“Expert - Consultant for the elaboration of the Ex Ante Evaluation and the Strategic Environmental Assessment (SEA) of the new IPA II Cross – Border Cooperation Programme “Greece– The former Yugoslav Republic of Macedonia 2014 – 2020””

3rd Deliverable
Final Report of the Strategic Environmental Assessment of the IPA II Cross-Border Cooperation Programme “Greece – The former Yugoslav Republic of Macedonia 2014 – 2020”

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Glossary of Acronyms

Acronym	Description
IPA	Instrument of Pre-Accession Assistance
CBP	Cross Border Programme
ERDF	European Regional Development Fund
EU	European Union
EC	European Commission
EEA	European Environment Agency
SWOT Analysis	Strengths, Weaknesses, Opportunities, Threats Analysis
GDP	Gross Domestic Product
R&D	Research & Development
RES	Renewable Energy Sources
GVA	Gross Value Added
NSRF 2007 - 2013	National Strategic Reference Framework 2007-2013
GHG	Greenhouse Gas
PA	Priority Axis
SME	Small and Medium-Sized Enterprise
SO	Specific Objective
TP	Thematic Priority
NGO	Non-Governmental Organizations
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organization for Economic Cooperation and Development
ICT	Information and Communications Technology
MA	Managing Authority
MS	Member States
GIS	Geographical Information System
TA	Technical Assistance
SEA	Strategic Environmental Assessment

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0. Introduction

Having regard, the specifications of the signed contract "Expert - Consultant for the elaboration of the Ex Ante Evaluation and the Strategic Environmental Assessment (SEA) of the new IPA II Cross – Border Cooperation Programme "Greece– The former Yugoslav Republic of Macedonia 2014 – 2020"" between the Managing Authority of European Territorial Cooperation Programmes of the Ministry of Development and Competitiveness and the Expert – Consultant PLANET S.A., the basic objective of the 2nd deliverable **"SEA of the IPA II Cross-Border Cooperation Programme "Greece – The former Yugoslav Republic of Macedonia 2014 – 2020""** is the elaboration of the Strategic Environmental Impact Assessment (SEA). The SEA is in accordance to the following provisions:

- Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001on the assessment of the effects of certain plans and programmes on the environment,
- JMD (Joint Ministerial Decision) 107017/28.8.2006 (GG 1225/B/5-9-2006): "Assessment of the environmental effects of certain plans and programs, in compliance with the provisions of Directive 2001/42/EC " on the assessment of the effects of certain plans and programs on the environment " of the European Parliament and of the Council of 27th of June 2001."

Furthermore the Expert – Consultant provides scientific, consultative support to the Managing Authority of European Territorial Cooperation Programmes and the Competent Authority of the Greek Ministry of Environment, Energy and Climate Change (YPEKA) throughout the entire procedure up to the completion of the Strategic Environmental Assessment.

The **main tasks** of the Strategic Environmental Assessment are described below:

- Evaluation, assessment and management of environmental impacts of the Programme.
- Consultation process and finalization of the Strategic Environmental Assessment (SEA).

Having regard, the Commission Implementing Regulation (EU) No 447/2014 of 2 May 2014,Article 30 - Geographical coverage for the purposes of cross-border cooperation between one or more Member States and one or more IPA II beneficiaries as provided for in Chapter II, the eligible areas for financing shall be, Nomenclature of Territorial Units for Statistics (NUTS) level 3 regions or, in the absence of NUTS classification, equivalent areas along land borders or along maritime borders separated by a maximum of 150 km, without prejudice to potential adjustments needed to ensure the coherence and continuity of cross-border programmes established for the 2007-2013 programming period.

A. NON TECHNICAL SUMMARY

General Information

Having regard, the specifications of the signed contract "Expert - Consultant for the elaboration of the Ex Ante Evaluation and the Strategic Environmental Assessment (SEA) of the new IPA II Cross – Border Cooperation Programme "Greece– The former Yugoslav Republic of Macedonia 2014 – 2020"" between the Managing Authority of European Territorial Cooperation Programmes of the Ministry of Development and Competitiveness and the Expert – Consultant PLANET S.A., the Expert – Consultant has elaborated the **"SEA of the IPA II Cross-Border Cooperation Programme "Greece – The former Yugoslav Republic of Macedonia 2014 – 2020""**.

The **IPA II Cross-Border Cooperation Programme "Greece – The former Yugoslav Republic of Macedonia 2014 – 2020 follows the** follows the provisions set in the Legislative framework of IPA II, namely Regulation 231/2014 and its implementing Regulation 447/2014.

The overall strategy statement of the IPA CBC Programme is:**" to enhance territorial cohesion by improving living standards and employment opportunities holding respect to the environment and by exploiting the natural resources for tourism"**.

The eligible area includes 9 NUTS III regions along the border of the two countries, Florina, Pella, Kilkis and Serres, Thessaloniki on the Greek side and Pelagonia, Vardar and Southeast and Southwest from the side of the former Yugoslav Republic of Macedonia.

The Programme is in line with key environmental initiatives that characterize and determine its operational context and interconnected with the following policies / Programmes:

Global Initiatives: Rio, +20, the Kyoto Protocol

EU Policies: Europe 2020, Seventh EU Environmental Action Programme,

Thematic Programmes: the Territorial Agenda of the European Union 2020, Horizon 2020, Roadmap for moving to a competitive low carbon economy in 2050, Life + etc

Cross Border Programmes: Greece - Albania IPA II CBC Cross Border Programme 2014-2020, fYROM – Albania IPA II CBC Programme 2014 – 2020,

Transnational Programmes: MED 2014-2020, South East Gateway 2014-2020 Balkan-Mediterranean 2014-2020, Adriatic-Ionian 2014-2020 Transnational Programme)

Interregional & ENPI Cross Border Programmes: Interreg Europe 2014-2020, ENPI CBC programmes 2014-2020,

Networking Programmes: ESPON programme 2014-2020, URBACT Programme 2014-2020, INTERACT Programme 2014-2020

Greek Regional Operational Programmes: Central Macedonia 2014-2020 Regional Operational Programme, Western Macedonia 2014-2020 Regional Operational Programme

Current Environmental State of the cross border Eligible Area

Atmospheric environment

GREECE

Data on air quality in Central Macedonia and Western Macedonia are only for Greater Thessaloniki Area (TGA) and Florina respectively. According to reports in Florina in the winter months were frequent reports of elevated levels of micro particles in the air, emanating mainly from the burning of unsuitable wood stoves and fireplaces. The levels of SO_2 and CO are low, while the level of ozone is high compared to the limit. Thessaloniki suffered severe air pollution problems during the last decades, mostly related to PM_{10} levels. The air quality, combined with the strong hot season of the Mediterranean climate, is known to be one of the worse in Europe, especially in summer, and leads to serious sanitary concerns.

fYROM

According to the collected data on air quality in urban centres on the fYROM's side of the eligible area of the program, it is concluded that the levels of air pollutant aren't so high. The main pollutant is the PM10 in urban areas exceeded the limit values for daily and annual mean concentration (40 μg/m^3) as a result of production processes, combustion processes in industry, production of electricity and heat, road transport and the building industry. With regard to NOx emissions, the highest contributors are electricity production, 35 %, and transport, 33 %, owing to poor quality of fuels and an obsolete vehicles fleet. For other pollutants, except PM10, no problematic measurements have been observed.

Climate conditions

GREECE

The area of Florina has a cold continental climate, with long, cold, humid winters and short warm and dry summers. The mesoclimate of the area is affected by the presence of large mountains volumes and is characterized by significant inter-seasonal and diurnal difference, due to the high latitude and the morphology of area. In the region of Central Macedonia there are three main climate types, which differ considerably. The *Mediterranean type (yellow areas)*is found in the coastal zone and the lowlands (Thessaloniki - Serres), the *Continental type (green areas)* is found in mountainous and semi-mountainous part of the region, as well as inland and the *Mountain type (blue areas) which* is the closer Medio-european retaining largely typical of the Mediterranean climate.

fYROM

Despite the relatively small surface of the FYROM, the climate varies significantly. There are five different types of climate: the Sub-Mediterranean area (50-500m), the Moderate continental sub-regions (up to 600m), the Warm continental forest continental mountain (600-900m), Subalpine area (1,650-2,250 m) and the Alpine area (>2,220m). According to the climate change scenarios developed under the National Communication on Climate Change, the Former Yugoslav Republic of Macedonia is in the group of vulnerable countries with significant mean temperature increases projected for the coming period.

Aquatic environment

GREECE

In Greece there are 14 River Basin Districts. In the eligible area belongs two of them (the Western Macedonia River Basin District and the Central Macedonia River Basin District). The water district of Western Macedonia (13,624 km^2) is characterized by intense ground relief and small plains and has a sufficiency in water. A great part of the water demand is supplied by the transnational Small Lake and Big Prespa Lake, while the River Aliakmonas is used for the water supply of the city of Thessaloniki. The river basin of Aliakmonas has the largest area in the district (8,847 km^2 or 65% of total) and the river is 93 km in length. Twenty-eight per cent of the total area consists of small watersheds. On the contrary, the water district of Central Macedonia (10,171 km^2) has a deficiency in water resources; it has the second poorest water resources. The demand for water in urban and agricultural usage is high because the city of Thessaloniki, the second most important centre of industrial development after Athens, and the crop productivity of the district is high. The demand for water is mainly supplied by the adjacent Aliakmonas river basin, as well as from transnational water resources, the River Axios and Doirani Lake.

fYROM

The hydrographical territory of fYROM is a unique natural basin in the Balkan Peninsula and wider area, due to 84 % of the available water being internal waters and only 16 % external. The eligible area of the Programme is covered by the three river basin districts Vardar, Crn Drim and Strumica. The river basin which is shared between former Yugoslav Republic of Macedonia and Greece covers almost the entire country of fYROM and outflows into the Aegean Sea (Mediterranean Sea) at Thermaikos Gulf (Greece). The main river of the area is the the cross-border Axios/Vardar River. There are three major natural lakes in the eligible area: Ohrid, Prespa, and Dojran, all three of which are shared with neighbouring countries. They are also part of the eligible area. Water users are irrigation with 44%, then nature (minimum accepted flows) with 31%, followed by industry with 14% and drinking water supply for the population and tourists only 11%.

Natural – Geographical characteristics

The cross-border region combines favorable natural resources (mountains, forests, lakes, biodiversity, unique natural forms, geothermal and mineral waters, waterfalls) and favorable climate conditions.

The surface of cross-border region of collaboration between Greece - fYROM covers extent 20,839km².The department, which belongs in Greece constitutes the 8% of total surface of Greece, while the department that belongs in the former Yugoslavian Republic of Macedonia constitutes the 39,7% of its surface respectively. The eligible Programme's area enjoys the benefits of having a vast, varied and mostly unspoilt natural environment. The region has a rich mixture of natural heritage in the form of flora and fauna, rivers, lakes, wetlands, grasslands, agro-ecosystems and forests. The main characteristics of the programme area along the borderline are the Prespa Lakes with the adjacent plains of Florina and Resen in the west, the mountain range of Voras/Nidze reaching up to 2.560m (constitutes a natural border between the two states) , the Axios/Vardar Valley, the Doirani/Dojran Lake and Beles/Belasica mountain range, reaching up to 2.029m in the East. In the south the Gulf of Thermaikos and the Axios/Vardar plain and Delta dominate.

In the eligible area there are numerous protected areas under International Conventions, European Directives and National legislative frameworks. The mountains of the area are rich in flora and fauna and there is a large number of protected areas.

Biodiversity – Flora – Fauna

GREECE

In terms of biodiversity the eligible area combines a great range of habitat niches and a spectacular flora and fauna. Apart from protected areas primarily related to wetlands, the forests and mountains, there are many valuable and sensitive ecosystems. These are located throughout the region and are critical water recipients and transitional waters. In Region of Central Macedonia there are the five main vegetation zones in which Greece is divided. This abundance is due to large fluctuations of factors that affect the configuration. The climate, the existence of the sea and along the strong orographic configuration, the effect of rivers and lakes in the microclimate, the geology and soil composition, and the effect of living of the large number of the species and humans. The Western Macedonia is recognized for its diversity and the complexity of the geological and geomorphological background. The wetlands of Central Macedonia are vital sites for breeding, wintering and migratory passage of many bird species, while the tops of the mountains and valleys are particularly important for the welfare of raptors. The water systems of the Western Macedonia Region are characterized by the diversity of the fish fauna and the specificity of amphibians. In Aliakmona, for example, is estimated to live 20 to 25 species of fish. In the eligibible area on the geek side there are 33 sites of the NATURA 2000, five (5) National Woodland Parks and four (4) wetlands of international importance according to the Ramsar Convention.

fYROM

The abundance of ecosystems, habitats, communities and species places the former Yugoslav Republic of Macedonia at the very top of the list of countries with impressive biodiversity in Europe ('hot spot'). It has been established that several ecosystem types are present in the Republic: wetland, shore, grassland, highland, steppe-like, forest and mountain, of which wetland, dry land/grassland, forest and mountainous are the key ecosystems. More than 260 flora communities have been recorded with dominance of grass and forest communities. Species diversity is represented by more than 16 000 taxa of wild flora, fungi and fauna. The fact that more than 900 regionally endemic species, among which 850 are truly endemic, exist in the former Yugoslav Republic of Macedonia is of particular importance. Lake Prespa is a natural monument and Ramsar Site (18,920 ha), which includes Strict Nature Reserve Ezerani (2,080 ha). Additionally, large parts of Galicica National Park and Pelister National Park are found within the Prespa Basin. The area is protected as a National Park and as a Special Protection Area under EU Directive 79/409, and also as a RAMSAR wildlife habitat. Other important natural lakes are the Ohrid Lake which has been a UNESCO World Natural Heritage site since 1980 and Doirani/Dojran Lake.

Environmental Infrastructure

GREECE

Greece is one of the EU Member States that collect their waste water at very high level. The tertiary treatment in Greece has a rate around 80%. Greece Is ranked 4th among the EU countries. The overall rate of population connected to secondary wastewater treatment in Greece is 99%. Waste management has been recognized as one of the most pressing problems in Greece, suffering of a low level of organization and relying predominantly on semi-controlled landfills until the end of the previous century. Nevertheless, during the last two decades the solid waste management in Greece has been upgraded. As of 2011, still 109 illegal dumping sites all over Greece remain in operation despite the ruling of the European Court of Justice of 2005 (case c-502/03, which dictated that by the end of 2008 all illegal dumping sites should have been closed and rehabilitated.

fYROM

The country lags behind in sanitation and water-supply infrastructure. Taking into consideration all existing treatment plants, the total rate of population served by waste water treatment is estimated at approximately only 12,5%. The oldest waste water treatment plants in the country are precisely those at the lakes; their treatment processes are now clearly outdated and the infrastructure is insufficient for assuring sustainable utilization of water resources. Most of the waste is disposed of in landfills, both legal and illegal. Waste recycling is very limited. Municipal solid waste is one of the main waste streams generated. The quantity of municipal waste was 349 kg/inhabitant or 0.9 kg/inhabitant per day in 2008. Around 77 % of the population is covered by the public municipal waste collection system operated by public enterprises.

Natural risks

GREECE

The Region of West Macedonia belongs entirely in Zone I (low seismic hazard) and the Region of Central Macedonia to Zone II. The Central Macedonia and the Western Macedonia eligible area is highly seismogenic. The areas that suffer from floods are closed hydrological basins in karst areas ,river floodplains, and urban areas. Summer drought episodes did not show any particular trend for the same period. Deforestation and urbanization significantly contribute to the genesis of floods. Deforestation, also related to soil erosion, is a major problem in Greece and in particular in the eligible area.

fYROM

The territory of fYROM, which is located in the Mediterranean and Balkan seismic region, is exposed to intensive neo-tectonic movements, causing relatively high and frequent seismic activity. According to World Bank estimates, the former Yugoslav Republic of Macedonia is among the ECIS countries that are most likely to experience dramatic increases in climate extremes (fifth among the twenty-eight countries analyzed). Climate change is responsible for the increased severity and frequency of natural disasters, which have a significant impact on the environment, the economy and the development of the area. The frequency and intensity of floods in the past several years in the former Yugoslav Republic of Macedonia are on the rise. Statistics show that floods are caused by overflow of the large rivers Vardar, Crna Reka, Strumica. 44% of all disasters in the 1989-2006 period were floods or flood related disasters.

Population

GREECE

The total population of the programme area is 1,399,597inhabitants (64.14%).In 2011, the legal population of the Region of Central Macedonia counted 1,726,430 residents registering a marginal increase over the previous census of 2001 of the Hellenic Statistical Authority. The Western Macedonia declining population compared to the previous census in percentage change -3.61 %. In 2001 the population of the region was 294,317 inhabitants and in 2011 fell to 283,689 inhabitants. The NUTSIII region of Kilkis presented the highest increase (9.9%) while Serres have a high population decrease of -12.8%. Pella and Florina presented population decreases by -4.2% and -4.98% respectively. Population density ranges from 29 persons/km^2 in Florina up to the tenfold figure of 238 persons/km^2 in Thessaloniki. The respective national averages are 82 for Greece and 80.1 for the former Yugoslav Republic of Macedonia.

fYROM

The total population of the programme area is 782,667 (35.86%). According to the latest population estimates (31.12.2012), the total population of the country is 2,062,294 inhabitants. and presents, in this decade, an increase of 1.9%. The average population density is 82.8

inhabitants per km² (estimated at 31.12.2012) but because of the intense migratory movements, there are huge disparities and differences in density. Skopje as the most densely populated (337 inhabitants per km²), almost ten times higher density of the Vardar region (38 inhabitants per km²). The region of Pelagonia presented the highest increase (1.89%) while Southeast has a small population decrease of approximately -0.96%. On the contrary, the Vardar and Southwest regions presented population increases by 0.46% and 0.01% respectively.

Social – Economic environnemt

GREECE

The financial crisis in Greece leaded to the reduction of GDP by 11.87% in Thessaloniki, by 36.51% in Kilkis, by 3,77% in Pella, in Serres by 8.77% and in Florina by 0.75%. In the Greek area, mainly in Thessaloniki, Pella, Kilkis and Serres, per capita GDP remained lower than the corresponding per capita GDP. On the contrary, Florina has relatively high per capita GDP because of energy economic activities The level of unemployment increased in the second quarter of 2012. In the region of Central Macedonia the rate has recorded the third highest rate in the country, 25.1%, following the regions of Western Macedonia (30%) and Central Greece (28.4%), compared with 23.6% of the country, 10 3% of the EU-15 and 10.2% of the EU-27. Health spending as a share of GDP is lower in Greece than in a number of European countries.

fYROM

The GDP in the former Yugoslav Republic of Macedonia regions, during the period 2007 – 2011, increased by 29.83% in Southeast, by 20% in Vardar, by 29.83% in Southwest and by 23,78% in Pelagonia. The social situation in the former Yugoslav Republic of Macedonia is characterized by a low employment rate of 38.5%, a high unemployment rate of 32% and a poverty estimated at 31% of the population. The employment rate in the Vardar, East, Southeast and the Pelagonia Region in 2013is above the total rate at the national level, with the Southeast Region having the highest employment rate of 56.8.The lowest employment rate in 2013 was observed in the Northeast Region. The lowest unemployment rate of 18.8 was recorded in the Southeast Region, which also had the highest employment rate. The fYROM health system is insurance-based. Compulsory health insurance is the main source of health care revenue undertaken through the publicly owned Health Insurance Fund (HIF). There are potential inequalities in health care delivery.

Cultural heritage

GREECE

In the eligible area there is a combination of significant areas of natural beauty, rich historical and cultural heritage. The cultural heritage in Central Macedonia is particularly rich and diverse and covers all stages of the Hellenic civilization from the Paleolithic era to the modern times. The diachronic presence of the humans in the Macedonian area is enriched with

numerous monuments, residential complexes, artwork or other creations that cover all the historical range. Prehistory - Ancient - Classical - Hellenistic - Early Christian - Byzantine - Metabyzantine –recent periods. Florina, is characterized by diversity of ecological zones and rarely for the Greek area lake systems including impressive picturesque villages.

fYROM

The fYROM has a rich history with heritage especially from ancient, medieval and Ottoman period. In the illegible area of the fYROM there is the natural and cultural heritage of the Ohrid region, included in the World Heritage List of UNESCO, which is situated on the shores of Lake Ohrid. The town of Ohrid is one of the oldest human settlements in Europe.

The strategy of the Programme

The overall strategy of the CBC Programme Greece – the Former Yugoslav Republic of Macedonia" served by three (3) priority axes and four (4) selected thematic priorities listed below.

Priority Axes

- PRIORITY AXIS: 1. Development and Support of Local Economy
- PRIORITY AXIS: 2. Protection of Environment - Transportation
- PRIORITY AXIS: 3 Technical Assistance

Thematic priorities

- **Thematic priority a:** Promoting employment, labour mobility and social and cultural inclusion across borders through, inter alia: integrating cross-border labour markets, including cross-border mobility; joint local employment initiatives; information and advisory services and joint training; gender equality; equal opportunities; integration of immigrants' communities and vulnerable groups; investment in public employment services; and supporting investment in public health and social services;
- **Thematic priority b:** Protecting the environment and promoting climate change adaptation and mitigation, risk prevention and management through, inter alia: joint actions for environmental protection; promoting sustainable use of natural resources, resource efficiency, renewable energy sources and the shift towards a safe and sustainable low-carbon economy; promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems and emergency preparedness
- **Thematic priority c**: Promoting sustainable transport and improving public infrastructures by, inter alia, reducing isolation through improved access to transport, information and communication networks and services and investing in cross-border water, waste and energy systems and facilities
- **Thematic priority d**: Encouraging tourism and cultural and natural heritage

Alternative Solutions

Alternatives have been considered in four ways:

- A baseline scenario "zero-solution" considers an absence of the Programme over the 2014-2020 period.
- Planning of the Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" based on the strategy of the current programming period (Current Situation).
- Development without a Core Strategic Planning (Unplanned Growth).
- Planned Growth based in a Core Strategic Planning (Planned Growth).

Regarding the Zero Solution, the non-implementation of the Programme will impede the real convergence with the developed regions of each country and the EU, with a negative impact on the economy, on the improvement of the living standards in the eligible areas, on the protection and enhancement of the natural and cultural wealth and on the improvement and protection of natural resources. Regarding Alternatives 1 and 2 these are rejected , while the Alternative 3 is the best one for the needs and opportunities of the cross border area. The strategic approach and the determined actions to be supported are quite broadly formulated. Improvement in the consideration of environmental issues is a question of addressing environmental orientation by more focused formulations and guiding principles for the selection of projects and monitoring.

Environmental Impacts

The expected environmental impact of the IPA II Cross Border Programme Greece –The former Yugoslav Republic of Macedonia 2014-2020 on the basis of environmental objectives, is presented on the following table:

A/A	ENVIRONMENTAL ASPECT	PROBABLE IMPACTS
1	**Biodiversity**	The overall impact of the IPA CBC Programme will be positive. This is due to the activities which are planned and expected to contribute directly or indirectly to the protection of the very important habitats that exist in the area, as well as of the rare flora and fauna species that live there. There will be a slight negative impact because of the establishment of new business actions. Due to the abundance of ecosystems in the border region is expected that there will be cases where such areas will be affected, either by the construction of infrastructure in or near such areas. The infrastructure projects are small scale and in all cases will be provided environmental protection measures to avoid negative consequences.
2	**Population – Human Health**	Activities that aim at the increase of the employment and the enhancement of the entrepreneurship of the area have the most important contribution to the population – human health. Human health will be improved due to actions of promotion the accessibility to health care services and due to improvement of the quality of environment.

A/A	ENVIRONMENTAL ASPECT	PROBABLE IMPACTS
3	**Soil**	The overall effect is positive in soil due to implementation of sustainable integrated management systems, treatment and recycling of waste. A slight negative impact is expected due to investment in development activities and infrastructure projects.
4	**Water**	The improvement of wastewater treatment and the reduction of pressures and impacts on environment through the effective treatment and reuse of liquid and solid wastes will support the improvement of water quality.
5	**Air**	The improvement and the extension of road networks will lead to an increase in road transportation and a further increase in air pollution. The improvement of waste management will have a positive impact to air quality.
6	**Climate conditions**	The joint and coordinated environmental actions in the border region contribute to the reduction of GHG emissions and carbon/water footprint and to the reduction of the impacts of climate change on ecosystems.
7	**Material Assets**	The expected improvement of economic indicators, the enhancement of natural environment, the improvement of employment rates and general the upgrade of the quality of life is expected to increase the value of assets. Undoubtedly, during the construction of infrastructure in some cases the value of neighboring to the works properties will be reduced temporarily. In any case this can be avoided if during the planning and implementation the works appropriate measures are taken.
8	**Cultural heritage**	The planned actions for the promotion and protection of cultural heritage will have strong positive impact. Support for the development of new and innovative touristic products and services to be delivered as well as supporting the protection and promotion of cultural heritage, will also have a positive impact on the protection and promotion thereof.
9	**Landscape**	Due to the abundance of wide areas of unique landscape, it is likely some of the infrastructure, and development activities, to adversely affect the landscape with land occupation, division and aesthetic degradation. The control of natural risks and hazards will have positive impact to landscape.
10	**Cumulative Impacts**	The interaction and relationship between the above factors, as estimated by the direction of the impact of each factor separately, will be positive.

Control/Prevention Measures

The proposed control/prevention measures to address the likely significant impacts of the of the IPA II Cross Border Programme Greece –The former Yugoslav Republic of Macedonia 2014-2020 on and the total cumulative effects are:

A/A	ENVIRONMENTAL ASPECT	CONTROL/PREVENTION MEASURES
1	**Biodiversity**	The prevention, reduction and control of environmental impacts of the Programme are achieved through two main mechanisms: a) the environmental licensing of projects and activities as applicable and b) specification for special conditions, provisions and / or conditions that will be applied in the implementation of program and will be incorporated into management processes (assessment instruments, integration projects). Individual actions proposed within each mechanism are described below: a) Environmental licensing projects and activities. ■ Compliance with the specific emission limit values of pollutant loads and concentrations for air, water and soil in accordance with the applicable provisions ■ Compliance with the specific limit values for noise. ■ Compliance with the provisions for the management of waste in each country. ■ Taking all necessary measures provided by the two countries legislation in relation to the prevention and reduction of pollution of protected areas, aquatic environment and forest in accordance with the relevant legislation. b) Specific measures to protect the environment. ■ Indicate directions, preconditions, restrictions and recommendations beyond compliance with licensing procedures aimed at avoiding the cumulative impacts that may be caused by the implementation of various projects, ■ maximize the environmental outcome of the CBC Programme. As a main principle for determining the measures to be proposed is recognized the principle of prevention.
2	**Population – Human Health**	
3	**Soil**	
4	**Water**	
5	**Air**	
6	**Climate conditions**	
7	**Material Assets**	
8	**Cultural heritage**	
9	**Landscape**	
10	**Cumulative Impacts**	

Monitoring system of significant environmental impacts

The system provided for monitoring the significant environmental impacts of the implementation of the program by environmental aspect, is presented in the table below:

A/A	ENIRONMENTAL ASPECT	ENVIRONMENTAL INDICATOR	MONITORING AUTHORITY	ENVIRONMENTAL PARAMETERS	MONITORING FREQUENCY
1	Biodiversity	■ Habitat alteration and land conversion from natural state ■ Number and / or extent of protected areas ■ Number of endemic and protected species ■ Area of key ecosystems ■ Protected areas as % of national territory and by type of ecosystem	■ Management bodies of protected areas ■ Responsible Public Authorities	■ Habitat alteration and land conversion from natural state ■ Number and / or extent of protected areas ■ Number of endemic and protected species ■ Area of key ecosystems ■ Protected areas as % of national territory and by type of ecosystem	Annually
2	Population – Human Health	■ Life expectancy ■ Work accidents ■ Percentage of population living under the line of poverty	■ Responsible Public Authorities	■ Life expectancy ■ Work accidents ■ Percentage of population living under the line of poverty	Annually
3	Soil	■ Percentage of degraded land ■ Quantities of waste disposed in landfills ■ Production Waste % recycling (paper, glass, aluminum)	■ Responsible Public Authorities	■ Percentage of degraded land ■ Quantities of waste disposed in landfills ■ Production Waste ■ % recycling (paper, glass, aluminum)	Annually
4	Water	■ Population connected to secondary and/or tertiary sewage treatment plant ■ Quality of surface water ■ Quality of groundwater ■ Water use by sector ■ Percentage of recycling water ■ Quality of seas	■ Responsible Public Authorities ■ Ministries of Environment	■ BOD5/COD in inland waters ■ Concentration of N & P in inland waters ■ Heavy metals ■ Organic compounds ■ pH ■ Microbiolgical parameters	The frequency is defined according to the monitoring systems of the water in the countries
5	Air	■ Days exceeded air quality limits ■ Emissions by Source	■ Responsible Public Authorities ■ Responsible Regional	■ SOx, NOx, PM10, CO ■ GHG ■ Pb	The frequency is defined according to the monitoring systems of the air in the countries

A/A	ENIRONMENTAL ASPECT	ENVIRONMENTAL INDICATOR	MONITORING AUTHORITY	ENVIRONMENTAL PARAMETERS	MONITORING FREQUENCY
			Authorities		
6	Climate conditions	▪ Greenhouse gas emissions by source (%) ▪ Shift of energy demand ▪ Energy production by source	▪ Ministries of Environment	▪ CO2 emissions ▪ CH4 emissions ▪ N2O emissions ▪ PFC, HFC, SF6 missions	Annually
7	Material Assets / Cultural heritage/ Landscape	▪ Number of restored buildings ▪ Number of restored monuments ▪ Urban green space per capita	▪ Responsible Public Authorities	▪ Number of restored buildings ▪ Number of restored monuments ▪ Urban green space per capita	Annually

B. GENERAL INFORMATION

B.1Managing Authority of the Programme

According to JMD (Joint Ministerial Decision) 107017/28.8.2006 (GG 1225/B/5-9-2006), Article 2 a **"Planning Authority"** is the authority responsible for the preparation of the Programme (Managing Authority of European Territorial Cooperation Programmes") and the **"Competent Authority"** is the Ministry of Environment, Energy and Climate Change of Environment (presently called Y.PE.KA).

