation scenario preparation for Kosovo. In order to carry out GHG Inventory is very important to have close collaboration with KEK, which has the best source of data related with coal mining production and their respective fugitive emissions from actual and abandoned mines.

At the following is presented the main laws and sub laws related with energy statistics in Kosovo.

Title	Subject matter and scope
The Law on Statistics Statistical Agency of Kosovo acts according to the Law No. 04/L-036 which entered into force on 12.12.2011.	This law is relevant to determine the fundamental principles and to establish a legal framework for the organization, production and publication of official statistics of Kosovo. The purpose of official statistics is the collection, processing and dissemination of data for statistical purposes to economic activities in general as well as all data in different energy sectors, social and general conditions in Kosovo, as well as to ensure Kosovo the fulfillment of international obligations in producing and publishing official statistics.
LAW No.03/L-184 “ON ENERGY”, 15 November 2010	<p>The scope of this law includes electricity, heating, natural gas, and renewable energy sources, and the law provides for:</p> <ul style="list-style-type: none"> <li>• the development and implementation of an energy strategy, including forecasting of energy</li> <li>• balances and policy on energy efficiency, renewable energy sources and co-generation;</li> <li>• the roles of the Government of Kosovo, of local governments, and of other institutions, and</li> <li>• provides for wider public participation in the development of energy strategy and its</li> <li>• implementation;</li> <li>• the imposition of public service obligations on energy enterprises where appropriate;</li> <li>• the issuance by the Ministry of secondary legislation on matters specified in this law; and measures that may be taken in the event of energy emergencies.</li> </ul> <p>Based on this law MED and MESP have the right to asked all data to all public and private companies to prepare energy balance, energy forecast all all other study needed for development of Kosovar Energy System.</p>
Law on ON ELECTRICITY), No.03/L-201, 15 November 2010	This Law establishes common rules for performing generation, transmission, distribution and supply of electricity, and for access to interconnections; for the organization of access to the transmission system and distribution system, and the operation of, and access to, the electricity market in Kosovo. According this law, provides the data all related data about fuel consumption, emission factors and electricity generation from all TPPs of

	Kosovo.
Law Energy Efficiency - LAW No.04/L –016, 22 JULY 2011	<p>The purpose of this Law is to provide the necessary legal and institutional professionals for arrangement of the energy efficiency field. Also, this Law regulates the issue of energy efficiency, preparation and approval of energy efficiency plans and reporting for them, determination of roles, duties and responsibilities of the institutions as well as addressing the obligations deriving from Energy Community Treaty regarding the energy efficiency.</p> <p>This law, clearly defines the procedure for reporting energy data for the purpose of supporting, developing and monitoring the national energy efficiency program. As defined in this Law, all energy commodities are obliged to submit yearly reports on amount of energy supplied to the customers.</p>

In the following will be described in detail institutions that should be used as primary ones to get all data sources and emission factor for fulfilling the Module 1 “Energy and Transport” of GHG Inventory.

A. The main categories which are included in **fuel combustion** are as following:

***VII. Energy and Transformation of fuels Industries:***

- Electricity and Heat Production.
- Petroleum Refining: all combustion activities supporting the refining of petroleum products;
- Other energy industries: emissions from own energy use in coal mining & oil and gas production.

Right from the beginning is important to declare that there is no one big refinery in full meaning of this kind of facility in Kosovo. But in the same time is very important to be mentioned that in last five years are build two small refineries in Ferizaj and Peja for processing crude oil and producing only diesel and bitumen. Those should be kept into consideration during the analysis of GHG inventory for the years 2008 and 2009 under this sub-category.

As previously mentioned, Kosovo has no natural gas and it relies primarily on its large reserves of lignite for the production of electricity. A small proportion of electricity is produced at hydro-power plants. Fuel wood, most of which is harvested within Kosovo is used as a source of heat in households and commerce. Petroleum products, all of which are imported, make up 30% of total energy consumption. They are most used in transport, but also for powering generators, smelters for industry and for heating, cooking and lighting. In addition to these four main sources, a small amount of solar energy is produced at the household/service level for preparation of domestic hot water. MED has developed some demonstration SWHS (Solar Water Heating Systems) projects for hospitals, kindergartens and some other public buildings during the last three years.

Kosovo has the world’s fifth-largest accumulation of lignite, technically recoverable reserves are estimated at 11.5 billion tonnes, located mainly in the Dukagjin valley. Lignite is Kosovo’s only domestic fossil fuel source and accounts for 97% of domestic electricity generation. It is also used directly by households and public and private service buildings.

Lignite is currently extracted (by KEK) in the open mines of Bardh, Mirash and the newly opened mine of Sibovc South-West used to feed the nearby power plants Kosovo A and B. The mines and plants are located in densely populated regions, adding to the difficult mining conditions. Emissions at the mines and power plants are well above internationally allowed limits, resulting in serious environmental and health impacts. The two older mines have an expected short life and the development of the new mine, the Sibovc South-West (SW) mine, ensures a 40-year supply of raw material. The Energy Strategy for Kosovo<sup>4</sup> estimates that this new mine will supply the Kosovo A and B power plants until their expected closure (Kosovo A is planned to operate until 2017 and Kosovo B is planned to operate until 2025) and provide the 650 to 750 Mt needed to fuel the new plant over its expected 40-year operational life. An additional 123 Mt of lignite will be needed to fuel the existing KEK plants to the end of their maximum expected lifetime (in 2025).

Kosovo’s total installed generation capacity is 1,513 MW, almost entirely lignite-fired thermal power plants and some medium and small HPPs and only three very small wind turbines installed in Golesh/Pristina (with 0.45 MW each); Most electricity in Kosovo is produced by two thermal power plants (TPPs) – Kosovo A and B – which are operated by KEK:

- Kosovo A comprises five units and has an overall rated capacity of 800 MW; however, the technical conditions of key components limit operational capacity to only 420 MW. This is largely due to poor maintenance since the

<sup>4</sup> The Kosovo Energy Strategy Document 2008- 2018 adopted by the Kosovo Assembly in 2009

1980s. More recently, four of the five units have been partially rehabilitated. However, their operation remains unreliable and their efficiency is 27%. The fifth unit is out of operation;

- Kosovo B consists of two units of equal rated capacity of 339 MW, which have an efficiency of more than 30%. In 2002, a fire caused massive damage to the plant; it resumed normal operation in 2004 but its total maximum available capacity is limited to 540 MW. (The technical details of these plants are given in tables below):

**Kosovo A TPP**

UNIT	Capacity (MW)	Producer	Age (Years)	Operating Capacity (MW)	Max. Available Capacity (MW)
Unit 1	65	Westinghouse	42	35-40	35-49
Unit 2	125	GE/US	38	None	0
Unit 3	210	USSR	35	None	120
Unit 4	210	USSR	33	140	140
Unit 5	210	USSR	30	110	120

**Kosovo B TPP**

UNIT	Capacity (MW)	Producer	Age (Years)	Operating Capacity (MW)	Max. Available Capacity (MW)
Unit 1	339	ALSTOM / MAN	21	None	250-280
Unit 2	339	ALSTOM / MAN	20	None	250 -280

Kosovo does not have any oil refineries and is completely dependent on imported oil products from neighbouring countries and the surrounding region. Kosovo's oil product market is fully liberalised following the 2005 adoption of the Law on Trade of Petroleum and Petroleum Product. The Petroleum Sector Council, established within Kosovo's Ministry of Trade and Industry, is responsible for regulation and monitoring of oil and oil products. The Council issues licenses for wholesale and retail sales, transport, storage and other operations pertaining to the trade of oil products.

