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**Draft Strategy**

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**Project Synopsis**

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| **Programme Name** | FWC Beneficiaries 2009 – Lot 6: Environment |
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| **Organisation:** | MoEPP | MoF/CFCD | Particip GmbH |
| **Role:** | Beneficiary | Contracting Authority | Contractor |
| **Address:** | Blvd GoceDelcev 18MK-1000 Skopje | Dame Gruev 14MK-1000 Skopje | Merzhauser Str. 183D-79100 Freiburg |
| **Telephone:** | +389 (75) 250234 | +389 (2) 3106 691 | +49 (761) 79074 0 |
| **Fax:** |  | +389 (2) 3231 219 | +49 (761) 79074 90 |
| **E-mail:** | j.ivanova@moepp.gov.mk | biljana.petrovska@finance.gov.mk | joerg.boehringer@particip.de |
| **Contact Person:** | JadrankaIvanova | BiljanaPetrovska | JoergBoehringer |
| **Overall Objective** | The overall objective of the project is to achieve an overall improvement of the quality of Environment and Climate change strategy (2014-2020).  |
| **Purpose** | The purpose of this assignment is to assist the Beneficiary institution with the preparation of Sector Environment and Climate change strategy 2014-2020. |
| **Expected Results** | 1. Completed Draft ECCS (2014-20)
2. Completed Strategic Environmental Assessment (SEA) for ECCS (2014-2020), according to Macedonian legislation.
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| **Key Activities** | Result 1: Completed Draft ECCS (2014-20) * Detailed sector assessment
* Action plan to address implementation gaps
* Mechanism for implementation of Action Plan
* Present draft ECCS at three workshops
* Finalise ECCS

Result 2: Completed Strategic Environmental Assessment (SEA) of ECCS * Prepare SEA
* Consultation process
* Finalise SEA
 |
| **Key Stakeholders** | MoEPP, Central Government, Municipalities |
| **Target groups** **Reporting period****Report Name****Authors of the Report** | MoEPPImplementation Phase SECTOR ENVIRONMENT AND CLIMATE CHANGE STRATEGY 2014-2020Iain Maclean* Version 2
 |

# **INTRODUCTION**

Necessity for development of the Environment and Climate Change Strategy arose from the need to set policy objectives and priorities in environment and climate change area for the period 2014-2020 leading towards improved quality of the environment and life of citizens. The Strategy will give directions that this can be achieved through commitment to upgrade existing environmental and climate change system and preparing for the challenges ahead, such as route the country to sustainable development and prepare for the European integration process.

The concept of sustainable development should become a determinant of the development of the state, because with it in the future environmental protection will be viewed in a wider context - environmental objectives aligned with the long-term national social and economic interests. In terms of this, the Strategy advocated the introduction of environmental concerns into all other strategic documents and consequently the integration of environmental protection in all other sectoral policies. Clean energies and climate change is recognized as one of the key priority in the implementation of sustainable development concept. At the same time, this Strategy takes into account that the EU integration is not just the harmonization of legislation, but also the implementation of European standards and criteria. It will mean changes in the current institutional relationships and engaging human and financial resources sufficient to achieve the set objectives.

What is expected from Macedonia in the process of EU accession for improvement of the system for environmental protection will be addressed in this Strategy starting from the fact that the proposed changes based on the selected priorities is a long-term interest of the country and the environment.

This document recognizes the current state of environment and liabilities, current and future pressures on the environment and the requirements to be fulfilled, guidelines that should be selected to respond to the pressures, and of course to determine the priorities and objectives in order to improve the quality of life and environment.

Planning of priorities and objectives that need to be carried out during 2014-2020 period is based on the assumption that the Republic of Macedonia will commence negotiations for the Chapter of environment by 20??at latest, and close them in the course of 20??. Hence, the year of 20??is taken as anticipated date for the Republic of Macedonia’s acquisition of full membership in the EU. The purpose of determining these dates is to establish starting grounds for setting the timeframe with start and end of proposed measures and activities. At the same time, they would be used as orientation for the required intensity of the assistance necessary to comply with the criteria for membership in the EU. In this context, when proposing priority measures and activities, much more care should be taken of the feasibility of their implementation. This should mean that financial abilities, economic potentials, social momentum, sectoral policies in related or concerned sectors and other relevant aspects will be taken into account. Only thus established measures and activities will be implementable. Otherwise, the country will get only one more in the series of well developed strategic documents that will serve no one and nothing.

The environmental sector or Chapter 27 is one of the most complex chapters requiring strong efforts for coordination, investments and massive responsibilities of administrations on both central and local levels. Furthermore, the environmental sector represents one of the most expensive chapters in the process of EU accession. The rights and the obligations provided for in the legislation on environment concern many stakeholders in the Republic of Macedonia, ranging from the citizen as an individual and part of the collective system, through civil associations, business sector, local governments and various other parties having their interest in securing healthy living environment.

Participation of the stakeholders in the process of this strategic document development is important in terms of determination of their interests, but also in terms of identificationof future obligations and rights to arise from the process of accession. Timely consideration of the framework for assistance provision offers possibility for active involvement in the implementation of activities specified in this document. Nevertheless, no stakeholder should be stressed specifically and they should be all together perceived as equal partners in this document elaboration and understanding. Although MoEPP has specific responsibility in the preparation of the National Environment and Climate Change Strategy 2014-2020, the role of the Ministry should not be greater than necessary to provide consistency of the policy and observation of the overall process of accession to EU and achievement of the objectives set in this document.

Through analyses of the environment and climate change areas, the Strategy aims to promote and define specific measures to improve institutional capacity for enforcement of national legislation and to overcome environmental and climate change problems, whilst ensuring that adequate national and foreign financial capacity is available for this purpose. In parallel, the development of the document derives from the planned utilization of resources under the existing financial instruments and mechanisms, such as the EU instrument for pre-accession assistance – IPA 2 (programming period 2014-2020); but, it also includes priorities related to all potential bilateral and multilateral donors active in the Republic of Macedonia. It is further intended that the administration developed to utilize pre-accession funding will be capable to fully utilize the increased level of funding that is expected to become available post-membership.

# **VISION**

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| --- |
| *Preserve, protect and promote the quality of the environment and the quality of life of citizens, in order to secure sustainable growth that will contribute to the achievement of the global environmental goals* |

For more than 20 years, global environmental policy focused primarily on the development of a legislative environmental framework, shifting towards the concept of sustainable development. Sustainable development is a framework for shaping policies and strategies of continuous economic and social progress, without harming the environment and natural resources essential for human activity in the future. It relies on an ambitious idea that development should not jeopardize the future of the coming generations wear non-renewable stocks and long-term devastation and pollution of the environment. So, its primary objective is to ensure sustainable use of natural resources at national and international level. This choice distant goal has changed the focus of environmental management to mitigate or eliminate damages to the environment as they are incurred, in planning prevention, how to avoid them. With such a set objective, environmental protection has become much wider than the traditional view, according to which it predominantly dealt with the protection of human health and the preservation of the integrity of ecosystems. The concept of sustainable development today is the origin of all modern economic and social trends, because they are harmful to the environment, damage the overall society, and vice versa, actions to protect the environment bring benefits in the form of economic growth, employment and competitiveness.

Achievement of the sustainable development goal for Macedonia passes through the door of the EU. Therefore, our path to the future towards sustainable development can be divided into two segments: a complex section unpredictable until accession to the EU which we should go alone, and other equally complex and less predictable, which we will do jointly with the EU members.

With all the challenges, with clearly defined principles and objectives, the environment in the Republic of Macedonia can be preserved on a long-term, and social and economic development will be directed towards sustainable development.

# **PRINCPLES**

We are taking in consideration the following:

* Macedonia accepts the concept of sustainable development as a way that leads to economic progress, social well-being, and to the maintenance of balance in the environment
* Macedonia will join the European Union
* Macedonia will have Environmental and Climate Change Strategy to elaborate the state of the environment and climate change and environmental protection system in the Republic of Macedonia
* Macedonia will make efforts to comply with international agreements’ commitments to protect the environment and climate change
* Objectives and priorities of the Strategy will be realistic and achievable.
* Last but not least - we want to pass on the next generations a society in which the major environmental problems now facing us have been solved.

With a desire to change current trends and practices which are harmful to the environment, derived from sustainability chosen by the Strategy assumes the following general principles:

* Environmental objectives can be achieved only if the protection of the environment integrates the areas that are associated with environmental damage,
* Environmental protection based on prescriptive compared command / control must be replaced by a shared responsibility, as only full cooperation of all stakeholders can achieve the agreed measures,
* The protection of the environment requires using mechanisms and instruments for environmental protection, but also encourages voluntary approach based on awareness of the daily needs of active care for the environment.

# **BASIC INFORMATION**

## General conditions in the Republic of Macedonia

The Republic of Macedonia is a landlocked country in the middle of the southern Balkan Peninsula, bordered by Serbia to the north, Bulgaria to the east, Greece to the south and Albania to the west. The territory of the country is 25.713 km2. Country’s capitol and biggest city is Skopje which is at the same time its administrative, political, economic, cultural, educational and scientific centre.

Country’s physical geography is defined by a central Vardar River valley and high mountain massifs along its borders: the Dinaric range in western and central part of the country and the Rhodope range in the east. About two per cent of the land area is covered by water. The country has 35 large and small rivers, 3 natural lakes and 50 artificial lakes. The country is at the junction of two main climatic zones between the Mediterranean and continental climates. Forests cover 40 per cent of the country, meadows and pastures 24 per cent. About 17 per cent of the land is arable, and 1 per cent is under permanent crops. Agricultural output is diversified; the leading position in the planted arable land areas belongs to grains (mainly wheat). The rest is shared between vegetables growing, vineyards, fruits and tobacco cultivation.

The Republic of Macedonia does not have any sources of crude oil or of natural gas. It is strongly energy import dependant, relying on other countries for its entire demand for oil and petroleum products, natural gas as well as electricity. On the other hand, the country has significant mineral resources like iron, copper, lead, zinc and nickel.

According to the last Census of population, dwellings and households (2002), the Republic of Macedonia has 2.022.547 inhabitants. About 60 per cent of the population lives in urban areas.

Macedonia is divided into 8 (eight) planning regions adopted by the Assembly of the Republic of Macedonia serving statistical, economic and administrative purposes. Besides regions, the first level administrative division in Macedonia concerns municipalities. Under the last territorial division of 2004, Macedonia is divided into 84 municipalities.

Surveys carried out so far indicate unfavourable trends in certain demographic characteristics, which can be intervened upon only through active population policy, including: explicit regional disparity in population growth higher than in developed European countries, changes in age structure with trend of growing number of elderly, net rate of reproduction of the whole population differing with current socio-economic and other structures, distinctive differences between urban and rural areas, etc.

Relations between the European Union and the Republic of Macedonia have progressively evolved over the years. The European integration has been at the top of Government’s agenda ever since the independence of the country and the membership of the European Union remains a strategic goal of the country.

In 2001, relations between the country and the European Union (EU) started to be developed in the context of the Stabilization and Association Process (SAP). As a long-term commitment to the region, both in terms of political effort and financial and human resources, the SAP enabled a progressively closer relationship with EU. Based on incentives and obligations, this contractual relationship includes the Stabilization and Association Agreement (SAA) and the assistance programme: the Community Assistance for Reconstruction, Development and Stabilization (CARDS) programme. Signed in April 2001 and entered in force three years later, the SAA is based on the gradual implementation of a free trade area and reforms in order to move forward EU standards.

In December 2005, considering substantial progress made in implementation of both Ohrid and SAA agreements, the European Council granted the candidate status for the European Union membership to the Republic of Macedonia, although without a clear date to start the negotiations.

In parallel with European Union negotiations, the Republic of Macedonia became a full World Trade Organization (WTO) member in April 2003. The country has also been looking for NATO membership since 1999, when it joined the Membership Action Plan.

Government pursued a range of economic reforms which were aimed at stimulating economic growth and improving the living standards of population through development of the private sector, improvement of the investment climate and greater job creation. The Republic of Macedonia is a small, open economy, relatively well integrated into international trade. It is a multi-party parliamentary democracy; political system is based on the division of power in executive, legislative and judicial branches.

## Institutional system of environmental protection in Macedonia

The Constitution of the country contains provisions regarding environment protection (articles 8 and 43). Most of the environmental protection issues are decentralized. Amendment XVII of the Constitution of the Republic of Macedonia specifies “in units of local self-government, citizens participate directly and through representatives in decision-making on issues of local relevance particularly in the fields of public services, urban and rural planning, and environmental protection.”

The environmental chapter is complex in respect to environmental functions and requires involvement of many governmental institutions with their constituent bodies, Local Self-Government Units (LSGUs), science institutions, professional associations and non-governmental organizations, as well as business sector in fulfilling the national environmental requirements.

The main responsibility lies with the Ministry of Environment and Physical Planning and its constituent bodies - Administration for Environment and Office of Spatial Information System. In 2014, the State Environmental Inspectorate got new independent status as a part of Inspectional Council.

All functions required by EU and national environmental legislation can be smoothly and efficiently implemented only through good communication, cooperation and coordination between the Ministry of Environment and Physical Planning and other Ministries especially the Ministry of Agriculture, Forestry and Water Economy (MAFWE), Ministry of Economy (MoE), Ministry of Transport and Communications (MTC), Ministry of Health (MoH), Ministry of Finance (MoF) and Ministry of Internal Affairs (MoIA).

Governmental institutions are mainly responsible for setting the regulations, preparation of policy making and planning documents, financial plans and proposing economic instruments, preparation of guidance and methodologies, providing trainings and dissemination of environmental information. Their special technical bodies are responsible for monitoring, registration, licensing and permitting procedures, public information and consultation, data collection and reporting.

Clear differentiation between the responsibilities regulated according to the new environmental legislation as well as other sector legislation (covering issues like energy, industry, transport, agriculture, health, chemicals management, construction matters, etc.) is crucial to avoid overlapping of competences between the Ministry of Environment and Physical Planning and other governmental institution on various issues.

The capacities of the Local Self-Government Units (LGSUs) / municipalities are permanently strengthened in accordance with the Law on Decentralization, and the new national environmental legislation prescribes new roles and responsibilities for these units. The Law on Local Self-Governments of 2002 delegated a variety of tasks to municipal level, including competences to perform urban and rural planning, environmental planning on local level and protection of environment, nature and spatial regulation, municipal services such as water supply, waste water treatment, collection, transport and disposal of municipal waste and supervision of the performance of activities carried out under municipal competency. Also, LSG units are competent (based on Article 24 of the Law on Environment) for assessment of the Environmental Impact Assessment Report (Elaborate) prepared by the investor/proponent for certain smaller activities and projects (compared to those determined by the secondary legislation as ones in competence of the central authorities).

Manyof the responsibilities for implementation and inspection have been delegated to the local self-government units. The law also introduces the possibility of inter-municipal cooperation in performing the functions under municipal competences. This requires mutual agreement among municipalities involved.

There is also environmental inspection and enforcement role of the LSG. Beside the state environmental inspectors, there are local environmental inspectors assigned by the LSG units. They perform regular inspection over the implementation of the environmental legislation and mitigation measures at IPPC B installations and the companies obliged to prepare the Environmental Impact Assessment Report (Elaborate).

Business community in general (including big industrial and power production facilities as well as small and medium size enterprises) as operators have the responsibility to carry out self-monitoring and reporting of emissions, prepare policy documents like Risk Management and Emergency Plans, obtain and maintain IPPC-license and permits for operation, respond to the monitoring and mitigation plans included in the Environmental Impact Assessment Study, provide public information, data collection and report to the responsible institutions regarding collection of environmental information.

Setting the technical standards, accreditation of laboratories, inspection and certification have been the responsibility of the Institute for Standardisation, through the Technical Committees consisting of representatives from governmental and academic institutions and technical experts, and the Institute for Accreditation. Their role will be more important in the coming period due to the fact that almost all EU Directives require setting of various technical standards (e.g. on emissions, data analysing methods, monitoring and data reporting, methodologies, etc.) and for accredited laboratories for monitoring of the state of environment.

The scientific institutions have the main responsibility in providing technical assistance to governmental institutions during regulation drafting process, setting the technical standards, policy making process, preparation of guidance and providing the trainings, and during the public information and consultation processes. Some of the laboratories under the University “St. Cyril and Methodius” and the Macedonian Academy of Sciences and Arts have the equipment, trained personnel and possibilities to perform the environmental monitoring and product quality, as well as to perform various research.

The role of the professional associations (e.g. Chamber of Commerce of Macedonia, Association of Packagers, Association of Operators with Secondary Raw Materials, Associations of Farmers, Macedonian Association for Energy Efficiency (MACEF), Association of Car Dealers, Association of Communal Enterprises, etc.) is to provide technical inputs to the public information and consultation process, support regulation drafting process with advice for practical implementation of the legislation and during the process of setting the technical standards.

Almost all EU Directives and the Aarhus Convention require public information, public participation and consultation during the implementation process. The current legal framework contains provisions providing for the obligations for governmental institutions to organize public consultation process on different issues (like EIA, IPPC procedures, preparation of strategic planning documents, proclamation of protected areas, etc.), disseminate environmental information and provide public awareness campaigns. All these functions are covered by the Public Relations Department under the Ministry of Environment and Physical Planning. The environmental civil society organisations (CSOs)representing the public opinion have a very strong role in these consultation processes, but the public participation is still in an early stage. These CSOsare mainly focused on the implementation of environmental projects of small scale, dealing with public awareness campaigns and public information, research and monitoring, as well as strengthening the capacity of environmental stakeholders. It should be pointed out that during the years some of them have raised their own capacities and started working on implementation of projects with more voluminous financial arrangements and set of activities.

## Environmental legislation and planning documents

**Legislation**

The status of candidate country opened the door for transposition and implementation of the EU Acquis, including the Environment and Climate Change Acquis. The sector has achieved high extent of transposition of the EU legislation (approximately 80%), but the implementation of provisions is not satisfactory. Transposition in the area of climate change is low due to the status of the Republic of Macedonia in the frames of the UN Framework Convention on Climate Change which is different than the one of the EU Member States and obligations differ accordingly.

The 2005 **Law on Environment** contains the fundamental environmental protection principles, which are basis for determination of the procedures for environment management and which are common for all laws regulating particular environmental media.