During the consultation process of the Strategic Environmental Impact Assessment (SEA), specific provisions should be taken into consideration following strictly JMD (Joint Ministerial Decision) 107017/28.8.2006 (GG 1225/B/5-9-2006), Article 8-Crossborder Consultation.

B.2Eligible Areas

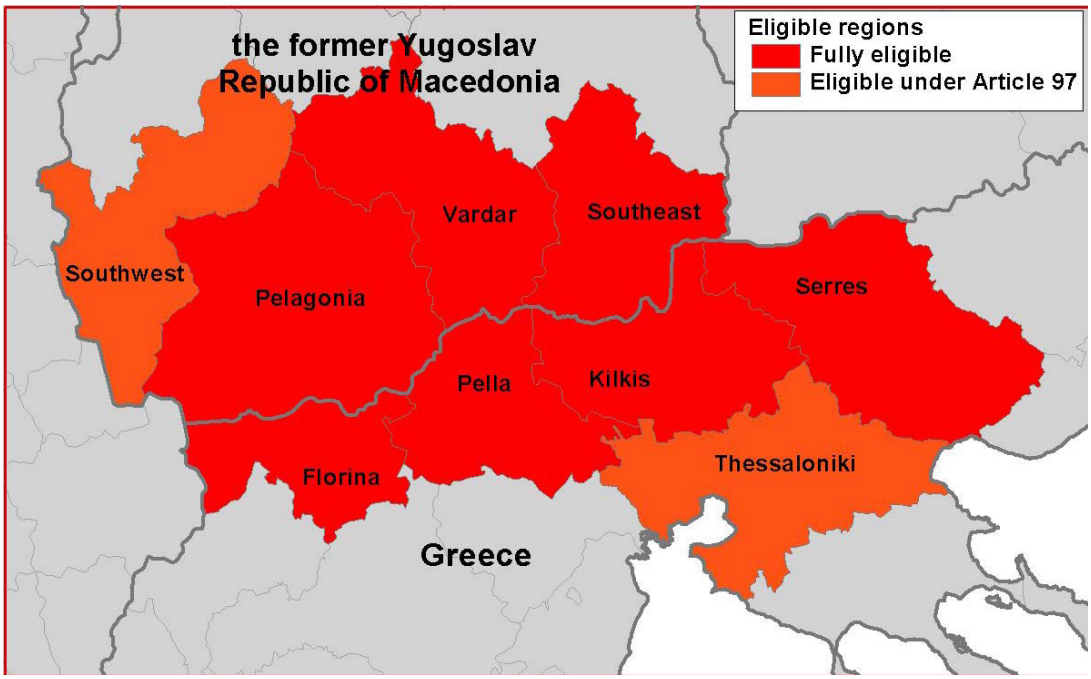
According to Article 30a) of the IPA II Implementing Regulation (447/2014), for the purposes of cross-border co-operation between one Member State and one beneficiary countries, the eligible areas for financing shall be NUTS III level regions along borders taking into account potential adjustments needed to ensure the coherence and continuity of the co-operation action, established for the 2007-2013 programming period;

The **eligible Cross Border Area**[1] is identical to the one of the previous Programming Period 2007-2013, with a total border length of 246km, covering an area of 29.259 km^2 (14.422 km^2 in Greece and 14.837 km^2 in the former Yugoslav Republic of Macedonia).

Hence, nine (9) regions from the two countries (Florina, Pella, Kilkis and Serres, Thessaloniki in Greece and Pelagonia, Vardar and Southeast and Southwest in the former Yugoslav Republic of Macedonia) are included in the eligible area.

[1] Greece – the former Yugoslav Republic of Macedonia IPA Cross-Border Programme 2007-2013, CCI : 2007 CB 16 I PO 009, APPROVED REVISION, OCTOBER 2011

Map 1: The eligible Cross-Border areas for the IPA II Greece-the former Yugoslav Republic of Macedonia CBC Programme 2014 – 2020"



B.3Author of SEA

Author of SEA is:

PLANET S.A

C. SCOPE AND OBJECTIVES OF THE PROGRAMME

In this section, the scope and the objectives of the Cross Border Cooperation Programme "Greece – The Former Yugoslav Republic of Macedonia 2014-2020" are presented.

In addition, in this section are also described:

- the national and international objectives in the field of environmental protection
- as well as the way these are incorporated in the design of the Programme and
- the interconnection with other relevant Plans and Programmes

The overall objective of the current section is the contribution to the Strategic Development Framework for the protection of the environment.

C.1Description of the SEA Process

The Strategic Environmental Assessment (SEA) of the IPA II Cross-Border Cooperation Programme "Greece – The former Yugoslav Republic of Macedonia 2014 – 2020" is a useful document for highlighting the potential positive environmental impacts of the Programme and for assessing the environmental effects of certain interventions and for integrating environmental considerations into the preparation and adoption process. The potential impacts are referring to environmental purposes and sustainable development.

SEA is an Environmental Report as stipulated in the Directive 2001/42/EC (EEL 197/30/21.7.2001) (Article 1) and its respective national adaptations, taking into account the objectives and contents of the IPA II Cross-Border Cooperation Programme "Greece – The former Yugoslav Republic of Macedonia 2014 – 2020", and the allocated financial resources. The scope and level of detail of the information to be included in the report shall be determined by consulting the relevant environmental authorities.

The aim of SEA elaboration are as follows:

- Identification of the existing environmental aspects relevant to the Programme and assessment of its environmental effects,
- Enhancement of the contribution of the Programme to sustainable development of the eligible areas,
- Definition of the relevant environmental protection objectives, examining the coherence with the environmental and sustainable development policies at cross border national, regional and local level.

Additionally, in accordance with Article 2b of the Directive2001/42/EC, the environmental assessment includes the following activities:

- elaboration of an environmental report,
- consultation process,
- integration of recommendations from the consultation process
- decision-making
- monitoring of the significant environmental impacts
- submission to the Planning Authority, follow-up and final approval

SEA evaluates potential environmental impacts related to the specific priorities of the Programme and gives recommendations on how to enhance its the quality in respect to environmental aspects. The assessment of positive and negative effects of the different interventions is summarized in a rating matrix. This assessment is only qualitative (direct & indirect effects), since a quantitative evaluation is applicable only on project level.

The European SEA Directive 2001/42/EC which is a European Union Directive, will be used in evaluating the IPA II Cross-Border Cooperation Programme "Greece – The former Yugoslav Republic of Macedonia 2014 – 2020", which can produce environmental effects. The environmental assessment procedure will be finalized to indicate, to describe and to evaluate all those effects which can happen on the environment when the Programme is implemented and as a consequence all the alternative solutions which can be realized on the basis of objectives and the environmental Programme's eligible areas.

The assessment will be applied in the areas of "agriculture, forestry, fisheries, energy, industry, transport, waste management, water management, telecommunications, tourism, town and country planning or land use". Besides, the Directive establishes that it will be necessary an environmental report at the end of the evaluation phases.

SEA is part of the preparation process of the Programme, and the SEA Environmental Report can be part of the draft Programme. Ex-ante evaluation report should also include the most important components of the environmental report and the consultation process. More specifically, SEA is related to ex ante evaluation process as follows:

- assessment of core environmental and sustainability impacts of the Programme.
- assessment of activities intended to promote sustainable development and protection of the environment.
- examination of coherence and relevance to EC and national environmental and sustainability objectives.
- evaluation of environmental indicators and recommendations/proposals.

In order to prepare the Strategic Environmental Assessment, the following steps will be followed:

- Determination of the relevant authorities such as public authorities, competent authority, other national regional and local organizations, that will be involved in the implementation of the Programme. This mapping is considered important since, it will contribute to the use of important data in the preparation of the SEA, and the preparation of stakeholders on the consultation process.

- Description of the specific objectives, scope, content and proposed interventions / activities that are expected to arise during the implementation of the Programme.
- Identification of the scope of the Programme, through the determination of the main areas and environmental issues linked to the implementation of the Programme.
- Identification of the qualitative approach of potential significant positive or negative impacts potentially caused linked to the priorities and areas of intervention of the Programme.
- Consideration of the relevance and consistency of the Programme with the existing environmental policies. Examination of the synergies and conflicts between the relevant environmental objectives and specific development goals and priorities /areas of intervention proposed in the Programme. The following policies should be considered: Climate Change policy, biodiversity, water resources and supply management, waste management and wastewater treatment, landscape protection, cultural heritage, protection of the urban environment, etc.
- Consideration of core issues included in the legislative framework(i.e. biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, cultural heritage including architectural and archaeological heritage, landscape and connection between the above factors) in relation to the priorities and objectives of the Programme, in order to determine the proposed environmental issues, objectives and indicators to be included in the SEA.
- Collection and integration of all available and up to date environmental and socio-economic data, for the assessment of the current situation, which will form the basis of the documentation of the core findings of the SEA (Report on Climate Change, National Plan for Biodiversity, Waste and Wastewater, Management Plans and Water Districts, etc).
- Collection and utilization of relevant studies(SEA reports and monitoring of the implementation of Operational Programmes, selected Environmental Impact Assessment, available monitoring reports etc).
- Consideration of alternatives and evaluation of results. Regarding the allocation of resources and categories of intervention evaluation of the performance of each approach will be implemented. Having regard the methodological model DPSIR (Driving - Force - Pressure - State-Impact - Response),evaluation of the environmental criteria will be implemented.
- Cooperation with regional-national authorities and agencies with responsibilities relating to the environment.

The process of the elaboration of the Strategic Environmental Assessment (SEA) is described in JMD 107017/28.8.2006 (GG 1225/B/5-9-2006), Article 7 and the **main steps** of this process are:

- The Managing Authority of European Territorial Cooperation Programmes applies to the Competent Authority[2], the relevant application form, together with ten (10) or more copies of the Strategic Environmental Impact Assessment (SEA), following strictly the structure described in Annex III, Article 11.
- If the SEA is not complete, the Competent Authority, within twenty (20) days of the submission date, should inform officially the Managing Authority of European Territorial Cooperation Programmes to complete the file of SEA with all the necessary information, data and documentation.
- Consultation process is carried out along with the relevant authorities and the local community. For this purpose the Managing Authority of European Territorial Cooperation Programmes, (after the final approval), forwards it within twenty (20) days following the submission date (or the submission of additional information): a) to public authorities, in order to express their opinion and additional comments on the content of SEA and b) to the Managing Authority of European Territorial Cooperation Programmes to communicate the SEA to the local community.

The relevant authorities should express their opinion and any additional comments to the Competent Authority within forty-five (45) days of receiving the SEA.

The consultation process with the local community includes the following steps:

- The Managing Authority of European Territorial Cooperation Programmes of the Ministry for Development and Competitiveness will disclose to the local community the SEA, highlighting the opportunity to make comments and express their points of view.
- The Competent Authority will disclosure the SEA, within five (5) days of receiving it, by publishing a notice in at least two daily newspapers.
- Within ten (10) days from the SEA disclosure, the Managing Authority of European Territorial Cooperation Programmes of the Ministry for Development and Competitiveness should send the relevant newspaper pages to the Competent Authority, as proof of the disclosure process. The Managing Authority can use, additionally and selectively, any other appropriate means in order to ensure public participation. The results should be sent to the Competent Authority, within forty-five (45) days of receiving the SEA.
- The Competent Authority after receiving the proposals/comments of the relevant stakeholders, or otherwise after forty five (45) days of submission, should evaluate the potential environmental impacts which are significant for the preparation of the Programme. A draft decision on the SEA (positive or negative) should be prepared within twenty (20) days.

[2]JMD 107017/28.8.2006 (GG 1225/B/5-9-2006), Article 4, the competent authority for plans and programs referred to in National, Regional and Inter-Regional level is the Environment Agency of the Ministry of Environment (EAPE/ Ministry of Environment now EYPE/ Y.PE.K.A)

This decision for the plans and the programs at national, inter-regional and regional level, are signed by the relevant Ministers[3].

The approval decision of SEA includes all relevant information concerning:

- the consultation with the relevant authorities and local community,
- the results of cross border consultations, if applicable,
- any variations that are imposed in the plan or program by the integration of the environmental dimension,
- the terms, restrictions and guidelines of environmental protection and management that must accompany the adoption of the plan or the program,
- the proposed monitoring program of significant environmental impacts from the implementation of the plan or program,
- the validity period of the decision.

The SEA is an integral part of the decision. The programming document, should be fully harmonized with the approval decision of SEA. According to Directive 2001/42/EC, Article 91b) following the approval of the Programme a "summary statement", should be prepared referring to the basic results of the consultation process.

Both countries are obliged to ensure that the Program and the "summary statement" are available to the relevant authorities, to the interested public and to any affected Member State that took part in the consultation process.

C.2Analysis and objectives

The overall strategy statement of the IPA CBC Programme Greece- The former Yugoslav Republic of Macedonia (2014-2020) is:**" to enhance territorial cohesion by improving living standards and employment opportunities holding respect to the environment and by exploiting the natural resources for tourism ".**

The Thematic Priorities of the Programme are the following:

- **Thematic priority a:** Promoting employment, labor mobility and social and cultural inclusion across borders through, inter alia: integrating cross-border labor markets, including cross-border mobility; joint local employment initiatives; information and advisory services and joint training; gender equality; equal opportunities; integration of immigrants' communities and vulnerable groups; investment in public employment services; and supporting investment in public health and social services;

[3] JMD 107017/28.8.2006 (GG 1225/B/5-9-2006), Article 4-Competent Authority

- **Thematic priority b:** Protecting the environment and promoting climate change adaptation and mitigation, risk prevention and management through, inter alia: joint actions for environmental protection; promoting sustainable use of natural resources, resource efficiency, renewable energy sources and the shift towards a safe and sustainable low-carbon economy; promoting investment to address specific risks, ensuring disaster resilience and developing disaster management systems and emergency preparedness
- **Thematic priority c**: Promoting sustainable transport and improving public infrastructures by, inter alia, reducing isolation through improved access to transport, information and communication networks and services and investing in cross-border water, waste and energy systems and facilities
- **Thematic priority d**: Encouraging tourism and cultural and natural heritage

The specific objectives of the thematic priority and expected results of the two Priority Axes of "IPA II Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020"" are the following:

Priority Axis 1	**Development and Support of Local Economy**
Specific objective 1.1	**Promotion of employment and mobility of human resources**
Expected results aim to:	▪ To use local opportunities to create jobs and enterprises, using the comparative advantages of the eligible area.The results will build on existing potential of the region and human resources, with emphasis on educated youth. ▪ Innovation and new types of business models that enable the differentiation of business activities according to the potentials and needs of the specific territory. It is crucial to mobilize internal assets, natural and human resources, in fields where the CB area is specialized. ▪ Increase mobility of human resources from urban to rural areas, benefiting from the CB area potentials, in specific sectors of economy. ▪ Focus towards creating missing links among sectors of economy; enhance innovation and ICT, knowledge transfer, business relations and exports' orientation. ▪ Increase the number of self-employed and SMEs, that produce new products and services, with added value for the CB area, or the international markets. ▪ enhance clustering and networking among local business, which will create new job positions ▪ promote entrepreneurship, by facilitating the economic usage of new ideas and fostering the creation of new firms

Priority Axis 1	**Development and Support of Local Economy**
Specific objective 1.2	Improvement of health and social investments and services for the support of vulnerable population groups
Expected results aim to:	▪ To create opportunities for everyone to participate fully in the social and economic life of the community, especially for young people who want to live and work in the countryside. And those (individuals and families) that are socially excluded. ▪ to promote equality in accessing employment, for specific groups such as individuals with disabilities (vulnerable) ▪ Help women who offer care services to children and the elderly etc ▪ to improve accessibility to health care services to citizens, without exceptions ▪ offer quality health care to isolated population
Specific objective 1.3	Encouraging tourism and cultural and natural heritage
Expected results aim to:	▪ to improve attractiveness of the touristic product of the eligible area, the creation of thematic touristic itineraries, the promotion and enhancement of natural and cultural heritage, as well as the networking and cooperation of stakeholders participating in touristic development ▪ to create a diversified touristic all- season product in the cross-border area focusing on the comparative advantages of rural areas attracting tourists with specific interests, such as eco-tourism, religious-historical tourism, gastronomic- wine tasting tourism, etc. ▪ To foster other sectors of economy along with the touristic product including the environmental preservation, employment and entrepreneurship. ▪ to use ICT technologies in promoting touristic products directly to target groups with specific interests

Priority axis 2	Protection of Environment - Transportation
Specific objective 2.1	Improvement of public infrastructure and reduction of isolation by improved access to transport, information and communication networks and services
Expected results are::	The specific objective aims to improve cross-border infrastructure and improve existing conditions and facilities for access to transport services in the eligible area.

Priority axis 2	Protection of Environment - Transportation
	▪ upgraded or improved cross - border infrastructure (such as customs or other related to border safety and transport) , ▪ information and communication systems related to transport aiming to support accessibility and mobility improve cross border accessibility and services ▪ facilitation of mobility for people and goods ▪ facilitation of trade, tourism, wealth creation and distribution of goods and services ▪ contribution to regional economic integration
Specific objective 2.2	Sustainable management, treatment and recycling of waste
Expected results concern:	▪ improvement of wastewater treatment ▪ joint operations for reduction of the volume of waste ▪ effective treatment and reuse of liquid and solid waste contribution to the fulfillment of EU landfill, waste and wastewater aquis
Specific objective 2.3	Sustainable management of protected areas, ecosystems and biodiversity
Expected results aim to:	▪ protection and sustainable management of protected areas, ecosystems and biodiversity in the cross-border area ▪ improvement of awareness and environmental education for the conservation of nature ▪ improvement of the conservation status of threatened habitats and species in the cross border area ▪ fulfillment of the commitments of the two countries under international conventions and agreements on protected areas and biodiversity (RAMSAR Convention, UNESCO Convention etc)
Specific objective 2.4	Prevention, mitigation and management of natural disasters, risks and hazards
Expected results are:	▪ Improvement on prevention, response and resilience to natural disasters and risks, especially forest fires, floods and climate impacts, in order to minimize their impact on the natural and human environment ▪ rehabilitation of degraded ecosystems and restoration of polluted area ▪ promotion of public safety and protection of public and private investments ▪ mobilization and capacity building of citizens and volunteers involved in natural disasters mitigation and management

Priority axis 2	Protection of Environment - Transportation
	▪ enhancement of operational readiness and effectiveness of public services and competent authorities and early cross-border identification and assessment of emergency situation, and effective disaster management

C.3Environmental Issues

C.3.1 Introduction

This section identifies environmental issues considered to have a strategic dimension in the context of the IPA II CBC Programme Greece -fYROM 2014-2020. The following sub-sections highlight concerns, challenges and pressures, in addition to on-going mitigation measures.

The range of themes, is categorized under three headings:

- Climate change
- Land-use management
- Energy and resource efficiency

C.3.2 Climate Change

Across the CBC Programme area, a range of impacts is anticipated from continued climate change. These include drier summers, changes in species migration patterns and more pressure on biodiversity, changes in sea temperatures, more extreme weather events, and increased coastal and inland flooding.

These challenges highlight the need for capacity-building and a better understanding of the process of climate change as well as its economic impacts. Evidently, a more integrated and pro-active response is required, with better-developed risk prediction methodologies that incorporate multiplier effects. Consideration should also be given to the scope for future-proofing new development from climate change through location, layout and building design.

Climate change mitigation can be supported through the development of renewable energy resources, reduced reliance on fossil fuels, and wider support for the transition to a low-carbon economy. Furthermore, there is already evidence of positive outcomes from climate change, such as the increased scope for agriculture in icy lands, and projects could orient their focus to encompass the potential to be derived from currently unfolding and future scenarios. In the last 40 years, the planet has warmed about 0.8˚ C.

Care will be needed in the extraction process to avoid man-made disasters. The challenge will be to find a balance between the threats to the environment that warming represents and the opportunities it provides. There is a need for preservation of the eligible area unique species and sensitive ecosystems in the programme area, to increase the environmental knowledge and to strengthen awareness-raising in this field. Impact assessments (environmental, social and regional) are required to maintain and improve quality in the eligible area conditions.

C.3.3 Land-Use Management

Management of the wider landscape is important for maintaining biodiversity levels. Particularly relevant for dominant land-use types such as agriculture and forestry. The wide range of issues to consider includes maintaining green lands, retaining traditional buildings, reducing the dominance of single land-use types in the landscape and retaining the distinctiveness of mixed agricultural landscapes and upland areas.

Agriculture has proved to be a key source of diffuse pollutants, with nutrient enrichment from agricultural run-off and discharges from wastewater treatment plants resulting in the eutrophication of rivers and lakes and coastal. There is also the danger that groundwater may also be polluted by agricultural use of fertilizers, manures and slurries.

There are concerns about the impacts of mining (and any extractive industry in general) on water resources, soil, the landscape and biodiversity in general.

Landscape character is also being threatened by a number of factors. These potentially include intensive farming, infrastructure improvements, land and flood management, forestry practicesand land abandonment. There is also evidence that the pressures on soil have been increasing through more intensive land management and changes in land use.

Future perspectives in the eligible area include the need to provide good quality green space, and remediate derelict and vacant land, whereas future investments in the natural and built heritage in the area are expected to emphasize sound environmental principles. There is also an impetus to invest in properties of most significant nature conservation or historic interest, to have sustainable re-use of the historic environment and local materials, and to increase sustainable tourism.

C.3.4 Energy and Resource Efficiency

The drive towards the low-carbon economy comprises a key theme for investment. The energy sector is one of the major contributors to greenhouse gas (GHG) emissions, and in some countries it makes the greatest contribution of all sectors.

There is a clear need and considerable scope to develop renewable natural resources, promote ecological sustainability and gain social acceptability for these activities. Overall, with effective promotion of low-carbon activities in all sectors, countries that take a pro-active role in developing a sustainable green economy are more likely to be successful in the future global economy.

Resource efficiency is an area of European policy that has significantly increased in importance during the current programming period, and the focus on using resources in a sustainable manner while minimizing impacts on the environment is at the heart of the Europe 2020 Strategy. Resource efficiency is a powerful driver for mainstreaming environmental considerations across the range of economic sectors. By focusing on raw materials such as fuels, metals and biomass, as well as the air, water and soil ecosystems that support them, resource efficiency reduces inputs – creating more for less – and minimizes waste in economic activities while also addressing environmental objectives. This approach extends equally to the public and private sectors.

Awareness-raising activities may highlight the potential benefits for individual companies through the adoption of environmental management systems, as well as broader benefits through implementation of the waste hierarchy (reduces, reuse, recycle) within relevant sectors and the protection of finite resources such as soil.