Kosovo currently has district heating (DH) systems in three major cities: Pristina (Termokos), Gjakova and Mitrovica (Termomit), all of which are state-owned enterprises. A small state-owned system also operates in Zvecan. Total rated installed heat capacity amounts to 228 MWthermal from 12 boilers, providing about 5% of the heat demand (the Pristina system accounts for 70% of total DH capacity). District heating in Kosovo is fuelled mainly by heavy fuel oil. As in the electricity sector, district heating is plagued by high technical and economic losses, an obsolete generation infrastructure, and low supply reliability in the distribution network.

Activity data concerning this category will be gathered for the year 2008&2009 from National Energy Balance which in all these years is prepared from the Department of Energy with its two Divisions: Energy Systems and Environment and Renewable Source and Energy Efficiency being part of the MED. These three units has in their job description the preparation of energy data base in general and energy balance in particular. The Department of Energy is tasks related with energy data base in general and energy balance in particular are as the following:

1. Implement energy sector development policies and strategies in Kosovo, and organize activities in implementation thereof;
2. Organize the Kosovo Energy Strategy Implementation Program;
3. **Collect energy data from demand and supply point of view for preparing yearly energy balance.**
4. Support effective implementation of development projects in the energy sector, as funded by the Kosovo Budget, international financial institutions, and donors;
5. Support adoption, approximation and harmonization of environmental protection legislation, in compliance with relevant EU regulations and directives;
6. Cooperate in identification, analysis, preparation and effective implementation of studies and development projects in the energy sector, funded by the Kosovo budget, international financial institutions and donors;
7. Encourage efficient energy use and energy resources in Kosovo, through drafting and coordination of implementation of a National Energy Efficiency program, and monitor energy efficiency targets;
8. Define conditions and criteria for eligible electricity and heating consumers;

**9. Coordinate drafting of secondary legislation in the energy sector including the procedures for collecting data and preparation of yearly energy balance;**

10. Prepare necessary programs and legislation on development of gas and liquid fuel sectors, including creation of conditions for establishment and maintenance of national strategic reserves of gas and liquid fuel supply, in compliance with relevant EU regulations and directives;

11. Work in implementing EU regulations and directives on electricity, gas, energy efficiency, renewable energy sources, and in drafting relevant technical rules on safety of energy products and environmental protection, in compliance with relevant EU regulations and directives;

Pursuant to Article 6 of the Energy Law No., 2004 / 8 and Administrative Instruction no. 2005/4, "Rules on Energy Balance", Ministry of Energy and Mines (MEM) has drafted the document Republic of Kosovo's Energy Balance. Data for preparation of the Energy Balance for different years most of the time have been collected via different institutions:

- VIII.** Gross Domestic Product – SOK (Statistical Office of Kosovo) and CBK (Central Bank of Kosovo);
- IX.** Supply with lignite, production and own consumption of the electric energy – KEK j.s.c. (Energy Corporation of Kosovo)
- X.** Import, export, distribution of and loses – KOSTT j.s.c. (Transmission, System and market Operator);
- XI.** Production and export of dried coal – j.s.c Kosovo Coal";
- XII.** Import of oil, coal and biomass (fire wood) – Kosovo Customs;
- XIII.** Data on heating – Central Heating Companies;
- XIV.** Data on solar energy – Kosovo Solar Energy (ESOK);
- XV.** Data on oil products – Kosovo Customs;
- XVI.** Data on fuel consumption in the rail – Kosovo Railways.
- XVII.** Data on kerosene (fuel jet) – Prishtina International Transport.

***XVIII. Industry: GHG from final consumption of fuels in industry (not for transportation in enterprises):***

- Iron & Steel;
- Non ferrous metals;
- Chemicals;
- Pulp, Paper & Print;
- Food Processing , Beverages & Tobacco;
- Other.

In the analysis of the updated document on Energy Strategy of Kosovo, the Industry Sector is divided into the following sub-sectors: Metallurgy, Chemical, Building Materials, Mining, Food/Beverage/Tobacco, Textile/Leather/Shows, Wood/Paper/Printing, Mechanical and others. The analysis of economic development during last years shows small improvements in the contribution of the Industry Sector to national development. In other words, general industrial production in terms of absolute value of GDP, contributes less now than it did before 1999. Energy sources in industrial sectors are consumed for motive power, process heating at low and higher temperatures, as well as for different technologies (e.g. the electrolysis process).

The Industrial Sector is an important sector for energy consumption, despite the fact that its development has been hampered by numerous difficulties and slow progress. In the absence of an inter-institutional implementing mechanism for energy efficiency, it is extremely difficult to give an accurate description of the existing situation of this sector or of the availability of data required to measure the potential impact of energy efficiency initiatives. If one could say that the consumption level reflects the industrial growth level, it can then be assumed that this sector is facing a development trend, and will consume more energy. From this perspective, EEI needs to follow this development trend.

Activity data concerning this category will be gathered for the year 2008 and 2009 from Kosovo Energy Balance prepared from Energy Department of MEM. The main problem here was concerning with energy commodities consumption for each sub-sector. This division was done based in analytic analyses and industrial energy survey carried from MEM on the year 2008.

***XIX. Transport: GHG from combustion and evaporation of fuels for all transport activities, as by sub-sectors:***

- Civil aviation (International and Domestic aviation);
- Road Transportation: Cars, Light Duty Trucks, Heavy Duty Trucks & Buses, Motorcycles;
- Railways;
- Navigation (International Marine and Internal Marine - except fishing);
- Other Transportation.

Energy sources are consumed in different economic sectors such as households, services in public and private buildings, industry, transport and agriculture. The relationship between the economic development of a country and its energy demand is considered a key issue and may be represented by a closed cycle. This cycle involves many economic, social and technological analyses. To define clearly their relationships, many studies are required on different economic and social development sectors. These will provide the basis for an understanding of the challenges facing the energy sector in Kosovo and the of commitment that is needed to ensure supply of energy sources at the lowest cost, to guarantee sufficient energy supply to meet consumer demand, and to create the conditions required for sustainable economic development.

The transport sector in Kosovo started to develop with fast growth rate after the 1960s, when, in addition to the quantitative increase of road transport means, the infrastructure and transporting capacities of the road and railway systems were developed, establishing a regional transport structure. The Transport Sector has an important role in the consumption of energy resources. The evident increase in the number of transport modes after 2000, especially in road transport, was accompanied by an increase of transport activity and an evident increase in fuel consumption, mainly diesel and gasoline.

Activity data concerning fuel consumption from passenger and freight transport subsectors will be gathered for the year 2008 and 2009 from Kosovo Energy Balance prepared from Energy Department of MEM. The main problem here was concerning with energy commodities consumption for each transport mode: road, rail and air transport.

***XX. Small Combustion: Emissions from fuel combustion in the following sectors:***

- Commercial/Institutional Buildings
- Residential Buildings
- Agriculture/ Forestry/ Fishing
- Other

Energy consumption in the household sector is divided into five distinct parts, each with different characteristics: space heating, air conditioning, hot water and cooking, lighting and other electric appliances. The residential sector occupies first place in the consumption of energy resources in Kosovo, accounting for 35% on the last years. As a consequence, it is important to know about the potential for energy savings in electricity, biomass, oil products (including LPG) and coal for each service. Since 2000, the energy supply and demand for space heating, cooking and hot water (using mostly fuel woods) have remained more or less in balance. After 2000, there was a massive decline in the supply of fuel woods from forest areas to residential zones. This resulted in a massive (and mostly illegal) cutting-down of fuel woods and overloading of electricity equipment (sub-stations, transmission and distribution lines).