The legal framework for waste management has been established by the 2004 **Law on Waste Management**. Relevant EU directives have been transposed in the Law on Waste Management (LWM), taking also into consideration the local conditions. The Law regulates issues concerning the framework Policy on Waste; Hazardous Waste; Landfills; Waste Oils; PCB/PCT; Incineration of Non-hazardous Waste; Incineration of Hazardous Waste; Hazardous Substances Containing Batteries and Accumulators; Packaging and Packaging Waste; end-of life vehicles; waste from titanium dioxide industry. The Law on Waste Management also provides grounds for the adoption of several secondary legislation acts. The Law incorporates the basic principles of waste management (principle of environmental protection in waste management - waste minimization, principle of precaution, closeness, service universality, polluter pays principle, system of deposit, etc.). Waste management, as a public service, is based on the principle of service universality (non-discrimination, sustainability, quality and efficiency, transparency, affordable price and full coverage of the territory). The issue related to the management of sludge from urban wastewater treatment is regulated in the Law on Waters.Separate laws have been adopted for packaging and batteries and accumulators, the Law on Management of Packaging and Waste Packaging in 2009, the Law on Management of Batteries and Accumulators and Waste Batteries and Accumulators in 2010 andthe Law on Electric and Electronic Equipment and Waste Electric and Electronic Equipmentin 2012. Most of the secondary legislation based on these laws has been adopted as well.

The 2008 new **Law on Waters** introduces the approach of an integrated water management and harmonisation of the national legislation with the relevant EU legislation. The Law incorporates all the aspects of water management: water resource use and allocation; protection against and control of pollution; protection against harmful effects of water and sustainable water management planning. The Law on Waters is a framework law and contains general standards and principles, rights, obligations and competences of the state administrative bodies, local self-government units, as well as the rights and obligations of legal and natural persons in the domain of water management. The Law regulates issues referring to all surface and ground waters; water management facilities and services; institutional setup and water management financing, as well as conditions for manner of and procedures for the use or discharge into water, and international cooperation in the area of water management. The Law on Waters establishes legal grounds for the adoption of the relevant secondary legislation which is in progress. However, the use of water for irrigation and hydro systems maintenance is under the competence of the Administration of Water Management under MAFWE, regulated by the **Law on Water Management Companies** (Official Gazette of the Republic of Macedonia no.85/03, 95/05, 103/08, 1/12 и 95/12)and the **Law on Water Communities**Official Gazette of the Republic of Macedonia no. 51/03, 95/05, 113/07 и 36/11).

The 2005 **Law on Nature Protection** contains provisions which transpose the European Union principles for nature and forestry. The protection of nature is carried out through biological and landscape diversity protection and natural heritage protection, in and outside protected areas. With regard to species, the Law regulates the issues of introduction of allochthonous species in nature and reintroduction of extinct autochthonousspecies; trade in endangered and protected wild species of plants, fungi and animals; protection of species enjoying protection under international agreements; keeping and breeding of wild animal species in captivity, as well as designation ofthreatened wild species included in the Red Lists and Red Data Book.

The Law also regulates the temporary protection of endangered wild species until their designation, by the adoption of specific act by the Ministry of Environment and Physical Planning (MoEPP). The Law specifies the prohibited activities related to strictly protected wild species. The protected wild species include: indigenous wild species that are endangered or rare, but not threatened with extinction within the territory of the country; wild species that are not endangered, but could easily be confused, due to their appearance, with certain endangered species; and wild species for which the relevant manner of protection is stipulated under international agreements. The use of protected wild species may be carried out in a manner and in quantity that will not put at danger theirfavourableconservation status. The Law also regulates the protection of habitats and ecosystems, including provisions that shall provide for the favourableconservation status of habitats, habitats monitoring, preservation of ecologically important areas and establishment of ecological network. The protection of habitats and ecosystems is carried out through measures and activities for nature protection, sustainable use of natural resources and space planning and development. The protection of ecosystems is provided through habitat type protection, by the determination of their conservation status. Establishment of the system of protected areas (in line with the IUCN categorization) and their management and financing is also prescribed in the Law.

The 2004 **Law on Ambient Air Quality** sets the system for management of the ambient air quality. It includes activities directed towards avoidance, prevention or mitigation of harzadous effects of air pollution through: assessment of the ambient air quality, determination of emission limit values and quality values, planning of the ambient air protection, establishment of ambient air monitoring and information systems as well as protection of the ambient air quality in the course of emmission control from stationary or diffuse sources of pollution.

The Law on Ambient Air Quality defines the obligation for the adoption of the National Plan for Ambient Air Protection and Programme for ambient air pollution reduction and quality improvement. The Law also stipulates an obligation for adoption of programmes for pollution abatement and ambient air quality improvement on the territory of a local self-government unit, in the zones and agglomerations where one or more pollutants are found to be above the air quality limit values, plus margin of tolerance, or such values are between the air quality limit values and the air quality limit values plus margin of tolerance.

According to the Law, the Plan and the programmes should be adopted within six years after the Law enters into force. So far, the country has not complied with this requirement. The elaboration of the national plan for emmission reduction and the national plan for ambient air protection was developed in 2012. On annual basis, MoEPP adopts the Programme for Operation of the Automatic Ambient Air Quality Monitoring Network

The 2010 **new Law on Chemicals** establishes system for chemicals management aiming at preparation of the Republic of Macedonia for REACH chemical management system, the Stockholm Convention on Persistent Organic Pollutants; Vienna Convention for the Protection of the Ozone Layer and the Montreal Protocol on Substances that Deplete the Ozone Layer, which are integral part of the national legal framework. Relevant strategic and planning documents in this area (National Implementation Plan for reduction and elimination of VOCs; State programme for gradual elimination of the substances depleting the ozone layer) contain strategic goals for chemicals management on the territory of the country.

The 2007**Law on the Protection against Environmental Noise**sets to MoEPP the general competence to reduce the level of environmental noise, but also determines that some activities will be implemented jointly, in cooperation and consultation with or through some planning document to be adopted in agreement with other authorities, especially the other ministries, City of Skopje and LSG units.

The 2009 **Law on Forests** regulates the management and protection of the country’s forests. This Law intends to permanently preserve forest areas, increase their value and enable the largest increment according to the natural conditions of the place of their growth and enable sustainable forest planning, management, and preservation of forests and forest land in a manner and with a scope that provide permanent preservation and advancement of their productive capabilities, capability for regeneration and vitality in the interest of present and future development of economic, environmental and social functions of the forest, without disturbing the ecosystem. The Law applies to all forests and forest land, regardless of ownership and purpose.

**Planning documents**

By signing the Stabilization and Association Agreement and acquiring the status of a candidate country, the Republic of Macedonia has clearly indicated its policy on the way towards the European Union. Existing policy documents developed in environmental sector, such as the second National Environmental Action Plan, defines the environmental problems and the measures and activities required for their settlement thus establishing a flexible framework for achievement of the main objectives: continuation of the process of approximation with the EU environmental policy, management of an integrated policy as a unique manner of proper overcoming the challenges, establishment of directions for environmentally sustainable approach, enhancement of the extent of compliance with the obligations deriving from regional and global agreements and opening of new perspectives and involvement in international systems for environment protection.

The National Programme for Adoption of the AcquisCommunautaire (NPAA) was adopted in April 2005 being subject of review and supplementing on annual basis. It comprises the plans for harmonization of the national legislation with the EU legislation, the necessary dynamics of institutional strengthening for implementation of the legislation, the necessary resources for realization, and Action Plan. The NPAA is a powerful instrument for monitoring the whole association process, to be used by the Government as well as by the European Commission. It helps to answer questions posed by the Commission based on which, the Commission prepares annual progress reports. Chapter 27 of the NPAA addresses the achievements and the remaining obligations in the field of environment.

Several important policy strategic documents in various environmental sectors have been adopted, clearly defining the Government’s environmental policy, including:

* National Strategy for Sustainable Development 2009-2030;
* 2nd National Environmental Action Plan 2006;
* National Strategy for Environmental Approximation – 2008;
* National Environmental Investment Strategy – 2009 - 2013;
* Second Environmental Performance Review - 2011;
* National Plan for the Protection of Air - 2012;
* National Strategy for Waste Management 2008-2020;
* National Waste Management Plan 2009-2015;
* National Strategy for Waters – 2012 -2042;
* National Biodiversity Strategy and Action plan – 2004 (in phase of revision);
* Third National Communication on Climate Change;
* National Strategy for Clean Development Mechanism 2008-2012;
* Strategy of Improvement of Energy Efficiency by 2020;
* National Implementation Plan for reduction and elimination of POPS in RM - 2004;Plan for Institutional Development of the National and Local Environmental Management Capacity 2009-2014;
* Strategy for Regional Development.

Considering the decentralization process which is ongoing in the country and the growing responsibility municipalities will be assuming in environmental management it is necessary that decision making at the local level is made in a coherent and conscious way. This can be achieved only if necessary strategic and planning documents at the local level, especially LEAPs, are adopted and updated. The current LEAPs are out of date and lack of implementation is obvious.

The country priority towards EU integration and accession poses the attention and pressure on the production and update of the legislation and policies to EU standards. This means that most of the already limited resources both financial and human are mainly devoted to policymaking rather than on its implementation. Moreover, to facilitate relationships and cooperation with other EU countries and institutions, a similar institutional approach to other states should be in place.

Since monitoring of the implementation of Strategies as a mechanism is missing, it is not possible at this stage to evaluate whether the Strategies are implemented and the investment made. In particular due to the financial crises, which particularly hit the country, the availability of planned funds for environmental investments and implementation of priorities identified in policy planning document is at low level at the moment. Yet, implementation of the measures under the planning documents is partially achieved through budgetary programmes, donor community support and Instrument for Pre-Accession Assistance of the European Union, as well as through soft credit lines of international financial institutions.

## Environmental policies and challenges in context of EU

**- Guiding European environmental policy**

EU environmental policy has been set in a series of Environment Action Programmes (EAPs) starting in 1973, providing long-term orientation on key objectives and planned policy action. The current, 7th Environment Action Programme (7th EAP) aims to build on EU policy initiatives in the Europe 2020 Strategy, including the EU climate and energy package, the Roadmap for moving to a low-carbon economy in 2050, the EU Biodiversity Strategy to 2020, the Roadmap to a Resource Efficient Europe, the Innovation Union Flagship Initiative and the European Union Strategy for Sustainable Development.

The 7th EAP is based on the precautionary principle, the principle of preventive action, the principle of rectification of pollution at source and the polluter-pays principle; and three priority areas: to protect nature and strengthen ecological resilience, boost resource-efficient, low-carbon growth and reduce treats to human health and well-being linked to pollution, chemical substances and impact of climate change. The nine priority objectives are intended to be broad, all-encompassing and to ensure that environmental policy is included in EU initiatives in every area of economic and social activity.

Furthermore, on 2 July 2014, the Commission published its “circular economy package” which aims at paving the way towards a Zero Waste EU and includes new targets for recycling.

In the area of waste management, stimulation of the market for recycled materials is a major interest, as especially shown in the Roadmap for Resource Efficiency.

The EU has promoted itself as a world leader on climate change action. In the Europe 2020 Growth Strategy the 20:20:20 target was set in relation to emissions of greenhouse gases. The specific targets being:  Climate change / energy greenhouse gas emissions 20% (or even 30%, if conditions are right) lower than 1990, 20% of energy from renewables and 20% increase in energy efficiency. In addition, the EU has prepared a white paper of transport policy aimed at reducing emissions of greenhouse gases in this sector whilst maintaining a high degree of mobility for citizens.

In the [climate and energy policy framework for 2030](http://ec.europa.eu/clima/policies/2030/index_en.htm)**,** the European Commission proposes that the EU sets itself a target of reducing emissions to 40% below 1990 levels by 2030. For 2050, EU leaders have endorsed the objective of reducing Europe's greenhouse gas emissions by 80-95% compared to 1990 levels as part of efforts by developed countries as a group to reduce their emissions by a similar degree. The European Commission has published a [roadmap for building the low-carbon European economy](http://ec.europa.eu/clima/policies/roadmap/index_en.htm) that this will require.

As a Flagship Initiative under the Europe 2020 Growth Strategy, a roadmap for resource efficiency in 2050 has been prepared. The *Roadmap to a Resource Efficient Europe* shows avenues for how Europe's economy can be transferred to a sustainable one by 2050.These resources addressed include raw materials such as fuels, minerals and metals but also food, soil, water, air, biomass and ecosystems.

**- Environmental approximation process in Macedonia**

The process of approximating is a huge task, that requires careful planning and management on an ongoing basis. As deadlines for implementing certain provisions from Directives and Decisions arise after EU accession, the current national efforts need to ensure that measures proposed and adopted are adequate to meet the future compliance demands that Macedonia will face as a Member State.

Macedonia needs to have in place a legislative and administrative framework that will asure co-ordination on horisontal and vertical level. Implementation of national legislation harmonised with EU acquis involves a wide range of stakeholders (civil society, NGOs, Business, Science, etc.), on the basis of open dialogue, allowing stakeholders and those who are potentially affected to be involved.

In addition, the aproximation process will lead to additional expenditure at central and local government level, for regulatory authorities, for industries and commercial operations, but also for the public. Access to information and public consultation will suport this process.

The main objective of the government is to develop a well-planned and well-designed environmental strategic programms that will enable effective implementation of the EU envionment and climate legislation. Macedonia should assess transitional periods that will be required for parts of legislation.

The National Strategy for Environmental Approximation provides a focal point for the overall co-ordination of approximation activities and should be supported with the preparation of Directive Specific Implementation Plans at the Directive level. Directive Specific Implementation Plans (DSIPs) will set out the actions required, draw up the timetable according to which activities will be completed, assign responsibilities and allocate resources. Issues concerning implementation deadlines arising after accession need to be considered in detail.

**- Main challenges, main sectors and basic financial arrangements**

**Main challenges**

Macedonia will continue with the challenges of EU accession, with a strong emphasis on the need for overall strengthening of the national system of environmental management and strengthening of administrative capacity at central and local levels to align national legislation in the field of environment with the European Union. In this regard, it takes special efforts in providing appropriate strategic basis for the implementation of legislation, as well as providing capacity and institutional structures needed for accelerated process of identification, development and implementation of programmes and projects according to the requirements of multilateral and bilateral support.

The ongoing process of decentralization has identified numerous priorities and actions designed to facilitate the process of transferring responsibilities from central to local level. Accent should be put on the strengthening of regional and local structures that Macedonia will prepare for the implementation of the legislation and full use of EU funds. In this context, measures should be aimed at assisting the establishment of a decentralized system for project management, identification of human resources required for preparation and implementation of investment projects at central and local level and strengthen their capacity and formation of departments and units at central and local level in the preparation and implementation of infrastructure projects with new hires.

In the Republic of Macedonia,special challenge is to set mechanisms for integration of environmental issues in other sectoral policies, a s well as mechanisms for monitoring of the level of implementation.

Challenges for setting a functional and efficient national system of environmental management is aimed at:

* + - Continuing the process of approximation with EU policies in the area of environment, primary legislation and specific requirements arising from directives;
		- Enhancing integration of environmental protection into other sectoral policies;
		- Strengthening the administrative structures necessary for efficient management of environmental protection;
		- Providing a platform for effective implementation and enforcement of the requirements for environmental protection by strengthening the capacity to effectiveenvironmentalmanagementat all levels by providing close cooperation between the competent authorities of the horizontal and vertical levels;
		- Encourage industry, service providers and other entities in the environment to greater responsibility for environmental protection;
		- Involvement of civil society/NGO sector in decision making processes;
		- Increasing the degree of fulfillment of obligations from regional and global agreements in the field of environment; and
		- Increasing the level of investment in the environment to achieve the EU standards and criteria.

**Main Sectors**

The sectors that influence or are related to air quality, management of municipal and hazardous waste, quality of drinking water, collection and treatment of waste waters and nature protection are distinguished as those looking for particular attention in the context of negotiation and accession. For them, beside the legislative framework, considerable financial resources will be needed in order to be regulated according to the new standards, in a manner that ensures compliance with, for example, the emission limit.

Other issues recognized by the Strategy objectives set need to be fulfilled, too.

In accordance with the progress reports, proper administrative and legal structures need to be established in climate change sector providing adequate responses at national level.

**Basic Financial Arrangements**

The National Environmental Investment Strategy for the period 2009-2013 is based on priorities identified in the above-mentioned national strategic documents and founded on three pillars: the first is to ensure the necessary funds (€ 205 million) from national and international sources; the second pillar refers to the allocation of the obtained funds according to clearly defined and agreed priorities; and the third refers to the institutional strengthening to ensure efficient and effective implementation to implement the Strategy. Although the Strategy is for the period 2009-2013, it gives overview of planned investments beyond 2014.Four main sources of funding have been identified, namely the central budget (47%), the EU IPA Programme (25%), other donors (8%) and “own contribution” (20%). The “own contribution” includes municipality budgets, loans made to municipalities and any public-private partnership funding.

|  |  |
| --- | --- |
| **Year** | **Total €m** |
| 2009 | 10.5 |
| 2010 | 23.2 |
| 2011 | 39.2 |
| 2012 | 41.7 |
| 2013 | 38.9 |
| 2014 and onwards | 51.6 |

The Strategy suggests establishing an inter-ministerial task force to address the current lack of coordination and streamline investment activities. This task force has not been established up to now, while coordination for investment planning and implementation among line ministries needs to be strengthened and the required capacity within the responsible departments of the Ministry of Environment and Physical Planning (MoEPP), including for monitoring and evaluation of the planned investments, is lacking.

Under the National Strategy for Environmental Approximation, an average annual capital expenditure of €141М was planned for the 15 year period 2008-2022. The planned expenditure was close to 3% of GDP, with 3% of GDP projected to average €247М over the period 2008 - 2012. Whilst the figures have changed since the National Strategy for Environmental Approximation was prepared, the key issue of the scale of investment required has not changed. An expenditure of 3% of GDP on meeting the environmental requirements is a challenging target for any economy.

The lack of resources has been recognised in every sector strategy that has been prepared and again highlighted in the EU Progress Report of 2014. At present, less than 1% of the national budget is spent on the activities in the environmental sector. Such a percentage is low by the standards of other countries that have recently gained EU membership. In the case of these countries the norm is about 2 % of the budget.

As a strategy, Macedonia should increase the allocation of funding in the environment at least by 3% annually over the period 2014 – 2020 and will allow hiring of extra staff during this period. These will approximately double the budget of the MoEPP in the duration period of the Strategy i.e. seven years.

More specific needs for increased resources are identified in individual sector strategies that are specifically directed towards establishing monitoring and reporting programmes.

## Macedonia and international cooperation

The process of accession to EU is assisted trough bilateral and regional cooperation, as well as implementation if obligations arising from regional and multilateral environmental agreements. Until today, the country has ratified nearly all relevant global and regional environmental agreements. However, some challenges in terms of effective implementation and compliance with the obligations of the multilateral environmental agreements (MEAs) still remain. Macedonia signed a set of bilateral agreements for cooperation and financial investments. Donor coordination between the Government and the donor community has improved steadily and reflects national development priorities and increased national ownership over the development agenda. In the period 2008-2010, programme-based approach (PBA) was introduced in five selected sectors, including agriculture and environment, in order to further strengthen and improve coordination mechanisms aimed at increasing effectiveness of external assistance.