C.4Legislative and regulatory framework

C.4.1 European legal framework

The main elements of the European legal framework for the environmental protection of individual sectors are described below:

Biodiversity-fauna-flora

- Convention on Wetlands of International Importance especially as Waterfowl Habitat (1971) –International Convention Ramsar
- Convention on the conservation of European wildlife and natural habitats (Bern Convention)
- Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention)
- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
- Council Directive 79/409/EEC COUNCIL of 2 April 1979 on the conservation of wild birds

Climate change

- Kyoto Protocol
- Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC

Air quality

- Directive 2008/50/EC on Air Quality

- Framework Directive 96/62/EC on ambient air quality assessment and management
- Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogendioxide and oxides of nitrogen, particulate matter and lead in ambient air
- Directive 2000/69/EC of the European Parliament and of the Council of 16 November 2000 relating to limit values for benzene and carbon monoxide in ambient air
- Directive 2002/3/EC of the European Parliament and of the Council of 12 February 2002 relating to ozone in ambient air
- Council Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.
- Directive 2003/87/EC establishing a scheme for greenhouse gas the Community and amending Council Directive 96/61/EC
- Directive 2001/81/EC of the European Parliament and of the Conational emission ceilings for certain atmospheric pollutants

Noise

- Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating the assessment and management of environmental noise

Pollution

- Industrial Emissions Directive 2010/75/EC

Soil protection

- Communication of 16 April 2002 from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions - Towards a ThematiStrategy for Soil Protection [COM (2002) 179 final
- Council Directive of 12 December 1991 on hazardous waste (91/689/EEC)
- Council Directive 99/31/EC of 26 April 1999 on the landfill of waste
- Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste

Water

- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000
- establishing a framework for Community action in the field of water policy
- Directive 2006/118/EC on the protection of groundwater against pollution and deterioration
- Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment
- Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources
- Council Directive 90/415/EEC of 27 July 1990 amending Directive 76/464»

- Council Directive 88/347/EEC of 16 June 1988 amending Annex II to Directive 86/280/EEC on limit values and quality objectives for discharges of certain dangerous substances included in List I of the Annex to Directive 76/464/EEC
- Council Directive 86/280/EEC of 12 June 1986 on limit values and quality objectives for discharges of certain dangerous substances included in List I of the Annex to Directive 76/464/EEC
- Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption
- Council Directive 78/659/EEC of 18 July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life, amended by Council Directive 91/692/EEC (further amended by Council Regulation 1882/2003/EC), and Council Regulation 807/2003/EC

Landscape

- Directive 92/43/EC on wildlife habitat protection
-

C.4.2 Greek legal framework

The main elements of the Greek legal framework for the environmental protection of individual sectors is described below:

Biodiversity-fauna-flora

- Law 1650/1986 «For the protection of the environment»
- Law 102(I)2005 for the assessment of the environmental impacts of Construction Projects

Climate change

- Law 3017/2002 Ratification of Kyoto protocol
- Ministerial Decision 54409/2632/27-12-2004, Transposition of Directive 2003/87/EC establishing ascheme for greenhouse gas emission allowance trading

Noise

- Ministerial Decision 37393/2028/29.9.2003, Measures and policies relating to the noise emission in the environment by equipment for use outdoors

Soil Protection

- National Action plan against desertification
- Law 2468/1997, United Nations convention against desertification
- Ministerial Decision 50910/2727/16-12-2003, Policy and measures regarding waste management,

- National and regional planning
- Ministerial Decision 37591/2031/17-9-2003, policy and measures for the management of healthcare waste
- Ministerial Decision 29407/16-12-2002, transposing Council Directive 99/31/EC on the waste Water
- Law 3199/2003, Transposition of Directive 2000/60/EC
- Ministerial Decision 5673/400/1997 for the management of wastewater
- Ministerial Decision 16190/1335, Measures for the protection of water from nitrates pollute
- Ministerial Decision 90461/2193, modification of Ministerial Decision 55648/2210/1991, for the protection of water, definition of upper values concentration for dangerous subs waste water
- Act of the Ministerial Council 255/13.7.1994, modification of Ministerial Decision 55648/2
- Ministerial Decision 55648/2210/1991, Measures for the protection of water, definition of value concentration limits for dangerous substances in wastewater
- Act of the Ministerial Council 73/1990, Definition of upper value concentration lim disposal of dangerous substances
- Ministerial Decision 5/288/23.1.1986 , for the quality of drinking water
- Ministerial Decision 46399/1352/1986
- Ministerial Decision 90461/2193, modification of Ministerial Decision 55648/2210/1991, Measures for the protection of water, definition of upper values concentration for dangerous substances in wastewater
- Ministerial Decision 18186/271/1988, Measures for the protection of water, definition of upper values concentration for dangerous substances in wastewater
- Act of the Ministerial Council 144/2.11.1987, Protection of water, restriction of dangerous substances disposal
- Ministerial Decision 46399/1352/1986

Landscape

- Law 1465/1950,highly valued landscapes
- Law 3208/2003, Forest protection

Cultural heritage

- Law 3028/2002, Protection of Cultural heritage

C.4.3 fYROM's legal framework

Below is the list of the key national laws related to environmental assessment:

Law on Environment	("Official Gazette of RM" No. 53/05, 81/05, 24/07, 159/08, 83/09, 48/10, 124/10, 51/11,

	123/12, 93/13 and 187/13)
Law on Waters	("Official Gazette of RM" No. 87/08, 6/09, 161/09, 83/10, 51/11, 44/12, 23/12)
Law for Waste Management	("Official Gazette of RM" No.68/04, 71/04, 107/07, 102/08, 143/08, 124/10,09/11, 51/11, 123/12)
Law on Public roads	("Official Gazette of RM" No. 84/08; 52/09; 114/09; 23/11, 168/12)
Law for safe traffic on roads	("Official Gazette of RM" No. 54/07; 86/08; 98/08; 64/09)
Law on ambient air quality	("Official Gazette of RM"No. 67/04; 92/07; 47/11, 59/12,100/12, 4/13)
Law on Noise protection	("Official Gazette of RM" No. 79/07;47/11)
Law for protection and welfare for animals	("Official Gazette of RM" No. 113/07)
Law for plant protection	("Official Gazette of RM" No. 25/98, 6/00)
Law for nature protection	("Official Gazette of RM" No. 67/04, 14/06, 84/07, 35/10, 47/11, 59/12, 13/13)
Law for health and safety during work	("Official Gazette of RM" No. 92/07, 136/11, 23/13, 25/13)
Law for fire prevention	("Official Gazette of RM" No.67/04, 81/07)

C.5Interconnection with other Programmes – Policies

This section identifies key environmental initiatives that characterize and determine the operational context for the IPA II CBC Programme GREECE – fYROM 2014-2020. This contextual awareness also highlights significant aspects of these various strategies, programmes or policies with regard to the scope for environmental impact afforded to the CBC Programme.

C.5.1 Global initiatives

At global level, the major relevant initiatives are the United Nations Conference on Sustainable Development (Rio+20), which took place in Brazil in 2012, and the updated Kyoto Protocol.

Rio+20 marked the 20th anniversary of the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro and the 10th anniversary of the 2002 World Summit on Sustainable Development (WSSD) in Johannesburg. Its objectives included securing renewed political commitment for sustainable development, and it resulted in a focused 'political outcome document' that contains practical measures for implementation. It also reaffirmed the need to achieve sustainable development by promoting sustained, inclusive and equitable economic growth, creating greater opportunities for all, reducing inequalities, raising basic standards of living, fostering equitable social development and

inclusion, and promoting integrated and sustainable management of natural resources and ecosystems. The Conference also adopted guidelines on green economy policies, and launched a process to develop a set of Sustainable Development Goals (SDGs) that build upon the Millennium Development Goals and converge with the post-2015 development agenda.

The **Kyoto Protocol** to the United Nations Framework Convention on Climate Change (UNFCCC) is an international treaty that sets binding obligations on industrialized countries to reduce emissions of greenhouse gases. The UNFCCC is an environmental treaty with the goal of preventing degenerative anthropogenic impacts on the climate system. As part of the Kyoto Protocol, which entered into force in 2005, many developed countries have agreed to legally binding limitations/reductions in their emissions of greenhouse gases over two commitment periods. The first commitment period applied to emissions between 2008 and 2012, and the second commitment period applies to emissions between 2013 and 2020. In December 2012, an agreement was reached to extend the Protocol to 2020 and to set a date of 2015 for the development of a successor document to be implemented from 2020. In addition, the new concept of 'loss and damage' was introduced, an agreement in principle that richer nations could be financially responsible to other nations for their failure to reduce carbon emissions.

C.5.2 EU Policies

Within the European Union, the documents with the greatest relevance are the **Europe 2020** Strategy and the proposed **Seventh Environmental Action Programme**. Sustainable development became a fundamental objective of the EU in 1997, when it was included in the Treaty of Amsterdam as an overarching objective. Subsequently, at the Gothenburg Summit in 2001, the first EU Sustainable Development Strategy (SDS) was launched. Whereas the Lisbon Strategy focused on employment, economic reform and social cohesion, the SDS added an environmental dimension and established a new approach to policy-making. In June 2006, the European Council adopted a renewed SDS.

Europe 2020

In 2010, a strategy for sustainable growth was launched – Europe 2020: A Strategy for smart, sustainable and inclusive growth[4] – which sets out a vision of Europe's social market economy for the 21st century. Its priority of sustainable growth means promoting a more resource-efficient, greener and more competitive economy. Such an approach is anticipated to help the EU to prosper in a low-carbon, resource-constrained world, while preventing environmental degradation, biodiversity loss and the unsustainable use of resources. It will also underpin economic, social and territorial cohesion.

[4] European Commission (2010) Europe 2020: A Strategy for smart, sustainable and inclusive growth.

Amongst its five objectives, which relate to employment, education, research and innovation, social inclusion and poverty reduction, and climate change/energy, the factors of greatest environmental relevance include limiting greenhouse gas emissions by 20 percent or even 30 percent compared to 1990 levels, creating 20 percent of energy needs from renewable sources, and increasing energy efficiency by 20 percent (the '20/20/20' climate/energy targets). Each EU Member State has adopted its own targets in these areas.

In addition, specific areas of action have been addressed through seven flagship initiatives, three of which are especially environmentally relevant.

The targets within Europe 2020 are interrelated: increased resource efficiency will improve competitiveness and foster job-creation; and investing in cleaner, low-carbon technologies will help the environment, contribute to fighting climate change and create new business and employment opportunities.

Seventh EU Environmental Action Programme

The proposed 7th Environmental Action Programme[5] sets out priority objectives to be attained (art. 192.3) in environmental policy in the context of the Europe 2020 Strategy. As part of the follow-up to the 2012 United Nations Conference on Sustainable Development described above, the new environmental action programme supports international and regional processes aiming to transform the global economy into an inclusive green economy in the context of sustainable development and poverty reduction.

Whereas many environmental challenges are global and can only be fully addressed through a comprehensive global approach, other environmental challenges have a strong regional dimension, which requires cooperation with neighboring countries. The programme foresees significant scope for reducing greenhouse gas emissions and enhancing resource efficiency in the Union. This will ease pressures on the environment and bring increased competitiveness and new sources of growth and jobs through cost-savings from improved efficiency, commercialization of innovations, and better management of resources over their whole lifecycle.

While progress has been made in the EU to decouple growth from greenhouse gas (GHG) emissions, resource use and environmental impacts, resource use is still largely unsustainable and inefficient, and waste is not yet properly managed. As a result, EU businesses are foregoing the significant opportunities that resource efficiency offers in terms of competitiveness, cost reductions, improved productivity and security of supply. Water quality

[5]European Commission (2012) Proposal for a DECISION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on a General Union Environment Action Programme to 2020 "Living well, within the limits of our planet" COM(2012) 710 final.

and air pollution levels are still problematic in many parts of Europe, and EU citizens continue to be exposed to hazardous substances, potentially compromising their health and wellbeing. Unsustainable land use is consuming fertile soils, with impacts on food security and the achievement of biodiversity targets. Soil degradation continues largely unchecked. Addressing some of these complex issues requires tapping into the full potential of existing environmental technology and ensuring the continuous development and uptake by industry of the best available techniques and emerging innovations. Rapid advances in promising fields of science and technology are also needed.

Reflecting recent policy developments, the proposed 7th programme is more strategic in nature than the 6th programme, re-clustering the previous four areas for action into three core thematic objectives:

- to protect, conserve and enhance the EU's natural capital;
- to turn the EU into a resource-efficient and more competitive low-carbon economy; and
- to safeguard EU citizens from environment-related pressure and risks to health and wellbeing.

In providing an overarching framework for environmental policy to 2020, the new programme should build on the EU Biodiversity Strategy to 2020, the EU climate and energy package, the Roadmap for moving to a low-carbon economy in 2050, the Roadmap to a resource-efficient Europe, and the Innovation Union Flagship Initiative

Thematic Programmes

The Programme implementation shall ensure effective respect for coherence and complementarities with EU's thematic programmes, such as:

- the Territorial Agenda of the European Union 2020 - Towards an Inclusive, Smart and Sustainable Europe of Diverse Regions (May 2011)
- Horizon 2020 - Framework Programme for Research and Innovation 2014-2020 (COM(2011) 809), LIFE +,
- Programme for the Competitiveness of Enterprises and SMEs 2014 – 2020 (COSME) (COM (2011) 834)
- the Roadmap for moving to a competitive low carbon economy in 2050 (COM(2011)112)
- the Roadmap to a Resource Efficient Europe (COM(2011) 572)
- Programme for the Environment and Climate Action (LIFE Programme) for the period 2014-2020 (PE-COS 70/13, 16103/13 ADD1).
- Erasmus for all

Coordination with other territorial, transborder or neighbourhood cooperation programmes: Among these programmes are:

Cross Border Programmes

Programme	Eligible Area
Greece - Albania IPA II CBC Cross Border Programme 2014-2020	Florina
Greece - Bulgaria IPA II CBC Cross Border Programme 2014-2020	Thessaloniki, Serres
fYROM – Albania IPA II CBC Programme 2014 – 2020	Pelagonia, Southwest

Transnational Programmes

Programme	Eligible Area
MED 2014-2020 Transnational Programme	Greece, fYROM
South East Gateway 2014-2020 Transnational Programme	Greece, fYROM
Balkan-Mediterranean 2014-2020 Transnational Programme	Greece, fYROM
Adriatic-Ionian 2014-2020 Transnational Programme	Thessaloniki, Serres, Kilkis, Pella

Interregional & ENPI Cross Border Programmes

Programme	Eligible Area
Interreg Europe 2014-2020	Greece, fYROM
ENI CBC programmes 2014-2020	Thessaloniki, Serres, Kilkis, Pella

Networking Programmes

Programme	Eligible Area
ESPON programme 2014-2020	Thessaloniki, Serres, Kilkis, Pella
URBACT Programme 2014-2020	Thessaloniki, Serres, Kilkis, Pella
INTERACT Programme 2014-2020	Greece, fYROM

Finally the CBC Programme will be in coordination with the following Greek Regional Operational Programmes:

Greek Regional Operational Programmes

Programme	Eligible Area
Central Macedonia 2014-2020 Regional Operational Programme	Thessaloniki, Serres, Kilkis, Pella
Western Macedonia 2014-2020 Regional Operational Programme	Florina

The CBC Programme GREECE – fYROM 2014-2020 will use specific mechanisms to highlight potential synergies, avoid duplication and identify fields where additional financial support

would be needed (a specific identification provided by the in-itinere evaluation of the relevant programmes, instruments and policies that represent an interest according to the orientations of the CBC Programme, etc.).

D. DESCRIPTION OF THE PROGRAMME

D.1Geographic coverage

The NUTS level III eligible regions in the Cross-border Cooperation Programme are the following:

Table 1:Eligible regions in the Programme area

GREECE		
NUTS III	**POPULATION**	**AREA (KM²)**
EL 134: P.U.FLORINA	56.374	1.924
EL 124: P.U.PELLA	151.747	2.506
EL 123: P.U.KILKIS	98.906	2.519
EL 126: P.U.SERRES	214.376	3.790
EL 122: P.U.THESSALONIKI	878.194	3.683
TOTAL IN GREECE	**1.399.597**	**14.422**
THE fORMER YUGOSLAV REPUBLIC OF MACEDONIA		
NUTS III	**POPULATION**	**AREA (km²)**
MK 005: P.U.PELAGONIA	233.952	4.717
MK 001: P.U.VARDAR	153.880	4.041
MK 004: P.U.SOUTHEAST	173.024	2.739
MK 003: P.U.SOUTHWEST	233.952	3.340
TOTAL IN fYROM	**794.808**	**14.837**
TOTAL ELIGIBLE AREA	**2.194.405**	**29.259**

D.2Interventions / projects as outputs during its implementation

The actions to be supported under the Thematic Priorities of the Programme and their expected contribution to the Specific Objectives are described below:

Table 2: Actions of the Programme

Priority Axis 1 "Development and Support of Local Economy"		
TP	**Specific Objective**	**Indicative Types of Interventions**
(a)	1.1 Promotion of employment and mobility of human resources	■ Initiatives to encourage support of unemployed and self employed or managers to innovation, creativity and entrepreneurship; ■ Awards on innovative ideas ■ University Students' mini-companies (competitions) ■ Business, guidance and counseling services (e.g. mentor support and business coaching, YE online portals and web sites, etc.); ■ Support to joint market initiatives and networking, incl. promotion and marketing campaigns for entrepreneurs. ■ Planning of integrated actions to support the creation of jobs and enterprises to promote tourism and protect environment in the cross border area ■ Networking of public services, authorities and nongovernmental initiatives for the exchange of know-how and the support of employment and entrepreneurship
	1.2 Improvement of health and social investments and services for the support of vulnerable population groups	■ Cross-border initiatives aimed at combating poverty and social exclusion; ■ Mobile units to provide health and social care at rural areas for vulnerable groups, children and the elderly ■ Promotion of early childhood care and promotion of equal opportunities for mothers ■ Communities development initiatives to support social and family care; ■ Supporting vulnerable groups to participate in social life and promote towards the labour market those who are capable to work ■ Cross-border initiatives for promotion of health and well-being of young people; ■ Promotion of people's participation in social care ■ Preventive health programmes ■ Networking of services in order to create integrated family care and counseling ■ Supply of equipment for health care and social care centers
(d)	1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area	■ ICT facilities developed/upgrade; ■ Establishment of info-centers and/or kiosks to guide potential visitors; ■ Development of joint GIS platforms; ■ Joint actions on potential niche tourism activities and/or on the demand for new tourist destinations and experience; ■ Joint activities to identify tourist products with potential for cross-border branding; ■ Development of local brand/s based on natural, historical and cultural heritage of the region; ■ Support for the development of new and innovative touristic products and services to be delivered on sites; ■ Creating knowledge networks for tourism innovations in the border area; ■ Multi-lingual on-line touristic platforms;

Priority Axis 1 "Development and Support of Local Economy"		
TP	**Specific Objective**	**Indicative Types of Interventions**
		■ Visualization of local brands, incl. 3D visualization, mobile applications, social networks, tailor-made internet platforms, and other innovative tools; ■ Identification and application of best practices in tourism promotion; ■ Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.). ■ Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management; ■ Surveys on domestic and international demand for cross-border tourism experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

Priority Axis 2 "Protection of Environment - Transportation"		
TP	**Specific Objective**	**Indicative Types of Interventions**
(c)	2.1 Improvement of public infrastructures and reduction of isolation by improved access to transport, information and communication networks and services	■ ICT systems and equipment to improve check point services and facilities ■ Improving cross-border road access and mobility ■ Improving cross border custom and safety infrastructure and equipment ■ Improving energy efficiency of public buildings and infrastructure
	2.2 Sustainable management, treatment and recycling of wastes	■ Integrated management and volume reduction of solid wastes ■ Recycling and reuse of wastes ■ Treatment and reuse of municipal, industrial and agricultural wastes ■ Monitoring, early warning and decision support systems for the sustainable management of solid and liquid wastes
(b)	2.3 Sustainable management of protected areas, ecosystems and biodiversity	■ Sustainable management, conservation and restoration of protected areas, threatened ecosystems and species ■ Environmental education and awareness for the protection of the environment ■ Sustainable usage of ecosystems services ■ ICT systems for environmental protection, monitoring and management
	2.4 Prevention, mitigation and management of natural disasters, risks and hazards	■ Improving the operational efficiency of public administration and public services in natural disasters management ■ Mobilization of citizens and support of volunteering to increase disaster

Priority Axis 2 "Protection of Environment - Transportation"		
TP	**Specific Objective**	**Indicative Types of Interventions**
		resilience and emergency preparedness ■ Cross-border networks of co-operations for the effective prevention and management of natural disasters, risks and hazards ■ Development of early warning and disaster management systems

E. ALTERNATIVES

Directive 42/2001/CE in article 5(1) and article 9(1b) requires an analysis of the alternatives and a justification of choices made. Especially, according to Article 5 / par. 1 of the Directive 2001/42/EU "where an environmental assessment is required under Article 3(1), an environmental report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme are identified, described and evaluated."

The risk of significant negative effects means alternatives must be considered within the Programme to provide decision makers the opportunity to select options that will eliminate or reduce environmental impacts and will improve the global environmental footprint of the programme.

Alternatives have been considered in four ways:

- A baseline scenario "zero-solution" considers an absence of the Programme over the 2014-2020 period.
- Planning of the Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" based on the strategy of the current programming period (Current Situation).
- Development without a Core Strategic Planning (Unplanned Growth).
- Planned Growth based in a Core Strategic Planning (Planned Growth).

E.1Zero Solution

The first Alternative examined is the zero solution. Zero solution is assessed as the most unfavorable in general and environmental level for the following reasons:

- The non-implementation of the Programme will impede the real convergence with the developed regions of each country and the EU, with a negative impact on the economy, on the improvement of the living standards in the eligible areas, on the protection and enhancement of the natural and cultural wealth and on the improvement and protection of natural resources.
- The cooperation and contact between two neighboring countries will be diminished.
- It is opposed to the general principle of the EU for the cohesion and balancing of inequalities in governmental and regional level.

E.2 Alternative solutions

Alternative Solution 1: Planning of the Cross Border Cooperation Programme "Greece-the former Yugoslav Republic of Macedonia 2014-2020" based on the strategy of the current programming period (Current Situation)

In case at the current programming period it has been adopted the strategy and individual thematic priorities of the previous programming period, this would indicate failure to be in line with the current EU policies as defined in the Instrument Pre accession Assistance (IPA II), namely Regulation 231/2014and the Strategy "Europe 2020".

The planning in the frame of the new programming period imposes new objectives which would take into account all the data of economic, social and territorial development and the European and national policies of the two countries, the "Partnership Agreement for Greece for the period 2014-2020" and the "Country Strategy Paper 2014-2020 EU assistance to the Former Yugoslav Republic of Macedonia".

If the planning of the Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" is based on the strategy that have been used at the current programming period (current situation) this denotes that the input from the current situation analysis and needs and priorities addressed, the regulation and rules of the new programming period for territorial cooperation have been neglected.

Alternative Solution 2: Development without a Core Strategic Planning (Unplanned Growth)

In this option, the actions to be implemented within the framework of the Programme will be not in accordance with a main / core Strategy for the Development Planning. All the actions will be planned in an ad hoc basis. In this case it is possible to derive serious environmental problems after the implementation of actions concerning the disposal of solid and liquid waste, the water management and the construction of the road infrastructure. In this case the promotion of sustainable management of the environment and sustainable infrastructure will be neglected.

Alternative Solution 3: Planned Growth based in a Core Strategic Planning (Planned Growth)

The strategy of the Programme supports all the key funding priorities for the Greek Partnership Agreement 2014-2020, the Country Strategy Paper for the period 2014-2020 and all the European policies and priorities which are suggested for the Cross Border Cooperation Programme.

The strategy has ensured the coherence and continuity with the present programming period in order to improve the effectiveness of the effort in the cross border area.

The present alternative solution aims to address deficiencies and problems that haven't been adequately addressed in the previous programming period and to give greater emphasis on actions relating to sustainable development and quality of life.

The new planned growth aims to exploit the strengths and the advantages of the cross border area, to address the weaknesses, to create new opportunities for socio – economic and regional development and to face the risks.

E.3 Reasons for choosing alternative solutions

According to the above mentioned description of alternatives for implementing the CBC Programme, we conclude the following:

- Regarding the Zero Solution, the non-implementation of the Programme will impede the real convergence with the developed regions of each country, with a negative impact on the economy, the living standards of the eligible areas, the protection and enhancement of the natural and cultural wealth and the protection of natural resources.
- Regarding Alternatives1 and 2 these are rejected while the Alternative 3 is the best one for the needs and opportunities of the cross border area. The strategic approach

and the determined actions to be supported are quite broadly formulated. Improvement in the consideration of environmental issues is a question of addressing environmental orientation by more focused formulations and guiding principles for the selection of projects and monitoring.

The Programme aim at the exchange, testing and spreading of good practices and policies. So it is less important to focusing on particular issues like reduction of GHG-emission or resource efficiency, it is more important to linking the different topics reflected by the Priority Axes and to connect efforts related to genuine environmental topics like low-carbon and resource efficiency, protection of the environment and competitiveness of SMEs and to mutually capitalize the achievements in favor of main streaming environmental protection.

E.4 Environmentally documented reasons for selecting the proposed Programme

The objectives of the IPA II Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" fall within the **objectives of the European Union**, that, according to the article 8 of the Regulation (EU) 1303/2013 (General Regulation) undertakes(using the existing EU financial instruments – European Structural and Investment Funds) to promote sustainable development and protect and improve the environment, as specified in the articles 11 and 191, paragraph 1 of the TFEU, taking into account the 'polluter pays' principle, aiming at reducing the economic, social and territorial disparities, which have arisen particularly in countries and regions that are lagging behind in economic development, in conjunction with economic and social restructuring and the aging population. This EU activity incorporates, at national and regional level, the EU's priorities for sustainable development.

Consequently, the evaluation of the alternatives for the implementation and non implementation of the CBC Programme (zero solution), for the programming period 2014-2020,is based on criteria, which are related to the priorities of the EU in favor of sustainable development, protection and improvement of environmental quality, enhancement of economic growth, competitiveness and employment and social inclusion.

F. DESCRIPTION OF THE CURRENT ENVIRONMENTAL SITUATION

F.1 Atmospheric environment

GREECE

Air Pollution

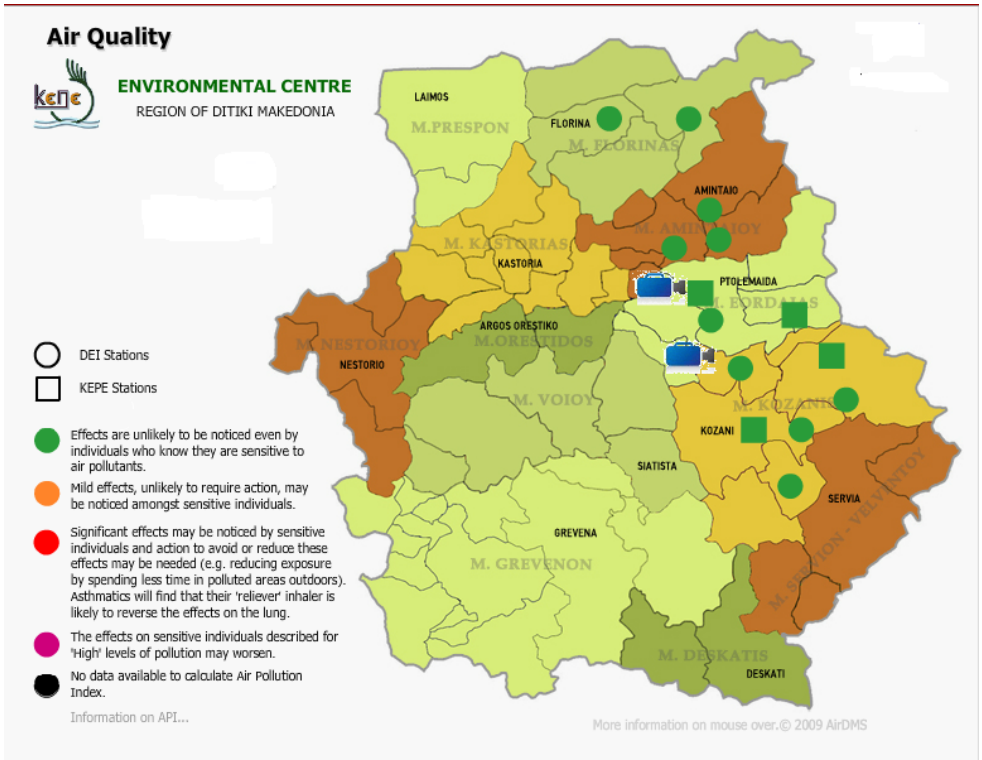
Following the economic and social development of the country, the sources of urban air pollution are mainly transport and central heating. The major challenges of transport in urban areas are the rising number of vehicles, their increased average age, and traffic congestion. Air quality problems from industrial sources mainly concern areas with thermo-electrical power stations and industrial units located close to residential areas.

Natural sources (e.g. transport of dust from deserts) and conditions (e.g. local topography and climatic conditions) also worsen urban air quality. Local meteorological conditions and topography have a major impact on air quality in coastal megacities (Athens and Thessaloniki) and contribute to the generation of air pollution episodes. Air quality is then strongly influenced by pollutants trapped due to thermal inversions caused from sea/land breezes and thermal internal boundary layers.

Exceedances of the mean hourly concentrations of nitrogen oxides and (8 hours limit) ozone target have been recorded mainly in major cities as Thessaloniki, while sulfur dioxide does not seem to be a problem with the exception of Western Macedonia (and Peloponese-Megalopolis). Exceedances of limits by Particulates concentrations seems to be a problem all around Greece.

Specifically, the air quality in the study area of Florina is monitored through two monitoring systems, one situated in Florina and one in Veyi which monitor the pollution of the atmosphere conditions. According to data reporting their effects in the atmosphere are shown in the map below, rarely observed effects even in sensitive population groups. According to reports in the winter months were frequent reports of elevated levels of micro particles in the air, emanating mainly from the burning of unsuitable wood stoves and fireplaces.

Map 2: Air quality of Western Macedonia



*Source:*www.**kepe**kozani.gr

Measurements in Florina showed that PM10 levels are quite high and it is estimated that there is an annual maximum and exceeded the 24 hour limit and therefore is the most important pollutant for the Region of Florina. The problem of exceeding the specified limits will worsen in the future due to more stringent limits set by EU regulation for particulate matter, therefore, power plants of Public Electricity Enterprise (DEI) should introduce better pollution control technologies to limit emissions.

The levels of SO_2 and CO are low, while the level of ozone is high compared to the limit.

Data on air quality in Central Macedonia are only for Grater Thessaloniki Area (TGA), where it operates a comprehensive network monitoring by the mid-1980s .

The Thessaloniki urban areas are among the most densely populated city in Greece, which suffered severe air pollution problems during the last decades, mostly related to PM_{10} levels. The air quality, combined with the strong hot season of the Mediterranean climate, is known to be one of the worse in Europe, especially in summer, and leads to serious sanitary concerns.