The Service Sector is divided in two branches: Public Service and Private Service. The Public Service Sector has a traditional experience of heat demand, based mainly on old technology, installations and organization, but in some cases new schemes have been introduced. The data on the quantity of energy demanded for each service and the contribution of each energy commodity is based on different surveys carried out by ex-MEM (actually MED). It should be underlined that space heating, hot water and lighting for all sub-sectors are generally provided at a low quality, due to old energy infrastructure in the public service institutions and the lack of an adequate budget for maintenance of energy systems.

2.9.1.1.1 Kosovo has been for many years a country where agriculture has dominated - it still remains at about 40% of total GDP. Energy in this sector is consumed on the cultivation of plants, livestock and forestry and, particularly in rural areas, agriculture continues to provide the main option for economic and social development. The development of the agriculture sector is conditioned by many factors, where the most important include:

- Farms are of minimal sizes and fragmented,
- Problems exist concerning the ownership of arable land,
- Very high prices of inputs and a disorganised and ineffective production and distribution system for agricultural products,
- Lack or insufficiency of agriculture credit,
- Lack or insufficiency of agriculture mechanics.

Activity data concerning small combustion category will be gathered for the year 2008&2009 from Kosovo Energy Balance. The main problem here was concerning with energy commodities consumption for each sub-sector and their division between Households (Residential), Public Building, Commercial Building, Agriculture, Forestry and Fishing. This division was done based in analytic analyses and simple surveys based on each from sub sectors mentioned above. For the year 2008 and 2009 will be very difficult to get such data and we have started immediately to work for this task in order to buy time to have all data ready by middle of May 2012.

**XXI. Other: All remaining emissions from non-specified fuel combustion except for wood. Also here should be included emissions from military fuel use.**

Activity data for military fuel use are gathered from Ministry of Defense and reported under the road transport.

**XXII. Traditional biomass burned for energy purposes: emissions of CO<sub>2</sub>, CH<sub>4</sub>, CO, N<sub>2</sub>O, NO<sub>x</sub> and NMVOC from the burning of wood.**

Activity data concerning wood consumption will gathered for the years 2008&2009 from Kosovo Energy Balance prepared from MEM based on the Yearly Report of Forestry Directorate. The main problem here was concerning with wood self collection and illegal cutting from forestry areas which is not registered. For the year 2008 and 2009 will be difficult to get such data and we have started immediately to work for this task in order to buy time to have all data ready by middle of May 2012.

**C.** In this category are included **Fugitive emissions from fuels** like:

**IV. Solid Fuels**

- Coal mining: total emissions (CH<sub>4</sub>) from underground & surface mining and post mining activities;
- Solid Fuel Transformation: Fugitive emissions arising during the manufacture of secondary & tertiary products from solid fuels: coke, etc.
- Other: other not elsewhere specified.

Kosovo electricity sector is dominated by KEK JSC, a vertically integrated system with the exception of the transmission system which is not part of KEK JSC KEK JSC consists of two lignite mines, Bardh and Mirash, two lignite-powered power plants, Kosovo A and B, with an overall effective capacity of 740-840 MW (with an installed capacity of 1478 MW), the distribution and supply systems. In the long-term lignite will remain the main combustion fuel for electricity production in Kosovo.

Kosovo's lignite has low sulfur content, a relatively good concentration of lime (calcium oxide) for sulfur absorption during the combustion process. The ratio between lignite and overburden is rather favorable; a fact that makes open cast mines economically attractive.

Lignite mining sector as we know it today is the outcome of capital investments realized some decades ago (1962 – 1984). These investments included the development of Bardh and Mirash mines, with total coal reserves of 300 million tons, the construction of Kosovo A power plant, and later Kosovo B power plant, with an overall installed capacity of 1,478 MW.

It was a widely known fact that Bardh and Mirash mines coal reserves are insufficient to supply the two power plants until the end of their operational lifespan; therefore, the development a new mine to supply TPP Kosovo A and TPP Kosovo B until the end of their operational life and potential development of generation capacities were planned. During 90-ies, due to politic and economic circumstances, the mining sector witnessed stagnation, degradation and the new mine was never opened.

Based on the projects for the development of a new mine, in an effort achieve continuous supply of TPP Kosovo A and TPP Kosovo B, KEK JSC is striving to open a new mine in Sibovc South-West. In the meantime, in order for the short-term effects to be facilitated, KEK has spread its activities in the eastern part of Mirash, or the Sitnica Sector, where usable reserves amount to 10 million tons.

Activity data concerning coal mining, enrichment coal post mining, coal transformation for dray coal production will be gathered for the year 2008 and 2009 based on the reports of KEK, ERO and verify figures of MED.

**V. Oil & Natural Gas**

- Production of crude oil only,
- Transport: loading & unloading of crude oil from tankers,

- Refining/storage of crude oil and oil by products,
- Distribution of oil products,
- Production/processing of natural and associated gas,
- Transmission/distribution of natural and associated gas,
- Other leakage: release of natural and associated gas at point of use.

As it was described above in Kosovo does not exist those oil activities:

- Production of crude oil only,
- Transport: loading & unloading of crude oil from tankers,
- Refining of crude oil,
- Production/processing of natural and associated gas,
- Transmission/distribution of natural and associated gas,
- Other leakage: release of natural and associated gas at point of use.

The only activities which should be counted for Kosovo in this direction are:

- Storage of oil by products,
- Distribution of oil products,

Activity data concerning storage of oil by products and distribution of oil products will be gathered for the year 2008 and 2009 from license companies issued from Ministry of Trade and Industry.

**VI. Venting & Flaring:** *the release and/or combustion of excess gas at facilities for the production of oil or gas and for the processing of gas.*

These activity data are not for Kosovo since there are no natural or condensate gas wells in the country.

*Annex 5: Former Yugoslav Republic of Macedonia*

## ***I*** **Institutional arrangements**

*List and briefly describe which institutions (ministries, agencies, statistical offices) or other entities (public or private) are responsible for energy data collection, compilation and publication. If there is no any institutional arrangement in place please put NE (not existing) notation key in the table below.*

Institution	Energy data
Ministry of Economy Energy Agency National Statistical Office	Energy balance (national level)
Ministry of Economy National Statistical Office	Fuel characteristics (NCV)
National Power Company (ELEM), District Heating Company (Toplifikacija), Power and heat plant "TE-TO", Power Distribution Company (EVN), Power Sistem Operator (MEPSO), Oil Refinery OKTA, Makpetrol, Large Consumers (USJE Cement Factory, FENI-Industry, Makstil, ArcelorMittal, Skopski Leguri, etc.)	Large emissions sources (power plants, refineries, ...)
National Statistical Office, Ministry of Internal Affairs Public Transport Enterprise	Transport (number and type of vehicles, average km of the public transport buses, average km of the intercity buses, average km in freight)
Ministry of Environment and Physical Planning	Technical characteristics of installations and types of fuel used