To respond to the increased needs arising from the EU integration process, the Secretariat for European Affairs (SEA) was established as a separate service of the Government in 2005, which provides support and coordination to the government institutions with regard to EU integration and foreign aid assistance. Furthermore, all ministries have sectors or units for European integration and IPA coordinators.

## Pressures to environment and climate

The four sectors: energy, transport, industry and agriculture are significant in relation to environment and climate change policy. It is a priority to increase recognition by these sectors of their contribution to environmental stress and to emissions of greenhouse gases. Each of these four sectors is a major stakeholder in the development and implementation of environment and climate change policy and the level of communication and cooperation between the Ministry of Environment and Physical Planning and these stakeholders must be enhanced.

### 4.6.1 Energy

Energy is sector conducting, on one side, negative impact on the environment and climate change, and offering greatest possibilities for environment and climate change promotion through utilization of renewable energy sources and energy efficiency, on the other.

The Strategy for Energy Development of the Republic of Macedonia defines the most favourable development of energy sector of the country in order to provide secure and proper quality supply of energy to consumers.

Energy development must not be contradictory to the principles of healthy environment. The Law on Environment contains provisions for environmental impact assessment (EIA), system of integrated pollution prevention and control (IPPC) permitting primarily through the concept of the Best Available Techniques; it also requires adoption of specific legislation for environmental management plans and environmental audits. Furthermore, the Law on Environment includes eco-labeling which in terms of energy contributes significantly to energy efficiency on the side of consumption.

Furthermore, development of new energy facility should take into account the obligations deriving from international conventions ratified by the Republic of Macedonia, including primarily the Convention on Environmental Impact Assessment in Transboundary Context and Convention on Biological Diversity, but also Convention on the Protection of Wetlands of International Importance for Waterfowls Conservation, Convention on the Protection of Migratory Species of Wild Animals and Convention on the Protection of Wild Flora and Fauna and Natural Habitats in Europe.

Energy security assumes satisfying demand for energy on regular basis under sustainable, ecologically acceptable conditions and at prices that do not slow down economic development and do not affect living standard of citizens. Provision of energy security requires greater diversification of energy resources by types, sources and suppliers, active role on the regional energy market and European energy community. Greater diversification will enhance competitiveness and that will provide confident supply of energy and sustainable prices of energy resources. To that end, it is necessary to achieve maximum possible utilization of domestic resources (renewable energy sources and coal) and strategically feasible long-term policy for connecting to the main energy lines in the region and beyond.

Energy sector contributes the most to the generation of overall emissions of sulfur dioxide (from 72 % in 2001 to 99 % in 2009), generating around 60% of the total annual emissions of nitrogen oxides, 21% of the total annual emissions of volatile organic compounds and major part (87 % in 2001 to 92 % in 2009) of overall generated emissions of particulate matters. The sector covers processes of combustion in thermal power plants, central heating plants and process of oil distillation, boilers for non-industrial buildings heating and household fireplaces and combustion processes in industrial production. The type of fuel used in these processes, content of polluting substances, calorific power of fuel, manner of combustion guiding and measures introduced to reduce the main parameters associated to pollutants emission. Installations in energy sector are characterized by the fact that major part of them are at the same time Large Combustion Plants (LCPs) with input heat capacity exceeding 50 MW and they are obliged to prepare Plans for reduction of the pollutants sulfur dioxide, nitrogen oxides and dust.

Energy sector in Macedonia contributes the most to environment pollution as close to 90% of primary energy is generated from fossil fuels, mainly lignite and crude oil. Thus, this sector contributes more than 70% to the overall emission of greenhouse gases with similar contribution to local pollution. Projections for greenhouse gas emissions under the scenario for electric power system development based solely on coal indicate average annual growth rate of 3.6% in the period 2008-2020, while analysis of environmentally promoted scenarios (introduction of co-generation gas pants, reduced growth in electricity demand and increased use of renewable energy sources) indicates that the average annual rate of growth in the period 2008-2020 will decrease to 1.4%

### Transport

National Transport Strategy 2007-2017 was prepared to present the necessary reforms in transport sector in line with the obligations under the National Programme for Adoption of Acquis of the European Union. This Strategy promotes, *inter alia,* protection of the environment and improvement of public health by building and investing in public transport and other types of efficient and constant transport reducing emission and consumption of resources and energy.

Transport sector has negative impacts on air pollution and climate change through emissions of certain pollutants from traffic. At country level, traffic contributes 24% to nitrogen oxides emission, 34% to carbon monoxide emission and 16% to emission of volatile organic compounds. Traffic also causes emissions of CO2 amounting 1.2 kt per year (National Plan for Air).

The cause of the great impact of traffic on the quality of air and climate change is the old vehicles with partial fuel combustion. Namely, according to the data of the State Statistical Office for 2010, 72% of vehicles were produced before 2000. According to surveys made in EU, emissions of NOx, CO and dust from diesel vehicles produced after 2000 are lower by around 36%, 37% and 50% respectively.

According to available data, energy sector is the main source of greenhouse gas emissions in the Republic of Macedonia, and road transport is the second great source of greenhouse gas emissions in the country, with an average of share of 9.15% in overall emissions of greenhouse gases or 12.55% of emissions from energy sector. Emissions from road transport are important for human health and make the main environmental problem in densely populated urban areas. Having in mind the above, it is necessary to undertake appropriate measures to reduce emissions of pollutants from traffic as envisaged in the national Plan for Ambient Air Protection.

### Industry

Industry holds an important place in the development of the overall Macedonian economy and ensuring its stability, with direct influence on employment increase, export growth, as well as social life of the population. It contributes around 21% to the structure of the overall GDP. The most significant industrial branches in the Republic of Macedonia with the highest and the most significant impact on environment, including air quality through emissions of polluting substances are metallurgy, chemical and pharmaceutical industry, construction industry, production of food and beverages and other foodstuffs, electric power industry and wood and paper processing. Industry contributes around 28% to the overall annual emissions of sulfur dioxide, around 14% to overall average annual emissions of nitrogen oxides and has great share (38%) in annual emissions of volatile organic compounds, as well as contribution of 60% of the annual emissions of particulate matters at an average.

The sector of industrial processes is responsible for less than 7% of the overall emission of greenhouse gases, while in energy sector (responsible for around 70% of the overall emission of greenhouse gases), 73% originate from industrial energy processes and 10.7% from production processes themselves. Particular challenge in this sector in future will be introduction and implementation of the European Emission Trade Scheme for greenhouse gasemissions.

Industrial facilities are obliged to introduce measures for reduction of emissions into all media of the environment (through issuance of IPPC permit, introduction of best available techniques, etc.).

According to the Industrial Policy of the Republic of Macedonia (2009-2020), the country sets a proactive industrial policy that encourages the orientation of the Macedonian industry to create products and services with higher added value based on knowledge, innovation and cooperation.By 2020, Republic of Macedonia needs to develop a dynamic mix of sustainable and authentic industries such as: organic wine and food, eco-steel, environment friendly construction, creative industries, information and communication technologies, medical equipment and services, authentic tourism and other industries.

Industry has many impacts on the environment and initially the policy will be to control and reduce such impacts through the use of “Best Available Techniques” as required under the Industrial Emissions Directive.

Environment policy in the Industrial Sector will be directed towards improved use of environmental management systems, as now required by the Industrial Emissions Directive, to move towards sustainability.

Industry will be required to follow any current EU “intensity guide” and where such are not available, to develop its own specific intensity guides. Initially such guides will be directed at energy efficiency, with a requirement to report annually the quantity of energy consumed per unit of product produced. The reported level of energy consumption should reduce year on year as energy efficiency measures are applied. In the longer term intensity guides will be developed for consumption of water and other raw materials and for significant emissions to the environment including carbon dioxide.

### Agriculture

In 2007, the Government of the Republic of Macedonia adopted the national Strategy for Agriculture and Rural Development specifying principles of the policies for support and measures adapted to expected changes in legislation, institutions and control systems (it is under revision). In 2007, the Government also adopted the National Strategy for Organic Agricultural Production (2008 - 2011) establishing the grounds for introduction and development of organic agricultural production. The National Programme for Agriculture and Rural Development for the period 2013 - 2017 mentions policies and measures for rural development, among which protection and improvement of environment and rural landscapes is mentioned as important priority area for support towards promotion of agricultural production practices for sustainable use of agricultural land, protection and improvement of environment and rural landscapes in order to conserve plant and animal diversity and improve soil, water and air.

Agriculture as a key economy sector plays a critical role in the social and economic stability of the country. From the economic perspective, the share of the primary agricultural production in the GDP has amounted from 8.9% to 12.8 %, during the period 2005 – 2012.

Agriculture land covers 51% of the total country surface area, out of which 22% are classified as arable land and 29% as permanent pastures. According to the results of the last census, there are about 192.675 agricultural holdings encompassing some 334.226 ha of utilized agricultural land with an average size of 1.73 ha with great fragmentation. The average plot size decreases constantly. The average plot size, depending on data source is 0.12-0.3 ha. Individual farmers own about 81% of arable land; the remaining is owned or leased by agriculture holdings (or state owned).

Having in mind that around 40 % of the country’s population lives in rural areas where the possibility of finding work outside of the farms is very limited, it can be concluded that almost half of the country and the population well-being depend on the agricultural sector.

In terms of pressure on environment and climate change, agricultural sector makes impact through emissions of ammonia into the air and emissions of the following greenhouse gases: CH4, N2O and CO2. Namely, 99% of the overall national emissions of NH3 come from agricultural sector, and it is the second in scale source of emissions of greenhouse gases: CH4, N2O and CO2. Emissions of greenhouse gases from agricultural sector contribute 8-15% to the overall emission and consist of methane (CH4) and nitrous oxide (N2O) originating from the following sources: enteric fermentations from domestic animals, emissions from fertilizers management with regard to organic and nitrogen compounds, emissions from rice fields, direct emissions from agricultural soils, as well as indirect emissions of nitrogen used in agriculture and emissions from agricultural residues burning.

Emissions to air and water will be controlled through use of “best agricultural practice” which will be codified during transposition of the Nitrates Directive 767/91/EEC. “Best agricultural practice” concerns the storage and use of fertilizers both natural and artificial.

## Environmental health and well-being in the Republic of Macedonia

In general, environmental health is focused on those aspects of human health and disease that are determined by the factors in the environment. It includes also the monitoring, assessment and management of these hazards that can potentially affect the human health. The modern environmental health includes both the proximal (direct) pathway of the pollution driving forces and their pressure which brings deterioration of the environment and the society as well, and finishes with direct negative human health effects of many pollutants in the air, water, soil and food. But it also includes the distal (indirect) pathway of this process, which means the broader context - the effects (often indirect) on health and well-being of the broad physical, psychological, social and aesthetic environment.

The main environmental and health driving forces in the Republic of Macedonia include energy production, transport, industrialization, urbanization, agriculture and land use. In this regard, special focus is on air pollution and noise, industrial hotspots, waste management (including medical waste), food and water safety, as well as establishment of a systematic environment and health information system as a platform for sharing data and knowledge of environmental exposures and health effects in the country. The evidence base produced in the country that links health and environmental risks to help policy-makers in setting priorities is not systematic and based mostly on study results funded by short term projects.

According to WHO estimates, the environmental burden of diseases in MKD showed 3.370 environment attributable deaths or 166 per 100 000. The total environment attributable DALYs (Disability Adjusted Life Years) per 100 000 was estimated at 2.567 or 17% of deaths. The total % of DALYs attributable to the environment nationally was 15 %. These facts are sufficient prove for urgent needs for more efficient actions in this field.

The current very fragmented approach of addressing health effects of separate hazards and ecosystems (like air, water, soil, or noise, chemicals, food contaminants, etc.) is obviously outdated and inefficient. The conceptual framework of assessing the risks and interrelated connections of various sectors and hazards like pollution and climate change, resource depletion, housing and urban living, social and health inequalities, influence the quality of life and social relation, while freedom of choice and security issues are neglected. There is an obvious need for more holistic treatment of the relation between environment and health. Application of ecosystem services approach in sectoral and cross-sectoral plans at all governmental levels is strongly recommended by the Convention on biological Diversity. Assessment of ecosystemsis intended to identify the causes for the changes inecosystemsand consequences of such changes on human well-being.Furthermore, demonstration of the value of ecosystem servicesin monetary units is an important tool for public awareness raising by spreading message to decision makers about the (relative) importance of ecosystemsandbiological diversity.Current experiences in the Republic of Macedonia with the application of these methods are modest. This approach is intended to upgrade the concept of sustainable development, which is widely accepted and used in policies adoption, through stronger integration of environment and economy.

The aim is to create policies which will *inter alia* include social and well-being aspects of environment and health, energy efficient policies which will include efficient use of recourses, natural capital and proper urban planning and land use.

# **OBJECTIVES OF THE STRATEGY**

Starting from the vision of the Strategy, towards **sustainability,** our ultimate objective is focused on improving the overall quality of life and avoiding any permanent damage to the environment, leading towards sustainable growth.

In terms of **environmental protection,** objectives are to preserve and improve the quality of water, air and soil in the Republic of Macedonia, conserve biodiversity in the Republic of Macedonia, and preserve natural resources.

In terms of **climate change** the objective is to reduce negative impact of climate change.

The **operational environmental and climate change objectives are**:

* + Fully harmonized legislation with EU
	+ Adopted planning documents provided in a given time frame, measures and actions needed to implement the legislation
	+ Establishmedand strengthened administrative structure that is ready to ensure implementation of the legislation and manage the process of accession to the EU.
	+ Implementedenvironmental legislation to the level that meets the requirements for EU membership and obligations under international agreements
	+ Integrated environmental protection in sectors that make impact on the environment
	+ Monitoring, analysis and assessment of the state of the environment and reporting on the state
	+ Raising awareness on environmental issues
	+ Reducing negative effects of climate change and establish a system of measures to limit greenhouse gases
	+ Increase adaptive capacities of the most vulnerable sectors to climate change
	+ Support for "clean" technologies and changes aimed at use of renewable energy sources and reduction of energy consumption.

# **PRIORITY ENVIRONMENTAL TOPICS**

## Horizontal legislation

### Brief description of the current situation

Full transposition of most of the legislation in horizontal sector has been achieved, but there are still gaps regarding the implementation. Implementation of the legislation in the horizontal sector has one advantage compared to other environmental sectors since no capital investment is required. Rather than to regulate a specific area, these items of legislation are more procedural. They provide for methods and mechanisms aimed at improving decision making and legislative development and implementation.

Most of the horizontal legislation has been transposed in the Law on Environment and regulations arising from it in which the Directive on EIA 2011/92, Directive on SEA 2001/42, Directive on access to information 2003/4/EC and Directive for public participation 2003/35/EC are fully transposed. Directive 2004/35/EC on environmental liability with regard to prevention and remedying of environmental damage and Regulation (EC) 166 / 2006 establishing the European Pollutant Release and Transfer Registry are partially transposed.

Directive 2008/99/EC on the protection of the environment through criminal law has been transposed in the Criminal Code and Directive 2007/2/EC establishing infrastructure for spatial information in the European Community (INSPIRE) has been transposed in the Law on National Infrastructure for Spatial Information.

Regarding the implementation of regulations in the area of horizontal legislation, most of the obligations for implementation are under the responsibility of the Ministry of Environment and PhysicalPlanning. More specifically, the responsibilities are fully defined and distributed among relevant departments within the Ministry, the Administration of Environment and the State Environmental Inspectorate. In addition, the local self-government units have obligations for implementation which are defined in the environmental horizontal legislation.

Also, the implementation of the horizontal legislation is closely linked with other environmental areas (sectors) and other relevant institutions and bodies on central and local level that have responsibility to implement the environmental horizontal legislation.

Delayed implementation of the horizontal legislation has been identified with regard to the responsibility for environmental liability only and as a result there is no a real case of application of the provisions in practice.

Furthermore, implementation of the provision for environment from the Criminal Code is on very low level due to lack of capacity for efficient initiation of proceedings and prosecution of environmental crimes.

### Gaps identified in the area and needsfor improvement

In the area of horizontal legislation, it is necessary to continue work on the following regulations:

• Directive 2007/2 / EC establishing the infrastructure for spatial information, transposed in the Law on National Infrastructure for Spatial Information.

• Directive on environmental crime transposed in Criminal Law in 2008/99

• Full transposition and implementation of Directive 2004/35 / EC transposed in Law on Environment.

Continuing the process of capacity strengthening of central and local administrations that have jurisdiction in this area, especially in the implementation of procedures for assessing the impact on the environment is needed.

Environmental authorities are responsible to make available environmental information to the public in easy and accessible way. In that sense, it is necessary to accomplish successful implementation of PRTRs Protocol and reporting requirements in practice. To that end, capacities of administration, operators and NGOs need to be strengthened in order to be competent and active partners fully engaged when dealing with environmental issues.

It is necessary to strengthen the administrative structure both on central and local level to monitor environmental media and improve the environment monitoring and information system, by new employments and investing in proper equipment.

Adoption of the national legal framework on national spatial data and infrastructure has advanced the implementation of the INSPIRE Directive. However, significant implementation efforts are still required to achieve full implementation of INSPIRE Directive. Introduction of effective system for spatial data, implemented through GEOPORTAL, is also needed. Progress in implementation of the Environmental Crime Directive is linked to the progress achieved in the alignment of the national legal framework to EU environmental legislation.

Enforcement of criminal environmental policy needs establishment of clear rules and procedures for effective coordination and cooperation among competent authorities in order to ensure that criminal offences are punishable by effective, proportionate and dissuasive criminal penalties.

For the purpose of the above, the enforcement of environmental legislation needs effective supervision which can be achieved through continuous capacity building of the State Environmental Inspectorate, the Authorized Environmental Inspectors of local self governments and other relevant bodies and continuous involvement in the activities on European and international level in order to combat environmental crime.

In addition, strengthening the judiciary by providing an effective system of punishment is required.

Introducing and development of measures to encourage development and promotion of financial security instruments or market based instruments for proper implementation of the Environmental Liability Directive is needed. Moreover, it is important to strengthen the capacity of the Administration of Environment (AE) and SEI and Authorized Environmental Inspectors of local self governments regarding assessment of significance of environmental damage and preventive and remediation measures that need to be developed.

In order to improve capacities, the Ministry is launching the project which will provide capacity building for state and local environmental inspectors as well as the capacity of local government units.

### Objective

Provide access to a wide range of environmental data for all stakeholders, including the public, thereby encouraging public participation in decision making in the Environmental and Climate Change Sector.

**Specific objectives**

* Full approximation of the legislation with priority on Directive on environmental damage.
* Established efficient system of spatial data through GEOPORTAL (INSPIRE Directive).
* Well developed Environmental Information System facilitating easy exchange of and access to environmental information.
* Effective system of legislation enforcement through application of inspection supervision and management of efficient court proceedings.
* Established integrated environmental monitoring system.