The interannual trend of SO_2 concentrations from all the available stations highlights the fact that there is a significant reduction, especially compared to the period 1990–1994. After 2001,

SO_2 concentrations have stabilized at considerably lower levels. This improvement is mainly due to de-sulphurization of fuels which resulted in the minimization of traffic-related SO_2 emissions. In the period 2000–2006 there were no exceedances of the SO_2 limit values set by Directive 1999/30/EC (the 1st Daughter Directive, DD).

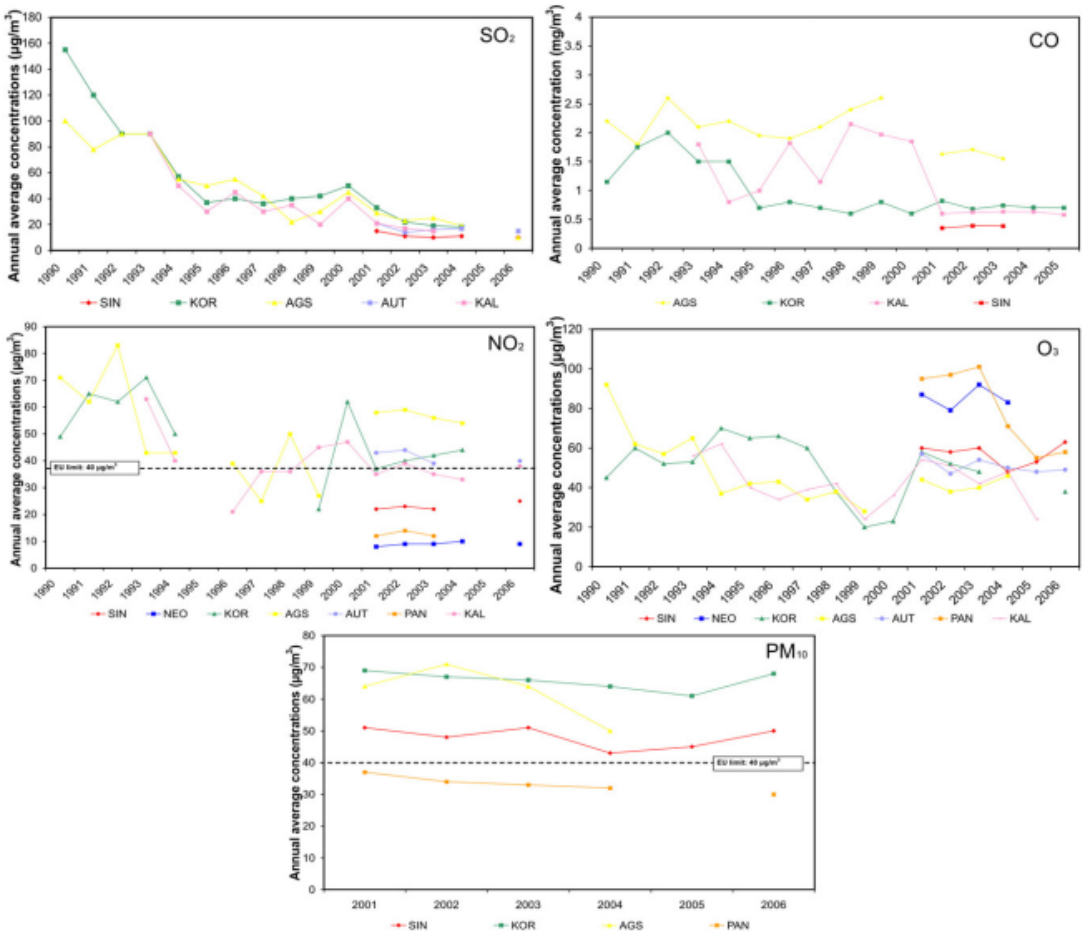
The interannual trend of CO concentrations from all the available stations indicates that since 2000 there is a significant reduction, especially compared to the period 1990–1999. This improvement is mainly due to the introduction of the 3-way catalyst converter which resulted in the minimization of traffic related CO emissions. In the 2000-2006 period the exceedance days of CO at the hotspot of Ag. Sofias Sqr. were much lower than the CO limit values set by Directive 2000/69/EC (the 2nd Daughter Directive, 2DD), which leads to the conclusion that CO does not constitute anymore a problem for the GTA air quality days of CO at the hotspot of Ag. Sofias Sqr. were much lower than the CO limit values set by Directive 2000/69/EC (the 2nd Daughter Directive, 2DD), which leads to the conclusion that CO does not constitute anymore a problem for the GTA air quality days of CO at the hotspot of Ag. Sofias Sqr. were much lower than the CO limit values set by Directive 2000/69/EC (the 2nd Daughter Directive, 2DD), which leads to the conclusion that CO does not constitute anymore a problem for the GTA air quality.

The highest NO_2 concentration levels are recorded at monitoring stations located in the "core" of the city centre, where road traffic frequently approaches saturation levels, such as at the Ag. Sofia Sqr. The interannual trend of NO_2 concentrations from all available stations points out that annual average NO_2 concentration levels have decreased since 1995. This reduction is not as significant as it should have been in order to achieve compliance with the annual limit value of 40 μg/m3 in specific micro-environments and hotspots. In other words, although catalyst technology has improved during the last years and NO_2 emission per vehicle is now lower, at the same time the number of vehicles has increased considerably over this period (5%–7% on an annual basis).

A stabilizing trend can be seen for O_3 levels during the period 2001–2006. Considerably elevated levels are observed at Panorama and Neohorouda, which are characterized as suburban and rural areas respectively.

The interannual trend of PM10 concentrations from all the available stations highlights the fact that in the city centre limit values set by 1DD for PM_{10} have been exceeded for a considerable number of days every year in the decade 1996-2006 during either summer or winter periods.

Table 3: Interannual variation of the annual average concentrations for SO2, CO, O3, NO2 and PM10 available measurements of the Air Pollution Monitoring Network of Central Macedonia Region



Data source: Air quality status in Greater Thessaloniki Area and the emission reductions needed for attaining the EU air quality legislation, N. Moussiopoulos, , Ch. Vlachokostasa, , G. Tsilingiridis, I. Dourosa, E. Hourdakisa, C. Nanerisa, C. Sidiropoulos, 2008

Greenhouse Gas

Assessment of short-term GHG trend (2009-2010)

The living standards[6] improvement, due to the economic development of the period 1990–2007, the important growth of the services sector and the introduction of natural gas in the Greek energy system represent the basic factors affecting emissions trends from Energy. The substantial increase of GHG emissions from road transport is directly linked to the increase of vehicles fleet but also to the increase of transportation activity. Emissions from industrial

[6] European Environment Agency

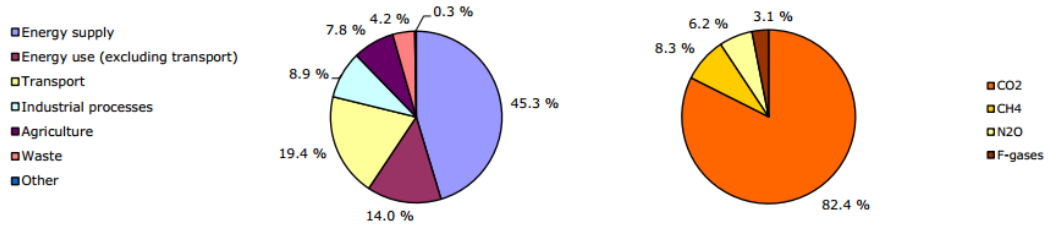
processes in 2008 accounted for 8.4 % of the total emissions (without LULUCF) and increased by approximately 10.69 % compared to 1990 levels. Intense fluctuation is observed mainly due to the cease of HCFC-22 production. Emissions reduction from agricultural sector is mainly due to the reduction of N2O emissions from agricultural soils, because of the reduction in the use of synthetic nitrogen fertilizers. Emissions have started levelling off since 2005.

Table 4: GHG trends and projection in Greece

GHG trends and projections in Greece — European Environment Agency

Key GHG data (1)	1990	2008	2009	2010	2011 (2)	2012	1990–2011	2010–2011 (2)
Average 2008–2012 target under the Kyoto Protocol (Mt CO_2-eq.)		133.7	133.7	133.7	133.7	133.7		
Total GHG emissions (Mt CO_2-eq.)	105.0	131.3	124.7	118.3	118.5	n.a.	12.9%	0.2%
GHG from international bunkers (3) (Mt CO_2-eq.)	11.2	13.3	11.4	11.0	n.a.	n.a.	n.a.	n.a.
GHG per capita (t CO_2-eq. / capita)	10.4	11.7	11.1	10.5	10.5	n.a.	1.0%	0.2%
GHG per GDP (constant prices) (4) (g CO_2-eq. / euro)	836	626	615	605	651	n.a.	-22.1%	7.6%
Share of GHG in total EU-27 emissions (%)	1.9 %	2.6 %	2.7 %	2.5 %	2.6 %	n.a.	37.0%	2.8%
EU ETS allocated allowances (free + auctioning)		63.7	63.2	64.6	74.6	n.a.		15.5%
EU ETS verified emissions - all installations (5) (Mt CO_2-eq.)		69.9	63.7	59.9	58.8	n.a.		-1.8%
EU ETS verified emissions - constant scope (6) (Mt CO_2-eq.)		69.8	63.6	59.8	57.0	n.a.		-4.8%
Share of EU ETS verified emissions (all install.) in total GHG (%)		53.2 %	51.1 %	50.7 %	49.6 %	n.a.		-2.0%
ETS verified emissions compared to annual allowances (7) (%)		109.7%	100.7%	92.7%	78.8%	n.a.		-15.0%
GHG emissions in the non-ETS sectors		61.4	61.0	58.3	59.7	n.a.		2.3%
Equivalent annual target for non-ETS GHG emissions		70.0	70.5	69.1	59.1	n.a.		-14.5%

Share of GHG emissions (excluding international bunkers) by main source and by gas in 2010 (1) (8)



Data source: European Environment Agency

Assessment of short-term GHG trend (2009-2010)

Greece showed the largest emission reductions within the EU (-5.1%) in 2010 compared to 2009. The significant decline in emissions was mainly due to fuel related emissions decreases in public electricity and heat, road transportation, manufacturing industries and households as well as process related emissions from cement production. This trend mainly reflects the continuing effects of the economic crisis.

Average 2008–2011 emissions in Greece were 15.2 % higher than the base-year level, well below the burden-sharing target of 25 % for the period 2008–2012.

In the sectors not covered by the EU ETS, emissions were significantly lower than their respective target, by an amount equivalent to 6.6 % of base-year emissions. LULUCF

activities are expected to decrease net emissions by an annual amount equivalent to 0.6 % of base-year level emissions. Taking all these effects into account, average emissions in the sectors not covered by the EU ETS in Greece were standing below their target level, by a gap representing 7.2 % of the base-year emissions. Greece was therefore on track towards its burden-sharing target by the end of 2011.

fYROM

Air Pollution

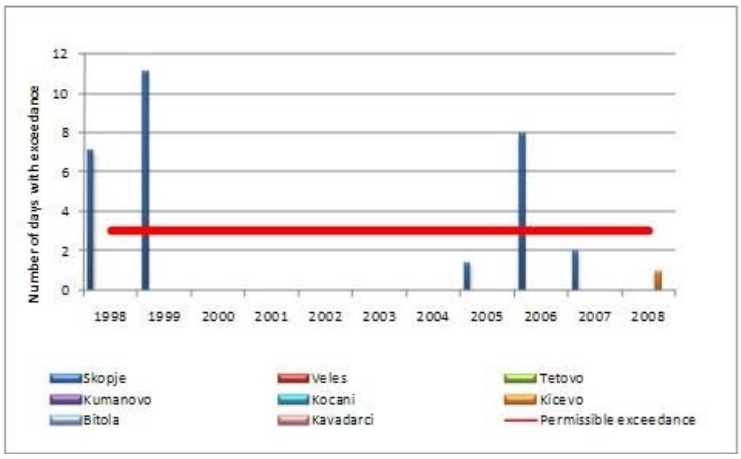
Information[7] indicates that the balance of the atmosphere has been disturbed over recent decades. Phenomena that are difficult to control continue, and huge amounts of pollutants are released into the air causing acidification, damaging the biosphere, affecting soil, etc., and are having negative impacts on human health and the environment. And man-made accidents such as oil leakages, industrial accidents involving emissions of toxic substances into the air and forest fires seem occur more frequently.

In 2008, the mean concentration of sulphur dioxide (SO_2) measured during the winter period was higher than the mean annual concentration at all measuring points. Mean annual SO_2 concentrations and mean winter period concentrations in excess of the limit values set for ecosystem protection were observed in major urban centres.

According to the available data, mean daily concentrations of SO_2 in excess of the limit value were observed in the City of Skopje only in 1998, 1999 and 2006 due to the operation of facilities for heat and energy production in the winter period, industry and heavy traffic. Such exceedances, however, were not found in fYROM cities in the eligible area of the Programme.

[7]Source: European Environment Agency

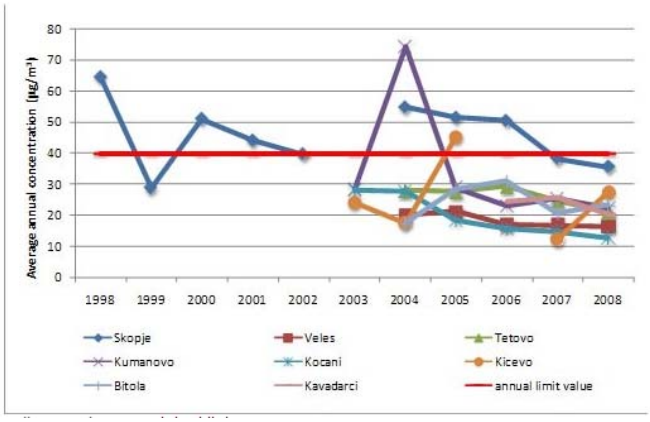
Figure 1: Number of days of SO_2



Data source: *http://www.eea.europa.eu/soer-draft/countries/mk/air-pollution-state-and-impacts-1/figure-1-number-of-exceedances-1 /view*

Regarding the annual average concentration of nitrogen dioxide exceedances were recorded in Kumanovo in 2004 and in Kicevo (eligible city) in 2005. This was probably due to high traffic density and the operation of industrial facilities. No exceedances were observed during 2007 and 2008 in the eligible area.

Figure 2: Annual average concentration of nitrogen dioxide



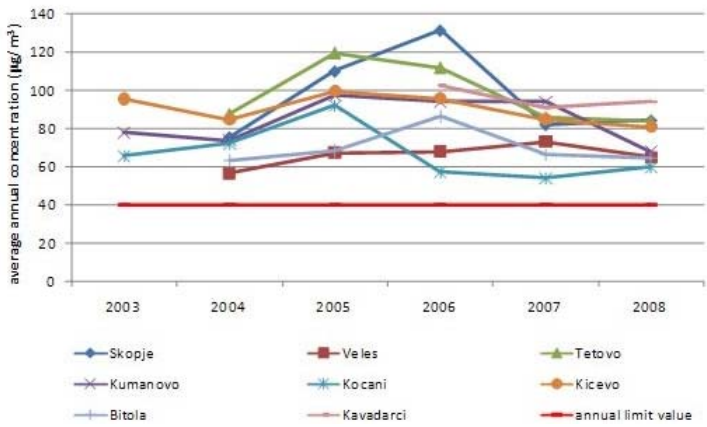
Data source: *http://www.eea.europa.eu/soer-draft/countries/mk/air-pollution-state-and-impacts-1/figure-1-annual-average-concentration-1/view*

In recent years measured concentrations of PM10 in urban areas exceeded the limit values for daily and annual mean concentration as a result of production processes, combustion processes in industry, production of electricity and heat, road transport and the building industry.

Most exceedances are observed in the autumn and winter, most probably due to increased traffic and fossil fuel combustion, to meteorological conditions and the topographic location of the cities.

Figure 3 shows that annual average concentrations of PM_{10} are exceeding the limit – a mean annual concentration of 40 μg/m^3 – in all cities where measurements are made.

Figure 3: Annual average concentrations of PM_{10}inthe fYROM



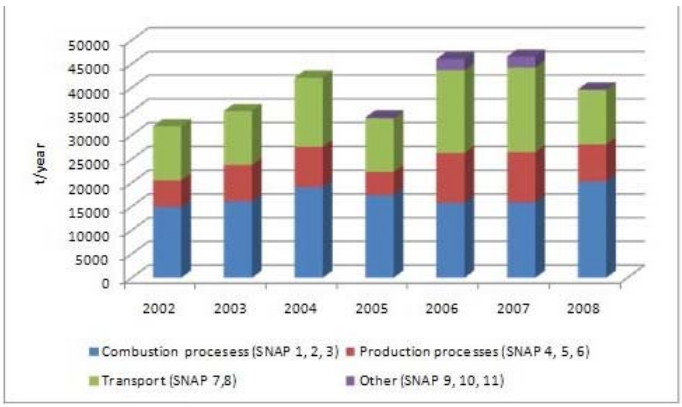
Data source: *http://www.eea.europa.eu/soer-draft/countries/mk/air-pollution-state-and-impacts-2/figure-3-annual-average-concentration-1/view*

With regard to emissions of nitrogen oxides (NOX), a varying trend was also seen in the period from 2002 to 2008, with falling emissions in 2005 and rising or almost constant trend in other years.

The highest contributors are electricity production, 35 %, and transport, 33 %, owing to poor quality of fuels and an obsolete vehicles fleet.

The drop in 2005 was due mainly to the reduced number and/or closure of production processes in metallurgy. Considering the instability of the transition period in the country, variations in the amounts of emission up to 2008 are not surprising. This, however, indicates that no continuous falling trend in the amounts of emission in the short or longer term can be achieved in the absence of specific measures and programmes for the reduction of polluting emissions.

Figure 4: NOx emissions by sector for the period 2002-2008 in the fYROM



Data source:http://www.eea.europa.eu/soer-draft/countries/mk/air-pollution-drivers-and-pressures/air-pollution-drivers-and-pressures/figure-7-nox-emission-by-1/view

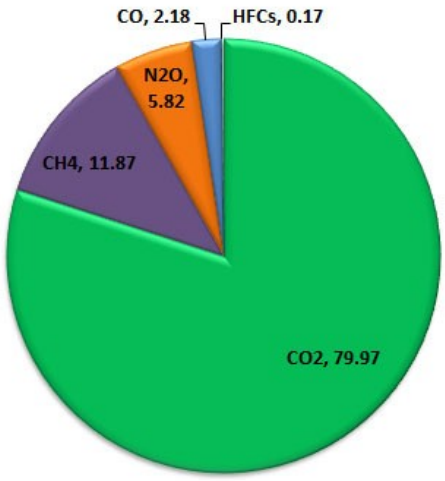
Total CO_2-eq emissions in the fYROM in the period 1990-2002 range from 11.9 to 14.4 Mt CO_2-eq .
Emissions in 2000 equaled 14.318 kt CO_2-eq or 7.16 t CO_2-eq per inhabitant.

Greenhouse Gas
Growth in GHGs emission has been noted only in energy sector (by 6%).
Falling trend in industrial processes and agriculture sectors is due to reduced activities of the national economy during the reporting period.

The main source of GHGs emission is the energy sector. The most significant among the key emission sources in the fYROM is the energy transformation sector, where the total emission actually originates from thermal power plants based on lignite.

GHGs emission for the period 1990-2002 had decreasing trend, namely by 35% in industrial processes sector and by 22% in agriculture, while it was variable in LUCF sector and unchanged in the waste sector.

Figure 5: GHGs contribution to total emission in 2000



Data source: *http://www.eea.europa.eu/soer-draft/countries/mk/climate-change-mitigation-state-impacts/figure-2-ghgs-contribution-to-1/view*

The major rise in the electricity-related emissions (absolute difference of 6,400 kt CO2-eq and 78% relative increase to the 2008 value) reflects the so-called black, lignite-based baseline scenario for the national power sector. Under baseline scenario, the other sectors also exhibit significant rise in the GHG emissions, as the 2025 values compared to the 2008 values are 75% (transport), 71% (heating and industry), 60% (agriculture) and 6% (waste).

F.2 Climate Conditions

GREECE

Region of Florina

The area of Florina has a cold continental climate, with long, cold, humid winters and short warm and dry summers. The mesoclimate of the area is affected by the presence of large mountains volumes and is characterized by significant inter-seasonal and diurnal difference, due to the high latitude and the morphology of area.

The mean annual temperature is 12.1 degrees Celsius and the mean annual relative humidity (RH) is equal to 69.2%. The mean minimum temperature during January is -3.5 degrees Celsius (RH 82.1%) whereas the mean maximum temperature during July is 28.8 degrees Celsius (Hellenic National meteorology Service).

Central Macedonia

In the region of Central Macedonia there are three main climate types, which differ considerably.

Mediterranean type (yellow areas)

In the Region of Central Macedonia this type of climate is found in the coastal zone and the lowlands (Thessaloniki - Serres). The plains of Thessaloniki and Serres climatically influenced by the presence of rivers, and coastal areas of Pieria affected a large part of the mountain of Olympus.

Continental type (green areas)

It is found in mountainous and semi-mountainous part of the region, as well as inland.

Mountain type (blue areas)

The climatic type is, the closer Medio-european retaining largely typical of the Mediterranean climate. The summer season at (Mediterranean climate) coastal areas lasts about 2.5 to 3 months from mid-June to early September. The higher temperatures are in July and August. The highlands have a long period of snow cover that lasts 3.5 to 4 months from the end of November to early April.

From temporarily available data by the Registry and Meteorological rain gauge stations in Greece, shows that the average annual rainfall in the water district of Central Macedonia ranges from 350 mm to 1000 mm approximately. The equivalent average annual rainfall for the region is estimated at 630 mm, which is considered lower than the national average - Tolikas, 1996

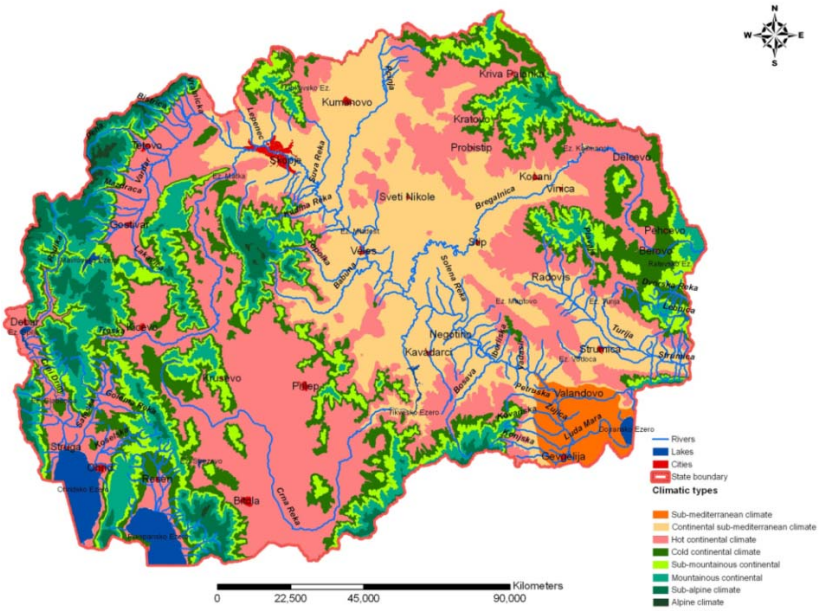
The intensity of the wind speed in Central Macedonia has a maximum during the winter and summer months and minimum in spring and autumn.

fYROM

Despite the relatively small surface of the fYROM, the climate varies significantly. There are five different types of climate:

- Sub-mediterranean area (50-500m)
- Moderate continental sub-regions (up to 600m)
- Warm continental forest continental mountain (600-900m)
- Subalpine area (1,650-2,250 m)
- Alpine area (>2,220m)

Map 3: Climatic map of fYROM



Data source: Quality ot the environment, Annual report 2012, Ministry of Environment and Physical Planning

A maximum air temperature of 44.8°C was recorded in Demir Kapija in July 2000, which was surpassed in July 2007, with 45.7°C recorded in Demir Kapija and 45.3°C in Gevgelija. A minimum air temperature of 30.4°C was recorded in Bitola in January 1993.

The largest annual sum of sunny hours, about 2,400, is in the central and southern part of Povardarie, with about 2,200 hours on the mountain massifs.

Precipitation is characterized by uneven spatial and temporal distribution across the country, due to the complex orography affecting the pluviometric regime during months, seasons and years. This distribution is accompanied by alternating periods of long droughts and high intensity rainfall, which contribute to soil erosion and land degradation.

According to the climate change scenarios developed under the National Communication on Climate Change, the Former Yugoslav Republic of Macedonia is in the group of vulnerable countries with significant mean temperature increases projected for the coming period.

Table 5: Climate, 2011, fYROM

Climate, 2011

Main meteorological stations	Average annual air temperature in Co	Annual precipitation in mm	Days with		
			Rain	Snow	Fog
Berovo	8.8	464.2	66.0	18.0	11.0
Bitola	11.5	381.3	95.0	20.0	22.0
Demir Kapija	13.8	391.8	72.0	11.0	59.0
Kriva Palanka	10.1	409.8	98.0	24.0	14.0
Ohrid	11.5	489.7	107.0	10.0	2.0
Prilep	11.6	399.7	89.0	21.0	10.0
Skopje	12.9	329.2	86.0	17.0	13.0
Shtip	12.9	310.1	79.0	17.0	10.0

Source: Hydro-Meteorological Service

F.3 Aquatic environment

GREECE

In Greece there are 14 River Basin Districts as it is shown in the following map:

Map 4: River basin Districts in Greece

The water district of Western Macedonia (13,624 km^2) is characterized by intense ground relief and small plains. The climate is continental with harsh winters and snowfalls and the mean annual temperature is 13^0C. The mean annual rainfall is 640 mm. This district has a sufficiency in water. A great part of the water demand is supplied by the transnational Small Lake and Big Prespa Lake, while the River Aliakmonas is used for the water supply of the city of Thessaloniki. The river basin of Aliakmonas has the largest area in the district (8,847 km^2 or65% of total) and the river is 93 km in length. Twenty-eight per cent of the total area consists of small watersheds. These watersheds, with an area that is less than 40 km^2, drain directly to the sea. They are characterized by ephemeral low flow and do not contribute to the water potential of the district. Another remarkable feature of this district is the production of hydroelectric energy from the utilization of the water potential of the River Aliakmonas.

The water district of Central Macedonia (10,171 km^2) has a deficiency in water resources; it has the second poorest water resources, the district of Attica having the worst. The mean annual temperature is 14^0C and the mean annual rainfall is 577 mm. The demand for water in urban and agricultural usage is high because the city of Thessaloniki is the second most important centre of industrial development after Athens, and the crop productivity of the district is high, the second in the country after Thessaly. The demand for water is mainly supplied by the adjacent Aliakmonas river basin, as well as from transnational water resources, the River Axios and Doirani Lake. The Axios river basin covers an area of1,644 km^2 and the river is 100

km long within the Greek boundaries. Other river basins with an area greater than 1,000 km^2 are those of Loudias and Gallikos. These basins cover 38% of the total area of the district. Small watersheds also account for 38% of the area.

fYROM

The hydrographical territory of fYROM is a unique natural basin in the Balkan Peninsula and wider area, due to 84 % of the available water being internal waters and only 16 % external. There are four river basins: Vardar, Crn Drim, Strumica, and Juzna Morava. The river basin areas of the River Vardar and River Strumica that flow towards the Aegean Sea cover 86.9 % of the total territory of fYROM.

The eligible area of the Programme is covered by the three river basin districts Vardar, Crn Drim and Strumica. Vardar basin which is shared between former Yugoslav Republic of Macedonia and Greece covers almost the entire country of fYROM and outflows into the Aegean Sea (Mediterranean Sea) at Thermaikos Gulf (Greece).

The main river of the area is the cross-border Axios/Vardar River.