## Energy data sources

	Source
<b>Energy Balance</b>	<ul style="list-style-type: none"> <li>• National Energy Balances (from the State Statistical Office and the Ministry of Economy)</li> <li>• IEA Energy Statistics of Non-OECD</li> </ul>
<b>Domestic Energy Prices</b> <ul style="list-style-type: none"> <li>– Oil and oil distillates (excluding LPG), natural gas, electricity and low thermal heat (LTH)</li> <li>– LPG</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Regulatory Commission (Annual reports)</li> <li>• Oil refinery OKTA</li> </ul>
<b>Resource Potential, including imports/exports</b>	<ul style="list-style-type: none"> <li>• Strategy for Energy Development of the Republic of Macedonia until 2030</li> <li>• Strategy on Use of the Renewable Energy Sources in the Republic of Macedonia by 2020, September 2010</li> </ul>
<b>Installed capacity and characterization of existing plants</b>	
– Power plants	• Annual Report for 2009 of the JSC Macedonian Power Plants - AD ELEM - for the electricity generation capacities ( <a href="http://www.elem.com.mk">www.elem.com.mk</a> )
– Heating plants	• Annual Reports of Toplifikacija AD Skopje ( <a href="http://www.toplif.com.mk">www.toplif.com.mk</a> )
<b>Characterization of new plants</b>	
– Hydro power plants	• JSC Macedonian Power Plants - AD ELEM - for the electricity generation capacities ( <a href="http://www.elem.com.mk">www.elem.com.mk</a> )
– Coal power plants	• Strategy for Energy Development of the Republic of Macedonia until 2030
– Wind power plants	• Wind Park Development Project Macedonia – Feasibility Study Bogdanci A, Infrastructure Project Facility for Western Balkans (EU's CARDS Programme, February 2010)
– CHP	• TE-TO AD Skopje ( <a href="http://www.te-to.com.mk">www.te-to.com.mk</a> )
– Solar PV and CCPP	• Default values from MARKAL template
<b>Load Profile</b>	Demand curves from the Electricity Transmission System Operator of Macedonia - AD MEPSO ( <a href="http://www.mepso.com.mk">www.mepso.com.mk</a> )
<b>Demand Drivers</b>	
– Population growth	• UN Projections
– GDP growth	• Ministry of Finance
<b>Fuel prices projections</b>	
– Oil, gas and coal	• World Energy Outlook (WEO) 2011
– Other fuels	• prices for other fuels are derived based on WEO projections
<b>Emission factors</b>	<ul style="list-style-type: none"> <li>• Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories (<a href="http://www.ipcc-nggip.iges.or.jp/public/gl/invs5a.html">http://www.ipcc-nggip.iges.or.jp/public/gl/invs5a.html</a>)</li> <li>• For lignite, country specific emission factor calculated (<i>Preparation of the GHG Inventory for the Second National Communication under UNFCCC - National Inventory Summary Report (2006)</i>; Page 8, Table 1.2)</li> </ul>
<b>Known energy policies</b>	<ul style="list-style-type: none"> <li>• Strategy for Energy Development of the Republic of Macedonia until 2030, March 2010</li> <li>• Strategy on Use of the Renewable Energy Sources in the Republic of Macedonia by 2020, September 2010</li> <li>• Energy Efficiency Strategy of the Republic of Macedonia, June 2010</li> </ul>

#### IV. Legal arrangements

List and briefly describe subject matter and scope of existing and/or planned legislation within the Party related to energy data collection, compilation and publication. If there is no any existing and/or planned legislation in place please put NE (not existing) notation key in the table below.

Title	Subject matter and scope
Law on national Statistics (Official Gazette (OG) 54/1997, 21/2007 and 51/2011).	Collection, processing, presenting, storage, protection and issuing of statistical data.
Energy Law, Article 12, (OG 16/2011)	Energy balances and Energy Statistics
Rulebook on Energy Balances and Energy Statistics (OG 138/2011)	<ul style="list-style-type: none"> <li>● the contents of energy balances;</li> <li>● the contents, manner, and deadline for submission of data required for the development and monitoring of energy balances implementation;</li> <li>● the contents, manner and deadline for submission of data required for the preparation of the Strategy on Energy Development and for the development and monitoring the outcomes of the Strategy's Implementation Program; the bodies within the state administration and within the local self-government units, license holders on energy activities, as well as energy and energy fuel consumers that will be required to submit data required for development and monitoring of energy balances implementation, as well as the deadlines on data submission.</li> </ul>
Law on ambient air quality (OG 67/04, 92/07, 35/10 and 47/11)	Legal bases for Rulebook OG 92/10 and Rulebook OG 79/2011
Rulebook on the format, methodology and manner of keeping and maintaining the cadastre of air polluters (OG 92/10)	Fuel types used in the installations
Rulebook on the format and content of the forms for submission of data on emissions from stationary sources into the ambient air, manner and time period of submission according to the installation capacity, content and manner of keeping the logbook of emissions into the ambient air (OG 79/2011)	Technical characteristics of installations including fuel types
Internal guidelines of the Ministry of Environment and Physical Planning for preparation of application for obtaining adjustment license (for existing installations)/IPPC licence (for new installation).	Fuel types used in the installations

As stipulated in the Energy Law, Article 12, (Official Gazette 16/2011), the Government of the Republic of Macedonia, by means of the energy balance covering a period of five years in the function of an indicative planning document, sets the total energy demand and demand for particular energy types, as well as the possibilities for their supply from in-country generation and from import. On the proposal from the Ministry of Economy and upon previously obtained opinion from the Energy Regulatory Commission, the Government of the Republic of Macedonia adopts the energy balance by the end of the calendar year. On behalf of the Ministry of Economy, the Energy Agency develops the energy balance and submits it to the Ministry by 31st October the latest. The Ministry of Economy submits the energy balance to the Government of the Republic of Macedonia by 15th December the latest.

The energy balance contains the detailed balance for the first year of the period covered, as well as a report on the implementation of the energy balance for the previous year and is prepared in compliance with the Rulebook on Energy Balances and Energy Statistics adopted in 2011 by the Minister of Economy (Official Gazette 138/2011). On the

request from the Ministry of Economy, the entities referred to in the Rulebook on Energy Balances and Energy Statistics are obliged to submit data for the development and monitoring of energy balances and data required for the preparation of strategies, programs and reports on implementation programs whose adoption has been stipulated under the Energy Law.

## **V. Procedural arrangements**

*Describe in more detail how energy data are collected and compiled (bottom-up from individual entities, top-down from government institution). Is this system centralized (one entity is responsible for all energy data) or decentralized (different institutions and teams are responsible that each work on different subset of energy data). Is this system out-sourced to private consultants, research institute, academic institutions, etc. Are there any procedures for quality control and assurance? Are there sufficient capacities to collect energy data for regular reporting? Are the energy data publicly accessible or published?*

### **Energy Balances, Ministry of Economy**

The Ministry of Economy sends request for data (data collecting templates are prescribed in the Rulebook on Energy Balances and Energy Statistics) to the following entities:

- Ministry of Environment and Physical Planning
- Ministry of Agriculture, Forestry and Water Economy
- Ministry of Finance
- Macedonian Customs
- Commodity Reserve Agency
- Energy systems operators
- Energy and energy fuels suppliers
- Wholesale traders of energy and energy fuels
- Energy and energy fuels producers
- Energy and energy fuels consumers

These entities submit their replies electronically and in hard copy to the Ministry of Economy and to the Energy Agency, based on which the Energy Agency prepares the energy balance. The Ministry of Economy publishes the energy balance electronically, on its website.

### **Energy Data, State Statistical Office**

The State Statistical Office uses “Energy Statistics Methodology Eurostat F4, 1998” to generate overall and separate (disaggregated) energy balances. Sources of data collection for the annual balances:

- Monthly surveys on energy
- Annual surveys on energy
- Quarterly survey on forestry
- Annual survey on forestry
- Annual survey on agriculture
- Statistical survey on external trade
- Estimation of consumption in households by types of energy commodities

The energy balances including (excel tables) can be downloaded from the State Statistical Office website.