## Waste management

### Brief description of the current situation

The current state of waste management in Macedonia can be described as nonstandard with regard to human and financial resources, as well as insufficient and ineffective with regard to the monitoring and implementation of regulations, which results in different malfunctioning systems in society and numerous related negative effects on environment and human health.

The development of the Republic of Macedonia towards a sustainable waste management system will require further approximation of the national legislation with the EU one, changes in institutional organization and in general waste management practice. Successful changes in waste management can be initiated by the Government by setting strategic objectives and goals of the contemporary waste management practice taking into account existing environmental damage and by using its legislative and regulatory power and with full commitment of the local-self government; however, ultimate success in practice can only be reached if all members of society understand the relationship between non-proper waste management and adverse effects on the environment and public health, if they become aware of their responsibilities, obligations and tasks in waste management, and if they are encouraged by organizational and in particular by economic measures.

The Waste Management Strategy reflects the national policy in waste management and represents the basis for preparation and implementation of integrated and cost-effective waste management system. With this strategic document, Macedonia defines the fundamental directions in waste management for the twelve year period (2008-2020), on the basis of recognition of serious impacts to living and natural environment caused by improper waste management at present and in the past, and it determines the fundamental directions of gradual waste management system set-up based on the hierarchy of the main principles of waste management and the main principles of sustainable use of natural resources. In line with the Waste Management Strategy, it has been decided that waste management will be implemented through eight regions each having Inter-municipal Waste Management Board. The IWMB is responsible for the establishment of modern waste management facilities in its region.

The National Waste Management Plan determines activities and tasks of individual stakeholders in the society, sets priority of tasks and timetable by estimation of the time for realization of the individual tasks and procedures and determines human, institutional and financial resources needed in order to achieve the set goals, objectives and targets in the 6-year period.

The initial step has been to establish regional centers for waste management and prepare Regional Waste Management Plans. Regional Plans have been prepared for North-East Region and East Region. The plans for the other six regions remain to be prepared. Both plans define establishment of a modern landfill in the region and materials recovery facility to recover waste. The Plans also plan the treatment of organic wastes using composting.

According to data in the National Waste Management Strategy, the estimate of the total quantity of waste generated in Macedonia is 26.000.000 t/year, with expected growth in quantities by 1.7% per year in the next 10-12 years (with 2012 as baseline year).Calculations of the waste generated in municipalities have been done based on the assumption that quantity for the urban areas is 350 kg/year/inhabitant and for rural area 190 kg/year/inhabitant.

The solid waste generated in Macedonia is mostly disposed of by landfilling. The landfill Drisla, serving Skopje region, is the only landfill in Macedonia which is relatively well managed. This is already done! At the municipal landfills (or dump sites) in rural areas, the waste is simply dumped by Communal Enterprises with no operational costs, except for some overheads (paid to guardians, if any) and occasional water consumption costs for extinguishing spontaneously emerging landfill fires. None of the 54 municipal landfills meets the requirements for sanitary operation and environmental protection. Around 70% of the population uses the services of the system for municipal waste collection performed by public enterprises. The equipment for waste collection and the level of service is not compliant with the current requirements. Collection of unseparated fractions of municipal waste and non-hazardous industrial waste, as well as fractions of non-hazardous and hazardous waste is a common practice. There are no officially licensed collectors and transporters of hazardous waste. There are currently hundreds of illegal dumpsites in the country. The first priority for these illegal waste dumpsites should be to prevent any further activity at these sites as soon as possible.

Scrap metal represents the biggest part of collected recyclables and is being processed by steel factories “Makstil” Skopje, “Zeleznik” Demir Hisar or exported out of the country. There is a well-established network of collectors and/or brokers, as well as a strong and stable market for recovered scrap metal. It can be concluded that scrap metal represents almost 80% of the collected commodities. Collected and processed ferrous scrap includes cars, household appliances, technological/ industrial scrap, discarded machinery/equipment and various other steel products deriving from abandoned scrap. Roughly 50% – 60% comes from industrial sources and discarded machinery.

Also there are several licensed companies for collection and treatment of waste oils and waste tires. The recovery of these types of potentially recyclable materials is considered not financially viable under current conditions.

Hazardous wastes, e.g. industrial processing and health-care wastes are often mixed and disposed with municipal waste. Only in Skopje there is an incinerator for medical waste.

By entering into force of the Law on Management of Packaging and Packaging Waste (LMPPW), Law on Management of Batteries and Accumulators and Waste Batteries and Accumulators and Law on Management of Electric and Electronic Equipment and Waste Electric and Electronic Equipment, recycling activities are undertaken by the business sector for these types of recyclables such as metals, paper, plastics, batteries and accumulators and old electrical and electronic equipment.

The system of packaging waste management has been established in 2010, when the LMPPW entered into force. The Law is fully harmonized with the relevant EU legislation in this area. According to the Law, the producer is primarily responsible for generated waste but it also determines responsibility for all stakeholders involved in the process of management. According to the annual reports submitted to the MoEPP from collective schemes (four of them are established in the country), the total amount of collected packaging waste is 50 662 tons, out of which 7947 tones are collected and treated.The figures in the table show that there are some positive effects from the establishment of the system of packaging waste management system, but it is far from being satisfactory. The percentage of total packaging waste placed on the market covered by all four collective schemes is still about 50%, which is not satisfactory. The level of recycled packaging waste is also low. Because of that, there is a need for further intensive activities by the state, local authorities and business sector to improve this field. The same situation is also in the field of waste batterieas and accumulators and waste electric and electronic equipment.

Old environmental contaminated industrial sites represent a serious risk for humans who live in or near the contaminated areas, because of either their direct negative impact on human health or indirectly, through pollutants in the food chain production. Currently, Macedonia starts with initial steps for solving this issue trough issuing concessions for some of the contaminated industrial sites.

Under the new environmental legislation, the Environmental Inspectorate is responsible for the monitoring over the closure of non–compliant landfills and transition measures towards compliance with EU disposal standards for operating landfills. It will require additional resources which exceed the currently available in terms of qualified staff at national and local / regional level.

From among 13 EU Directives and regulations covered in the area of waste management, the level of transposition of the EU legislation in this area is 98%, except Directive 2006/21/ЕС concerning management of waste from extractive industry where the level of transposition is 23% and new Framework Waste Directive 2008/98/ЕС with a level of transposition of 59%.

Namely, the adoption of the Law on Waste Management (2004) was followed by further approximation of the national legislation with the EU law in the segment of special waste streams by drafting and adoption of the Law on the Management of Packaging and Packaging Waste (2009), Law on the Management of Batteries and Accumulators and Waste Batteries and Accumulators (2010) and Law on the Management of Electric and Electronic Equipment and Waste Electric and Electronic Equipment (2012). Based on the said laws, numerous bylaws have been adopted to regulate in more detail individual issues in the area.

The Ministry of Environment and Physical Planning, Administration of Environment is responsible for the implementation of the legislation on waste management, through achievement of the goals and priorities in the area of waste, arising from strategic and planning documents; it also participates in the implementation of the national legislation, provides instructions to LSGUs and other stakeholders in the process and provides high level of integrated waste management in the Republic of Macedonia.

The Ministry of Economy is responsible for the implementation of Directive 2006/21/ЕС concerning management of waste from extractive industry.

In parallel with the above, laws concerning special waste streams are implemented as well. Database was established to keep the registry of producers releasing on the market or importing as end users in the Republic of Macedonia batteries and accumulators, and two permits were issued for collective handlers of waste batteries and accumulators. Database was established to keep the registry of producers releasing on the market or importing as end users in the Republic of Macedonia electric and electronic equipment. In the segment of packaging waste treatment, four collective handlers have been registered.

Programme for closure of non-compliant landfills in the Republic of Macedonia and Programme for reduction of the quantities of biodegradable waste on landfills have been prepared. In the frames of IPA, project for strengthening the institutional capacity in waste management and mechanisms for waste management coordination on central and local levels was implemented.

Implementation of individual obligations related to Sewage Sludge Directive is planned for 2015 and 2016 while envisaged date for full implementation is 2017.

The implementation of Batteries Directive is already well advanced. As regards the Packaging Waste Directive, targets for recovery and recycling of packaging waste will be attained by 2020, which is also set as the date of full implementation.

The implementation of the PCB/PCT Directive is planned for the end of 2015.

Implementation of the POPs Regulation has been further postponed. Full implementation previously planned for the end of 2014 has been postponed for the end of 2017.

Implementation of the WEEE Directive is at an early stage with only few obligations implemented so far. The date for full implementation is set for the end of 2020 with intermediary dates set for 2014, 2015 and 2016.

Target dates for full implementation are defined for all Directives, except for the Waste Framework Directive, End-of-Life Vehicles Directive, the Landfill Directive and the Mining Waste Directive. Target dates range from 2015 to 2020.

### Gaps identified in the area and needs for improvement

Major problems and constraints in the domain of waste management in the Republic of Macedonia are present in almost all areas of the current system of waste management, as well as all relations in the society related to waste management: policy and legal framework; organization of institutions and human resources, coverage of costs and financing of services and investments, awareness of involved stakeholders and their information, all phases of technical management ranging from waste collection to waste disposal, existence/remediation of environmental burdens, impacts on human health and environment/nature with potential effects on Macedonia’s economy.

There is a need to finalize transposition of EU legislation, including EU measure 32008L098, Regulation 1013/2006/ЕC on export, import and transit of waste. It is additionally needed to fully transpose Directive 2006/21/ЕС and the new Framework Waste Directive 2008/98/ЕС.

It is necessary to strengthen the capacity of the units of local self-government in implementing the national legislation in the segment of establishment of regional waste management and support in the implementation of projects in the area of integrated waste management, primarily in the domain of preparation of feasibility studies, preparation of regional waste management plans, technical documentation and construction of regional landfills and infrastructure for waste collection, selection and recycling.

Support is needed in the adoption of the remaining planning documents for special waste streams management (Programme for management of waste batteries and accumulators) and Waste prevention programme, as well as establishment of system of hazardous waste management in Macedonia.

In the context of the above, there is a need to adopt specific plans for implementation of the Landfill Directive to define project pipeline for investments in waste management, to cover construction of new and closure of non-compliant landfills. As modern waste management facilities are provided, existing landfills must be finally closed in a manner that protects the environment. The manner of closure will be determined by the need to protect surface and ground waters as determined in the River Basin Management Plans.

Introduction of collection at source separated waste is an important step in the establishment of a system of waste recycling and recovery. The provision of materials recovery facility will allow for certain waste streams e.g. metals, plastics and glass to be recycled, with much of the remaining waste being processed to become fuel.

The greater the amount of waste recovered via material recovery facilities, the lower is the need for disposal of waste via landfill. The balance between use of waste recovery and disposal via landfills must be monitored at national level to ensure that waste recovery is promoted and provision of new landfill capacity is restricted to provide only for that fraction of the waste that cannot be recovered.

Financing of the set-up of the new waste management system as well as remediation of environmental burdens will be carefully considered. Coverage of capital investment costs and operational costs is an important factor for a country with 2 million inhabitants and small streams of waste where the effect of economy of scale is especially exhibited regardless of the waste recovery, treatment or final disposal process.

### Objective

Establishment of institutional capacity and adequate infrastructure facilities for regional municipal waste management and enforcement of measures for other types of waste.

**Specific objectives**

1. Full approximation of the legislation
2. Established regional centres for waste management in all regions through adoption and implementation of Regional waste management plans - Support implementation of regional waste management plans
3. Adopted Plans for special waste streams management and implementation of identified measures for special waste streams
4. Established list of infrastructural projects containing well designed measures for construction of new and closure of non-compliant landfills, as well as construction of infrastructure for waste collection, selection and recycling in regional waste management systems for waste management and biodegradable waste reduction
5. Established system for hazardous waste management.

## Water Management

### Brief description of the current situation

Republic of Macedonia is located in the central part of the Balkan Peninsula. According to hydrographical conditions of the country, there are four river basin areas[[1]](#footnote-2) and three major natural lakes[[2]](#footnote-3). Most of the surface waters are formed on the territory by precipitation. The country is not rich in surface water (about 3.000 m3/capita) and depends mainly on precipitation. Due to morphological, hydro-geological and hydro-geographical structure of the relief, the run off quickly runs into the hydrographical network (rivers, streams and lakes) and out of country. Only the karst areas divert from this general picture where water retains in the ground for longer periods and recharges the running waters of the river network. In total, the annually available surface water is assessed to be in the order of 6.372 billion m3.

About 4.400 springs with a total annual yield of 992 million m3 have been registered, out of which 58 springs have a capacity of over 100 l/s. Macedonia has 21 major reservoirs, with combined total storage capacity of 1.39 billion m3, and an average capacity of 66.0 million m3.A further 28 reservoirs are planned, with a combined storage capacity of 1.44 billion m3 and an average capacity of 51.3 million m3. However, no good data exists about the groundwater yield due to lack of systematic and continuous monitoring.

According to the total water demand by users, currently the major water consumer is the irrigation sector with 46%, minimum accepted flow[[3]](#footnote-4) with 28%, then industry with 14% and the population and tourist consumers with 12%. The same water demands by the river basins are as follows: river Vardar 79% of the total water demand, river CrnDrim basin 12% and river basin Strumica 9% of the total water demand. Approximately 60% of the drinking water is supplied from karstic springs, 20% from surface waters, and 20% from groundwater.

The total annual consumption of water for municipal and industrial sectors in Macedonia is 581.8 million m3. Of that total, nearly half (49.3 percent) is used for industrial purposes, including mining.

With regard to waste water collection and treatment, there are 65 agglomerations envisaged falling within the scope of the Urban Wastewater Treatment Directive 91/217/EEC (agglomeration is a settlement or group of settlements, where the sewage is collected and centralized to one common WWTP). Thereof, 4 agglomerations are above 100 000 PE, 25 agglomerations with PE above 15 000 to 100 000, 7 agglomerations of 10 000 – 15 000 PE and 29 agglomerations of 2000-10000 PE. The far biggest agglomeration is the capital city of Skopje, which, including suburban municipalities, results to approx. 882 000 PE. However, agglomerations are not completely identified and are based on the investigation made during implementation of IPA project for preparation of pipeline of projects for water sector. With regard to the extent of the constructed sewerage network and waste water treatment facilities, the country lags behind in comparison with the water-supply infrastructure. At the national level, the sewerage network comprises 1.239.1 km of pipelines. From the total number of 697.529 dwellings (Census 2002), 65% are connected to public sewage system, whereas 21% of the dwellings have septic tanks and another 12% only have a system of uncontrolled waste water discharge. Generally, the existing sewerage systems in major urban areas are designed as a single system collecting and conveying both wastewater and precipitation water. There are only 12 cities having separate sewage systems. The City of Skopje, as the largest contributor with the highest production of pollution, has constructed a separate system for sewage (534 km) and storm water (196 km). At present, WWTP exists only in 6 agglomerations over 10 000 inhabitants (Ohrid (Vranista), Resen, MakedonskiBrod, Dojran, Kumanovo and Berovo). Three of them are in communities located on the shore of the three large tectonic lakes Ohrid, Prespa and Dojran that are of the highest priority concerning natural protection. Current condition of the sewage systems is different in certain urban and rural areas. Generally, the systems are rather old, worn out, the collecting network is constructed of different materials, the pipes are cracked and there is leakage of the wastewater in the ground. The capacity often is not sufficient to collect all the wastewater. The systems are not separate systems for urban wastewater and storm water, and during floods, the pipes are overloaded and suffer from increased pressure.In urban areas where the sewage systems are rehabilitated or newly constructed, collection and disposal of the wastewater is efficiently performed.Management of the sewage systems is the responsibility of the same public utilities as the drinking water supply.

**Legislation -** The following laws governing the water sector are in force: Law on Environment; Law on Waters (Official Gazette no.87/08, 6/09, 161/09, 83/2010, 51/2011, 44/12, 23/13, 163/13) Law on Water Management Enterprises (Official Gazetteno.87/2008; 6/2009; 61/2009; 83/2010, 51/2011); Law on Drinking Water Supply and Urban Wastewater Drainage (Official Gazetteno.68/04,28/06,103/08, 17/11, 54/11, 163/13). The Law on Waters (LW) was enacted in 2008. It has defined the framework for the future water resources management, through transposition of the Framework Water Directive (FWD) 2000/60/ЕC, Directive 76/160/ЕЕC concerning the quality of bathing water, Directive 91/676/ЕC concerning the protection of waters against pollution caused by nitrates from agricultural sources, Directive 98/83/ЕC on the quality of water intended for human consumption, Directive 91/271/ЕЕC concerning urban waste water treatment, Directive 86/278/ЕЕC on sewage sludge, Directive 1976/464/ЕC on discharge of dangerous substances into the aquatic environment and Directive 75/440/ЕC concerning the quality required of water intended for abstraction of drinking water. The LW regulates issues pertaining to surface water, including permanent watercourses or streams in which water occasionally flows, lakes, reservoirs and springs, groundwater, coastal land and water habitats and their management including distribution of water protection and conservation of water and protection against harmful effects of water, water facilities and services, organization and financing of water management, as well as the conditions, methods and procedures under which they use or release water. In order to enable the implementation of the LW concerning water management, significant number of bylaws were adopted in the past period, concerning transposition of technical requirements of the WFD, also requirements of urban waste waters Directive, Sewage Sludge Directive, part of the requirements of the Nitrates and Dangerous Substances Directive. The highest and almost full level of transposition has been achieved for Directives on drinking water and urban wastewaters as well as for WFD.

The lowest percentage of transposition has been recorded for Flood Directive which is at the same time the least implemented and there is a need to first conduct preliminary assessment of risk of floods, identify river basins and areas associated with flood risk, prepare flood risk maps and ultimately establish plans for flood risk management focused on prevention, protection and preparedness.

In addition to the above, implementation of Nitrates Directive and Bathing Water Directive should be initiated.

The government will also need to set overall policy within the context of the EU Directives, for example establishing the role that taxation or other fiscal measures will have in implementing water quality objectives. In addition, the Urban Waste Water Directive (91/271/EEC) and the Directives concerned with use-related water quality (for example the Bathing Water Directive (2006/7/EC) and Drinking Water Directive (80/778/EEC, as amended by Directive 98/83/EC) require action from water and sewerage providers.

**Planning Documents -** According to WL, three types of planning documents need to be adopted, namely: National Strategy for Waters for a period of 30 years, Water Management Master Plan for a period of 20 years and River Basin Management Plans at every six years. In 2010, Water Strategy was prepared and adopted. The Strategy analyzes in detail the state of surface water and groundwater with aim of setting necessary objectives and measures. State is treated from three different aspects – state of water use, state of river training and protection against harmful effects of water and state of water and ecosystem quality.

**River Basin Management** - The new approach to water management set out in the WFD and in the Floods Directive requires water to be assessed and managed on the basis of river basins, rather than according to geographical or political boundaries.