There are three major natural lakes in the eligible area: Ohrid, Prespa, and Dojran, all three of which are shared with neighboring countries. They are also part of the eligible area. According to the Second Assessment of Transboundary Rivers, Lakes and Groundwaters (UNECE, 2011), abstraction of water in Prespa Lakes basin and Ochrida Lake basin throughout the two basin puts a pressure on natural ecosystems.

Table 6: Largest natural lakes in the fYROM

Name	Surface area, Km^2	Attitude, m	Maximum depth, m
Ohrid	349(1)	693	286
Prespa	274 (2)	853	54
Dojran	43(3)	148	10

(1) 118,9 Km^2 belong to Albania

(2) 49,4 Km^2 belong to Albania and47,8Km^2 to Greece

(3) 15,6 Km^2 belong to Greece

Data source: Geographical Institute at the Faculty of Natural Sciences and Mathematics

Of the 4,414 springs that exist in the country, only three are located in the area of the middle flow of the Vardar, the others are in the western regions. Only seven springs with very small yields have been registered in the eastern part of the country.

The annual available water resource is about 3,150m^{3}per person, putting the country in the middle category of European countries in terms of available water resources. This quantity is close to the limit threshold of water resources needed for sustainable development.

Water users are irrigation with 44%, then nature (minimum accepted flows) with 31%, followed by industry with 14% and drinking water supply for the population and tourists only 11%.

Total water demand is divided between the river basins: the largest current demands are in the main basin in the country – the Vardar basin, 79 %, then the Crn Drim basin, 12 % and Strumica basin 9 %.

Map 5: River basin districts in the Former Yugoslav Republic of Macedonia

Data source: *http://www.eea.europa.eu/soer-draft/countries/mk/freshwater-why-care-macedonia-the/map-1-river-basin-districts-1/view*

The main area of higher biological oxygen demand (BOD) concentration is in the catchment of Vardar river, the main river basin in the country and in the eligible area.

A trend of rising BOD5 and ammonium concentrations was tracked in the rivers in the fYROM at certain measuring points in the period 1988-2008. Eutrophic status with high BOD was particularly recorded in two rivers: Crna Reka and Vardar. These results could reflect the status of inefficient treatment of urban and industrial wastewaters in the country, as well as the inadequate protection of river basins.

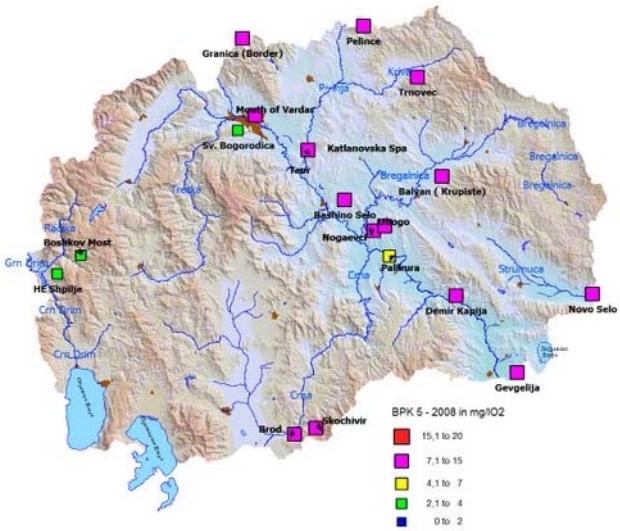
Among the main reasons for the poor river water quality are also solid waste and wastewater discharge from almost all settlements.

The same applies to the concentration of nitrates and orthophosphates which are still at a high level with no substantial changes.

On the other hand, there has been well-documented improvement in the quality of bathing waters and also an improvement in drinking water quality.

During 1988-2006, the rising trend in BOD 5 and concentrations of ammonium in rivers were tracked at certain measuring points in the former Yugoslav Republic of Macedonia. In the Crna Reka and Vardar, eutrophic water status with a high BOD value was recorded. These results could reflect the inefficient treatment of urban and industrial wastewaters, as well as inadequate protection of river basins. The annual mean concentrations of nitrates and orthophosphates were relatively stable during the analyzed period, 1988-2006. Increased annual mean values of these were, however, recorded at certain points in the River Vardar.

Map 6: BOD concentration in rivers, fYROM



Data source: http://www.eea.europa.eu/soer-draft/countries/mk/freshwater-state-and-impacts-macedonia/map-2-bod-concentration-in-rivers-1/image_view

Throughout the observed period, the Ohrid lake sustained its oligotrophic nature with relatively stable concentrations of phosphorus and nitrates with annual mean concentrations below 0.015 mg/l and 0.55 mg/l respectively. Unfortunately, more recently the situation has been getting worse and is expected to show in the level of eutrophication. Significantly higher concentrations were found in the waters of the Prespa lake, where the content of organic matter has reached a high level, increasing the risk of eutrophication.

The total quantity of water abstraction in the country is decreasing, especially from surface waters.

The decreased quantity of surface and ground water abstracted for industry may be an indirect sign of the industrial crisis in the country, but even current industry is still the biggest user of groundwater. As per the spike in 2004 it should be emphasized that this was hydrologically a very reach year which among others resulted with a substantial increase of the quantities of water abstraction especially by the Manufacturing industry and the area of production of electricity. As a consequence of this, the water quantities lost during the transport also were increased in 2004. Public water supply is still the highest user.

F.4 Natural – geographical characteristics

The cross-border region combines favorable natural resources (mountains, forests, lakes, biodiversity, unique natural forms, geothermal and mineral waters, waterfalls) and favorable climate conditions.

The surface of cross-border region of collaboration between Greece - fYROM covers extent 29,259km². The department, which belongs in Greece constitutes the 8% of total surface of Greece, while the department that belongs in the former Yugoslavian Republic of Macedonia constitutes the 39,7% of its surface respectively. The eligible Programme's area enjoys the benefits of having a vast, varied and mostly unspoilt natural environment. The region has a rich mixture of natural heritage in the form of flora and fauna, rivers, lakes, wetlands, grasslands, agro-ecosystems and forests.

The main characteristics of the programme area along the borderline are the Prespa Lakes with the adjacent plains of Florina and Resen in the west, the mountain range of Voras/Nidze reaching up to 2.560m(constitutes a natural borderbetween the two states) , the Axios/Vardar Valley, the Doirani/Dojran Lake and Beles/Belasica mountain range, reaching up to 2.029m in the East. In the south the Gulf of Thermaikos and the Axios/Vardar plain and Delta dominate.

The area has fossil fuel reserves in Florina (lignite) and significant deposits of decorative rock (granite, marble, bauxite) as well as mineral and thermal springs..

The main river of the area is the cross-border Axios/Vardar River. The river basin which is shared between former Yugoslav Republic of Macedonia and Greece covers almost the entire country of fYROM and outflows into the Aegean Sea (Mediterranean Sea) at Thermaikos Gulf (Greece).

In the eligible area there is the transboundary Lake Dojran/Doirani and also a small part of the Struma/Strymonas River Basin, although the Struma/Strymonas River is typically considered to be shared by Bulgaria and Greece. The Prespa Lakes basin, and the Ochrida Lake basin are also part of the eligible area. Ohrida Lake is the deepest natural lake in the Balkans, 285 m.

In the eligible area there are numerous protected areas under International Conventions, European Directives and National legislative frameworks. The mountains of the area are rich in flora and fauna and there is a large number of protected areas.

From Greece's side, the eligible region includes two administrative units in level of Regions, i.e. Central and Western Macedonia, four units in level of Prefectures, i.e. Florina, Thessalonica, Kilkis, Pella and Serres. In the former Yugoslavian Republic of Macedonia, the region includes four units in level of Prefectures, 12 regions (teams of municipalities) in level NUTS IV and 27 units in level NUTS V(municipalities).

F.5 Biodiversity - Flora – Fauna

In the eligible area there are numerous protected areas under International Conventions, European Directives and National legislative frameworks. In 2000 was declared the creation of the transnational Prespa Park, under the auspices of the Ramsar Convention.

GREECE

As a result of complex geographical relief and, until recently, mild human activities, Greece possesses great biological diversity, both at the species and ecosystem levels. There are twenty-five habitat types, the most important of which are maquis, phrygana, wetlands, and forest habitats. With the longest coastline in the Mediterranean, marine and coastal habitats are also very important to Greece. In spite of the fact that the largest part of the biodiversity of Greece at the species and genetic levels remains unidentified, existing data show clearly that it is especially high with regard to wild fauna and flora and the genetic resources related to agriculture and food products. While 15,000 animal species have already been recorded, it is estimated that there are approximately 50,000 animal species, of which up to 25% are endemic. Similarly, there are over 5,500 species of plants, of which over 1,000 are endemic. There are approximately 700 animal and 900 plant species protected by law, but only few have specific management measures in place. Because of its high level of endemism and because it comprises one of the last refuges of many threatened, endangered and rare species on a European scale, Greece is an important area for the European and the Mediterranean fauna and flora.

In terms of biodiversity, Greece is one of the richest countries of the European Union. Its diverse features, ranging from high mountains to the deepest waters of the Mediterranean - including a 16,000-km-long coastline and some 10,000 islands - combine with a variable climate generating a great range of habitat niches and a spectacular flora and fauna.

Greece hosts some 6,600 taxa of vascular plants with the highest number of endemics in Europe (approximately 1,450 taxa, which are 22% of the total indigenous flora).

The fauna comprises 115 mammal species, 12 of which are marine, 446 bird, 22 amphibian and 64 reptile species. Moreover, 162 freshwater and 476 marine fish species are hosted in Greece's waters. Some 30,000-50,000 invertebrates are also present, exhibiting a very high degree of endemism, exceeding 50% in some groups.

At present, the Natura 2000 network consists of 425 sites, covering around 4,200,000 hectares, which represent 27.2% of the total land and 6.1% of the total marine area of the country.

Greece with its rugged mountainous relief (42 summits over 2,000m), its complex geology and the numerous islands and convoluted coastline (longer than the perimeter of France) presents a great diversity of natural scenery. In addition, the remoteness of some biotopes has led to the evolution of many endemic and rare animal and plant species. Equally interesting is the great variety of meteorological conditions that vary from dry semi-arid, semi-desert of SE Crete to the cold, humid continental climate of Rhodope mountain range bordering the Northern shores of the Aegean Sea.

The variety of the meteorological conditions combined with the geomorphological features reflects the rich flora and fauna. The diversity of the vegetation is evident by the large number of different habitats.

In 1992 the Rio Convention and the EU Directive 92/43 were designed to confront the threat of extinction of many species and the deterioration of the worlds' habitats. The EU Habitats Directive 92/43 was incorporated into Greece's national legislation by the Joint Ministerial Decision 33318/3028/1998. The main aim of the Directive is to promote the maintenance or restoration of biodiversity, taking account of economic, social, cultural and regional requirements. The natural habitat types and the species are listed in Annexes I and II of the Directive. The backbone for the conservation and protection of the of the natural environment is the creation of a European ecological network of protected sites named NATURA 2000. The network, which will be under a special management committee consisting of representatives of the member states.

To achieve the goal for the identification and evaluation of biodiversity, the Directive was implemented in Greece in 1994 by a national project titled "Inventory, Identification, Evaluation and Mapping of the Habitat types and Flora and Fauna species in Greece". The creation of the NATURA 2000 network, to which Greece is committed, will assist in the protection of endangered species and their habitats by ensuring their restoration and maintenance at a favorable conservation status.

Apart from protected areas primarily related to wetlands, the forests and mountains, there are many valuable and sensitive ecosystems. These are located throughout the region and are critical water recipients and transitional waters, such as the Thermaikos bay that receives significant and diverse anthropogenic pressures. The suburban forests are of particular importance for the ecological balance of urban areas and the quality of life, small coastal wetlands , the streams of the coastal area and the rural area is a habitat of a large number of species of fauna.

In Region of Central Macedonia there are also the five main vegetation zones in which Greece is divided. This abundance is due to large fluctuations of factors that affect the configuration. The climate, the existence of the sea and along the strong orographic configuration, the effect of rivers and lakes in the microclimate, the geology and soil composition, and the effect of living of the large number of the species and humans.

The Western Macedonia is recognized for its diversity and the complexity of the geological and geomorphological background. These characteristics form a unique landscape with

sloping sides and large height differences. The characteristic landscape formed by the valleys of the main rivers, which form smaller branches that are traversed by an equal number of tributaries and streams, often with particular ecological characteristics. Consequently, there is a complex of habitats, which corresponds to varied ecosystems.

Flora

The Greek flora has a particular high species diversity. According to the research so far is estimated to contain more than 6,900 taxa (ie species and subspecies), of which about 1,350 are endemic (endemism rate 19%). The abundance of species, but also the configuration polymorphs plant communities is the result of the influence of several parameters such as morphology, climate, human influence, the isolation regions etc.

The Western and Central Macedonia regions host a variety of vegetation formations from sea to alpine level including wetland and coastal vegetation, evergreen and deciduous shrubland and forests, riparian forests, dry and wet grasslands and meadows.

The area counts among the most forested in Greece, holding ca. 25% of the total Greek forest cover (Voulgaris et al., 2010). Among the evergreen forests, interesting formations are at the montane and subalpine levels the Pinus nigra forests, a European priority habitat, and the Balkan Pinus heldreichii and Abies x borisii-regis forests.

Interesting deciduous forest formations include the Fagus sylvatica forests and mixed broad-leaved forests dominated by oaks (Boratynski et al., 1992; Strid & Tan, 1997; Phitos et al., 2009). Riparian forests and galleries develop along rivers and streams with permanent or seasonal flow and are mostly dominated by Salix alba, Populus alba, Platanus orientalis and or Alnus glutinosa (Dafis et al., 2001). Grasslands and meadows, especially at the montane, subalpine and alpine levels host numerous rare, endemic and endangered plant species (Strid & Tan, 1997).

Fauna

According to the Red Book in Greece there are recorded more than 23,120 species of land and fresh water, 3,500 species of sea and according to an assessment the fauna counts about the 30,000 species (of which 92% arthropods). Macedonia is considered the richest in terms of species. This variety is due to the number of habitats, abundant presence of aqueous component and the existence of mountains that offer refuge to species. For many of the species Central Macedonia is one of the last fauna places not only to the Greek territory and internationally, while there are also several endemic species that living in the Region.

The wetlands of Central Macedonia are vital sites for breeding, wintering and migratory passage of many bird species, while the tops of the mountains and valleys are particularly important for the welfare of raptors. According to the database of the network Natura, in Central Macedonia (SPA and SPA) are recorded 276 bird species of which 127 species are

included in the European list of interest, and many more are identified as threatened or vulnerable at national level.

The water systems of the Western Macedonia Region are characterized by the diversity of the fish fauna and the specificity of amphibians. In Aliakmona, for example, is estimated to live 20 to 25 species of fish. Of these species, six are considered threatened while two of them are protected by Community legislation. The diversity of the fish fauna of Aliakmona considered high compared to other rivers and ecosystems include species that have limited global distribution and are strictly protected. Also, in small lakes in the mountains recorded abundance of reptiles and amphibians, such as the rare alpine newt.

Sites of the NATURA 2000 network in Greece

Greece includes at its National List **241 Sites of Community Importance (SCI)** according to the EU Directive 92/43 and has declared **202 Special Protected Areas (SPA)** according to EU Directive 79/409. The boundaries of each site have been defined and displayed in maps on topographic background (scale 1:100000) and Standard Data Form has been completed with data on natural habitats and species of community importance.

The sites of the NATURA 2000 In the eligible area are presented in the following table:

Table 7: Sites of the NATURA 2000 In the eligible area - Greece

Code	Category	Protected Sites	Extent (ha)
THESSALONIKI			
GR1220001	SCI	LAKES BOLBI KAI LAGKADA	26,947.81
GR1220002	SCI	DELTA OF AXIOS-ESTUARY OF LOUDIA-DELTA OF ALIAKMONA	33,676.35
GR1220003	SCI	RENTINA	2,905.16
GR1220005	SCI/SPA	LAGGON OF AGGELOCHORI	377. 2
GR1220009	SPA	LAKES VOLVI AND LAGKADA	15,671.24
GR1220010	SPA	DELTA OF AXIOS-LOUDIAS-ALIAKMONAS-SALTMARSH OF KITROS	29,647.09
GR1220011	SPA	LAGOON OF EPANOMI	689.4
GR1220012	SCI	LAGOONOF EPANOMI & MARINE COASTAL ZONE	830.38
KILKIS			
GR1230001	SCI	LAKE PIKROLIMNI	1,089.35
GR1230002	SCI	FOREST MOURION	774.92

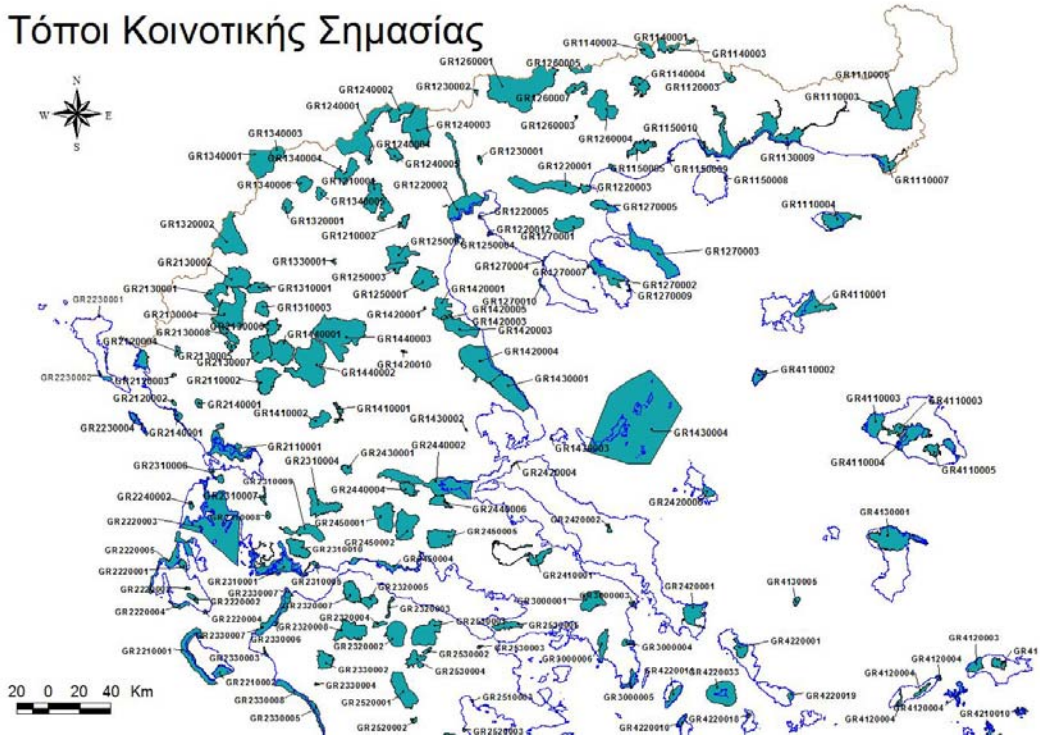
Code	Category	Protected Sites	Extent (ha)
GR1230003	SPA	LAKE DOIRANI	2,126.12
GR1230004	SPA	LAKE PIKROLIMNI-XILOKERATEA	2,012.31
PELLA			
GR1240001	SCI/SPA	TOPS MOUNTAIN VORA	40,435.09
GR1240002	SCI/SPA	MOUNTAIN TZENA	12,576.93
GR1240003	SCI	MOUNTAIN PAIKO	35,252
GR1240004	SCI	LAKE AGRAS	1,249.75
GR1240005	SCI	APSALOU-MOGLENITSAS	6,110.57
GR1240006	SPA	LAKE & DAM AGRAS	1,385.76
SERRES			
GR1260001	SCI	LAKE KERKINI- KROUSIA - TOPS MOUNTAIN BELES, ANGISTRO - CHAROPO	78,303.96
GR1260002	SCI/SPA	ESTUARIES OF RIVER STRYMONA	1,297.1
GR1260003	SCI	AI GIANNIS-EPTAMYLOI	327.29
GR1260004	SCI	TOPS MOUNTAIN MENOIKION - MOUNTAIN KOUSKOURAS - YPSOMA	23,288.69
GR1260005	SCI	TOPS MOUNTAIN ORVILOS	4,871.04
GR1260007	SCI	MOUNTAIN VRONTOUS-LAILIAS-EPIMIKES	6,799.47
GR1260008	SPA	ARTIFICIAL LAKE KERKINIS - MOUNTAIN KROUSIA	27,712. 64
GR1260009	SPA	VALLEY TIMIOU PRODROMOU - MENOIKION	26,513.82
GR1260010	SPA	MOUNTAIN BELES	25,310.84
FLORINA			
GR1340001	SCI/SPA	NATIONAL PARK PRESPON	26,613.06
GR1340003	SCI/SPA	MOUNTAIN VARNOUNTA	6,076.62
GR1340004	SCI	LAKES VEGORITIDA-PETRON	12,569.02
GR1340005	SCI/SPA	LAKES CHEIMADITIDA - ZAZARI	4,064.39
GR1340006	SCI	MOUNTAIN VERNON-TOPS MOUNTAINI VITSI	8,202.13
GR1340007	SPA	LAKE PETRON	6,696.16

The distribution of "Natura 2000" / SPA sites in Northern Greece is shown in the following map.

Map 7: Natura 2000" / SPA sites in Northern Greece

The distribution of “Natura 2000” / SCI sites in Northern Greece is shown in the following map.

Map 8: Distribution of “Natura 2000” / SCI sites in Northern Greece



National Woodland Parks

National Woodland Parks are areas include mainly forests with special ecological and scientific interest. **Ten National Woodland Parks** have been declared under Law 996/1971, which is part of Law No. 86/1969 “On Forest Law”. Five of them are in the Greek eligible area.

Table 8: National Woodland Parks

Name of Site	Extent (ha)
National Woodand Parks (Law 996/71)	
National Woodand Park of Prespes	19.470
National Parks (law 1650/86)	
National Wetland Park of Lakes Koroneia - Bolbi and Macedonian Tempi	16.388
National Park of Lake Kerkinis	
National Park Axios - Loudias - Aliakmona	33.800
National Park of Prespes	32.700

Nature Preserve Areas Law No. 1650/1986 (art. 18 and 19).

Table 9: Nature Preserve Areas

Name of Site
Zone A2 (Macedonian Tempi) of National Wetlands Park of Lakes Koroneia - Bolbi and Macedonian Tempi
Zones PD1, PA2, PD3, NF4, PA, B1, B2, B3, B4, B5, B6 and B7 of National Park Axios - Loudias - Aliakmona
Zones B1, B2, B3, B4, B5, B6 and B7 of Prespa National Park

RAMSAR Sites

In the eligible greek area there are four wetlands of international importance according to the Ramsar Convention.

Table 10: Wetlands of International Importance according to the Ramsar Convention

Wetlands of International Importance according to the Ramsar Convention	
Code	**Name of Site**
3GR005	Lakes Bolbi and Lagada
3GR006	Artificial lake Kerkini
3GR007	Delta of Axios, Loudias, Aliakmonas
3GR008	Lake of Small Prespa

fYROM

The abundance[8] of ecosystems, habitats, communities and species places the former Yugoslav Republic of Macedonia at the very top of the list of countries with impressive biodiversity in Europe ('hot spot'). Based on the available scientific research, it has been established that several ecosystem types are present in the fYROM: wetland, shore, grassland, highland, steppe-like, forest and mountain, of which wetland, dryland/grassland, forest and mountainous are the key ecosystems. More than 260 flora communities have been recorded with dominance of grass and forest communities. Species diversity is represented by more than 16 000 taxa of wild flora, fungi and fauna. The fact that more than 900 regionally endemic species, among which 850 are truly endemic, exist in the former Yugoslav Republic of Macedonia is of particular importance.

Two bio-geographic regions can be distinguished: continental and Alpine, and one sub-region: sub-Mediterranean. Depending on the location and height above the sea level, eight climatic

[8]Source:European Environment Agency – state and outlook

vegetation and soil zones are distinguished. Two areas are distinguished in the sub-Mediterranean belt: the sub-Mediterranean area – 50-500 metres above sea level (masl.) – covering a surface area of 800 000 ha and the continental sub-Mediterranean area – 501-600 masl – with an area of 97 000 ha, more 35 % of the sub-Mediterranean belt. Four areas are distinguished in the continental belt: the hot continental area of 601-900 masl with a surface area of 740 000 ha, 27.4 % of the total; the cold continental area of 901-1 100 masl with a surface area of 342 000 ha, 13.3 % of the total; the lowland mountainous area of 1 101-1 300 masl with a surface area of 250 000 ha, 9.7 of the total; and the mountainous continental area of 1 301-1 650 masl with an area of 269 000 ha, 10.4 % of the total. Two areas are distinguished in the Alpine belt: the sub-Alpine area of 1 651-2 250 masl with an area of 97 000 ha, 3.8 % of the belt and the Alpine mountainous area of more than 2 250 masl with an area of 13 000 ha, just 0.5 % of the total belt.

The main components of biodiversity in the fYROM have been determined in accordance with the international criteria of the Convention on Biodiversity (CBD). The status of preservation of ecosystems, habitat types and species have been analyzed by scientists in development of the Country Study for Biological Diversity of the fYROM (MEPP, 2003) and the National Strategy for Biological Diversity Action Plan (MEPP, 2004).

Flora

The number of vegetation communities in the Republic is high – more than 270. Forest wood communities dominate with more than 55 % of the total, followed by grass communities, lake and river vegetation communities, with swamp communities and temporal communities being the smallest areas. The analysis of the structure of forest communities shows that *Quercus coccifera* and *Caprinus betulus* communities are dominant – 35 %, followed by *Quercus pubescens* and *Caprinus betulus*– 27.5 %, *Quercus petraea* – 13.5 %, then highland beech (*Fagus silvatica*)- ,10.6 %, lowland beech (*Fagus silvatica*), 9.7 %, five-leaved pine (*Pinus peuce*) and Macedonian pine (*Pinus mugos*)- 3.8%.

Flora diversity of 7,486 species is dominated by more than 3,200 higher plants species, followed by algae – 2,169 species, fungi – more than 1,250 species, mosses – 398 species and lichens – 354 species. Other groups are represented by small numbers of species.

Wetland vegetation communities are represented in running and standing waters. Floating and submersed plant communities in the three natural lakes are of particular significance. Swamp plant communities have been preserved in a fragmentary form in major swamps and marshes. Thirteen swamp plant communities dominated by reed-mace, reed, and other species are especially significant

Uncontrolled anthropogenic activities have negative impacts on and continue to negatively influence the survival of ecosystems, habitat types and especially populations and spread of wild species. As well as by degradation of land and vegetation, threats are also induced by over-use of biological resources, mostly for commercial purposes. Thus, high number of indigenous medicinal plants and native fungi are under threat: *Orchis spp.*, *Gentiana lutea, Gentiana punctata,* bearberry (*Arctostaphylos uva-ursi) Adonis vernalis*, *Polipodium vulgare,*

Boletus pinikola, Boletus edulus, Boletus aereus, and Morchella spp. Among diatom algae (*Bacillariophyta*), more than 110 species are under threat. Among lichens, 12 species are under threat, as are 12 species of ferns and 20 species of mosses. Of native fungi, 67 species are under threat.

Fauna

Species diversity includes more than 16,000 wild species in several groups: bacteria, lichens, fungi, mosses, higher plants, invertebrate and vertebrate animals, 853 of which are endemic (Table 4).

Fauna diversity of 10,354 species is dominated by invertebrates, namely arthropods –8234 species, roundworms – 613 species and molluscs – 366 species. There are also 535 species vertebrates animals. There are 308 species and 20 subspecies of birds, 82 mammals, 78 indigenous fish species, 32 species and 8 subspecies of reptile and 15 amphibians species and 2 subspecies.

It is also notable that the number of endemic animal species, 602, is far greater than the number of endemic plant species – 251.