### **Energy strategic planning, ICEIM-MANU**

The Research Centre for Energy, Informatics and Materials of the Macedonian Academy of Sciences and Arts (ICEIM-MANU) is among the key players in the country with regards to the strategic planning in energy and related fields of vital national importance. Hence, in cooperation with the other stakeholders in the energy sector, it developed the

National Energy Strategy (adopted by the Government in April 2010), National Strategy for Renewable Energy Sources (adopted in September 2010), and National Strategy for Sustainable Development (responsible for the sector energy; adopted in February 2010). The Centre is the steward of the MARKAL-Macedonia model developed under the framework of the USAID Strategic Planning task which has been used to analyze the implications of energy efficiency and renewable energy sources on the national energy system development. ICEIM-MANU has also been active in the field of Climate Change for more than a decade. The main activities include preparation of the National Inventory of GHG Emissions and Mitigation Analyses for the purpose of the National Communications under the UNFCCC. In particular, the Centre deals with Climate Change and Energy issues, including environmental and economic evaluation of energy technologies and policies, as well as developing mitigation strategies.

## **VI. National system for estimation of GHG emissions by sources and removals by sinks**

The GHG Inventory in Macedonia was prepared for the first time as a part of the First National Communication on Climate Change using Revised 1996 IPCC methodology, where the three main GHG - CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O are inventoried for the period 1990-1998. As prescribed by this methodology, the GHG inventory comprised the following sectors: Energy, Industrial Processes, Agriculture, Land-use Change and Forestry, and Waste. This inventory has undergone substantial national peer-review, and also received technical feedback, provided by the National Communications Support Unit (NCSU).

In general, the GHG Inventory process for the First National Communication on Climate Change did not incorporate many of the good practice elements defined in IPCC Good Practice Guidance and Uncertainty Management, 2000. Also, in accordance to the national circumstances many data gaps in the activity data (particularly in the waste sector) were identified, as well as the simplest methods (Tier 1) for emissions calculation were applied.

Under the Second National Communication the main goal regarding GHG inventorying was to prepare national GHG inventories for the years 1999-2002 (with 2000 as base year), according to the guidelines for the preparation of National Communications (17/CP.8). The main source of information was the State Statistical Office (official yearbooks), as well as official data from other national institutions, such as the Ministry of Agriculture, Forestry and Water Economy and Ministry of Interior. In addition, the following specific tasks were undertaken:

- Inclusion of information on the other non-direct GHGs: HFCs, PFCs and SF<sub>6</sub> as well as CO, NO<sub>x</sub>, SO<sub>x</sub> and NMVOCs.
- Revision of the input data, taking into consideration data gaps and areas needing improvement identified in the stocktaking exercise
- Identifying and developing methods for overcoming data gaps
- Application of higher Tiers (more sophisticated methods) for emissions calculation wherever possible
- Inclusion of the sector Solvent and other product use into the national inventory whenever possible (for the years when the relevant activity data are available)
- Recalculation the time series for the period 1990-1998
- Developing a full documentation of activity data and emission factors for the year 2000
- Implementation of good practice elements to maximal possible extend

This in turn resulted in a (more) reliable time series 1990-2002 for the national GHG Inventories, reported in the National Inventory Report (NIR), complete and consistent EXCEL database (1996 IPCC EXCEL Spreadsheets), appended by the full documentation of activity data and emission factors for the year 2000 (Documenting material). The GHG inventory process under the Second National Communication involved the following steps:

- Identification of Data Sources
- Entering the Activity Data and Emission Factors
- Calculating the Emissions
- Checking and Validation of Input Data
- Recalculation and Validation of Emissions Estimates

- Key Sources Analysis
- Uncertainty Management
- National Expert and Public Review
- International Peer-review
- Reporting the Emissions

The national GHG inventory team was structured in a way that it enables control and assurance of quality of input data and estimated emissions to maximal possible extent. It involved the following entities:

**Ministry of Environment and Physical Planning (MOEPP)**, having the responsibilities for:

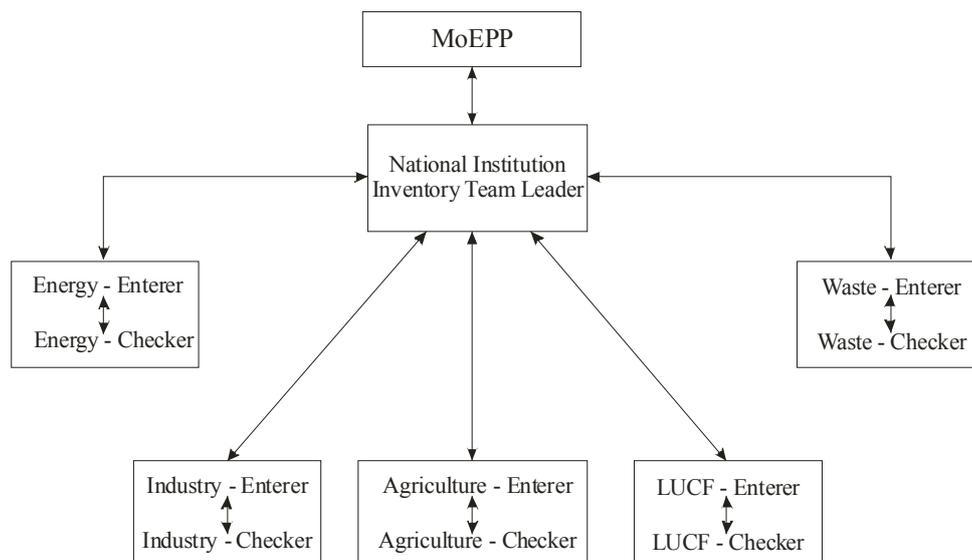
- \_\_\_\_\_Supervising the national inventory process, and
- International reporting the emissions.

**National Institution (NI)**, who

- \_\_\_\_\_Acts as a National Inventory Team Leader (NITL)
- Maintains the whole GHG inventory,
- Incorporates good practice elements such as key sources analyses, uncertainty management,
- QA/QC procedures, documenting and archiving, and
- Reports the emissions to MOEPP
- Coordinates and supervises the **Sectoral Experts** (two experts for each sector):

**Enterer**, responsible for identification/verification of data sources, entering and documenting the input data, and

**Checker**, responsible for checking and validating the input data and emission estimates.



**Structure of the national GHG inventory team**

The national institution appointed as National Inventory Team Leader, was the Research Center for Energy Informatics and Materials of the Macedonian Academy of Sciences and Arts (ICEIM-MANU).

It should be noted that this inventory system is project based, established for compiling the national GHG inventories under the National Communications. The Law on Environment (Official Gazette 53/05, 81/05) provides legal framework for development of a National Inventory. Hence, as stipulated in this Law (Article 188, paragraph 3), the Minister of Environment and Physical Planning, managing the body of the state administration responsible for the affairs of the environment, shall prescribe the details on the conditions, manner and procedure of preparation of the GHG Inventory. The National Inventory shall be prepared once in three years (Law on Environment, Article 188,

paragraph 4) and shall be integral part of the National Plan on Climate Change (referred to in the Law of Environment, Article 187).

The establishment of sustainable inventory process in the country requires further analyses which will suggest the most appropriate inventory system, taking into account the national circumstances (institutional and legal settings, level of experiences and capacities), international good examples, European and UN reporting requirements, as well as the related financial implications. Also, the analytical efforts should be accompanied with tailor-made capacity building and training programs for the involved stakeholders.

*Annex 6: Montenegro*

## I. Institutional arrangements

Institutional arrangement for GHG inventory preparation in Montenegro is regulated by the Law on Ambient Air Protection (Official Gazette, No. 25/10, Art.36). National system for the estimation and reporting of anthropogenic greenhouse gas emissions by sources and removals by sinks will be established by the Regulation on greenhouse gas emissions monitoring (planned for 2013). Institutional arrangements for GHG inventory management and preparation in Montenegro will be decentralized and out-sourced with clear tasks breakdown between participating institutions including Ministry of Sustainable Development and Tourism, Montenegrin Environment Agency and competent governmental bodies responsible for providing of activity data. The preparation of GHG inventory itself is entrusted to Montenegrin Environment Agency.