River Basin Management Plans (RBMPs) - RBMP for Prespa Lake was prepared in 2012; there is ongoing preparation of RBMP for the river Bregalnica, tributary of river Vardar, also for Strumica RB and IPA Project TAIB09 started the preparation of initial elements for characterization of Vardar RBMP. The Government of the Republic of Macedonia defined the boundaries of the River Basin Districts (RBDs) (Official Gazette of RM no. 107/12).

**Programme of Measures** - In line with the WFD, it needs to be developed in the frames of each RBMP. A programme of measures designed to achieve or maintain good environmental status, in accordance with Article 13 and the Government of Macedonia need to adopt a Programme for measures for each RBD on the territory of the country aiming at achieving the environmental objectives determined in the LW and in the River Basin Management Plan. New project for implementation of Programme of Measures for Prespa RBMP started in 2012.

MOEPP should prescribe the requirements and procedures for establishing water protection zones, and for information and mapping. Water protection zones shall be established for: water bodies intended for human consumption, water bodies designated as recreational waters, including bathing waters, nitrate vulnerable zones and water bodies sensitive to urban waste waters discharge.

Data for each RBD has been partially collected and it is not in accordance with WFD. The competent body is MoEPP-Administration of Environment and other public bodies that operate monitoring stations under the State Monitoring Network, such as Hydro-meteorological Institute under the MAFWE, Public Health Institute under the Ministry of Health, Monitoring networks under the MoEPP and Hydro Biological Institute in Ohrid under the Ministry of Education and Science.

**Responsibility -** Responsibilities and obligations in Water management are implemented through appropriate governmental institutions. Competencies are divided between several ministries: Ministry of Environment and Physical Planning is designated competent authority for implementation of the Directive, in cooperation with theMinistry of Agriculture, Forestry and Water Economy, Ministry of Economy, Ministry of Transport and Communications, Ministry of Education and Science, Ministry of Health and Public Health Institute. Administrative capacity in water sector is weak at both national and local level. Further strengthening of their capacity has been identified.

### Gaps identified in the area and needs for improvement

Implementation of Water Framework Directive is at an early stage in Macedonia, with only few obligations reported as implemented. Progress in implementation will be achieved in the upcoming period as a result of the outputs of the ongoing technical assistance in the field of water management. So far, there are three implementation obligations completed: (i) identification of RBDs, (ii) giving legal effect to administrative arrangements for international rivers, lakes or coastal waters, and (iii) the identification of competent authorities.

In the coming period, it is necessary to pay specific attention to the enforcement of the legislation on waters management, especially through adoption of RBMPs and implementation of measures specified therein.

Capacities of MoEPP and units of the local self-government (LSGUs) are not sufficient to fulfill the obligations deriving from the Law on Waters. Achievement of good implementation of the Law requires sufficient administrative structure, both on central and local levels. Besides this, it should be taken into consideration that the Law introduces completely new approach to the management of waters in the Republic of Macedonia, which by itself requires systematic approach in structures establishment. It is necessary to establish strong administrative centre to facilitate cooperation with all parties involved in waters management, including competent ministries and institutions on one side and operators on the other. It is additionally necessary to establish institution to cover the gaps in professional and scientific preparation of RBMPs which is presently not well provided.

The importance of strengthening the Local Government - The WFD and the Floods Directive are to a large extent based on a "decentralized" concept of river basin management and encourage the involvement of local people as much as possible in the whole planning process. Also, the MSFD is partly based on decentralized approach with measures and strategies developed for marine regions and sub regions, which to a large extent involves regional authorities and people from neighbouring countries.

The WFD and Floods Directive will require the co-operation of local authorities in developing operational and strategic objectives that are to some extent also use-related (e.g. waters for drinking water abstraction, waters for bathing). Measures to meet prescribed water quality standards and abstraction limits will in any case require local action. A similar approach will be required for the implementation of the MSFD in defining and implementing programme of measures.

The provision of water, sewerage and waste management services may be the responsibility of the local government. Such bodies will be involved in ensuring that drinking water is safe and human waste products are disposed of in a satisfactory way so as to minimize public health risks and/or harm to water resources otherwise. Local administrations may be responsible for, and be funded to construct, water and wastewater treatment plants, water mains, sewerage networks and waste management facilities. In such cases the regional authority may be appropriate competent authority in terms of Drinking Water Directive (98/83/EC) or Urban Waste Water Treatment Directive (91/271/EEC) and the Waste Framework Directive (2008/98/EC) and other relevant waste-related Directives such as the Landfill Directive (99/31/EC). The role of the local authority in implementing these Directives, and the possible conflict of interest, must be considered in such cases, since the authority could be in the position of both the regulator and the regulated.

We should stress the need to establish monitoring of water quantity and quality, especially for ground waters. Based on the assessment of the current status made by waters monitoring, Programme for monitoring should be adopted to envisage future development of the waters monitoring system in Macedonia. The Programme will identify deficiencies in the existing monitoring system, the need for upgrading and its operational programme.

Strengthening the Monitoring, Inspection and Enforcement - Monitoring is an essential part of the implementation of the whole range of EU water legislation, including, in particular, the WFD but also Floods Directive and MSFD. The monitoring has to be in accordance with set standards, technical formats also corresponding with the requirements for exchange, collection of information established by the INSPIRE Directive (2007/2/EC).

The Drinking Water Directive (98/83/EC) should be implemented early in the implementation plan as it is of great importance to public health and will continue to have some sort of "stand alone" function. The Urban Waste Water Treatment Directive (91/271/EEC) is an important Directive and, in areas with basic sewerage needs, requires lot of financial resources and technical infrastructures and should be implemented at an early stage. At the same time, the issue of sewage sludge in the context of waste legislation has to be addressed, as appropriate ways for sewage sludge reuse and/or disposal will be required.

### Objective

Establishment of river basin management and improvement of the state of the environment and safeguarding of human health through improvement of water quality.

### Specific objectives

* Completion of transposition
* Completion of RBMP including identification of programme of measures
* Establishment of comprehensive waters monitoring system
* Establishment of system for assessment, protection and preparedness for floods combating and development of FRMPs
* Increasing the level of investments relative to GDP through construction of systems for waste waters collection and treatment
* Provision of safe drinking water for the population through modern water supply systems and established mechanisms for application of the polluter pays principle.

## Air Quality

### Brief description of the current situation

The quality of air is an important issue vitally linked with public health, economy and environment. Pollution of the air can cause deterioration of human health, including premature death, as well as disruption of ecosystems. This causes huge economic damage for the country expressed through reduced productivity of the workforce and degraded state of the environment.

In order to improve the quality of air, the Republic of Macedonia has initiated approximation with the European legislation towards adopting the standards for air quality. To that end, in 2004, MoEPP prepared the Law on Ambient Air Quality and so far 16 bylaws have been adopted under it, where EU Directives on air have been transposed almost entirely (2008/50/EC, 2001/81/EC and 2004/107/EC).

Directive on Clean Air in Europe 2008/50/EC has been 96%transposed,Directive 2004/107/ECon heavy metals 98%, and Directive on emission ceilings 2001/81/EC 100%. Furthermore, in February 2014, the Law on the Control of Emission of Volatile Organic Compounds in Petrol Use was adoptedin order to establish system for air pollution reduction associated with volatile organic compounds from petrol, transposing provisions of EU measures 1994L0063 and 32009L0126. In accordance with the provisions of this Law, 5 bylaws have been prepared so far, and the remained ones are planned for adoption by the end of 2014.Up to date, Directives on volatile organic compounds 94/63/EC and 2009/126/EC have been transposed up to 97% and 100%, respectively. Directive on the quality of liquid fuels 1999/32/EC has been transposed in the Rulebook on the quality of liquid fuels up to 92.5%.

In the course of 2010, eight Protocols to CLRTAP were ratified.

All Directives have been partially implemented, i.e. responsible institutions have been defined, databases have been established and reporting is conducted. Other requirements, such as measurement of all substances listed in Directives are not fully accomplished due to lack of financial resources and capacity. Although responsible institutions for implementation of the Protocols to CLRTAP have been defined, implementation of the Protocols to CLRTAP is partial.

Requirements of Directives concerning monitoring of the basic pollutants have been almost entirely implemented. Namely, the Ministry of Environment and Physical Planning has established and operates the State Automatic Air Quality Monitoring System (SAQMS) consisting of 17 automatic air quality monitoring stations. Five stations are positioned in Skopje (Karposh, Centar, Lisiche, Gazi Baba and Rektorat). Two monitoring stations are set in each Municipality of Ilinden (villages Mrshevci and Miladinovci), Veles and Bitola and one in each Kumanovo, Kochani, Kichevo, KavadarciTetovo and Lazaropole.Monitoring stations measure the following parameters: SO2 (sulfur dioxide), CO (carbon monoxide), NOx (nitrogen oxides), PM10 (suspended particulate matters with a size up to 10 micrometers), PM2.5 (suspended particulate matters with a size up to 2.5micrometers), О3 (ozone) and BTX (benzene, ethyl benzene, toluene, ortho and para xylene). Data from all monitoring stations are collected in a database in MoEPP and they are subject to daily verification, validation, appropriate processing, analysis, presentation and reporting. Data from automatic stations are publically accessible in real time on the web site on air quality(http://airquality.moepp.gov.mk).

The analysis made of the air quality data obtained from monitoring stations and inventory of air emissions presented in the Annual Report on 2013 produced the following status of the quality of the air by pollutants:

**Sulfur dioxide –** 93.8% of the total amount of SO2is released from electricity and heat production, i.e. combustion of fuels in the process of electricity and heat generation. 3% is released from combustion plants in production industry. With regard to this pollutant, air quality limit values exceeding has not been recorded.

**Nitrogen oxides** – the greatest amounts of nitrogen oxides emission are released from electricity production (54.97%), road transport (28.41%) and combustion in production industry (8.49%). Exceeding of hourly limit value for nitrogen dioxide was recorded only in Skopje during winter period, while average annual concentration does not exceed the air quality limit value.

**Total Solid Particles** and their proportional distribution to emission, as well as particles with a size up to 10 micrometers and up to 2.5 micrometers (PM10and PM2.5) by SNAP sectors for 2012 at the level of the Republic of Macedonia indicate that predominant sources of total dust are the processes for heat and electricity generation, as well as production processes, and the highest percentage of emission arises from non-industrial facilities. Significant share belongs to production facilities, especially in the area of metallurgy, as well as facilities for electricity production. Transport at national level contributes to the emission of these pollutants. Annual average concentrations of PM10for 2013 show exceeded air quality limit values at all measuring points except in Lazaropole.

**Carbon monoxide –**The highest percentage of carbon monoxide emission derives from the sector of non-industrial combustion installations (households and administrative facilities – 55.81%) and sector associated with emissions from road traffic (32.09%). This is most probably due to incomplete combustion of solid and liquid fuels used in these two sectors. With regard to this pollutant, air quality limit values exceeding has not been recorded.

**Ozone** – higher concentrations of ground ozone O3, formed by photochemical reactions involving NOX, VOCs and other ozone precursors in the presence of solar light can cause harmful effects with people and environment. Highest concentrations of this pollutant are measured during spring and summer.

**Non-methane volatile organic compounds (VOCs)** – The highest percentage of non-methane volatile organic compounds emission originates from the sector of fuel combustion in non-industrial facilities (23.34%), followed by the sector of extraction and distribution of fossil fuels and geothermal energy (20.42%), use of solvents (19,17%), road transport (15.93%) and agricultural sector (14.8%).

**Ammonia (NH3) –**almost entire identified emission of ammonia comes from agriculture sector (97%), most of which from cows breeding and around 2.53% from traffic.

On the basis of analyses of data on air emissions and air quality, MoEPP has so far produced several national strategic documents defining measures for air emissions reduction. **The National programme for phasing out the quantities of emissions of certain pollutants at the level of the Republic of Macedonia for the period 2012 to 2020**was adopted by the Government. The Programme identifies the measures for reduction of the emissions of the following pollutants: sulfur dioxide, nitrogen oxides expressed as nitrogen dioxide, ammonia, volatile organic compounds, total suspended particulates and carbon monoxide in the air. **The National Plan for Ambient Air Quality Protection** presents the status of air quality, defines measures for protection and improvement of the quality of ambient air in the Republic of Macedonia and all relevant institutions responsible for their implementation in the next 5 years (2013-2018). The National Plan for air was adopted by the Government.

Besides national planning documents, for the purpose of reducing local pollution, plan for improvement of the quality of air has been so far prepared for the city of Bitola and preparation of such programmes is planned for other bigger cities, too.

### Gaps identified in the area and needs for improvement

National legislation is not fully implemented in the domain of preparation of comprehensive emission inventories, provision of the proper quality data requiredfor modeling and application of modeling in air quality assessment. Furthermore, preparation and monitoring of the implementation of planning documents are partial. There is a lack of continuous measurement of heavy metals, organic substances, measurement and control of air emissions, control of the quality of fuels and application of the procedures for provision of quality assurance and quality control for procedures. Implementation of the Protocols to CLRTAP is partial, because it is not implemented with regard to the measurement of all polluting substances covered by Protocols.

Namely, according to the requirements for Directives implementation, current capacity is not sufficient and the need to strengthen capacity on national and local level has been identified.

Existing monitoring system is effective, though its extension is needed with additional measuring instruments for PM2.5and ozone in background areas, as well as establishment of continuous monitoring of heavy metals and polycyclic hydrocarbons.

In addition to the above, Programme for air monitoring in the Republic of Macedonia to cover all existing monitoring stations and propose framework for the air monitoring network completion has not been adopted yet.

Some of identified gaps in this area will be overcome through the implementation of the Twinning Project expected to achieve the following outputs:

* Strengthening of the capacity for air quality and air emissions monitoring and chemical analysis of sampled air;
* Improvement of the quality of data, documents control and procedures in calibration laboratories;
* Strengthening of the capacity foruse of dispersed modeling and preparation of emission inventory;
* Strengthening of the capacity forair quality data management and reporting;
* Strengthening of the capacity forair quality plans development;
* Strengthening of the capacity forassessment of the impact of air pollution on human health.

Yet, the following additional tasks should be planned for the period after the finalization of the Twining Project in the framework 2017- 2020:

* Planning the setting up of measurement stations, also identifying hot spot pollution areas.
* Establishing and co-ordinating ambient air quality monitoring programme.
* Preparing the air quality plan or short-term action plans to improve air quality in areas where it does not meet the ambient air quality standards.
* Implementing plans for air quality improving.
* Planning the measures needed to ensure compliance with the VOC legislation, both in terms of controlling VOC emissions in industrial installations and for paints and varnishes but also in the storage, transport and refill of petrol in service stations. This requires periodic monitoring and supervision as well as certain measures to verify compliance with technical and safety standards.
* Undertaking permitting and enforcement of standards.
* Preparation and implementation of National Plan for Ratification and Implementation of the amended three last protocols under the Convention on Long-Range Transboundary Air Pollution (CLRTAP).

### Objective

Тo improve the quality of air in Macedonia in order to improve the health of all citizens

**Specific objectives**

* Effective and functional system for air pollution monitoring and information system for air quality data management in place
* Measures defined in the planning documents for air quality protection aiming to achieve limit values for air quality protection implemented
* Strengthening the administrative capacities towards integrated approach for tackling the Air Quality challenges
* Continuous activities for raising public awareness for the role of air quality in socio-economic aspects and human well-being.
* Reduction of the emissions of air pollutants in accordance with projections defined in the National emission reduction program accomplished.
* National legislation in full compliance with EU legislation and with the standards for the storage of petrol and its distribution from terminals to petrol filling stations.

## Protection of Nature and Biodiversity

## Brief description of the current situation

Biological diversity and ecosystem services contribute in different ways to human well-being. Richness and heterogeneity of species and ecosystems are the main features of biological diversity in the Republic of Macedonia. According to the analysis of the richness of biodiversity in individual countries on European continent, Republic of Macedonia has been ranked on the very top of countries known as European Hotspot.

Considering its exceptional natural heritage, the Republic of Macedonia has worked actively on the establishment of appropriate system for nature and biodiversity management.

According to data contained in the Fifth National Report to the Convention on Biological Diversity (2014), within different ecosystems and habitat types in the country, around 1700 algae species, 3200 vascular plants, more than 2.000 fungi and 450 lichens, over 13.000 invertebratespecies, 85 fish and cyclostomes, 15 amphibians, 32 reptiles, 333 birds and 84 mammal species have been registered so far.

Despite the fact that the total territory of the Republic of Macedonia covers an area of 25.713 km2 and represents 0.26% of the territory of the European continent, major part of diversity occurs in the Republic of Macedonia ranging from 33.64% for vascular plants, 14% for freshwater fish, 20.3% for amphibians, 25.2% for reptiles, 64% for birds and 29% for mammals. Biodiversity of the Republic of Macedonia comprises 70-90% of the entire Balkan biodiversity.

According to the Law on Nature Protection (Official Gazette of RM no. 67/2004, 14/2006, 84/2007, 35/10, 47/11, 148/11, 59/12, 13/13, 163/13 and 41/14), nature protection is regulated through protection of biological and landscape diversity and conservation of natural heritage in and outside protected areas, as well as protection of natural rarities.

With regard to the implementation of the provisions of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern 1979) and Law on Nature Protection, in the period 2002 to 2008, National Emerald Network of Areas of Special Conservation Interest (ASCIs) was developed. The National Emerald Network incorporates 35 sites occupying an area of 752.223 ha or 29% of the territory of the Republic of Macedonia. Emerald Network is used as preparatory tool to comply with obligations of EU Bird and Habitat Directives and establishment of Natura 2000 network.

Furthermore, according to international criteria, 42 localities have been designated as Important Plant Areas (IPAs), 77 localities have been identified as Corine biotopes, 22 sites have been designated as Important Bird Areas (IBAs) and 8 PrimeButterfly Areas (PBAs) have been identified on the territory of the Republic of Macedonia.

According to the Law on Nature Protection, the system of protected areas is established for the purpose of conservation of biological diversity within natural habitats, processes going on in nature, as well as abiotic characteristics and landscape diversity. By designating the area as protected, it acquires the status of natural heritage.

Currently, the network of national protected areas covers 86 areas occupying around 8.94% of the country territoryaccording to data in the Annual Report of Processed Data on the Quality of Environment (MoEPP, 2013).

Analyses by category of protection shows that the largest portion is covered by National Parks (4.50% of the territory of the Republic of Macedonia), followed by Nature Monuments (3.07%), Multi-Purpose Area (0.98%), Strict Natural Reserves (0.30%), Park of Nature (0.11%), and the smallest area is occupied by the category Protected Landscape (0.01%).

According to the Sectoral Study on Natural Heritage Protection prepared for the purposes of the Spatial Plan of the Republic of Macedonia (2004) with validity by 2020, an increase of protected areas coverage is envisaged up to around 12 % of the territory of the Republic of Macedonia, which is close to the average in EU Member States.