For fauna diversity, groups of day butterflies, stream crab and crayfish, river and lake shells, and 115 vertebrate species are also under threat. The most endangered group among the last of these is fish of which as many as 30 native species are threatened – Macedonian stream trout (*Salmo macedonicus*), Pelister trout (*Salmo peristericus*), Pelagonian trout (*Salmo pelagonicus*), Ohrid trout (*salmo letnica*), Struga trout (*Salmo balcanicus*), Prespa bleak (*Alburnus belvica*), Prespa barbell (*Barbus prespensis*), Macedonian barbell (*Barbus macedonicus*), Prespa minnow (*Pelasgus prespensis*). The Prespa carp (*Ciprinus carpio prespensis*) is critically threatened as are Stream and lake crayfish and Macedonian sand-hopper. Due to illegal collection, populations of terrestrial snails – the edible snails *Helix pomatia* and *Helix figulina*; terrestrial turtles – the spur-thighed tortoise (*Testudo graeca*) and Hermann's tortoise (*Testudo hermanni*); aquatic turtles and nose-horned viper (*Vipera ammodytes*) have been affected, and the sharp-headed viper is under threat. As a consequence of poaching, more than 60 bird species are threatened, including six species of birds of eagles and vultures. Among mammals, bats, lynx, otter and badger are under threat.

Protected Areas

Protected areas occupy around 8.7 % of the national territory. The majority of them are national parks – around 4.4 % of the national territory – followed by monuments of nature at around 2.5 % and the Jasen multi-purpose area of around 1.1 % of national territory. A relatively small area of 0.5 % is strict nature reserves, the smallest being around 0.1 % of the fYROM. Each landscape category has outstanding natural characteristics and individual flora and fauna species.

By World Conservation Union (IUCN) category, the fYROM's protected areas are as follows:

Category I: Strictly Protected Natural Reserves. The fYROM has two strictly protected natural reserves:

- Ezerani, on Prespa Lake, with 2,080 ha, a wetland area. Biodiversity is represented mainly by swampy and grass vegetation and water birds.
- Tikves, in the gorge of Crna Reka with 10,650 ha. Biodiversity is represented by hilly and mountainous dendoflora, birds of prey, water birds, and animals.

Category II: National Parks. Natural parks are the largest area of protection, covering 108,338 ha. These are all in forested, mountainous areas:

- Mavrovo, with 73,088 ha, was declared a park in 1958. Some 27,000 ha are forested. It is estimated to include more than 1,000 types of higher plant forms, about 100 (or 10 percent) of which are extremely rare and which are endemic to the Balkans. Mavrovo is also home to over 100 brown bears and other fauna.
- Galicica, with 22,750 ha, is situated between Lake Ohrid and Lake Prespa and was declared a park in 1958. The vegetation in this park is particularly rich with 19 different forest communities and several extremely rare types of flora.
- Pelister, with 12,500 ha, the oldest national park — was established in 1948. The park gets its name from the five-needle Molica (Pelister or Macedonian) pine, the only such variety in the world, and covers approximately 1,600 ha — the largest concentration of this Balkan endemic (which also has a small population in Bulgaria). Pelister is also home to over 27 brown bears and other fauna.

Category III: Natural Monuments. Natural monuments occupy 58,084 ha. Biological diversity within the natural monuments is mainly represented by aquatic flora and fauna species (in water ecosystems), grass, swampy, hilly and mountain flora, fungi, and fauna.

These include the three glacial lakes:

- Ohrid Lake with 23,000 ha
- Prespa Lake with 17,680 ha
- Dojran Lake with 2,730 ha

Map 9: Protected areas in the fYROM

Ramsar Sites

The Ramsar List of wetlands of international importance includes Prespa Lake (1995) and Dojran Lake (2008). The responsible authority for coordination of activities for protection of the natural heritage and biological diversity conservation are MEPP and the National Ramsar Committee.

Balkan Green Belt

Within the framework of the activities of the IUCN concerning the initiative for establishment of the Balkan Green Belt, the fYROM's part of the green belt was established in 2004 in its border regions with Bulgaria, Greece and Albania (Map 2).

The fYROM's Green Belt includes 11 protected areas: the three National Parks Pelister, Mavrovo and Galicica; three natural lakes, which are also Monuments of nature - Ohrid, Prespa and Dojran; a Strict nature reserve - Ezerani (Prespa Lake); Monuments of nature – Vevcani springs, Smolare waterfall, Kolesino waterfall; and a floral site - Majdan.

The goal of the initiative is to link the protected areas in South Eastern Europe to provide integrated protection of nature and biodiversity and promote cooperation between countries for the protection of natural heritage.

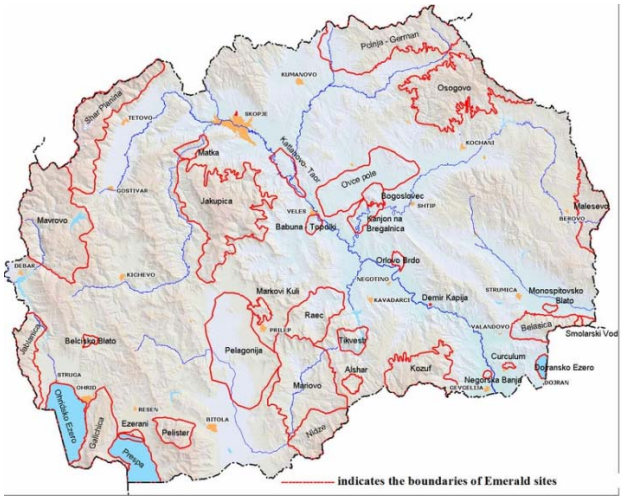
In total 42 areas have been identified in the Republic as the most important plant habitats (IPA), 77 sites as Corine biotopes, 14 important bird areas (IBA) and 8 important butterfly areas (ILA). Parts of the protected areas cover important plant habitats, the most important bird areas and important butterfly areas, and constitute part of Corine biotopes.

National Emerald Network

In accordance with the provisions of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern, 1979) and the Law on Nature Protection, four projects that aim to establish the National Emerald Network in the Republic were implemented between 2002 and 2008. This was an important enabling activity/mechanism for the establishment of a coherent European Natura 2000 network

Thirty-five sites have been identified in the National Emerald network of areas of special importance for conservation. Under the first project implemented in 2002-2003, three areas were identified: SNR Ezerani, NP Galicica and MN Dojran Lake, with a total area of 27 660 ha –3.6% of the total network. Under the second project implemented in 2004, three more areas were identified: SNR Tikves, NP Pelister, and MN Demir Kapija, with a total area of 28 000 ha –3.8% of the total network. Under the third project implemented in 2005-2006, 10 areas were identified with a total area of 144 783 ha – 19.1%, and under the fourth project implemented in 2008, 19 areas were identified with a total area of 556 447 ha – the remaining 73.5%. By this, the National Emerald Network comprises 35 sites covering 752 223 ha or 29 % of the Republic's territory.

Map 10: National Emerald Network in the fYROM



Data source: http://www.eea.europa.eu/soer-draft/countries/mk

F.6 Environmental Infrastructure

F.6.1 Wastewater management

GREECE

Greece is among the EU Member States that collect their waste water at very high level. The overall rate of population connected to wastewater treatment in Greece is 88%. The tertiary treatment in Greece has a rate around 80%. Greece Is ranked 4th among the EU countries.

Figure 6: Compliance results per member state in EU

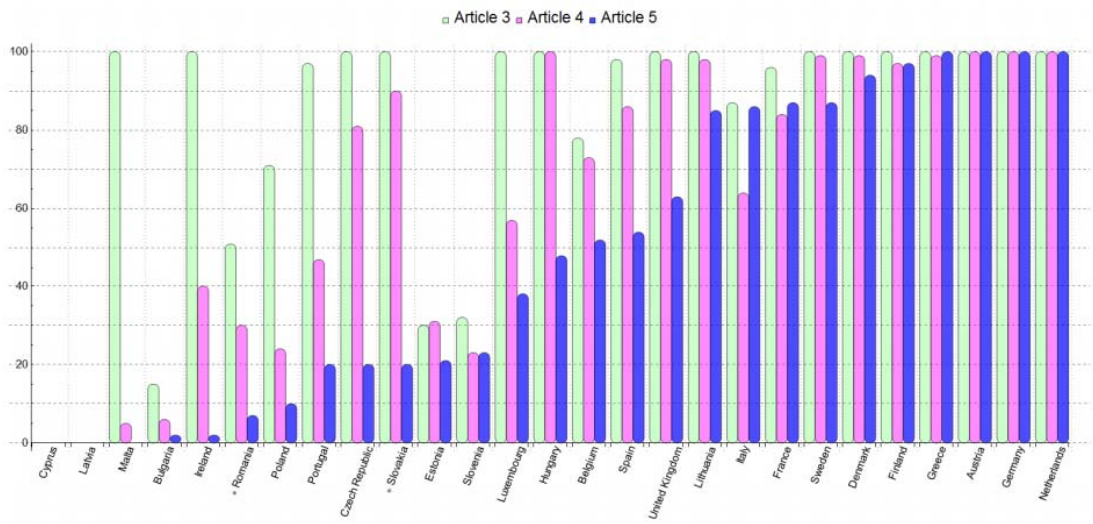


Figure 2:Compliance results per Member State regarding article 3 of the Directive (collection), in green, Article 4 (secondary treatment), in pink and article 5 (more stringent treatment), in blue. Countries are classified showing first those having lowest compliance levels for article 5, and then in increasing order of compliance. In Slovakia (art 5) and Romania (arts 3, 4 and 5), the concept "installations in place" is represented instead of compliance, as the deadlines for those articles had not expired yet by the reported year (figures on compliance were not requested, but MS reported the waste water collected and treated). In Cyprus and Latvia compliance results were equal to 0% because the collecting systems and treatment plants were not fully operational yet in the reported year(2009).; however, significant progress has been made since then and recent compliance rates are much higher.

http://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment

The overall rate of population connected to secondary wastewater treatment in Greece is 99%.

Table 11: Compliance results per Member State

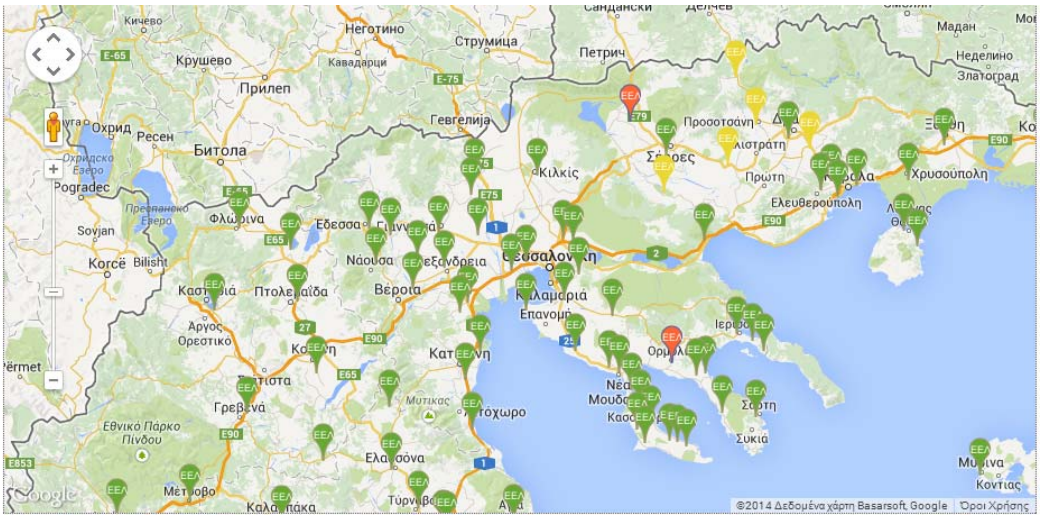
Member State	Collection compliance rate (%)	Secondary treatment compliance rate (%)	More stringent treatment compliance rate (%)
Austria	100	100	100
Belgium	78	73	52
Bulgaria	15	6	2
Cyprus[1]	0	0	0
Czech Republic	100	81	20
Denmark	100	99	94
Estonia	30	31	21
Finland	100	97	97
France	96	84	87*
Germany	100	100	100
Greece	100	99	100**
Hungary	100	100	48
Ireland	100	40	2
Italy	87	64	86*
Latvia	0	0	0
Lithuania	100	98	85
Luxembourg	100	57	38
Malta	100	5	0
Netherlands	100	100	100
Poland	71	24	10
Portugal	97	47	20
Romania[2]	transition period pending	transition period pending	transition period pending
Slovakia	100	90	transition period pending
Slovenia	32	23	23
Spain	98	86	54
Sweden	100	99	87
United Kingdom	100	98	63
EU 15	**97**	**88**	**90**
EU-12[3]	**72**	**39**	**14**
EU 27[4]	**94**	**82**	**77**

http://www.eea.europa.eu/data-and-maps/indicators/urban-waste-water-treatment

In the illegible area of Greece operate the following Wastewater Treatment Plants, as it is shown in the map, which are monitored by the National Database of Wastewater Treatment Facilities of the settlements of the country under the provisions of Directive 91/271/EEC and show satisfactory performance operation.

In the region of Florina there is only one Wastewater Treatment Plant.

Map 11: Wastewater treatment plants in the Greek eligible area



Source: http://ypeka.plexscape.com/Services/Pages/Browse.aspx

fYROM

The country[9] lags behind in sanitation and water-supply infrastructure. Taking into consideration all existing treatment plants, the total rate of population served by wastewater treatment is estimated at approximately only 12,5%. Industrial and urban wastewater is discharged as untreated or insufficiently treated, including the sewage from the city of Skopje to the Vardar/Axios river, whose pollution is affecting not only the country but also the Aegean Sea. Furthermore, the three large cross-border lakes Ohrid, Prespa and Dojran are the highest priority concerning nature protection. The oldest waste water treatment plants in the country are precisely those at the lakes; their treatment processes are now clearly outdated and the infrastructure is insufficient for assuring sustainable utilization of water resources.

Around 50% of the population in the country is connected to some sewerage network.

Most wastewater is discharged directly into inland waters with a serious bad effect on water quality.

The average rate of wastewater collection in sewerage collection systems is around 70 %, and around 60% of households are connected to a public sewerage network, 21% of households have septic tanks, and the remainder have uncontrolled discharge of wastewater. At present,

[9]Instrument for Pre-Accession Assistance (IPA) Multi-annual Indicative Planning Document (MIPD) 2011-2013 the former Yugoslav Republic of Macedonia

there are six urban wastewater treatment plants and two are under construction. Although some rural areas with more than 2 000 inhabitants have developed combined domestic sewerage and storm-water collection systems, there is no treatment prior to discharge. Industrial wastewater is also discharged without prior treatment, or pre-treatment is in poorly maintained, inefficient facilities.

F.6.2 Waste Management

GREECE

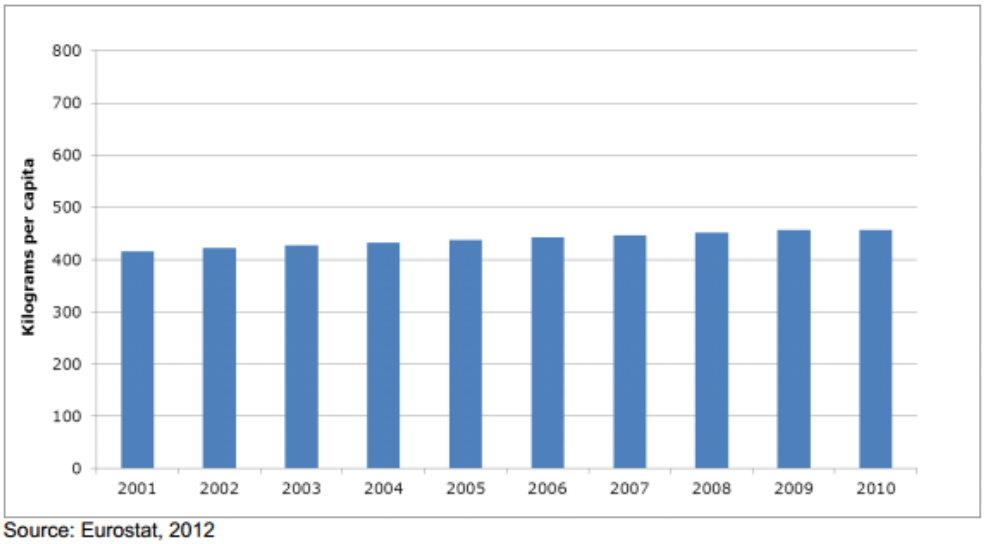
Waste management has been recognized as one of the most pressing problems in Greece, suffering of a low level of organization and relying predominantly on semi-controlled landfills until the end of the previous century. Nevertheless, during the last two decades the solid waste management in Greece has been upgraded. While it is still generally considered as a major problem, progress has been increasingly observed, and solid waste management in Greece is becoming a well-structured, organized and environmentally responsible activity with specific goals, mostly in urban areas (EIB, 2010).

The legal framework that designates the direction of waste management in Greece follows closely the development of European waste management and the corresponding Directives (EIB, 2010). Over the last decade all relevant EU Directives have been transposed to Greek laws, with the most recent case being the transposition of the Waste Framework Directive (2008/98/EC) in the Law 4042/2012 of 2012 (YPEKA, 2012).

The major driver behind waste management in Greece in the last decade has been the Joint Ministerial Decision 50910/2727/2003 'on measures and terms for solid waste management - national and regional planning management' with the National Waste Management Plan annexed to it. Basic principles and targets for solid waste management together with the specifications for national and regional planning are set there. The plan will be revised every five years or earlier if necessary (HSWMA, 2012).

The next Figure shows the development of MSW generation per capita in Greece from 2001 to 2010. There is a slow but gradual increase throughout the years from 416 kg per capita in 2001 to 457 kg per capita in 2010. Data for the year 2010 is a Eurostat estimate maintaining the same value as in 2009, which denotes a stabilization trend in the generation of MSW per capita in Greece.

Figure 7: MSW generation per capita in Greece from 2001 to 2010



Source: Eurostat, 2012

As of 2011, still 109 illegal dumping sites all over Greece remain in operation despite the ruling of the European Court of Justice of 2005 (case c-502/03) which dictated that by the end of 2008 all illegal dumping sites should have been closed and rehabilitated (WWF, 2011).

The generation of MSW in Greece has been constantly increasing since 2001, by approximately 75 000 tonnes more each year, or nearly 1.5 % per annum until 2009. The later increase to 2010 was somewhat more moderate increasing only by 21 000 tonnes. Despite the economic recession and the subsequent financial crisis in Greece, the level of MSW generation has continued to increase.

The disposal of Municipal Waste in landfills is ensured through interim management solutions including diverting disposal in neighboring municipalities with facilities (intermunicipal or Interregional), resulting in the uncontrolled disposal to be restricted to only 5% of the population in 2013.

The served population by landfills for the disposal of Municipal Waste is presented for the year 2011 in the table below. Overall 94% of the population was served with sanitary disposal of Municipal Waste in 2011.

Table 12: Population served by landfills in Greece – year 2011

REGION	OPERATIONAL	SERVED POPULATION
01 EAST MACEDONIA - THRACE	3	422,845
02 CENTRAL MACEDONIA	11	1,829,558
03 WEST MACEDONIA	1	283,689
04 EPIRUS	4	336,856
05 THESSALY	7	732,762
06 IONIAN ISLANDS	3	203,759
07 WESTERN GREECE	6	602.562
08 CENTRAL GREECE	7	484.748
09 ATTICA	1	3,821,839
10 PELOPONNESE	1	406,657
11 NORTH AEGEAN	3	166,243
12 SOUTH AEGEAN	18	264,931
13 CRETE	9	622,967
COUNTRY TOTAL	**74**	**10,179,416**

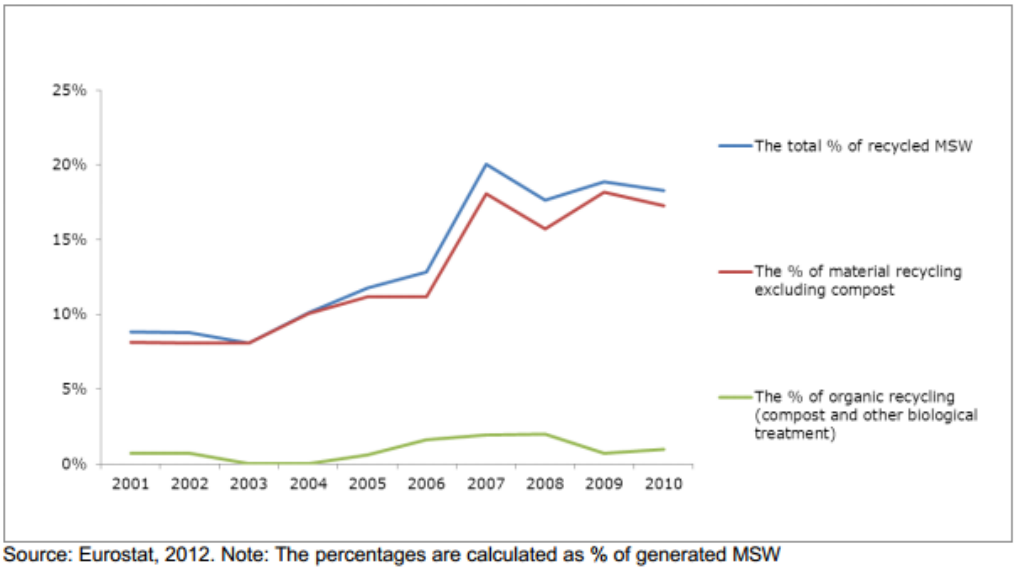
Greece is among the countries in the EU which still maintain high rates of landfilling. The amount of MSW landfilled in 2010 was 4.2 million tonnes, equivalent to 81 % of the total generated MSW.

Although the amount of MSW going to landfill has remained relatively stable over the last 10 years, amounting to around 4 to 4.3 million tonnes, the share of landfilling has decreased by 10 % between 2001 and 2010, from 91 % to 81 %. This trend can be attributed to recycling which has acquired an increased importance in Greek waste management in recent years, especially after the year 2007 when recycling (material and organic) peaked at 20 % of the total generated MSW.

In general, recycling increased in Greece in the decade between 2001 and 2010. This increase, however, has not been smooth, since a moderate increase was followed by a sharp one between 2006 and 2007 while afterwards, recycling rates seem to have stabilized.

Composting seems to play a minor role in MSW treatment with no more than 2 % of MSW composted. In fact, no composting was reported in 2003 and 2004.

Figure 8: Recycling of MSW in Greece



Source: Eurostat, 2012. Note: The percentages are calculated as % of generated MSW

The program source separation is divided into two main categories:

- the group sorting of recyclables in "blue bins" and
- the sorting of four or fewer separate materials.

In the following table are listed the types of source separation programs per region.

Table 13: Source separation programs per region

REGION	SoURCE SEPARATION PROGRAMME	NUMBER OF MUNICIPALTIES	SERVED POPULATION (2011)
01 EAST MACEDONIA - THRACE	Packaging (Blue Bin)	3	100.273
02 CENTRAL MACEDONIA	Packaging (Blue Bin)	34	1.265.268
03 WEST MACEDONIA	4 materials (Green Point)	12	281.797
04 EPIRUS	Packaging (Blue Bin)	5	82.767
05 THESSALY	Packaging (Blue Bin) Collection of Paper - Carton	20(1)	529.165
06 IONIAN ISLANDS	Packaging (Blue Bin)	3	161.006
07 WESTERN GREECE	Packaging (Blue Bin)	9	425.186
08 CENTRAL GREECE	Packaging (Blue Bin)	24	467.808
09 ATTICA	Packaging (Blue Bin) Bins of 3 materials Glass drums	61	3.460.135
10 PELOPONNESE	Packaging (Blue Bin)	15	444.134
11 NORTH AEGEAN	Packaging (Blue Bin) Bins of 4 or 3 materials(Green Point)	1 (3)	19.168
12 SOUTH AEGEAN	Packaging (Blue Bin) Bins of 4 or 3 or 2 material(Green Point)	11 (3)	93.399

REGION	SoURCE SEPARATION PROGRAMME	NUMBER OF MUNICIPALTIES	SERVED POPULATION (2011)
13 CRETE	Packaging (Blue Bin) Special glass drum	18 (10)	533.836
TOTAL		216	7.863.939

fYROM

Environment protection and nature conservation are recognized as fundamental constitutional values, which everyone has the responsibility to protect and improve. The situation in the former Yugoslav Republic of Macedonia is similar to almost all other countries in the region and faces the environmental liabilities from the past.

Waste management is one of the most serious environmental issues in the Former Yugoslav Republic of Macedonia, taking into account the fact that waste quantities continue to grow.

Most of the waste is disposed of in landfills, both legal and illegal. Waste recycling is very limited. The impacts of landfills on the environment and thus on human health are huge due to emissions methane, a greenhouse gas; organic micro-pollutants, dioxins and furans; emissions of volatile heavy metals into the air and leakages that may contain toxic substances discharged to the soil and ground waters.

There are significant initiatives to reduce waste quantities, encourage recycling and implement safe standards for waste landfilling.

Table 14: Waste quantities in the eligible regions of the fYROM

thousand tonnes

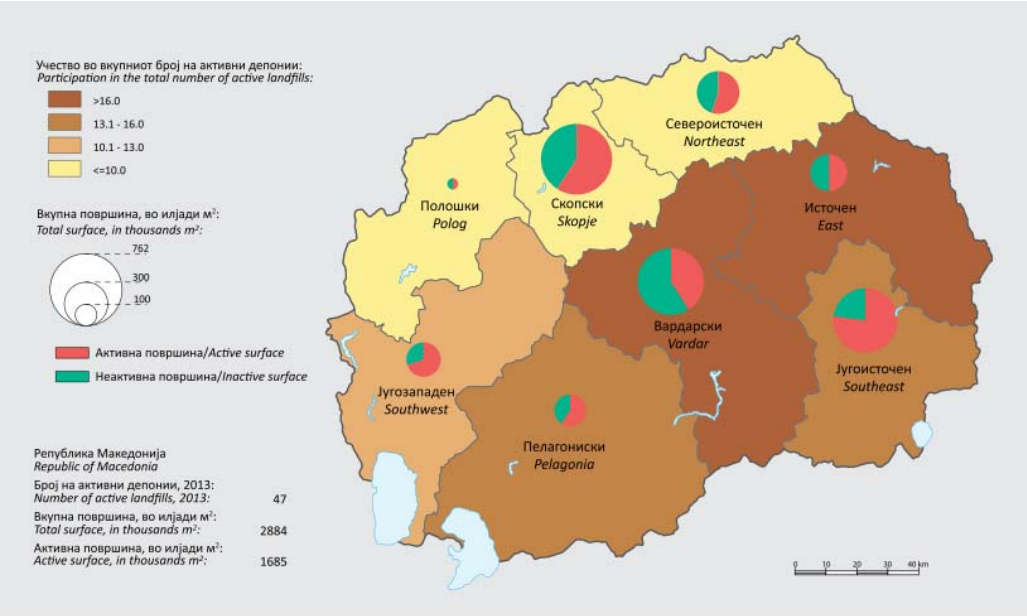
	fYROM	VARDAR REGION	PELAGONIA REGION	SOUTHWEST REGION	SOUTHEAST REGION
2011					
Collected municipal waste	544	65	65	47	40
Structure (%)	100	11.9	11.9	8.6	7.4
Generated municipal waste	735	78	77	88	91
Structure (%)	100	10.6	10.5	12.0	12.4
2012					
Collected municipal waste	555	62	72	49	45
Structure (%)	100	11.2	13	8.8	8.1

	fYROM	VARDAR REGION	PELAGONIA REGION	SOUTHWEST REGION	SOUTHEAST REGION
Generated municipal waste	787	119	85	87	68
Structure (%)	100	15.1	10.8	11.1	8.6
2013					
Collected municipal waste	555	67	69	55	34
Structure (%)	100	12.1	12.4	9.9	6.1
Generated municipal waste	793	129	82	97	51
Structure (%)	100	16.3	10.3	12.2	6.4

The largest amount of collected municipal waste in 2013 was observed in the Skopje Region - 147 thousand tonnes or 26.5%, whereas the lowest amount of collected municipal waste in the same period - 34 thousand tonnes or 6.1%, was registered in the Southeast Region. The total amount of collected municipal waste in the fYROM in2013 (555 thousand tonnes) was landfilled. There were 47 active landfills in the Republic of the fYROM in 2013.