Institutions responsible for energy data collection, compilation and publication in Montenegro are the following:

Institution	Energy data
Ministry of Economy and Statistical Office of Montenegro (MONSTAT)	Energy balance (national level)
Ministry of Economy and Statistical Office of Montenegro (MONSTAT)	Fuel characteristics (NCV)
Ministry of Economy and Statistical Office of Montenegro (MONSTAT)	Large emissions sources (power plants, industry)
Ministry of Interior	Number of registered vehicles distributed by categories and traffic flow
Ministry of Economy and Statistical Office of Montenegro (MONSTAT)	Amount of extracted materials, Industrial productions, Energy and fuels consumptions for the different sectors

The basis for an estimate of the GHGs emission from Energy sector is the national energy balance. Production, imports, exports, stock change and consumption of fuels are shown in the national energy balance report in natural units (kg or m<sup>3</sup>). The national energy balance is based on data from all available sources. The data from Statistical Office of Montenegro about production, usage of raw material and consumption of fuels in all industrial facilities in Montenegro are used. The data from questionnaires about monthly use of natural gas in certain sectors from all distributive company in Montenegro, about annual consumption of coal in certain sectors and the data from Customs Administration about import of fossil fuels are also used.

## VII. Legal arrangements

List and briefly describe subject matter and scope of existing and/or planned legislation within the Party related to energy data collection, compilation and publication. If there is no any existing and/or planned legislation in place please put NE (not existing) notation key in the table below.

Title	Subject matter and scope
Energy Act (Official Gazette of MNE, No. 28/10)	Competent authority for preparation of the annual and long-term Energy Balance is the Ministry of Economy-Energy Sector, Art.4). The Energy Balance is comprised of five balances: <ol style="list-style-type: none"> <li>1. the electro energy balance</li> <li>2. the heat balance</li> <li>3. the coal balance</li> <li>4. oil, oil derivatives, biogas and gas balance (excluding natural gas)</li> <li>5. natural gas balance (Art. 13)</li> </ol> Key institutions involved in activity data collection and reporting are: <ul style="list-style-type: none"> <li>•Energy companies (power/heat, gas)</li> <li>•Customs authority</li> </ul>

	<ul style="list-style-type: none"> <li>• Statistical Office of Montenegro</li> <li>• Other energy undertakings (energy and/or heat distributing companies)</li> </ul> Ministry of Economy is responsible for coordination of data collection.
Regulation on Energy Statistics (planned)	Defines energy data collection and energy balance creation, according to Energy Act (Official Gazette of Montenegro, No. 28/10). The Regulation on Energy Statistics is currently in preparation stage and should be adopted latest within the second half of current year.

### VIII. Procedural arrangements

*Describe in more detail how energy data are collected and compiled (bottom-up from individual entities, top-down from government institution). Is this system centralized (one entity is responsible for all energy data) or decentralized (different institutions and teams are responsible that each work on different subset of energy data). Is this system out-sourced to private consultants, research institute, academic institutions, etc. Are there any procedures for quality control and assurance. Are there sufficient capacities to collect energy data for regular reporting. Are the energy data publicly accessible or published.*

The Energy Act (Official Gazette of Montenegro, No. 28/10) Chapter II, Article 15 defines the creation of the annual energy balance by the Government of Montenegro, latest by 15th December of the current year for the next year. Article 13 of the Act states that the energy balance must consists of:

1) The balance of power, 2) The balance of coal, 3) The balance of oil, petroleum products, biofuels and gas, excluding natural gas, 4) the balance of natural gas and 5) the balance of heat for district heating and/or cooling, and industrial use.

Energy companies (Electric Power Utility of Montenegro, Coal Mine Pljevlja, oil and gas distribution companies: Jugopetrol AD Kotor, Montenegro Bonus, INA Crna Gora, Energogas) are obliged to prepare and submit to the Ministry of Economy adequate energy balances, no later than 15 November current year for the next year.

In accordance with existing contractual obligations, all energy entities are required to harmonise their balances with the official energy balance of Montenegro, no later than 31 December of the current year.

The energy data are collected, compiled and published jointly by the Ministry of Economy (Sector for Energy) and MONSTAT (The Statistical Office of Montenegro). For the data collection, the bottom-up approach is applied. Energy balance is creating dual, according to IEA and EUROSTAT methodology. The energy online database (IT energy system) for energy data collection, compilation and publication is currently under development and will also be managed by the Ministry of Economy and MONSTAT. The energy online database will allow energy entities online submission of energy data through a web portal on a monthly, semiannual and annual basis, depending on entity. The IT system will strengthen capacities and simplify the whole energy data collection process. Until now, there is no quality control and quality assurance of data. As regards the publication of energy data, energy balance is publicly accessible on the Ministry of Economy's website and starting from this year, the entire energy balance is published in the Official Gazette of Montenegro.

*Annex 7: Serbia*

## 1. Institutional arrangements

Institution	Energy data
Ministry of Infrastructure and Energy, Statistical Office of the Republic of Serbia	Energy balance (national level)
NE	Fuel characteristics (NCV)
Ministry of Infrastructure and Energy, Statistical Office of the Republic of Serbia, Serbian Environmental protection agency (SEPA), within the Ministry of Environment, Mining and Spatial Planning	Large emissions sources (power plants, refineries, ...)
Republic of Serbia Ministry of Interior	Transport (number and type of vehicles)
Serbian Environmental protection agency (SEPA), within the Ministry of Environment, Mining and Spatial Planning	Overall energy data needed for preparation of the National greenhouse gas emission inventory

## IX. Legal arrangements

Title	Subject matter and scope
Energy Law	Defines energy balance (content, adoption, implementation and publishing)
Energy Sector Development Strategy by 2015	This document envisages establishment of modern system of energy statistic (Center for Energy Statistics within the Statistical Office of Republic of Serbia to be funded. The center will establish a modern system for data collection, selection and verification and maintaining of database, with detailed representation of energy flows (balance) at the national level.
Official Statistic Law	Defines: data collection, processing, storage and dissemination; reporting units and their obligations; international cooperation.
Regulation on Methodology of Collection of Data for National GHG Inventory	Based on the provisions of Law on Air Quality this Decree prescribes the collecting data methodology needed for the National greenhouse gas inventory.

## X. Procedural arrangements

### Current situation of energy statistic in Serbia

Ministry for infrastructure and energy in accordance with the Energy Law (adopted in July 2004) began with the preparation of energy balance using methodology of EUROSTAT and the International Energy Agency. Energy balance prepared by Ministry includes the flows of energy and fuel for three years: the implementation of the previous year, current year assessment, and plan for next year.

A major problem in the preparation of energy balance has been the lack of adequate energy statistics within the Statistical Office of the Republic of Serbia, which is responsible institution for statistical research. On the other hand Ministry doesn't have the capacity to implement all the necessary statistical surveys to fulfil data gaps. This problem is primarily related to lack of data on energy consumption and energy sources.

Since 2005 Statistical Office of the Republic of Serbia has been started with establishment of energy statistics. In 2009 for the first time it included most of the energy balances (the balance of electric and thermal energy, balance of coal,

natural gas balance, the balance of oil and petroleum products, geothermal energy balance, the balance of firewood) while energy statistics in the field of renewable energy isn't yet fully established.