Regarding international importance of protected areas, Ohrid region is included on the List of UNESCOas World Natural and Cultural Heritage (1979), while Monuments of nature MarkoviKuli and Cave SlatinskiIzvor (2004) areincluded on UNESCO’s Tentative List.Two protected areas – Prespa Lake with riparian marshy belts (1995) and Dojran Lake (2007)have been designated as wetlands of international importance and included onWorld Ramsar List.

Nomination of Ohrid-Prespa region for biosphere reserve was officially considered on the MAB Committee of UNESCO in June 2014 and by unanimous decision of the Committee this region was proclaimed as Transboundary Biosphere Reserve. Inauguration of Ohrid-PrespaTransboundary Biosphere Reserve was held on 13 October 2014 in Korcha, Republic of Albania.

In the area of nature protection, in the frames of the process of harmonization of the national legislation with the EU nature protection legislation, the following level of approximation has been achieved: Directive on the Conservation of Wild Birds 2009/147/EC (81%), Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (55%) and ZooDirective (20%). Furthermore, during the last four years, several amendments have been prepared to the Law on Nature Protection, accomplishing its further compliance with EU Acqui, i.e. provisions of Habitats and Birds Directive.

Under the Law on Nature Protection, laws on proclamation of 12 protected areas were adopted, as well as bylaws concerning protection, collection and trade of wild plants, fungi and animals; valorization and re-valorization of protected areas, content of protected areas managementplanand records on nature protection. With reference to the implementation of the national legislation, progress was achieved in the segment of development of protected areas management plans. List of strictly protected and protected wild species was adopted in 2011, however the national red lists of threatened species have not been adopted yet.

The Fifth National Report to the Convention on Biological Diversity was prepared during 2014 as well asdraft version of the National Strategy for Biological Diversity with Action Plan.. Preparatory activities for development of National Strategy for Nature are underway.

## Gaps identified in the area and needs for improvement

Gaps have been identified in inventory and assessment of natural habitats and wild species; no studies assessing bio-potential of commercial wild species in their natural habitats have been developedhence no quotas for sustainable use of commercial wild species of plants, fungi and animals have been established,; National Red List of threatened species and respective Red Book for wild species protection have not been elaborated; the process of valorization of the natural heritage and re-valorization of protected areas has not been completed; the process of harmonization of system of protected areas has not been finalized and activities for proclemation of protected areas should proceed in accordance with the Law on Nature Protection. Expansion of the system of protected areas should continue in a way representing the key habitats and species that are important for biological diversity conservation andsupporte by the local communities for proclamation of new protected areas is crucial. Alsomanagement plans for most of the protected areasare lacking.

Lack of financial and human capacities has been identified, especially expert staff on a national and local level with particular accent on the segment of protected areas management. Specific professional body for nature protection has not been established. National Council for nature protection and National committee for biological diversity protection are not sufficiently operational. Deficiencies in the administrative structure for NATURA 2000 management have been identified. It is necessary to initiate the process of identification of potential areas in the Republic of Macedonia for inclusion in the European coherent ecological network NATURA 2000.

Transposition ofEU Directives on nature and biodiversity protection has not been completed due to the need for engagement of professional staff (biodiversity experts) in this area. Envisaged bylaws deriving from the Law on Nature Protection have not been adopted yet. Methodology for nature monitoring has not been adopted and consequently national monitoringsystem on nature has not been established.

Improvement of the state will need to:

* Establish national monitoring system;
* establish a system whereby general protection is afforded to all birds in the wild state;
* identify and designate Special Protection Areas (SPAs) for birds;
* identify, map and assess the threat status of natural habitats;
* identify and designate Special Areas for Conservation (SACs);
* encourage scientific research aiming to develop protection measures for certain plants and animals;
* develop management plans for protected areas;
* conduct appropriate assessments of projects that might have impact on SACs and SPAs
* Development of National Red Lists and Red Book.

## Objective

To promote the establishment of protected areas of national, European and international importanceand their functional connectivity in order to at least maintain the current status of biodiversity and encourage improvement of biodiversity status through effective implementation of other relevant strategies

**Specific objectives**

* Approximation of the national legislation with the EU Acquis in the area of nature protection through amendments of the Law on Nature Protection and preparation of bylaws.
* Identified SPAs and SACs as part of the Natura 2000 Network
* Established administrative structure for NATURA 2000, through adopted protected areas management plans and efficient system for NATURA 2000 network financing and development.
* Established monitoring of natural habitats and strictly protected and protected wild species in the Republic of Macedonia.

## Industrial Pollution Control and Risk Management

## Brief description of the current situation

IPPC Directive is fully transposed in the Law on Environment (LE), in its Chapter XII. Additionally, several pieces of secondary legislation were adopted in order to regulate the procedure and the manner of issuing as well as form and content of IPPC permits. However, two more chapters within the LE are related to IPPC Directive, these being Chapter XIII – General Environmental Audit and XIV Adjustment Permits with an Adjustment Plans.

Macedonian system of IPPC permits recognises two types of integrated environmental permits: A-integrated environmental permit (A-IPPC permits) and B-integrated environmental permits (B-IPPC permits). The responsible authority for issuing A-IPPC permits is the Administration of Environment, a public body within the MoEPP, while the responsible authority for issuing the B-IPPC permit is the local administration of the municipality on the territory of which the installation is located, except installations which are located in protected areas, in which case the B-IPPC permit will be issued by the MoEPP as well as in cases when the local level authorities do not have the capacity for issuing permits. According to LE, A-IPPC permits are for installations (A installations) which comply with capacity and industry sectors as stipulated in Annex I of IPPC Directive, and B-IPPC permits for installations (B installations) which are smaller than the one stipulated under the IPPC Directive. Installations which cannot meet standards as stipulated in the LE and are defined as existing installations (operational before 2009), are obliged to obtain A or B adjustment permit with adjustment plan (A or B adjustment permit) by which installations are given time frame and actions that they should take in order to meet IPPC standards. A installations should comply with BAT while B installations should meet emission level standards. According to the LE, IPPC standards should be met in general by 1 April 2014 at the latest. However, for big scale A installations which need significant improvement in their technology the deadline can be prolonged for five more years until 2019. It is estimated that in Macedonia there are about 140 A installations and about 500 B installations. By date, 135 applications for obtaining A or B adjustment permits and A or B IPPC permit were received in the MoEPP, while 100 of them are issued. There is no precise data about applications for adjustment permits or B-IPPC permit for B installations; however, the Municipalities by date have issued 170 permits for B installations.

There is no legislation that fully transposes the IED into national law, and this Directive is the successor of the IPPC Directive and in essence it is about minimising pollution from various industrial sources, achievement of a high level of protection for the environment as a whole, as well as indicate that the installations must be operated according to an integrated permit issued by the competent authority, containing emission limit values based on BAT.

It amends existing EU legislation concerning industrial emissions:

* + Large Combustion Plants (LCP) Directive 2001/80/EC
	+ Integrated Prevention and Pollution Control Directive 2008/1/EC
	+ Waste Incineration Directive 2000/76/EC
	+ Directive on VOC emissions from solvents 199/13/EC
	+ Directives related to the titanium dioxide industry 78/176/EC, 82/883/EC and 92/112/EC

With the entry into the force of the IED, the BAT conclusions become the reference for the permit conditions regarding the ELVs, which cannot be higher than the BAT- associated emission levels (BAT-AELs) from the BAT conclusions.

Also, significant new moments in the IED is extension of activities already covered in previous Directive (wood-based panels; production of food from animal and vegetable raw materials, both in combined and separate products with a specified finished production capacity), as well as new activities such as: capture of CO2 streams from installations covered by the IED; preservation of wood and wood products with chemicals, with a production capacity exceeding 75m3; independently operated treatment of waste water not covered by Directive 91/271/EEC (concerning urban waste-water treatment).

For full implementation of the regulations which are arising from the Industrial Pollution Control legislation, the estimation is made and results lead to a total cost of approximately 1.2bn Euros. This brings us to the conclusion that these activities are very expensive. Such costs may present big obstacles in order to improved implementation of the above mentioned regulations.

Another significant issue in this sector is the Directive on control of major-accident hazards involving dangerous substances, which is regulated by the so-called Sevesso II Directive (96/82/EC). In this case, all establishments with larger quantities of dangerous substances present the so-called upper-tier establishments, are identified and preparation of Safety Reports is required. However, there is lack of information regarding the smaller establishments (lower-tier) which indicates the need for further work in order to properly identify such establishments. To date, there are 18 Sevesso establishments identified of which 11 are identified as upper-tier establishments.

With regard to the prevention of major accidents involving dangerous substances, high level of approximation with Directive 96/82/ЕC (78 %) has been achieved through its transposition in the Law on Environment (Chapter XV)and several bylaws have been prepared enabling relative start of the prevention of major accidents involving dangerous substances. Rulebook on the content of the report on safety measures and Rulebook on the content of the plan for prevention of major accidents are in final stage of adoption and they will be of crucial importance in the implementation of these aspects of environment protection.

## Gaps identified in the area and needs for improvement

It is necessary to undertake additional measures towards full transposition of Directive 2010/75/ЕC on industrial emissions, as well as strengthening of the capacity of MoEPP and State Environmental Inspectorate in order to fully implement the process of issuance of IPPC adjustment permits with adjustment plans, as well as their transition in IPPC integrated environmental permits. The above will enable clear overview of the status of environmental standards in industrial sector.

Full approximation with Directive for accidents prevention is necessary, as well as strengthening of the Division of chemicals and industrial accidents with new employments. At the same time, designation of entities obliged to undertake measures for preparation of plans for accidents prevention is necessary.

The need has been identified for strengthening of institutional capacities of institutions for industrial policy identification with regard to the development of the concept of EMASsystem introduction in the Republic of Macedonia.

It is necessary to provide direct support to legal entities concerning introduction of ecological labeling, as well as its promotion. Additionally, it is necessary to review legislation in this area and approximate it with the latest legislation of the EU, and adopt standards for products and services for ecological labeling.

The main identified difficulties which can reduce the implementation of the IPPC legislation are:

* Administrative:Institutional available option, in order to implement integrated system of issuing the permits in a proper manner is well described in secondary legislation; however, coordination between appointed institutions is not sufficient. With the introduction of the IED, Macedonia has to ensure sufficient emphasis on monitoring and compliance, securing efficient authority to detect and prosecute cases of non-compliance. This implies that enforcement should be improved. The administrative system has to ensure sufficient coordination with the air, water and horizontal sectors to ensure a coherent, transparent legal framework, which is understandable for regulated installations or activities on one hand and the general public on the other. The EIA Directive, Public Participation Directive, the Access to Environmental Information and the Environmental Liability brings additional strong element of public participation and access to environmental information on IPC sectoral legislation.
* Technical: The introduction of technical control for not only the emissions but for the process as a whole. In order to pollution control regulations fully satisfy IED, there may be several difficulties, in part because the mentioned technical issues are very complex and largely not in line with the previous experience of regulatory regimes, but also because of the requirements of the Directive itself, which allows for discretion and national interpretation. The obtaining of suitable expertise and training should be a subject for serious consideration. Sufficient resources should be reserved for training of Ministry staff and personnel from the competent bodies as well as for producing technical guidance. The BREF documents are key issue in understanding the IED as well as the interpretation of BAT to be applied in IED identified installations.

Industry will be the most concerned party in relation to costs and timeframe within which they have to be incurred. Industry will also be concerned with the nature of the data that they have to publicly report.

The public and NGOs are interested in participation in monitoring of the industry and how they can access data of emissions. Communication is a high priority and should be planned as an ongoing process from the date of issuing the integrated permit. The mechanism to accomplish this will be one public meeting per year on which all stakeholders are invited.

## Objective

Reduction of the overall level of emissions to each environmental medium arising from industrial sources.

**Specific objectives**

Following identification of the gaps in implementation, the following objectives have been set for the Industrial Pollution Control and Risk Management Sector:

* Full compliance of legislation - Transposition of the new IED on industrial pollution control.
* Issued А – integrated environmental permits to all industrial facilities through implementation of Directive on emissions from industry and provision of supervision over the permits enforcement- Integrated Permitting of all relevant activities
* Adopted plans for industrial accidents prevention and provided integrated access in their evaluation and inspection of the implementation of control of major industrial accidents
* Implementation of the VOC legislation
* Adoption of criteria for ecological labeling and established system for EMAS introduction.

## Chemicals

## Brief description of the current situation

The Law on Chemicals (adopted in 2010) regulates wide range of measures. These include requirements for prior notification to and authorisation from the competent authority; risk assessment procedures; classification, packaging and labelling of regulated substances (or organisms); registration requirements, evaluation and market intervention requirements, restrictions on production, supply and use, applying good laboratory practices, as well as control and notification regarding imports and exports.

The adoption of the Law on Chemicals (2010) contributed to the reduction of the negative effect from the use of chemicals on human health and environment, establishment of appropriate system for placement and use of chemicals in relation to hazard and risk carried by them, establishment of appropriate institutional capacities and creation of administrative tools for achievement of adequate control of chemicals. The Law is fully harmonized with the European legislation through implementation of REACH (Regulation (ЕC) 1907/2006) system of chemicals management. At the same time, the law on Chemicals has transposed the provisions of the Regulation (ЕC) 1272/2008 concerning classification, labeling and packaging of substances and mixtures, Directive 98/8ЕC on releasing biocides into trade, Regulation (ЕC) 689/2008 on import and export of dangerous chemicals and Regulation (ЕC) 648/2004 on detergents.

The purpose of the Agency for Drugs is to provide assistance in the implementation of the law and assistance to entire industry in understanding and application of obligations and responsibilities they will get through the new law. Agency for Drugs needs to establish system of sustainable Integrated Registry of Chemicals, composed of Registry of chemicals and Registry of biocide products (as well as data on preparations for plants protection), designed as electronic database where chemicals produced or imported in the Republic of Macedonia would be entered. Drugs Agency works on the establishment of the basis for setting the integrated registry. Republic of Macedonia is party to international legally binding agreements on ozone layer depleting substances, persistent organic pollutants (POPs)andRotterdam Convention on Prior Informed Consent in Chemicals Trading and Minamata Convention on Mercury. Also, Republic of Macedonia is Party to regional legally binding agreements, such as those on persistent organic pollutants, heavy metals and industrial accidents. In this context, specific regulation was adopted to strengthen the control over the trade in ozone layer depleting substances, and amendments of the Law on Environment introduced rules on the manner of cooling devices collection and recycling. Furthermore, for the purpose of management of ozone layer depleting substances, series of activities have been undertaken to implement the provisions of the Montreal Protocol resulting in elimination of 99% of the consumption of chemicals from this group in the country.

With regard to the group on POPs, National Implementation Plan (NIP) for POPs reduction and elimination was adopted (2005) and activities were carried out to record and eliminate polychlorinated biphenyls (PCBs). In this context, detailed identification of PCB containing equipment and waste was made, temporary storage for PCB containing equipment was constructed and treatment technology was installed (170 tons of PCB containing transformers treated). In the period 2012 – 2014, activities were undertaken to update the NIP with additional incorporation of actions for reduction and elimination of the new 10 POPs. In order to implement priorities and actions set in the NIP, settlement of historical problem concerning waste in the landfill with HCH in OHIS Skopje was initiated.

As in other countries, chemicals were treated as individual groups approached to in sequence through implementation and fulfillment of obligations under the mentioned conventions dealing with specific chemical groups. Therefore, global trends aim at integrated approach in chemicals management and consequently several conventions are covered by a single global initiative for integrated chemicals management (SAICM). Republic of Macedonia has been involved actively in this initiative as well, both on global and regional levels, and on national level it was among the first countries that implemented projects for incorporation of chemicals in development planning of the country.

## Gaps identified in the area and needs for improvement

Further approximation of the legislation in this area is needed through adoption of bylaws based on the law on Chemicals. Institutional strengthening on national level is needed as well.

It is necessary to provide financial resources for the establishment and putting into operation of the registry of chemicals, as well as development of REACHhelpdesk and its networking into the network of already registered helpdesks. Education of the staff of the Drugs Bureau in this matter is necessary.

The implementation of the provisions of the Law on Chemicals, in the segment of Globally Harmonized System (GHS) of classification, labeling and packaging requires strengthening of the capacity through trainings and public awareness rising, as well as industry and concerned parties dealing with this subject matter.

In the segment of POPs management, transposition would be finalized with the adoption of legislation to transpose Regulation 850/2004on persistent organic pollutants.

Based on the above, as incorporated in the National Action Plan for Safe Chemical Management, it is necessary to strengthen control over the access to chemicals on the market, improve information on the chemicals present on the market through Global Harmonized System, improve chemical safety and protection of the health of professional and wider public exposed to chemicals, strengthen and apply good agricultural practices and establish legal framework in relation to areas of high risk in contaminated sites and obsolete reserves.

## Objective

Implementation of the Sound chemical management through control labeling, import, storage and use of chemicals to avoid harmful effects on human health and the environment

**Specific objectives**

* Full approximation of the legislation
* Established registry of chemicals with efficient administration for registration, evaluation and control of chemicals
* Settlement of historical pollution with chemicals (HCHin OHIS).

## Noise

## Brief description of the current situation

Environmental noise is a serious problem. Noise is in constant growth, difficult to control in densely populated agglomerations and residential areas close to highways, railways and airports. Noise measurement and monitoring are necessary to achieve and maintain the level of environmental noise within limit values defined in four areas according to the extent of protection against noise, with ultimate objective to protect health and well-being of the population.

MoEPP, AE and units of the local self-government are responsible bodies for the area of environmental noise, especially for the application of the Law on the Protection against Environmental Noise and bylaws adopted on the basis of this Law. All of these bodies lack adequate administrative structure. According to the Law on the Protection against Environmental Noise, data from noise level measurement and monitoring are delivered to the Macedonian Environmental Information Centre. Inspection supervision over the enforcement of the Law and bylaws adopted on the basis of the Law is carried out by the State Environmental Inspectorate, as well as authorized inspectors of environment in the units of the local self-government. Certain responsibilities in noise management are also performed by the State Sanitary and Health Inspectorate within the Ministry of Health with regard to noise control from health point of view, i.e. assessment of the harmful effects of environmental noise on the health of exposed population. Ministry of Economy is responsible for control of the noise generated by products and LSGUs with regard to noise generated by catering, craft and tourist activities.

With reference to noise monitoring, Public Health Centres in Bitola, Kichevo and Kumanovo (and Skopje by 2005) perform measurements of the level of environmental noise and assessment of the harmful effects of environmental noise on exposed population, at several measuring points, and processed results are delivered to the Macedonian Environmental Information Centre, where Cadastre of noise polluters is maintained and updated. Collected, verified and processed data and information on the state of environmental noise constitute the official database of the state of environmental noise, serving as basis for noise management and protection against noise.