The total amount of generated municipal waste in fYROM in 2013was 793 thousand tonnes. The largest amount of generated municipal waste in 2013 was observed in the Skopje Region - 172 thousand tones or 21.7%, while the lowest amount of generated municipal waste in the same period - 51 thousand tonnes or 6.4%, was recorded in the Southeast Region.

Map 12: Active landfills in the fYROM



Municipal solid waste is one of the main waste streams generated. The quantity of municipal waste was 349 kg/inhabitant or 0.9 kg/inhabitant per day in 2008. Around 77 % of the

population is covered by the public municipal waste collection system operated by public enterprises. Collection of non-separated municipal and non-hazardous waste, as well as non-separated non-hazardous and hazardous waste fractions is a general practice. Active landfills for municipal waste have been categorized by their environmental risk assessment (Special Study C, Closure/Reclamation of non-Compliant Municipal Landfills, 2005).

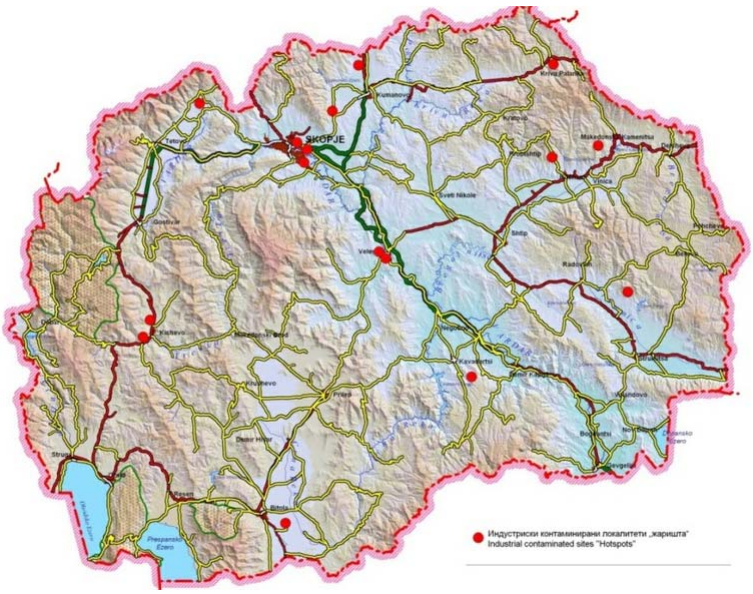
Map 13: Overview of active municipal landfills with their environmental risk

Data source: http://www.eea.europa.eu/soer-draft/countries/mk/waste-state-and-impacts-macedonia/map-1.-overview-of-active-1/view

Activities of municipal waste recovery and recycling are very limited and unorganized. Recovery of many types/grades of materials with recycling potential is financially unviable under current conditions. Composting and anaerobic digestion of biodegradable waste are not practiced in the country and there is, no formal system yet for collection and recycling packaging waste. There are no organized systems for the collection of construction and demolition waste or for the collection and treatment of agricultural and livestock waste. At present, there is no organized system for collection of waste batteries and accumulators, and waste electric and electronic equipment. Waste legislation on the waste from end-of-life vehicles will enter into force in 2011 and is aimed at preventing it. Around 35 % of hazardous medical waste is collected separately, transported to and burnt at the Drisla landfill. The majority of hazardous waste is disposed of at industrial landfills. There are no official authorised hazardous waste collectors and transporters. Local hazardous waste deposits are considered as hot-spots due to their environmental impact (National Waste Management Plan (2009-2015) of the fYROM, 2009).

Certain combustible hazardous wastes are burnt as fuels. Identification of locations with PCB-containing transformers is underway and incineration is carried out abroad.

Map 14: Industrial contaminated sites in the fYROM



Data source: *http://www.eea.europa.eu/soer-draft/countries/mk/waste-state-and-impacts-macedonia/map-1.-overview-of-active-1/view*

The overall generation of municipal waste has been growing in line with the growth of gross, as well as with the growth of personal consumption, but is not significantly higher than the growth of population. Urbanization has grown at a faster rate than planned, so most cities have poor urban infrastructure, especially in terms of solid waste management – 87 % of the population is concentrated in the major cities. (Second National Environmental Action Plan, 2006).

The capacity of municipal solid waste management systems will be strongly influenced by the future economic development of the country.

According to the data of the State Statistical Office, the country's trade deficit is 35.5% in USD. Imports include mostly crude oil, electricity and motor vehicles, while exports are dominated by ferrous nickel, iron and steel products and clothes.

According to the greenhouse gas (GHG) inventory, the contribution of the waste sector to total GHG emissions ranges between 5.5 % and 7.0 %.

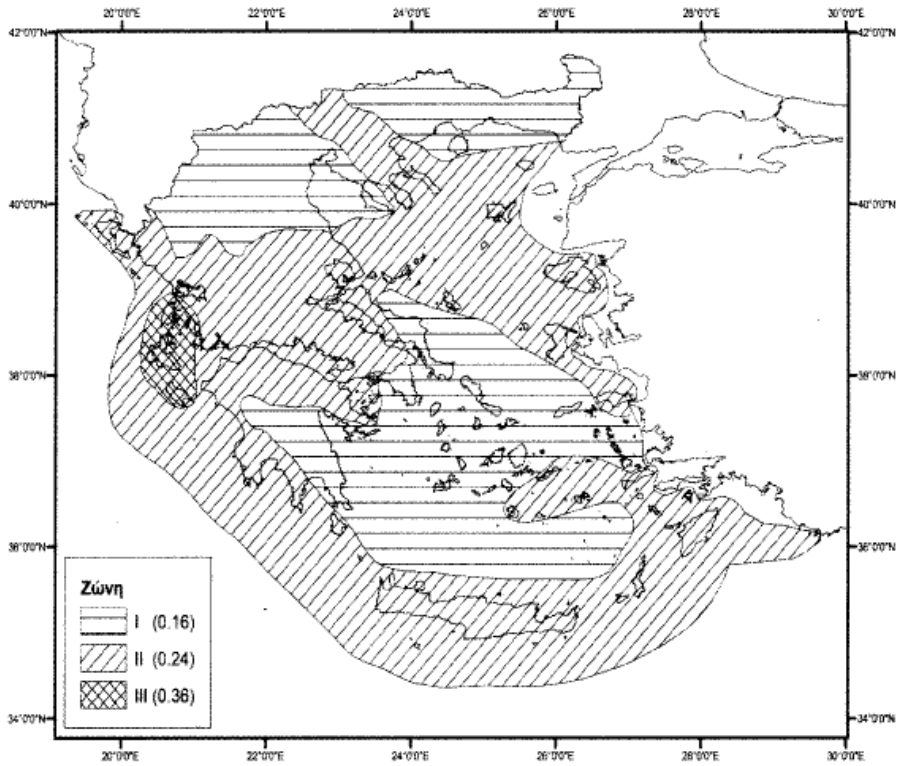
F.7 Natural Risks

There is a general falling trend of the annual average discharges for all river basins. This is most marked in the region with moderate-continental-sub-Mediterranean climate. The results indicate that river basins with low precipitation would be severely affected by climate change.

GREECE

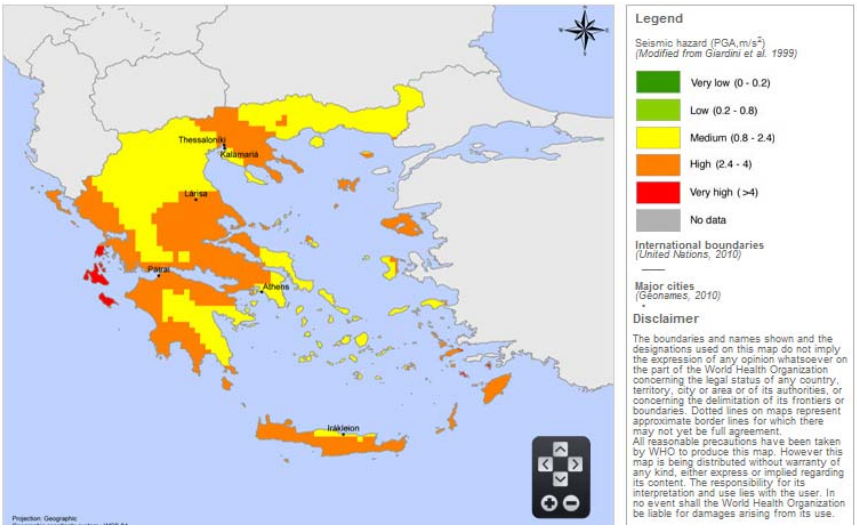
Based on the current map of the Greek Seismic Code (GG 1154/V/03), the country is divided into three Seismic Risk Zones I, II and III, the limits of which are shown on the map below. The study area belongs into two Zones. The Region of West Macedonia belongs entirely in Zone I (low seismic hazard) and the Region of Central Macedonia to Zone II.

Map 15: New seismic Hazard map



Greece is on the verge of contact and convergence of the African and Eurasian lithospheric plate. For this reason, active tectonics in this area are strong, as is shown by large earthquakes, the deformation of the various geological zones and volcanic phenomena observed in the region. The most striking geomorphological features of tectonic origin of this area is the "Greek moat", the "Greek arch" and the "basin of the north Aegean".

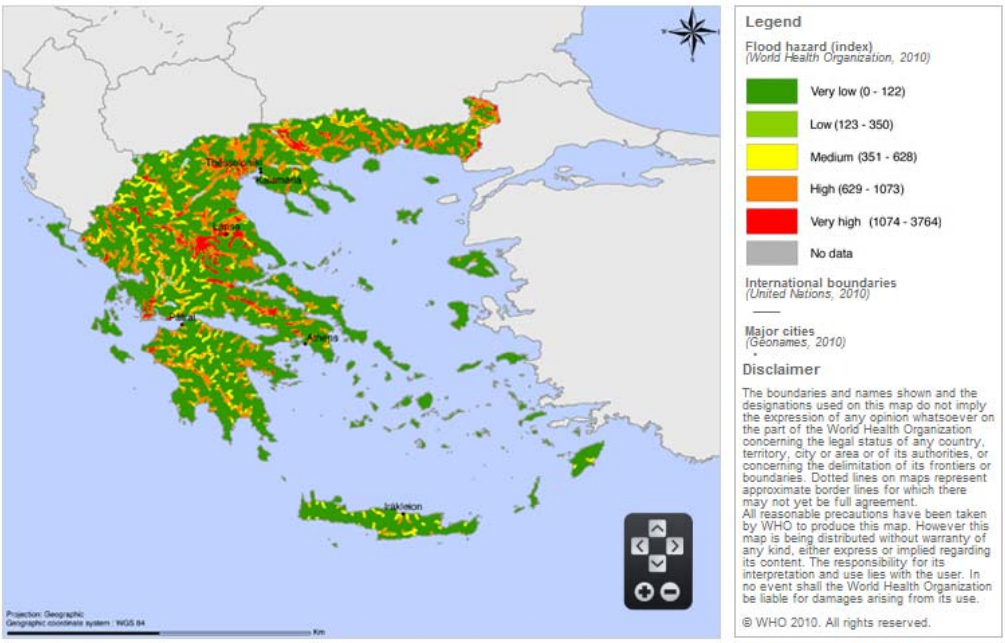
Map 16: Seismic hazard distribution map



The areas that suffer from floods are closed hydrological basins in karst areas, river floodplains and urban areas.

For the first two categories flood hazard has been mitigated in the last century by building major protective works such as drainage tunnels for closed karst basins and dams and levees for rivers. However, the situation has been deteriorated in urban areas as urbanization was seldom combined with the necessary protective works such as channel improvements and storm drainage networks.

Map 17: Flood frequency - Greece



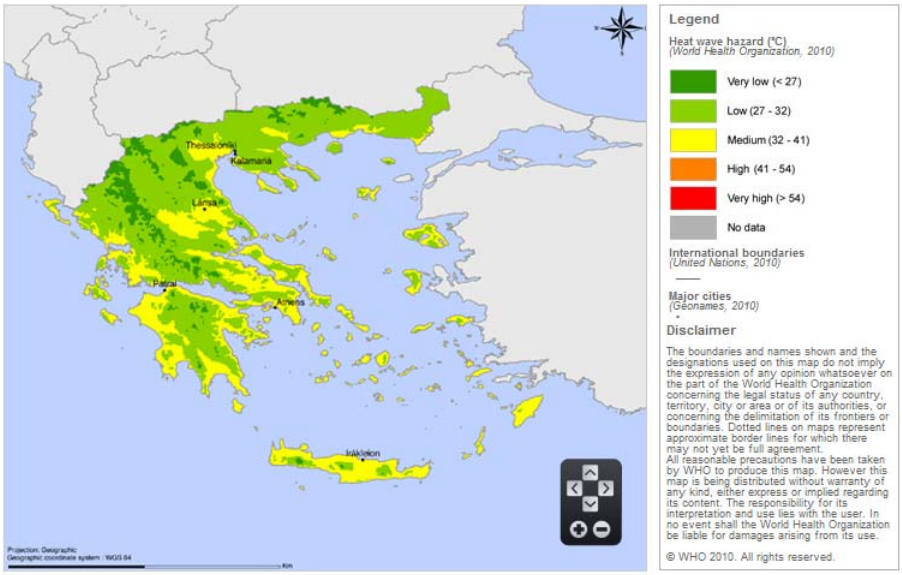
Data source: WHO, 2010

During the period 1961–1997[10] there was a statistically significant increasing trend and a positive correlation between the number of fires and area burned and the annual drought episodes in Greece. Summer drought episodes did not show any particular trend for the same period. The average number of fires and area burned were significantly higher in Greece during the sub-period 1978–1997, when Greece entered a prolonged period of drought, compared to the previous sub-period 1961–1977. From a statistical analysis of fire occurrence in Greece during 1900–2010 it was concluded that total area burned at a national scale is controlled by precipitation totals rather than air temperature. The summer of 2007 was characterized by uncontrolled wildfires in Greece. These particular large-scale wildfires caused the loss of 67 lives, damaged more than 100 villages and settlements and burned forest and agricultural land that constitutes about 2 % (190,836 ha) of the total area of Greece.

Deforestation and urbanization significantly contribute to the genesis of floods. Deforestation, also related to soil erosion, is a major problem in Greece. Today only 18% of the territory of Greece is covered by forests, whereas at the beginning of the 19th century it was more than 40%. Deforestation was caused mainly by human activities such as fires, illegal land reclamation, pasturing etc.

Map 18: Heat wave hazard distribution (5 year return period) - Greece

[10] www.climateadaptation.eu



Data source: WHO, 2010

The hazard intensity levels and number and percentage of people exposed in Greece in the period 1980-2010 are shown in the next table:

Table 15: Hazard intensity levels in Greece, 1980-2010

Hazard	Hazard intensity levels and number and percentage of people exposed					
	Very high No. exposed (%)	High No. exposed (%)	Medium No. exposed (%)	Low No. exposed (%)	Very low No. exposed (%)	No data No. exposed (%)
Seismic	98 058 (0.88 %)	4 424 680 (39.56 %)	6 541 220 (58.49 %)	0 (0.00 %)	0 (0.00%)	119 435 (1.07 %)
Flood	457 004 (4.09 %)	3 162 018 (28.27 %)	299 928 (2.68 %)	981 598 (8.78 %)	5 796 348 (51.83 %)	486 497 (4.35 %)
Landslide	107 (0.00 %)	50 270 (0.45 %)	25 332 (0.23 %)	8 458 611 (75.64 %)	2 036 533 (18.21 %)	612 540 (5.48 %)
Heat wave (2 Years)	0 (0.00%)	0 (0.00%)	1 753 035 (15.68 %)	9 227 083 (82.51 %)	114 965 (1.03 %)	88 310 (0.79 %)
Heat wave (5 Years)	0 (0.00%)	0 (0.00%)	7 898 003 (70.62 %)	3 130 729 (27.99 %)	66 351 (0.59 %)	88 310 (0.79 %)
Heat wave (10 Years)	0 (0.00%)	0 (0.00%)	9 723 210 (86.94 %)	1 323 034 (11.83 %)	48 839 (0.44 %)	88 310 (0.79 %)
Wind speed (2 Years)	0 (0.00%)	0 (0.00%)	51 790 (0.46 %)	10 725 683 (95.91 %)	0 (0.00%)	405 920 (3.63 %)
Wind speed (5 Years)	0 (0.00%)	0 (0.00%)	10 778 072 (96.38 %)	0 (0.00%)	0 (0.00%)	405 321 (3.62 %)
Wind speed (10 Years)	0 (0.00%)	4 (0.00%)	10 778 068 (96.38 %)	0 (0.00%)	0 (0.00%)	405 321 (3.62 %)

Data source: WHO, 2010

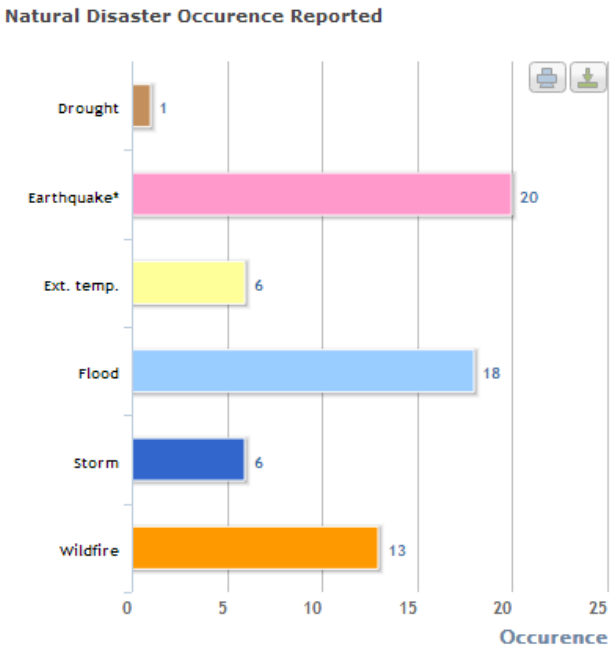
The number of natural disasters in Greece in the period 1980-2010 are shown in the following table.

Table 16: Natural Disasters from 1980 – 2010 in Greece

No of events:	64
No of people killed:	1,574
Average killed per year:	51
No of people affected:	303,548
Average affected per year:	9,792
Economic Damage (US$ X 1,000):	12,039,059
Economic Damage per year (US$ X 1,000):	388,357

The natural disaster occurrence reported in Greece in the period 1980-2010 is shown in the following Figure.

Figure 9: Natural disaster occurrence reported in Greece, 1980-2010



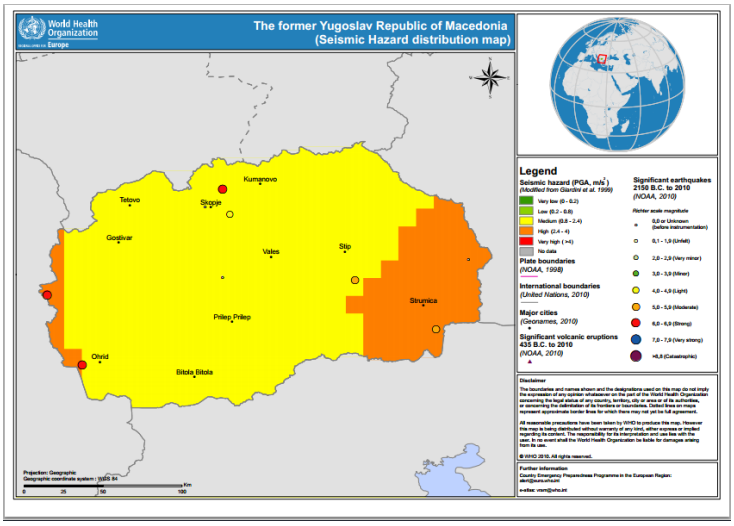
fYROM

According to World Bank estimates, the former Yugoslav Republic of Macedonia is among the ECIS countries that are most likely to experience dramatic increases in climate extremes (fifth among the twenty-eight countries analyzed). Climate change is responsible for the increased severity and frequency of natural disasters, which have a significant impact on the environment, the economy and the development of the area. According to the South East European Forum on Climate Change Adaptation-SEEFCCA (2012), the consequences from climate change are expected to vary significantly all over fYROM, with explicit implications in the southern part of the country.

Most of the natural hazards in the former Yugoslav Republic of Macedonia are related to hydrometeorology and weather and climate conditions; droughts, winds and storms, heavy rains, river and city floods, flash floods, landslides, wild fires, extreme temperatures. Besides the hydrological and meteorological hazards, there are many other weather depending hazards affecting FYR of Macedonia like allergic reactions to dispersion of pollen, smoke and other air borne pollutants, dispersion of insect pests, slippery roads, diseases and many other things. The former Yugoslav Republic of Macedonia ranks 4th by number of disasters and 4th by degree of disaster consequences in South East Europe. The 2007 UNDP report on the 1993-2007 period counts 16 major disasters caused by natural hazards with 122,000 people affected and US$ 441 million worth of damage.

The territory of fYROM[11], which is located in the Mediterranean and Balkan seismic region, is exposed to intensive neo-tectonic movements, causing relatively high and frequent seismic activity. Over the last 100 years, more than 1 000 earthquakes have occurred within the national territory, a considerable number of which have been of damaging (MMI = VI-VIII) or destructive (MMI = IX-X) intensity. Of the 194 earthquakes with an intensity (MMI) greater than VI, 44 had an MMI of VII, 15 had an MMI of VIII, nine had an MMI of IX and two had an MMI of X.

Map 19: Seismic hazard distribution map

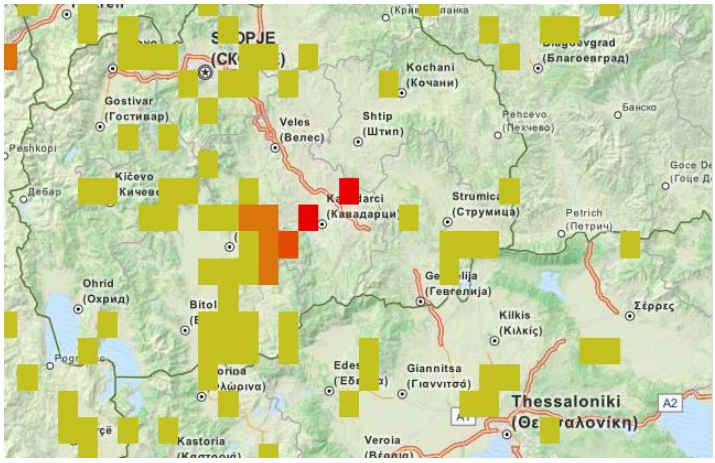


Forest fires (95% caused by man) are recognized as one of the risks the former Yugoslav Republic of Macedonia most often faces. In the 2003-2007 period, 1,329 fires were reported with 94,000 hectares burned. The area affected and the economic consequences of forest fires in the past few years support the previous conclusion. One of the most frequent and often crucial causes is weather, i.e. climate characteristics and extreme temperatures, which cause

[11]OECD, TOWARDS EFFECTIVE MITIGATION AND EMERGENCY RESPONSE IN THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA

rapid and easy burning of the dry and flammable material. The Macedonian Forests Public Enterprise manages 935,000 ha or 90% of Macedonian forests and almost all of the state owned forests. Only a small share is managed by the National Parks Directorate and other public utility enterprises.

Map 20: Forest Fires in the fYROM



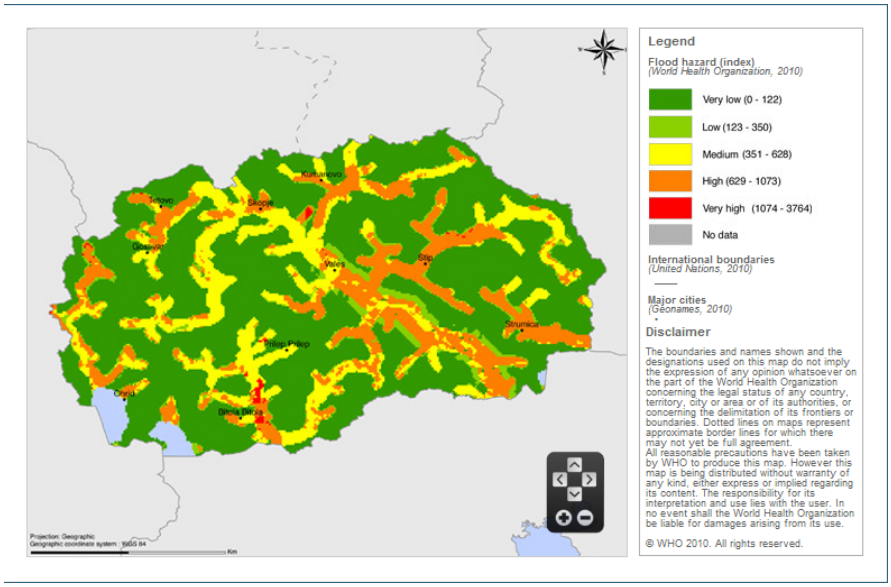
Legend

	Less than 30 events/pixel
	30-100 events/pixel
	100-300 events/pixel
	300-1,000 events/pixel
	More than 1,000 events/pixel
X	No data

Source: www.prevention web.net

The frequency and intensity of floods in the past several years in the former Yugoslav Republic of Macedonia are on the rise. Statistics show that floods are caused by overflow of the large rivers Vardar, Crna Reka, Strumica. 44% of all disasters in the 1989-2006 period were floods or flood related disasters. There were two major floods in 1962 and 1979 with damage ranging between 7.2 and 7.4% of the GDP. The 1993-2007 UNDP report, registers seven floods affecting 111,400 people and causing an estimated damage of around US$ 353,600. Only in 2004, intense rainfalls, caused floods and torrents affecting 26 municipalities (mainly in the area of upper Vardar, but also in the central, southern and south eastern part of the country) with estimated damage of 15 million Euros. Most of the damage from floods was caused in rural areas by flooding households and arable land.

Map 21: Flood frequency in the fYROM



Source: *http://data.euro.who.int/e-atlas/europe/countries/former-yugoslav-republic-macedonia/former-yugoslav-republic-macedonia-hazard.html*

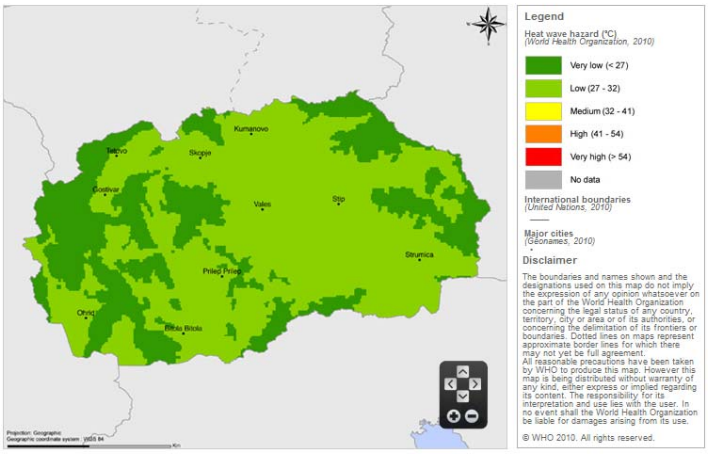
Concerning the impact of climate change on the former Yugoslav Republic of Macedonia's water resources and extreme hydrological phenomena, the risks from intensive torrents and prolonged droughts are expected to increase.

Percentage 13%[12] of all disasters caused by natural hazards are related to extreme temperatures. Extreme temperatures and heat waves or cold waves are caused by climate effects. They have direct influence (diseases and fatal conditions) and indirect influence (effects caused by extreme weather conditions like floods, droughts or storms) on people's health.

According to climate change studies, projected changing climate and increasing climate variability in the region indicate a growing risk for extreme hydro meteorological and climate-related events in the region. Additionally along modernization of the societies they become more vulnerable to natural hazards.