Therefore, Ministry since 2009 launched the reconciliation of data relating to realization of energy balance with Statistical Office in order to get unique and as much as possible better and more reliable data about production and consumption of energy sources. This is necessary because Ministry is responsible for energy balance and for providing data to the International Energy Agency.

Since 2009 Serbia made significant improvement in the field of energy statistics that improves an energy balance calculations, too. Work on improvement of energy statistics and energy balances is continuous process in all countries and the common practice is to make revisions of energy balances. Starting from energy balance for 2009 further improvement is needed in a sense of (1) the full establishment of energy statistics in the field of renewable energy sources and (2) conducting research on power consumption, which would enable the development of energy indicators. Within the framework of Energy Community and taking into account insufficient quality of data on production and consumption of biomass in 2011, an expert was engaged who conducted a survey for year 2009 and 2010.

Based on this survey and new data on the consumption of biomass primarily for heating in the households, that were significantly higher than data of the Statistical Office, a revision of the energy balance for 2009 has been done. Using data on consumption of biomass in 2010 from the same survey energy balance was prepared by Ministry, that is not a part of the energy balance prepared by the Statistical Office. According this new data about the consumption of biomass energy balance for 2011 (assessments) and the plan for 2012 have been prepared, too.

Research about power consumption, which would enable development of energy indicators, has not been adequately implemented so far in Serbia. This is because there is no reliable data of energy consumption by sectors, energy sources and energy services. In order to fulfil this gap and to conduct research on power consumption the Ministry since 2007 has been submitting project proposals to be financed through IPA that were not approved. There are indications such project could be accepted in 2012.

Analysis and calculation of energy intensity is not possible because the Statistical Office doesn't have data required for the calculation of the energy indicators by internationally accepted methodology.

Comparing data on production and consumption of energy for the last few years certain differences are seen. Those are results of data correction on data related to production and consumption of biomass (primarily since 2009 to date) but also:

- Gas crisis in 2009 that implies reduction of natural gas imports by nearly 30% compared to 2008;
- A significant increase in domestic production of natural gas (over 30%) and crude oil (40%);
- Reduction in domestic refining and domestic production of oil derivatives that significantly increase imports of petroleum products;
- Electricity generation from hydropower in 2009 and 2010 was significantly higher compared to the 2011. In 2011 hydropower production was decreased by 28% compared to 2010 due to poor hydrology conditions (from April to the end of 2011);
- For the same reasons in 2011 production of electricity from thermal power plants and CHP significantly was increased, as well as coal production primarily due to the needs of thermal power plants.

Ongoing development of an energy information system (through the design of the new strategy and the IMIS project funded the IPA, in progress) will display spatial, technical and other data and energy balances of the Serbian energy sector from 1990 to date, as well as quality monitoring of the implementation of energy balance.

## **Energy data sources**

Data necessary for compilation of energy balances are provided from:

1. Regular statistical surveys from the field of energy statistics;
2. Regular statistical surveys of:
  - Foreign trade,
  - Construction,
  - Transport,
  - Agriculture and Forestry;

### 3. Publications of IEA/OECD.

#### **Reporting units of energy statistics**

Reporting units for electricity balance sheet are:

- producers of electricity: hydro plants, thermal power plants, CHP, autoproducers,
- Public Enterprise “Electric Network of Serbia”, Serbian TSO and Market Operator, Regional distributors of electricity, and
- Public Enterprise “Electric Power Industry of Serbia”, state owned generator.

Reporting units for heat energy balance sheet are:

- producers of heat energy: thermal power plants, CHP, autoproducers, district heating plants, and
- enterprises for transmission and distribution of heat energy.

Reporting units for coal energy balance sheet are:

- producers of solid fossil fuels,
- producers of manufactured gases, and
- merchants of solid fossil fuels.

Reporting units for energy balance of oil and oil derivatives are:

- petroleum refineries,
- petrochemical industry,
- factory of lubricants,
- traders of oil and oil derivatives.

Reporting units for energy balance of natural gas are:

- producers of natural gas,
- transporters and distributors of natural gas,
- traders of natural gas.

Reporting units for energy balance of geothermal energy are:

- spa and
- “NIS”-oil company.

Reporting units for energy balance of firewood are:

- producers of firewood and
- traders of firewood.

#### **Special characteristics of certain energy balances**

##### *Electricity balance*

Production of hydroelectric energy also includes production in pump-storage hydro power plants. Quantities of electricity that crossed the national border are provided by Serbian Transmission System Operator. Own use of electricity contains losses in transformers which are considered as integral parts of the plants. All positions of Final energy consumption present data and partly estimation of Public Enterprise “Electric Power Industry of Serbia”.

##### *Heat energy balance*

Most of the heat producers, because they don't possess devices for metering of generated and delivered heat energy, put lot of effort and they made an expert estimation of data required in statistic's questionnaires. Autoproducers include the facilities which don't produce heat only for their own consumption, but they also give a part of heat to others.

##### *Coal energy balance*

All positions of Final energy consumption are estimations made from data received from statistical researches for energy, foreign trade, construction, transport, agriculture and forestry.

#### *Energy Balance of Oil and Oil Derivates*

Energy Balance of Oil and Oil Derivates is a sum of energy balances of all primary and secondary oil products. Report on all production within national boundaries including off-shore production. Stock changes don't include retail enterprises, house-holds, commercial and public services and activities which are not included elsewhere. In part of the Energy Balance, Transformation output, position other covers lubricants except refineries. Final consumption includes estimation by producers and wholesalers of oil derivatives and natural gas. Final consumption in Transport doesn't include fuel consumption for vehicle out of (except) public road. This consumption is presented within activity where this fuel is used. Fuel consumption in air transport doesn't include fuel from airplanes that cross national border. Fuel consumption for fishing boats is shown within Agriculture.

#### *Energy Balance of Geothermal Energy*

Energy Balance of Geothermal Energy covers heat which is used only for heating.

#### *Energy Balance of Firewood*

Energy Balance of Firewood covers firewood from legal forests felling.

### **Collection of Data for National GHG Inventory**

In addition, should be mentioned that Serbian Environmental protection agency (SEPA), within the Ministry of Environment, Mining and Spatial Planning developed Regulation on Methodology of Collection of Data for National GHG Inventory that was approved by the Government in 2010. This Regulation is in compliance with Decision 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and Commission Decision 2005/166/EC of 10 February 2005 laying down rules implementing Decision No 280/2004/EC as well as following prescribed data forms. This is for the purpose of preparation of the GHG Inventory that is, according to the Law on Air quality, responsibility of SEPA. It is necessary to avoid overlapping in collection of the same data through this system in the energy sector.

Data collection for the Inventory is conducted for the systematic record-keeping and submitting data necessary for reporting on anthropogenic emissions from sources and removals by sinks of greenhouse gases. In accordance with this Decree, the data are submitted by the reporting entities that collect and/or have the data necessary for the Inventory.

Reporting entities shall submit information in the stipulated forms. The reporting entities are state agencies and organizations, public institutions, local governments, associations, companies and other entities of environmental protection or entities whose work is directly or indirectly related to environmental protection. The reporting entities submitting the data for the Inventory once a year, and at the latest until March 31 of the current year for the previous calendar year.

Data need to be submitted to the Agency in paper, duly signed and certified by a person in charge and in electronic form to the e-mail address of the Agency or on a CD without signature and verification. The Agency shall provide the submission of data for the Inventory, check their quality, as well as the quality of the calculations, in accordance with the Law. The Agency shall be required to develop a Plan and provide quality control data in accordance with the Convention. The Agency shall provide data and information exchange with reporting entities, by providing access to such data and information through the information system of environmental protection of Serbia.