The first step towards establishment of state environmental noise monitoring network was made with the adoption of the Decision for establishment of state environmental noise monitoring network.

The Law on Noise has been approximated with EU Framework Directive 32002L0049, concerning environmental noise assessment and management. So far, all bylaws have been adopted by which EU Directive 32002L0049 has been fully transposed in the legislation of the Republic of Macedonia relating to protection against environmental noise.

## Gaps identified in the area and needs for improvement

In the coming period, it is necessary to achieve approximation with other EU Directives concerning environmental noise, more specifically with regard to identification of individual sources of noise caused by road, railroad and waterway traffic, thus transposing EU measures 31984L0372, 31989L0629 and 31998L0020, as well as identification of closer types of noise – devices, apparatuses and appliances with regard to standards for protection against noise, to transpose Directive 32009L0125 and finally noise caused by the neighbourhood.

It is necessary to strengthen the capacity on central level, but there is also a need to strengthen capacities of the LSGUs in noise management, especially through strengthened inspection supervision.

Preparations should start for collection of data on environmental noise and action plans for noise. In this regard, it is necessary to adopt programme for noise monitoring, in order to identify gaps in the measurement of the levels of environmental noise, specify measures for establishment of comprehensive noise monitoring and programme for operation of the environmental noise monitoring network.

## Objective

Reduce the levels of stress associated with noise in those areas covered by noise mapping

**Specific objectives**

* Full approximation of the legislation
* Implementation of the provisions of applicable legislation in the area of environmental noise
* Adopted strategic noise maps and action plans for protection against noise
* Established system for environmental noise monitoring
* Definition of quiet zones within and outside agglomerations

## Forestry

## Brief description of the current situation

Total forest area (land use) is currently 949,329 ha, which is 37 per cent of the territory. This figure has remained relatively stable over the past decade. State-owned forests account for nearly 89 % of the total forest area, with the remainder in small parcels of private ownership.

As elsewhere in the Balkans, broad-leaved trees dominate the country´s forests, with oak and beech being the principal species. The proportion of forests by major species groups has remained relatively unchanged over the past 15 years. More than four fifths of the forests are available for wood production, and all but some small areas of plantations are classified as semi-natural. High forest makes up about one third of the forest area, with the remainder being coppice reproduction and about 11 per cent plantations.

Some of the main threats and problems in forest management are: illegal logging; other illegal activities; forest fires, which have affected nearly 100,000 ha for the last 10 years; climate change through the process of drying of the forests; insect damage; and diseases. Illegal logging is a serious and long-term problem, jeopardizing sustainable forest management as well as forest value in a broader perspective. Illegal logging disturbs natural regeneration and creates potential for erosion, forest fires, diseases and pest calamities, and disturbances to the water regime. Illegal logging and illegal sale of wood create economic losses to the state sector.

Macedonia does not yet have a land cadastre (real estate) of public versus private lands; therefore, land ownership boundaries are not marked on the ground. Also, some protected areas do not have recorded boundaries. This cadastre would help differentiate forest land from agricultural or other land uses. The cadastre is needed to sustainably manage and protect the state forests and protected areas. For example, protecting these forests against illegal logging and enforcement of other regulations is problematic when ownership boundaries are not clearly marked.

The Government adopted Forestry Strategy in 2006. Its general goal is to increase the contribution of the forestry sector to the national economy and rural development through sustainable forest management, ensuring renewable resources, and protection of the local and global environment, and providing products and services for improving the quality of life of all citizens. The strategy also addresses game management and non-timber forest products.

Management of forest resources falls under the responsibility of the Ministry of Agriculture, Forestry and Water Economy (MAFWE) through Forestry and Hunting Department. Department of Forest Police is separate organizational unit (its purpose being to protect forests from illegal logging). MAFWE incorporates the State Inspectorate for Forestry and Hunting as its constituent body, as control mechanism for laws and planning documents implementation.

This area is regulated by the Law on Forests in which EU measures have not been transposed, given the fact that this area is primarily regulated by the national legislation of EU Member States. The new Law on Forests (2009) established conditions for application of land consolidation, policies in forestry, forest inventory, cadastre of forests and information surveillance system, in order to undertake the measures necessary for restructuring and institutional strengthening, etc.

Timber Regulation 995/2010/EU has not been transposed in the national legislation. This area also needs strengthening of the capacity with new employments and organization of trainings.

## Gaps identified in the area and needs for improvement

Present weaknesses in the Forestry Department of the MAFWE include lack of adequate forest resources in Macedonia and forest inventory aimed at modernization of forest resources management in Macedonia, taking also into account the necessity to overcome institutional deficiencies for policy implementation as precondition for sustainable forestry management in Macedonia. In this way, the following results would be achieved:

* Improvement of the overall forest resources conservation and management
* Sustainable use of forest resources
* Support the implementation of forestry policy
* Integration of forestry policy with strategies in environment and policies for rural development
* Integration of measures for adaptation to climate change in forest management
* Contribution to the establishment of appropriate financial management
* Facilitation of the process of accession to EU through approximation of the legislation
* Improvement of forest monitoring system
* Strengthening of human resources in forestry sector
* Reduction of losses in forestry resulting from forest fires.

Forest inventory will establish Forest information system in Macedonia.The Timber Regulation 995/2010/ЕU is the most significant legislation in this sector and has yet to be included in the national legislation.

## Objective

To manage forests in a sustainable manner which supports the national initiatives on Nature Protection, while seeking to maximize the potential of forestry as a sink for greenhouse gases thus mitigating GHG emissions.

**Specific objectives**

* Full approximation of the legislation (2018)
* Established Forest information system in Macedonia and completed inventory of forests in the Republic of Macedonia(2018)
* Build capacity for sustainable forest management.
* Identification of biodiversity rich forests and forest certification

# **CLIMATE CHANGE**

## Introduction

Acknowledging the importance of the problem of climate change and the necessity of taking effective actions to mitigate the problem of the negative impact of climate change, the Republic of Macedonia ratified the UN Framework Convention on Climate Change (UNFCCC) on December 4, 1997 (Official Gazette of RM no. 61 / 07) to become a Party to the Convention on 28 April of 1998, as a non-Annex I Party. The country is a non-Annex B Party of the Kyoto Protocol since its entrance into force in 2005.

The Ministry of Environment and Physical planning (MoEPP) was designated as the National Focal Point to the UNFCCC, and it is a Designated National Authority to the Kyoto Protocol. Six projects under the Clean Development Mechanism have been registered so far.

As an advisory body for policy-making, National Climate Change Committee was established (Official Gazette of RM no. 44/00, 79/03 and 4/04).

Number of national documents that set policies for development of the key climate-related sectors was adopted. Responding to the obligations towards the UNFCCC, the country prepared and submitted the Initial National Communication on Climate Change in 2003, the Second National Communication in 2008, and the Third one in January 2014. The Ministry of Economy designed a three tier energy policy: the “Strategy for Energy Development in the Republic of Macedoniafor the Period 2008-2020 with a Vision to 2030” (adopted in 2010); Renewable Energy Sources Strategy of Macedonia till 2020 (adopted in 2010); and “National Strategy for Energy Efficiency in the Republic of Macedonia till 2020” (adopted in 2010). Also, a new Law on Energy (Official Gazette of R. Macedonia No. 16/2011) was adopted in February 2011. The Strategy for Energy Development offers a set of ambitious and specific numerical targets for 2020 following the EU climate change policy track, e.g. reducing the energy intensity of the economy by 30% relative to 2006 or increasing the share of renewables (including hydropower and wood heat) to more than 20% of total final energy. But still, half of the country’s electricity is projected to come from lignite-burning plants, both in 2020 and in 2030, and the overall total electricity demand is projected to grow by around 52% by 2030.

Republic of Macedonia, through the Ministry of Environment and Physical Planning, has been acting on several levels for more than ten years:
• sets the necessary strategic, legal and planning framework to combat climate change
• cooperates at bilateral, regional and international levels in joint efforts to combat climate change

A particular challenge of the State is the adoption of EU legislation in the field of climate change, and this requires capacity strengthening on all levels. Introducing legal obligations for different parts of the legislation requires detailed assessments of the potential for reducing emissions in different sectors (energy, waste, agriculture, industry, transport), as well as share of such activities in the gross domestic product . The same commitment would mean that the developmental paths of national economies will incorporate measures to mitigate climate change.

Furthermore, it is gradually needed to build capacity for future inclusion in emissions trading mechanism as well as to develop legal provisions on monitoring mechanism of greenhouse gas emissions, which will require the introduction of a set of technical, administrative and institutional measures for collecting and managing data and reporting.

It will be necessary to strengthen public and private financial flows for taking measures to reduce and adapt to climate change, as well as technology transfer and capacity building. The development of Law and long-term strategy for climate action within the IPA TAIB 2012 is already planned.

In order to enable environment and gradually introduce EU GHG trading scheme, the country is implementing by-lateral project with support of Norwegian Government. The project is a follow-up of a developed Roadmap on implementation of EU Directives on emissions trading and monitoring mechanism, using the Bulgarian experience and their allocation as their obligation after the climate summit in Copenhagen.

The state is expected to determine the so-called contributions regarding emissions reductions of greenhouse gases till the Summit in Paris in 2015. Preliminary analyses were made ​​under the Third National Communication on Climate Change and the First Biannual update report and in accordance with the National Programme for the Adoption of the Acquis. A policy paper is planned to be adopted at Governmental level.

The state actively participates in the work of the regional network of Environment and Climate (ECRAN), established under the IPA Multi-beneficiary.

## Brief description of the current situation

Macedonia’s institutional and policy frameworks to deal with climate change related issues have improved noticeably since 2008.

In spite of the relatively small area of the Republic of Macedonia, the country has a diverse climate, with eight climatic regions. With the exception of 2011, the six most recent years (2007-2012) were among the ten warmest years for the period between 1951 and 2012, and a heat wave has been recorded in almost every year since 1987. Two basic pluviometric regimes are present in Macedonia: Mediterranean and continental. The areas with highest precipitation are the mountain ranges in Western Macedonia; the driest areas of the country are Ovche Pole, Tikvesh and the surroundings ofGradsko.

Total direct GHG emissions in Macedonia for the year 2009 amounted to 10.252 kt CO2-eq including land-use, land-use change and forestry (LULUCF). National emissions per capita in that year amounted to 5.6 t CO2-eq. Emissions originated primarily from the Energy sector (73%, ranging mostly between 8.500-9.000 kt CO2-eq per year), followed by Agriculture (13%, decreasing from year to year due to decreasing numbers of livestock) and Waste (7%, rising due to population growth). The Industry sector produces 7% of the country’s emissions. The Land Use, Land-Use Change and Forestry sector accounts for 3–10% of emissions, depending on the amount of forest fires, the management of soils (limestone and fertilizer application) and the conversion of land in the specified year.

Looking at the direct GHGs, CO2 accounts for 75–80% of emissions for the period covered (mostly from the burning of fuels in the energy sector), CH4 accounts for 12–14% of emissions (mostly from agriculture and waste), N2O accounts for 7–9% of emissions (from burning fuels and emissions from soils) and 1–2% are HFCs from the industry sector. For the indirect GHGs, Most of the NOx (7% of total indirect GHG emissions in the period covered) and CO (32%) emissions come from the energy sector, from the transport and energy industries (coal, lignite), and from burning in agriculture (crop residues) and LULUCF (forest fires). NMVOC emissions (25%) originate from the industry sector, especially from mineral production processes, and a smaller share from the transport sector and from solvent use, while most SO2 emissions (36%) arise from the energy industries, construction and transport.

As a non-Annex I and non Annex B country, the country currently has no emissions reduction requirements under the UNFCCC. While this will not necessarily change upon entrance to the EU, many speculate that the EU will ask the acceding countries to take on full Annex I responsibilities or to at least agree to some additional obligations such as participation in the EU Emission Trading Schemes. The latter arrangement would, in effect, create emissions reductions requirements for non-Annex I countries without changing their UNFCCC classification. The country associated to the Copenhagen Accord at the end of January 2010 and submitted its reduction targets and a preliminary list of mitigation actions (without quantifying the associated emission reductions) based on the action plan developed as part of the Second National Communication to the UNFCCC. The Cancun agreement formally recognizes the planned actions to reduce or limit greenhouse gas emissions communicated by developing countries since Copenhagen. It also reaffirms that non-annex 1 countries will implement nationally appropriate mitigation actions (NAMAs) in the context of sustainable development. Mitigation actions taken by non-Annex I Parties will be subject to their domestic measurement, reporting and verification of the result which will be reported through their national communications every two years.

Even though the Second National Communication was a key in identifying priorities for interventions, the translation of these assessments into concrete sector policy and measures with a broader impact is still rather low, especially in some sectors. Sectoral climate change policy and measures are yet to be assessed in terms of their economic, environmental and social impacts.

Despite of its status under the UNFCCC, the country puts significant efforts in achieving Annex I requirements concerning GHG inventory, GHG emissions projections and reporting. Comparative analysis of the International Commitments under the UNFCCC and Kyoto Protocol and those at national level are presented in Table 1.

Table 1: Comparative analysis of the International Commitments under the UNFCCC and Kyoto Protocol and those at national level

|  |  |  |  |
| --- | --- | --- | --- |
|  | Annex I Party to Kyoto | Non Annex I Party to Kyoto | Macedonia |
|  | **GHG Inventory Requirements** |
| Frequency | Submit annual inventories to the UNFCCC in an electronic format.  | No set frequency; can be submitted in hard copy. Upon availability of resources  | GHG inventory submitted in electronic format as part of the National Communication or Biannual Update Reports. |
| Coverage | Trends in emissions of the six primary GHGs1, from 1990 to the most recent year for which data is available; includes sectoral background data. Kyoto inventory systems have additional structural detail.  | Trends in emissions for CO2, CH4, and N2O only, with estimates for other gases encouraged but not required from 1990 or 1994 for the first inventory and 2000 or later for the second; sectoral background data is not required.  | Trends in emissions of the six primary GHG are reported for 1990-2012, including the sectoral background data. |
| Standards | Use both the IPCC Guidelines and Good Practice Guidance and thoroughly document emissions estimation methods and data sources.  | Use IPCC Guidelines; use of the Good Practice Guidance encouraged but not required. Documentation of methodologies is encouraged.  | The IPCC Guidelines and Good Practice Guidance used for reporting and thoroughly document emissions estimation methods and data sources, as well as 2006 IPCC Guidelines for National GHG Inventories. |
| Methods | Generally adopt higher-tier methods  | Generally adopt lower-tier methods  | Generally adopt higher-tier methods. |
| Review | Subject to annual review by expert teams following agreed upon review guidelines. At least once every five years, inventory systems are subject to a more detailed in-country review. Parties to the Kyoto Protocol are subject to more rigorous review, and if review teams determine a Party’s inventory report or system is deficient, the Party may be judged to be out of compliance and subject to penalties  | No subject to review | Subject to voluntary review by experts under the National Communication Supporting Programme (NCSP). |
|  | National Communications | Biannual Update Reports | Mitigation Action Requirements |
| Frequency | Submitted every five years  | No specified frequency | Voluntary submitted every five years  |
| Content | Nat Coms include a description of each mitigation policy and measure, organized by sector and gas. Description includes status, implementing body, and, if possible, estimated effect on emissions to date and in the future.  | Encouraged but not required to report on mitigation policies and measures.  | NatComs include a description of each mitigation policy and measure, organized by sector and gas. Description includes status, implementing body, and, if possible, estimated effect on emissions to date and in the future. |
| Actions | Subject to binding national emissions targets, and international monitoring and reporting requirements to verify the achievement of these targets.  | None | Voluntary international monitoring and reporting requirements. |
| Review | NatComs are also subject to international expert review, conducted in accordance with internationally-agreed guidelines.  | Not subject to review | Not subject to review |

The Law on Environment puts legal obligation for preparation of the National Plans for Climate Change (stipulating that preparation of GHG inventory is obligatory). The Ministry of Environment and Physical Planning (MoEPP) is responsible governmental institution for coordination of activities on preparation of National plans and their submission to the Government for final adoption. The MoEPP is a leading governmental institution for coordination of part on climate change under the National Programme for adoption of acquis, including the transposition of the EU climate acquis, and is appointed UNFCCC Focal Point. The National Climate Change Committee is established for inter ministerial coordination and stakeholder involvement.

The country is vulnerable to climate change. Vulnerability assessments were developed for the most vulnerable sectors in the country (water resources, agriculture, biodiversity, health, culture heritage, tourism), However, it is certain that the country’s preparedness to respond to climate change challenges, especially investments in vulnerable sectors such as agriculture, water and forests, as well as in energy efficiency and renewable will be costly and will require long-term commitment and efforts from all segments of the society – policy and decision makers, public administration, private sector, CSOs, academic and research institutions and others.

The potential for climate mitigation is large with potential substantial side-benefits, but substantial efforts are required in order to integrate climate change into sector policies and strategies.

The country regularly associated itself with EU positions in the international context, but progress in transposition of the climate acquis has been slow, although several preparatory studies and capacity building programmes have been carried out with EU and international support.

The country needs to develop a comprehensive policy and strategy on climate change, in accordance with the expected EU 2030 policy framework for climate and energy.

A legal framework is needed for coordinated action at national level with regard to mitigation and adaptation to climate change. This includes a legal base for setting the responsibilities of institutions, their role and manner of exchange of information.

Technical, institutional and administrative capacity needs to be strengthened in this field. A national strategy is needed to guide the necessary capacity building.

In order to set a pathway towards climate resilient economy and society, a separate national long-term Strategy and Law on Climate Action will be developed to further elaborate strategic goals, the specific objectives and resulting strategic measures in climate action.

The long-term Strategy on Climate Action will be the main national framework strategy document for climate action. The Strategy will guide the incorporation of climate action (mitigation and adaptation) in relevant sector strategies (e.g. energy, agriculture) and cross-cutting strategies (e.g. research and development). A Law on Climate Action will be developed under coordination of MoEPP. The Law will provide the legal framework for coordinated action at national level for mitigation and adaptation to climate change. The Law will also provide the legal framework for transposition of priority elements of the EU climate acquis. The Law will establish the responsibilities of institutions as well as serve as a legal basis for further secondary legislation necessary for implementation of priority set of climate aquies. The implementation of the Strategy and Law on Climate Action will be managed through the National Climate Change Action Plans.

Long-term objectives of the climate action are: full transposition and implementation EU climate acquis, achieving a competitive low carbon economy and achieving a climate resilient society and economy.

## Objective

In order to achieve the above mentioned long term objectives on climate action, the objective of this strategy is:

To confirm the need for preparation of comprehensive strategic and legal framework for coordinated climate action

**Specific Objectives**

1. Contribute to the EU accession process by providing the legal framework for transposition of the priority elements of the climate acquis
2. Secure compliance with the country’s obligations under the UNFCCC.
3. Achieving a climate resilient society and economy through optimisation of the costs and benefits
4. Contribute to the global efforts of GHG emissions limitation
5. Raise awareness and strengthen cooperation with stakeholders.