*Annex 8: Turkey*

## 1. Institutional arrangements

Institution	Energy data
<b>Ministry Of Energy and Natural Resources</b>	<b>Energy balance (national level)</b>
<b>Ministry of Transportation</b>	<b>National level transportation data</b>
Turkish Hard Coal Enterprises –TTK	The data on quality of hard coal, including the heat values
Erdemir and Kardemir Iron-Steel Factories	Heat contents of the hard coal
Catalagzi Thermal Power Plant	Heat contents of the hard coal
Private hard coal power plants (Isken, Colakoglu and Icdas)	Heat contents of the hard coal
Turkish Coal Enterprises –TKI	Production, inner consumption, stock and consumption (sales) of lignite
Electricity Production Incorporated Company (EÜAŞ)	Heat contents of the hard coal, lignite, natural gas of power plant
Turkish Electricity Transmission Corporation-TEİAŞ	Heat contents of the hard coal, lignite, natural gas of private power plant
The Directorate of Mining Affairs – MİGEM	Record of produced and sold lignite amounts
Petroleum Pipeline Corporation-BOTAŞ	Data on overall natural gas transactions
General Directorate of Petroleum Affairs-PIGM	Balance sheet of oil and oil products
Energy Market Regulatory Authority-EPDK	Annual reports on energy sectors including the natural gas sector, oil sector
Private power plant or other sectorial users	In reply to questionnaire of MENR
TUIK, Turkish Statistical Institute	Data supply for imported fuels
Undersecretary of Foreign Trade	Data supply for imported fuels
Petroleum Manufacturers Association of Turkey (PETDER).	Fuel consumption values for road transport source categories
DG of Airports Authority (DHMI)	Air traffic data
Istanbul Technical University (ITU)	The method for the estimation of emissions from road transportation in 2005
DG of Highways, Turkish Statistical Institute, DG of National Police and Turkish Automotive Manufacturers Association (OSD).	Vehicle types and other important information necessary for calculations of road transport

*P.S. This section will be reviewed after release of 2<sup>nd</sup> National Communication*

## 2 Legal arrangements

Turkey does not have legislation or regulation solely for the collection of greenhouse gas inventory data. However, The Official Statistics Programme, based on the Statistics Law of Turkey No 5429 and Decisions of Council of Ministers, defines the authorities in charge and responsible for collection, compilation and publication of GHG emissions as well as other national official statistics. Existing legal arrangements as tool of collection, compilation and publication are listed as below:

Title	Subject matter and scope
Statistics Law of Turkey (Act number 5429) and Decisions of the Council of Ministers on Putting The Official Statistics Programme Into Practice	To compile and assess data and information, produce, publish and disseminate statistics on the areas that country needs, including GHG emissions.
Decree on State-owned Enterprises	Transfer of all activity data from institutions (TTK, TKI, EUAS, TEİAŞ, TETAS, TKI, TTK, TPAO,

	BOTAS and ETT Maden) to MENR
Establishment Laws	Transfer of all activity data from PIGM, EIEI, MTA, TAEK, EPDK and BOREN to MENR
Establishment law of Ministry of Energy and Natural Resources	Transfer of all activity data from private power plant and other sectoral users to MENR through questionnaire <sup>5</sup>
Petroleum Market Information Legislation	Data collection and submission obligation

### 3 Procedural arrangements

#### Energy Data Collection

Data related to energy activities is collected from all existing energy industries which are within access<sup>6</sup>, analysed and published by the Turkish Ministry of Energy and Natural Resources in a centralised fashion. Although there are several public and private actors in combustion sector, all report eventually to the Ministry of Energy and Natural Resources through existing legislation or contracts.

Balance sheets for fuel types or main sectors are transferred into the main energy balance sheet by the Ministry of Energy and Natural Resources.

Data on combustion fuels is gathered both from public and private energy industries. Data gathered from institutions operating in energy sector are compared for consistency and accuracy by the Ministry against reports of energy industries (power plants cement and sugar producers, residential users etc.). Additionally, data on quality of certain fuels are reassured by tests conducted by the Central Laboratory of EUAS for proximate and ultimate analysis for data cross-checking purposes.

If there is a case of inconsistency or inaccuracy, data is fed back to their sources for re-evaluation. An example to this basic quality control system operated by the Ministry of Energy and Natural Resources would be comparison of data set of natural gas importing company and the distribution companies mostly owned by municipalities which record values related to natural gas consumption and publish reports of the prior year.

Once Balance tables are completed, they are reviewed for accuracy and consistency using both the sectoral and reference approaches.

As a summary, energy data collection of “public electricity and heat production (1A1a)” and transportation (1A3) is based on bottom up study:

- Public electricity and heat production data collected by instructions under MENR.
- In transportation sector, DG of Airports Authority (DHMI), Petroleum Manufacturers Association of Turkey (PETDER) provides data.
- Vehicle types and other important information necessary for Tier 2 calculations of road transport are taken from DG of Highways, Turkish Statistical Institute, DG of National Police and Turkish Automotive Manufacturers Association (OSD).

Top to bottom approach was used in other sectors such as residential areas.

#### QA/QC

TUIK is responsible for QA, while QC is performed by the data providers involved in the preparation of the inventory for the various sectors. The NIR mentions category-specific verification procedures for transport, and public electricity

<sup>5</sup> This information will be revised or verified based on discussions with Mr. Ali Can of TUIK.

<sup>6</sup> This information will be revised or verified based on discussions with Mr. Ali Can of TUIK.

and heat production, but includes only very limited information on general QC procedures implemented in the country. Therefore, documentation on the QC procedures is required.

That is why, source-specific QA/QC and verifications are covered by “general QA/QC of the greenhouse gas inventory”. Consequently, there is not any formal QA/QC procedures/management plan referred for data gathering, documentation, emission calculation and overall coordination. In this respect, UNFCCC Expert Review Team recommended Turkey to define and document all responsibilities of institutions/ experts with regard to their contribution to the inventory, including QA/QC.

The internal quality control system includes control of consistency to ensure data integrity, its correctness and completeness, determination and correction of errors and documentation and archiving of material used for the inventory preparation and QC activities. During UNFCCC expert reviews Turkey acknowledged that the QA/QC procedures have been only partially implemented and that no overall QA/QC management system has yet been set up.

#### **Data collection capacity**

The capacity to collect energy data is limited to the assigned staff and resources of Ministry of Energy and Natural Resources and additional capacity is required especially considering the need for establishment and operation of QA/QC management system.

#### **Data availability**

Access to energy data is limited to relevant governmental staff and agencies due to a number of reasons including industrial confidentiality issues. However, national energy balance, national inventory reports and statistics derived from energy data, except resource data of fuel balance table, are publicly accessible and published regularly.

#### **Abbreviations**

BOREN National Boron Research Institute  
BOTAS Petroleum Pipeline Corporation  
EIEI Electrical Power Resources Survey and Development Administration  
EPDK Energy Market Regulatory Board  
ETI MADEN General Directorate of Eti Mine Works  
EUAS General Directorate of Electricity Generation Corporation  
MIGM General Directorate of Mining Affairs  
MTA General Directorate of Mineral Research and Exploration  
PIGM General Directorate of Petroleum Affairs  
TEDAS Turkish Electricity Distribution Company  
TEIAS Turkish Electricity Transmission Company  
TEMSAN Turkish Electro-mechanics Industry  
TETAS Turkish Electricity Trading and Contracting Company Inc.  
TKI General Directorate of Turkish Coal Enterprises  
TPAO Turkish Petroleum Corporation  
TTK General Directorate of the Turkish Hard Coal Enterprises  
TUIK Turkish Statistical Institute