# **ACTION PLAN TO ACHIEVE ENVIRONMENTAL OBJECTIVES**

The Environmental and Climate Strategy provides a focal point for the overall co-ordination of approximation activities and will be supported at the working level by a range of other activities to prepare implementation plans at the Directive level. Implementation plans will set out the actions required, draw up the timetable according to which activities are to be completed, assign responsibilities and allocate resources. Questions concerning implementation deadlines arising after accession will need to be considered in detail.

The Action Planoutlines number of basic issues which need to be incorporated into strategic planning considerations:

* environmental approximation activities need to be integrated into other policy areas;
* all new investments should comply with the acquis;
* establishment of cross-ministerial working groups to develop co-ordinated approaches to certain environmental issues;
* development of long-term programmes to recruit and train staff for public sector organisations in each sector;
* use of "twinning" projects whereby environmental administrative structures in the candidate countries are matched with corresponding administrations in Member States to facilitate the transfer of administrative know-how.

The text below outlines the measures and the activities to be undertaken to achieve the goals and specific objectives in the areas of environmental sector defined in this document. Some of the projects are approaching or have entered initial stage of implementation. Most of them are only proposals on the list of required assistance which should not be deemed as exhaustive. This accounts especially for projects to be funded by the European Union’s Instrument for Pre-Accession Assistance (IPA). Priorities presented will serve only as a framework for projects planning to be further defined in more detail. Dates at the end of each priority are only indications of the timeframe within which the activity is expected to start and end. This has been done in order to provide logical consequence of the expected outputs of the projects in line with the schedule of their implementation.

Priorities proposed for each area of environment and climate change sector may be achieved through two types of support: technical assistance and direct investments in environment. Activities proposed for technical assistance could be implemented as twinning projects, contracts for services and equipment procurement to be funded by IPA, through bilateral agreements where financial support is provided by donor community, as well as by international mechanisms available for funding projects in the area of environment. Current credit lines supporting projects in the spheres of water supply and sewerage systems will not be included in the overview, because most of the financial resources for the time horizon covered by the Strategy are allocated to beneficiaries.

The manner of IPA support implementation is defined in the SectoralProgramme supporting environment and climate change areas. Furthermore, donor funds are specified with strategic frames for cooperation with donor countries for given time periods and financial frames.

Activities proposed in the segment of environmental investments will concern direct support of infrastructural projects development in the areas of waters and waste, as well as partial elaboration of technical documentation required for infrastructure projects implementation. Other areas are incorporated with minor scale.

The main priority in the development of infrastructural projects is the area of waters management. Given the fact that all river basins in Macedonia belong to international basins, the first priority in the sector of environment is waters management through allocation of most of the external support intended for investments for construction of water utilities infrastructure (collection and treatment of waste waters and improvement of water supply systems). Second priority in investment is management of waste through establishment of regional waste management systems involving construction of infrastructure for waste collection, selection and recycling and its disposal.

As already mentioned, based on the estimates, full implementation of environmental laws, i.e. full achievement of environmental standards assume €2 billion cost for Macedonia. Considering the fact that it is difficult to provide this amount within short time period, the implementation of the laws in Macedonia will have to take place within a timeframe allowing for gradual compliance with the standards. Almost all laws offer possibility for transitional periods within which all stakeholders will prepare themselves adequately and accept the requirements that they pose. Such approach to the designing of the timeframe for environmental standards achievement also derives from the fact that stakeholders differ in the level of preparedness.

**Resources and financial planning**

The implementation of this Strategy, that also covers the implementation of the EU environment and climate legislation, requires large investments in infrastructure over an extended period of time.

The cost of implementation and the time required by Macedonia to achieve full compliance with the Acquis is determined by several constraints:

* The present condition of the environmental infrastructure and starting service levels;
* Affordability at consumer level. This determines the amount of cost that can be recovered from end users;
* Affordability at national level. The amount of GDP that Macedonia can allocate to environmental projects;
* The capacity of the administration to effectively legislate and subsequently plan financially and programme optimally all financial resources available.

Distribution of Cost by Environmental Sectors

The cost estimates have focused on the “Heavy Investment Directives” which are:

1. Urban Waste Water (UWW);
2. Drinking Water (DW);
3. Nitrates;
4. Municipal Solid Waste (MSW);
5. Large Combustion Plants recast (IED);

It is provisionally estimated that together they account for almost 80% of the total cost.

The expected amount of funding disbursed up in the period 2014- 2020 is approximately ∑ = €300 million. This sum is comprised of National budget funds and own contributions (including loans) (15 per cent of total), EU funds i.e. IPA instrument (75 per cent), bilateral and multilateral donors (10 per cent).

As a result of the planned infrastructure projects for which development of project documentation is underway, the extent of IPA funds utilization is expected to increase in the period of the Strategy implementation.

Funding of environmental projects is still to the highest percent dependent on external financing and absorption capacity of central and especially local governments. There is an evident need to increase national funding.

**Implementation and coordination**

It is essential that Macedonia should continue to enhance the framework for co-ordinating legislative and administrative practice across different ministries and legislative units with a view to achieving full and harmonious implementation in law and practice streamlined and coherent with regulatory and policy activities.

It is vital that the MoEPP together with other ministries, departments and stakeholders in the environment sector continue improving their coordination efforts to ensure a smooth mechanism for environmental and climate cooperation. Relevant for the implementation of the Strategy is good cooperation between institutions, in particular in relation to the dissemination of data and information, as well as commitments from responsible persons in key institutions. Enhanced participation of civil sector in the implementation of measures will contribute to more efficient implementation of the Strategy.

The Implementation of this Strategy, which covers areas of EU environmental law is likely to cause significant change in the national law and policy. It is thus crucial that the implementation process involves a wide range of stakeholders , allowing stakeholders and those potentially directly or indirectly affected by the new legislation and other activities to be involved in and get acquinated to the new requirements and the manner the new requirements are being practically implemented.

**Monitoring and evaluation**

Monitoring and evaluation of the Sector Environment and Climate Change Strategy will be carried out through monitoring and evaluation of the proposed activities, results and indicators for the sets of measures, presented concisely in the Action Plan for achievement of environmental objectives addressed adequately in the Sector Environment and Climate Change Strategy. As already mentioned, proposed measures are grouped into three main sets:

1. Technical assistance
2. Investments, and
3. Grant schemes.

Accordingly, each measure incorporates related activities in different environment and climate change areas.

|  |
| --- |
| ***1. TECHNICAL ASSISTANCE (2014-2020)*** |
| **MEASURE1.1. Support in the process of accession to EU in the area of environment** | This measure includes activities for preparation of planning documents that will outline long-term framework for environmental investments planning and management and establishment of administrative structure prepared to lead negotiations and undertake obligations from EU membership |
| **Activities*** Approximation of environmental legislation
* Identification and development of Directive Specific Implementation Plans (DSIPs) for which transitional periods will be requested with projectpipelines, estimate of costs and identification of financial instruments for directives implementation(UWWD, DrinkingWaterDirective, LandfillDirective, IED, VOCfrompetrolstation, INSPIRE,etc.) (2015-2018)
* Development of Strategy for Environmental Investments and Funding to sum up all resultsunder the Directive Specific Implementation Plans (DSIPs) (2017)
* Project management – strengthening of administrative system, establishment of procedures for projects planning, preparation and implementation of projects, strengthening of the capacity for funds management (2016-2018)
* Preparation of plan for development of institutional capacity for environment management and policy support(2015-2016)
 | **Results*** Adoption of new and amendment of existing environmental laws with preparation of bylaws
* Developed Directive Specific Implementation Plans (DSIPs) for directives requiring transitional periods
* Investment framework through developed Strategy for Environmental Investments and Funding defined
* Strengthened administrative capacity through establishment and implementation of mechanisms for project cycle management
* Plan for development of institutional capacity for environment management and policy support prepared
* Training curriculum developed
 |
| **Indicators*** Adopted amendments to three (3) environmental laws
* Adopted Directive specific implementation plans for at least eight (8) selected directives requiring transitional periods
* Number of trained civil servants
* **Developed programmes for training**
 |
| **MEASURE1.2.Implementation of the legislation in areas requiring significant changes in approximation** | This measure includes activitiesaimed at accelerating the process of transposition and implementation in areas where transitional periods are not allowed or are rather limited, as well as supporting implementation of the legislation in the areas requiring significant changes in behavior. |
| **Activities - Nature*** Identification of SACs that will include the full range of indigenous species, and habitat types listed in Annex I and habitats of the species listed in Annex II.
* Implementation of the process of development of ecological network (NATURA 2000) and its functional connectivity, and preparation of Management plans for protected areas (2017-2020)
* Introduction of monitoring of natural habitats and species in Macedonia and identification of protected species in Macedonia (2020-2022)
 | **Results*** Identified habitat types of national and European importance
* Selected sites of ecological network Natura 2000 (SACs and SPAs)
* Management plans for protected areas which are of community interest prepared (potential NATURA 2000 sites)
* Programme for monitoring of natural habitats and species in Macedonia prepared
* Red lists of threatened species and Red book prepared
* Species protection measures developed
 |
| **Activities - Waters*** Development of Basin Management Plans compliant with Water Framework Directive (with implementation measures) (2014-2018)
* Development of Flood Risk Management Plans in accordance with Directive on flood risk assessment and management (with implementation measures) (2016-2018)
* Strengthening of administrative capacity for waters management through river basin management bodies (system of permitting and supervision) (2016-2020)
* Development of Feasibility Studies and technical documentation for infrastructure projects (2014-2020)
 | **Results*** Draft River Basin Management Plans for Vardar, Bregalnica, Strumica and CrnDrim Rivers done according to the requirements of the WFD
* Developing a programme of measures designed to achieve or maintain good environmental status, in accordance with WFD Article 13.
* Improved implementation of Flood Directive through developedFlood Risk Management Plans
* The administrative capacity for implementation of WFD strengthened
* Feasibility Studies and technical documentationfor wastewater collection and treatment in Radovish, Berovo, Kichevo, Kumanovo, Strumica, Bitola, Tetovo, Gostivar, Kavadarci, Debar and for sewerage network for Skopje developed
 |
| **Activities–Climate change*** + Strengthening of administrative capacity for climate change management and transposition of the legislation (2016-2018)
	+ Establishment of system of greenhouse gases inventory taking (2016-2020)
	+ Establishment of system of emission monitoring, assessment and reporting (2018-2020)
	+ Enhancement of climate change adaptation capacity of vulnerable sectors (2016-2022)
 | **Results*** The Long-term Strategy and Law on Climate Action prepared and adopted establishing the legal frame of issues that need to be covered arising from EU climate acquis
* Establishment of functional monitoring mechanisms of GHG emissions
* Institutional, legal and procedural arrangements in place on mechanism for monitoring GHG emissions
* Reduced vulnerability of sectors sensitive to climate change through preparation of strategic and legislative framework
 |
| **Indicators*** Number of prepared Management Plans for protected areas
* Number of prepared Draft River Basin Management Plans
* Number of preparedFeasibility Studies and technical documentationfor wastewater collection and treatment
 |
| **MEASURE1.3 Undertaking of measures and activitiesin areas requiring significant changes in behavior, namely implementation of the legislation** | This measure includes activitiesaimed at enhancing the implementation of the legislation in priority areas |
| **Activities–Waste management*** Transposition of the new Framework Waste Directive (2017)
* Revision of the legislation on the treatment of end-of-life vehicles and other special waste streams (2017)
* Revision of the National Strategy and National Plan for Waste Management in line with the new Framework Waste Directiveand upgrading of the Electric and Electronic Waste Management Plan (2017)
* Development of Regional Waste Management Plans (2014-2016)
* Support in the management of special waste streams (selection, separation, recycling, etc.) (treatment of end-of-life vehicles, waste oils, etc.) and adoption of Management Plans for special waste streams (2016-2020)
* Preparation of Feasibility Studies and technical documentationfor infrastructure projects (landfills, establishment of systems for waste collection, selection and recycling)(2014-2017)
 | **Results*** New Law on Waste adopted
* Amendments to the legislation on the treatment of end-of-life vehicles and other special waste streams adopted
* National Waste Management Strategy revised
* National Waste Management Plan revised
* Electric and Electronic Waste Management Plan upgraded
* Regional Waste Management Plansfor regions in the Republic of Macedonia developed
* Management Plans for special waste streams adopted
* Feasibility Studies and technical documentationfor infrastructure projectsconcerning construction of waste transfer stations and landfills in Eastern and Northeastern regions prepared
* Administrative capacity for implementation of the Framework Waste Directive strengthened through further development and implementation of the legal framework
 |
| **Activities - Integrated Pollution Prevention and Control*** Support to the implementation of the management of emissions from industry, implementation of the requirements of Industrial Emissions Directive
* Strengthening of inspection supervision of IPPCinstallations (2016-2020)
* Support to the preparation of plans for industrial accidents prevention and provision of integrated approach to their evaluation and inspection(2016-2018)
* Support to the introduction of ecological labeling and EMAS (2017-2020)
 | **Results*** Law on major installations prepared
* Inspection supervision of industrial facilities strengthened
* Plans for industrial accidents prevention prepared
* EMASand ecological labeling procedures introduced
 |
| **Indicators*** % of selected and recycled waste
* Number of EMAS certifications
* Number of issued integrated permits (IPPC recast)
* Increased level of compliance of the national with the EU legislation
 |
| **MEASURE 1.4. Undertaking of measures and activitiesfor transposition and implementation in other areas (2015-2020)** | This measure includes activitiesaimed at enhancing the implementation of the legislation in other areas of environment |
| **Activities– Air quality management*** Development of National Plan for Air Protection 2017-2022 and revision of the National Programme for Air Emissions Phasing-out (2016-2017)
 | **Results*** National Plan for Air Protection developed
* National Programme for Air Pollutants Emission Phasing-out revised
 |
| **Activities–Protection against noise*** Preparation of Strategic Noise Maps and Action Plans with programmes of measures for reduction of the negative impact of noise(2018-2019)
 | **Results*** Strategic Noise Maps and Action Plans with programmes of measures for reduction of the negative impact of noise prepared
 |
| **Indicators*** Increased level of compliance of the national with the EU legislation
 |
| **MEASURE1.5. Undertaking of measures and activitiesto strengthen the capacity for information and monitoring systems management and access to information (2017-2019)** | This measure includes activitiesaimed at improving the state of collection and exchange of environmental information, as well as access to information and strengthening the capacity for use of this information in decision making process |
| **Activities*** **Preparation and/or upgrading of programmes for monitoring** in priority environmental areas in accordance with the EU requirements (2016-2020)
* Upgrading of the **EnvironmentInformationSystem**for all environmental media (2019-2022)
* Establishment of efficient system of spatial data through GEOPORTAL (2019-2022)
 | **Results*** Adopted programmes for monitoring of surface and ground waters, nature, noise and air)
* Established central **EnvironmentInformationSystem**for all environmental media
* Established GEOPORTAL
 |
| **Indicators*** Number of collected, processed and disseminated information of all environmental media
 |
| **MEASURE 1.6. Undertaking of measures and activitiesin other areas covered by EU environmental legislation (2017-2020)** | This measure includes activitiesin other areas of Chapter 27 - Environment |
| **Activities*** **Forestry**(conducting inventory of forest ecosystems in Macedonia, establishment of forest information system, implementation of conservation activitiesof forest habitatsin NATURA 2000sites, etc.) (2018-2020)
* **Chemicals**(establishment of Chemicals Registry) (2018)
 | **Results*** Inventory taking of forests in the Republic of Macedonia initiated
* Established framework of Chemicals Registryin the Republic of Macedonia
 |
| **Indicators*** % of inventory
* % of the level of compliance of the national with EU legislation
 |
| ***2. ENVIRONMENTAL INVESTMENTS (2014-2020)*** |
| Measures for support and implementation of environmental investments will be focused the most on waters and waste management areas for priority projects identified on the basis of criteria for priority assessment |
| **Activities - Water*** **Establishment of List of projects** required for full implementation of the requirements of Directives including also establishment of institutional system for management at river basin management level (taken over from DSIPs) (2017)
* Construction of systems for collection and treatment of waste waters for the purpose of implementing the **Urban Waste Water Treatment Directive** (transitional period will requested and thus preparation of DSIP is necessary) (in accordance with DSIP) (2014-2024)
* Construction of water supply systems to implement **Drinking Water Directive** (transitional period will requested and thus preparation of DSIP is necessary) (in accordance with DSIP) (2014-2020)
 | **Results*** Constructed wastewater collection and treatment infrastructure facilities for Prilep, Kichevo, Strumica, Radovish, Tetovo, Bitola, Debar, Kochani, Gevgelija, Delchevo
* Constructed , extended and rehabilitated sewage systems for Prilep, Kumanovo, Berovo, Skopje, Kichevo
* Constructed water supply systems for Tetovo, Lipkovo and Zajas and water filtering station for Gostivar
 |
| **ActivitiesWaste*** Development of integrated and financially self-sustainable waste management system in order to implement Landfill Directive - construction of the selected infrastructure facilities, closure of the noncompliant landfills/dumpsites and supply of equipment for waste collection and transferring
* **Preparation of plan for landfills that need to be closed** in accordance with Directive requirements and projects for their closure and implementation of closure (2016-2017)
 | **Results*** Integrated and financially self-sustainable waste management system constructed - construction of the selected infrastructure facilities, closure of the noncompliant landfills/dumpsites and supply of equipment for waste collection and transferring in Eastern and Northeastern planning regions
* Landfills closure plan prepared
 |
| **Activities - Other areas for investment*** Elimination of historical contamination from sites in the Republic of Macedonia (2014-2018)
 | **Results*** Implementation of activitiesfor elimination of historical contamination caused by landfilling of HCH – isomers (alpha, beta and delta) and mercury in Ohis
 |
| **Indicators*** Number of developed integrated and financially self-sustainable waste management systems
* Number of constructed systems for waste waters collection and treatment
* Number of constructed water supply systems
 |
| ***3. GRANT SCHEMES (2014-2020)*** |
| * Grant scheme for implementation of pilot measures for sustainable management of natural resources
* Grant scheme for implementation of pilot measures for climate change and energy efficiency
 |
| **Results*** Strengthened capacity of beneficiaries of the funds of grant schemes
 |
| **Indicators*** % of implemented funds
* Number of beneficiaries included
 |

1. River Vardar. river Crn Drim, river Strumica and river Juzna Morava [↑](#footnote-ref-2)
2. Ohrid Lake, Prespa Lake and Dojran Lake [↑](#footnote-ref-3)
3. Minimum acceptable water flow is a biological minimum which should be constantly available in the riverbeds for water life preservation; it is defined as 10% of the average discharge of a river [↑](#footnote-ref-4)