Map 22: Heat wave hazard distribution (5 year return period) in the fYROM

[12] According to the 2008 SEEDMAI analysis



The number of natural disasters in the fYROM in the period 1980-2010 are shown in the following table.

Table 17: Natural Disasters from 1980 - 2010

Overview

No of events:	15
No of people killed:	34
Average killed per year:	1
No of people affected:	1,121,805
Average affected per year:	36,187
Economic Damage (US$ X 1,000):	262,163
Economic Damage per year (US$ X 1,000):	8,457

The hazard intensity levels and number and percentage of people exposed in the fYROM in the period 1980-2010 are shown in the next table:

Table 18: Hazard intensity levels in the fYROM, 1980-2010

Hazard	Hazard intensity levels and number and percentage of people exposed					
	Very high No. exposed (%)	High No. exposed (%)	Medium No. exposed (%)	Low No. exposed (%)	Very low No. exposed (%)	No data No. exposed (%)
Seismic	0 (0.00%)	281 293 (13.77 %)	1 762 067 (86.23 %)	0 (0.00 %)	0 (0.00%)	0 (0.00%)
Flood	3 581 (0.18 %)	806 400 (39.46 %)	665 185 (32.55 %)	125 356 (6.13 %)	442 838 (21.67 %)	0 (0.00%)
Landslide	1 (0.00%)	3 308 (0.16 %)	17 496 (0.86 %)	1 280 305 (62.66 %)	742 250 (36.32 %)	0 (0.00%)
Heat wave (2 Years)	0 (0.00%)	0 (0.00%)	0 (0.00%)	1 884 503 (92.23 %)	158 857 (7.77 %)	0 (0.00%)
Heat wave (5 Years)	0 (0.00%)	0 (0.00%)	0 (0.00 %)	1 974 749 (96.64 %)	68 611 (3.36 %)	0 (0.00%)
Heat wave (10 Years)	0 (0.00%)	0 (0.00%)	42 893 (2.10 %)	1 945 374 (95.20 %)	55 093 (2.70 %)	0 (0.00%)
Wind speed (2 Years)	0 (0.00%)	0 (0.00%)	25 262 (1.24 %)	2 018 098 (98.76 %)	0 (0.00%)	0 (0.00%)
Wind speed (5 Years)	0 (0.00%)	0 (0.00%)	2 043 360 (100.00 %)	0 (0.00%)	0 (0.00%)	0 (0.00%)
Wind speed (10 Years)	0 (0.00%)	55 (0.00 %)	2 043 305 (100.00 %)	0 (0.00 %)	0 (0.00%)	0 (0.00%)

F.8 Population

The total population of the programme area is 2,182,264 people, of those 1,399,597inhabitants (64.14%) live in Greece, and 782,667 (35.86%) live in the former Yugoslav Republic of Macedonia (Eurostat - Demographic Balance 2011).

The total area covers 29,259 km^2, 14,422 km^2 in Greece and 14,837 km^2 in the former Yugoslav Republic of Macedonia.

On the population, according to the census of the Hellenic Statistical Authority in 2011, the legal population of the Region of Central Macedonia counted 1,726,430 residents registering a marginal increase over the previous census of 2001 the Hellenic Statistical Authority. The permanent population of the region corresponding to 17.38% of the relevant population occupying the second position in the country after the Attica with 35.34% (ELSTAT, 2011). Boasting the region of Thessaloniki, where the last decade has seen a population growth that may be construed as increasing urbanization and strengthening the metropolitan center of Thessaloniki. The Western Macedonia declining population compared to the previous census in percentage change -3.61 %.The 2001 the population of the region was 294,317 inhabitants in 2011 and fell to 283,689 inhabitants. From the above, it becomes even more apparent difficulty of the other areas to provide jobs and incentives and prospects to retain and attract residents.

The table presents the changes in the population especially the NUTS III regions belonging to border region.

Table 19: Population in the eligible area in Greece

NUTS III	REGION	POPULATION CENSUS 2001	POPULATION CENSUS 2011	% 2001-2011
EL122	Thessalonikl	1,057,825	1,110,312	4.9
EL123	Kilkis	89,056	80,419	9,7
EL126	Serres	200,916	176,430	-12.8
EL124	Pella	145,797	139,680	-4.2
EL134	Florina	54,109	51,414	-4.98

According to the last census, in 2002, the total population of fYROM is 2,022,547 residents and maintain an upward trend, albeit at a slower pace. According to the latest population estimates (31.12.2012), the total population is 2,062,294 inhabitants. and presents, in this decade, an increase of 1.9%. Regarding the age structure, stands out as a negative element of the aging population. In particular during the period 2002-2012, the participation of the youth population (age group 0-14) in the total population decreased from 21% to 17%, whereas the participation of the population aged 65 and over increased from 10.6% in 12%. The average population density is 82.8 inhabitants per km² (estimated at 31.12.2012) but because of the intense migratory movements, there are huge disparities and differences in density. Skopje as the most densely populated (337 inhabitants per km²), almost ten times higher density of the Vardar region (38 inhabitants per km²). Still, Municipalities including urban settlements have the highest density in contrast to purely rural municipalities with a much smaller population.

The NUTIII regions of Kilkis presented the highest increase (9.9%) while Serres has a high population decrease of -12.8%. Pella and Florina presented population decreases by -4.2% and -4.98% respectively. On the contrary, Kilkis presented the higher increase by 9.7% (ELSTAT Population census 2001, 2011).

Table 20: Population in the eligible area in the fYROM

NUTS III REGION	POPULATION CENSUS 2002	POPULATION CENSUS 2011	% 2002-2011
Vardar	154,535	153,822	0,46
Pelagonia	238,136	233,628	1,89
SouthWest	221,546	221,517	0,01
Southeast	171,416	173.056	-0,96

The region of Pelagonia presented the highest increase (1.89%) while Southeast has a small population decrease of approximately -0.96%. On the contrary, the Vardar and Southwest regions presented population increases by 0.46% and 0.01% respectively(former Yugoslav Republic of Macedonia population census 2002, 2011).

Population density ranges from 29 persons/km^2 in Florina up to the tenfold figure of 238 persons/km^2 in Thessaloniki. The respective national averages are 82 for Greece and 80.1 for the former Yugoslav Republic of Macedonia.

The demographic indicators at regional level show considerable differences which point to a big disproportion in the territorial distribution of the population. The Skopje Region, as the most densely populated, has almost ten times higher density than the Vardar Region, which is the least densely populated.

F.9 Social - Economic environment

F.9.1 Gross Domestic Product (GDP) - Income

The eligible border area is one of the poorest in Europe. At a macro-economic level and in particular in terms of evolution of the Gross Domestic Product, while the Greek side is during the last year under recession, the fYROM's side is developing.

The GDP in the former Yugoslav Republic of Macedonia regions, during the period 2007 – 2011, increased by 29.83% in Southeast, by 20% in Vardar, by 29.83% in Southwest and by 23,78% in Pelagonia.

On the other hand, the financial crisis in Greece leaded to the reduction of GDP by 11.87% in Thessaloniki, by 36.51% in Kilkis, by 3,77% in Pella, in Serres by 8.77% and in Florina by 0.75%.

In the Greek area, mainly in Thessaloniki, Pella, Kilkis and Serres, per capita GDP remained lower than the corresponding per capita GDP. On the contrary, Florina has relatively high per capita GDP because of energy economic activities.

Table 2: Per capita Gross Domestic Product by NUTS III regions[13]

Euro

[13]ELSTAT, http://www.statistics.gr/ , Eurostat, http://epp.eurostat.ec.europa.eu/portal/page/portal/eurostat/home, Gross value added at basic prices by NUTS III regions

NUTS III	GDP				
	2007	2008	2009	2010	2011
GREECE					
Thessaloniki	17.900	18.700	18.200	17.100	16.900
Kilkis	16.700	16.300	14.400	13.300	12.000
Pella	13.000	13.600	13.100	13.000	12.500
Serres	11.000	10.900	10.800	10.500	10.200
Florina	20.500	21.300	20.700	19.600	20.500
the fORMER YUGOSLAV REPUBLIC OF MACEDONIA					
Vardar	400,0	425,7	425,9	453,8	500,0
Southwest	359,0	472,6	444,0	492,6	511,6
Southeast	393,4	409,2	466,6	542,0	636,1
Pelagonia	577,3	692,8	734,4	753,3	757,4

A higher gross domestic product per capita compared to the average of the fYROM was recorded in the Skopje Region with an index of 149.4, the Southeast Region with an index 109.7, and the Vardar Region with an index 104.6. All other regions had gross domestic product per capita below the average of the fYROM[14].

F.9.2 Employment

GREECE

The level of unemployment increased in the second quarter of 2012. In the region of Central Macedonia the rate has recorded the third highest rate in the country,25.1%, following the regions of Western Macedonia (30%) and Central Greece (28.4%), compared with 23.6% of the country, 10 3% of the EU-15 and 10.2% of the EU-27. The impact of the crisis is much more evident in the employment area where the unemployment rate in Western Macedonia (for ages 15 years).
According to Eurostat data for 2012 the unemployment in Western Macedonia has reached 29.9%, while according to the Hellenic Statistical Authority for the second quarter of 2013 the unemployment rate in Western Macedonia has reached the 32.9%.

According to the "Labour Force Survey" - 4th quarter 2013 of the Hellenic Statistical Authority, the geographical areas (NUTS II regions) with the highest unemployment rate in Greece are Central Macedonia (30.3%) and Western Macedonia (29.7%).

[14] FYROM, State Statistical Office, 2014

While unemployment rates in the last five years have followed an upward trend in the level of the whole EU, however, this rate of increase in unemployment is much higher and is expected to continue with growth rates.

Table 21: unemployment rate 2001-2011 in eligible area in Greece

	THESSALONIKI	PELLA	KILKIS	SERRES	FLORINA
2001					
Unemployment rate %	11,3	10,8	14,6	13,6	11,95
2011					
Unemployment rate %	21,8	15,0	15,6	10,7	16,2

In 2011, the highest unemployment rate was observed in the region of Thessaloniki (21,8%) and the lowest in the region of Kilkis.

fYROM

The social situation in the former Yugoslav Republic of Macedonia is characterized by a low employment rate of 38.5%, a high unemployment rate of 32% and a poverty estimated at 31% of the population. Economic and social differences between cities are also evident and the inequalities between urban and rural centres are further widening. Regional unemployment is particularly high in most rural areas. Low geographical mobility of the population is another reason for regional unemployment variations as well as the lack of information on job opportunities elsewhere in the country.

Analyzed by profiles, most vulnerable groups are multi-member households, bearing in mind the fact that 54 % of the poor people live in households with five and more members. The poverty rate for the unemployed is 40.5%. The percentage of long term unemployed persons has increased steadily since 1996, being a real challenge for employment, labour market and social protection policies with all the negative effects such as deterioration of human capital, discouragement and de-motivation.

One of the burning issues of the country's human development is obviously the shortage of formal employment opportunities. That points to an under utilization of human capital, hindering its economic growth.

The unemployment rate in fYROM is one of the highest in the Balkan region and is expected to increase due to the global financial crisis, with the majority of unemployed people living in rural areas where agriculture is predominant (World Bank,2010).

The employment and unemployment rates of the population at the regional level show oscillations (differences) in relation to the total rates at the country level.

The employment rate in the Vardar, East, Southeast and the Pelagonia Region in 2013 is above the total rate at the national level, with the Southeast Region having the highest employment rate of 56.8.

The lowest employment rate in 2013 was observed in the Northeast Region. The lowest unemployment rate of 18.8 was recorded in the Southeast Region, which also had the highest employment rate.

The highest unemployment rate was observed in the Northeast Region.

Table 22: Employment in the fYROM

	VARDAR REGION	PELAGONIA REGION	SOUTHWEST REGION	SOUTHEAST REGION
2011				
Working age population (persons)	126,086	190,697	179,157	140,279
Activity rate %	59.7	63.9	56.7	71.0
Employment rate %	38	43.8	32.4	64.4
Unemployment rate %	36.4	31.4	42.8	9.3
2012				
Working age population (persons)	126,510	190,195	181.650	140,857
Activity rate %	59.1	62.8	56.2	70.7
Employment rate %	37.9	46.9	35.6	60.9
Unemployment rate %	35.9	25.3	36.7	13.8
2013				
Working age population (persons) %	125,708	189,136	182,000	140,938
Activity rate %	60.7	64.4	56.2	69.9
Employment rate %	42.6	50.1	35.6	56.8
Unemployment rate %	29.8	22.2	36.7	18.8

Data source: State Statistical Office

F.9.3 Energy

GREECE

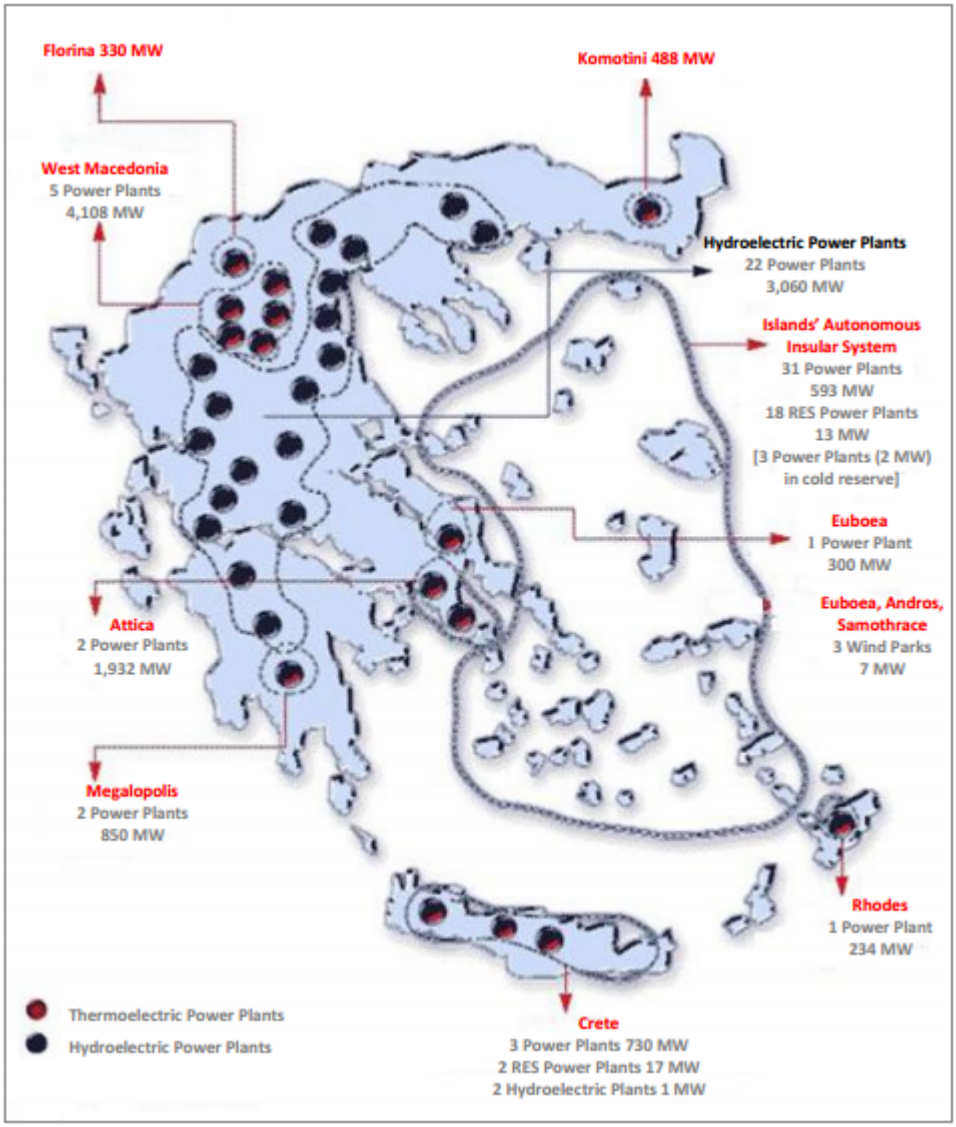
Energy production in Greece is dominated by the state owned Public Power Corporation (known mostly by its acronym ΔΕΗ, or in English DEI). In 2009 DEI supplied for 85.6% of all energy demand in Greece, while the number fell to 77.3% in 2010. Almost half (48%) of DEI's power output is generated using lignite, a drop from the 51.6% in 2009.

12% of Greece's electricity comes from Hydroelectric power plants and another 20% from natural gas. Between 2009 and 2010, independent companies' energy production increased by 56%,from 2,709 Gigawatt hour in 2009 to 4,232 GWh in 2010.

DEI has 34 large thermal and hydro power stations and three wind farms of the interconnected system of mainland. The insular non-interconnected network has 61 autonomous stations (Crete, Rhodes and other islands), 39 thermal, 2 hydroelectric power stations, 15 wind farms and 5 photovoltaic plants.

The total installed capacity of the 98 stations of PPC comes up to 12.760 MW.

Map 23: Geographical distribution of power plants in Greece



Data source: www.dei.gr

The power plant of DEI installed in the Greek illegible area are the following:

Table 23: Power plants of DEI

Description of plant	Area	Installed units
HPS Agras	Pella, Central Macedonia	2 units, total capacity 50 MW
HPS Edesseos	Pella, Central Macedonia	1 unit, total capacity19 MW
TPS Aminteou	Florina, Western Macedonia	Principal FuelLignite2 units, total capacity 600 MW

Data source: www.dei.gr

Renewable Energy Sources (RES)

In 2008 renewable energy accounted for 8% of the country's total energy consumption, a rise from the 7.2% it accounted for in 2006,but still below the EU average of 10% in 2008. 10% of the country's renewable energy comes from solar power, while most comes from biomass and waste recycling. In line with the European Commission's Directive on Renewable Energy, Greece aims to get 18% of its energy from renewable sources by 2020. In 2013,according to the independent power transmission operator in Greece (ΑΔΜΗΕ) more than 20% of the electricity in Greece has been produced from renewable energy sources and hydroelectric power plants. This percentage in April reached 42%. Greece currently does not have any nuclear power plants in operation, however in 2009 the Academy of Athens suggested that research in the possibility of Greek nuclear power plants begin.

The contribution of RES[15] to the national energy balance in 2008 was approximately 7.8% of gross final energy consumption and around 16.3%, of primary energy production. Primary energy produced from RES in 2008 was 1.64 Mtoe. Out of these, biomass use in households accounts for 600ktoe, and the use of biomass in industry for 265 ktoe. Moreover, 285 ktoe are produced by hydroelectric plants, 193 ktoe from wind power plants, 174 ktoe from solar thermal systems, 63 ktoe from biofuels, 35 ktoe from biogas, mainly for electricity generation and 17 ktoe from geothermal energy.

The objectives of the EU on energy and climate change are known as "20-20-20 targets" and relate the following to be achieved by 2020:

- Reducing greenhouse gas emissions by at least 20% below 1990 levels.
- 20% of energy consumption from renewable sources.

[15] NATIONAL RENEWABLE ENERGY ACTION PLAN IN THE SCOPE OF DIRECTIVE 2009/28/EC, Ministry of Environment Energy & Climate Change

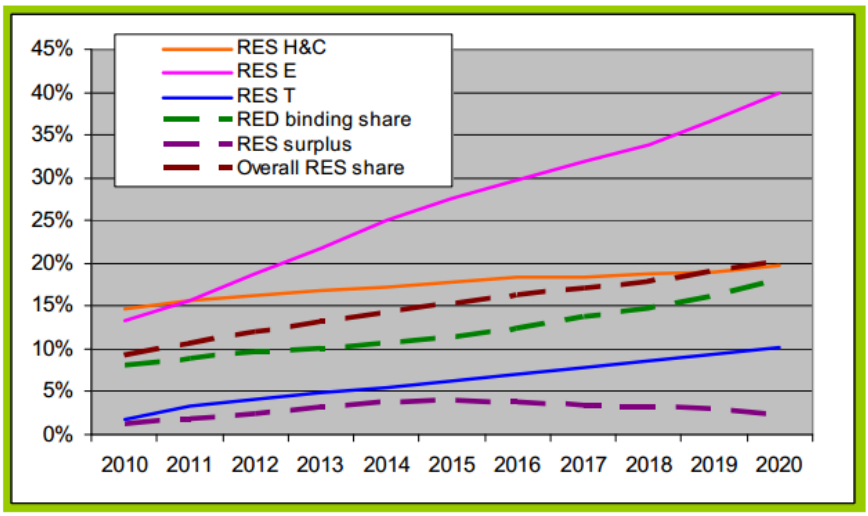
- 20% reduction in primary energy use compared with projected levels by improving energy efficiency.

In this context national targets established for renewable energy by 2020 are:

- The contribution of electricity produced from RES in gross final energy consumption by 20%.
- The contribution of electricity produced from RES in gross electricity consumption by 40%.
- The participation of RES in final energy consumption for heating and cooling by at least 20%.
- The participation of RES in final energy consumption from transport by at least 10%.

The overall percentages of RES broken down by sector application (i.e. heating/cooling, electricity and transport), along with the projected surplus, in the gross national final energy consumption are shown in Figure 8 below.

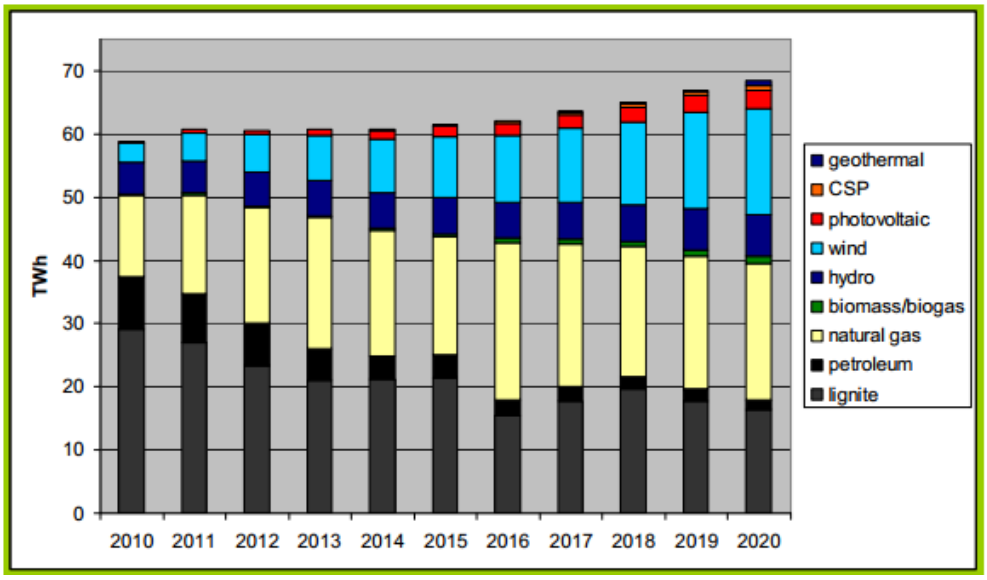
Figure 10: Projections of the share projection of RES in the final consumption of the three main sectors (electricity, heat & cooling, transport) and the overall share of RES as well as the expected surplus in gross final energy consumption to 2020.



Data source: http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3d&tabid=37

The projected contribution of the different technologies, RES and conventional and fuels in electricity production is presented in next Figure.

Figure 11: Estimated electricity generation from the different technologies/fuels to 2020.



Data source: http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3d&tabid=37

fYROM

In 2010, the energy import dependency of the fYROM was 44.2%. Energy efficiency of consumption was 62.7% of Gross inland consumption. Household energy consumption was 262 kgoe per capita. Electricity consumption was 3301 kWh per capita from final electricity consumption.

Table 24: energy statistics and energy indicators in the fYROM

Energy statistics and energy indicators

Energy statistics		2009	2010[1]
Total primary energy production	1000 toe	1 607	1 616
Net energy imports	1000 toe	1 273	1 274
Net oil imports	1000 toe	1 034	925
Net natural gas imports	1000 toe	84	93
Gross inland energy consumption	1000 toe	2 810	2 882
Final energy consumption	1000 toe	1 671	1 806
Industry	1000 toe	422	543
Transport	1000 toe	440	460
Services and households, etc.	1000 toe	809	801
Gross electricity generation	GWh	6 828	7 260
Final electricity consumption	GWh	6 392	6 784
Socio-economic statistics			
Gross domestic product (at current exchange rate)	Mio EUR	6 703	7 057
Population (annual average)		2 050 671	2 055 004
Energy intensity			
Gross inland consumption / GDP	kgoe/1000 EUR	419	408
Final energy consumption / GDP	kgoe/1000 EUR	249	256
Energy consumption per inhabitant			
Gross inland energy consumption / capita	kgoe/capita	1 370	1 402
Final energy consumption / capita	kgoe/capita	815	879
Household consumption / capita	kgoe/capita	264	262
Final electricity consumption / capita	kWh/capita	3 117	3 301
Energy dependency			
Net energy imports / Gross inland consumption	in %	45.3	44.2
Energy efficiency			
Final energy consumption / Gross inland consumption	in %	59.5	62.7
Efficiency of thermal power stations	in %	36.2	35.2
Renewable energy			
Share of renewable energy in gross final energy consumption (normalised values)	in %	17.5	17.0
Share of electricity from renewables sources in total electricity production	in %	18.6	33.5
Share of electricity from renewables sources in gross consumption of electricity	in %	15.4	28.0

1) Preliminary data

Data source: State Statistical Office

Installed electricity production capacity

In 2013, the highest total installed capacity for electrical energy production was in the Pelagonia Region, with total installed power of all capacities of 712 MW.

Table 25: Installed electricity production capacity in the fYROM

MW

fYROM	VARDAR REGION	PELAGONIA REGION	SOUTHWEST REGION	SOUTHEAST REGION
2011				
1,849	330	683	257	2
2012				
1,913	330	709	258	2
2013				
1,938	331	712	263	3

Source: State Statistical Office

Electricity consumption in the industry sectors

The largest consumption of electricity in the industry sectors in 2012 was in the Vardar Region (38.6%) and the Skopje Region (24.8%).

Table 26: Electricity consumption in the industry sectors

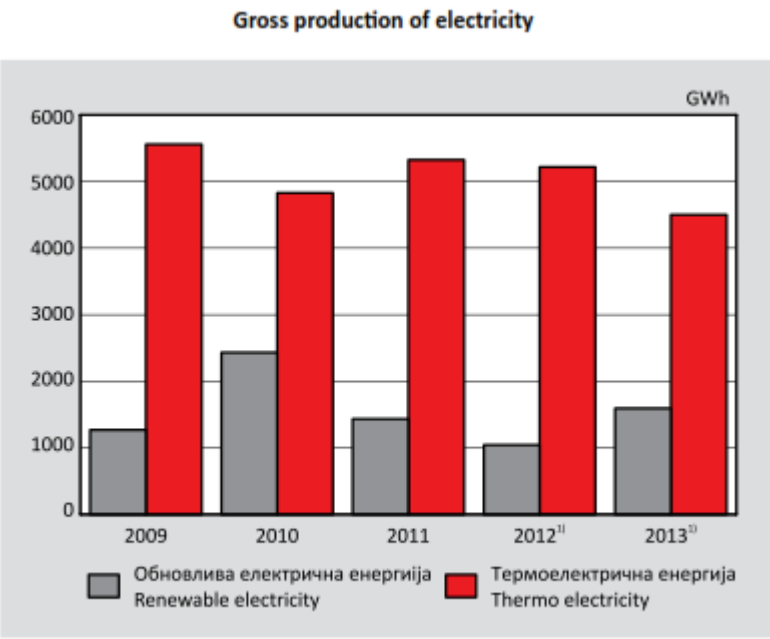
GWh

fYROM	VARDAR REGION	PELAGONIA REGION	SOUTHWEST REGION	SOUTHEAST REGION
2011				
2,194	686	149	44	138
2012				
2,693	856	156	45	139
2013				
2,369	915	169	42	155

Data source: State Statistical Office

The gross production of electricity, renewable and electricity, during the period 2009-2013, is presented below:

Figure 12: Gross production of electricity in the fYROM



Data source: State Statistical Office

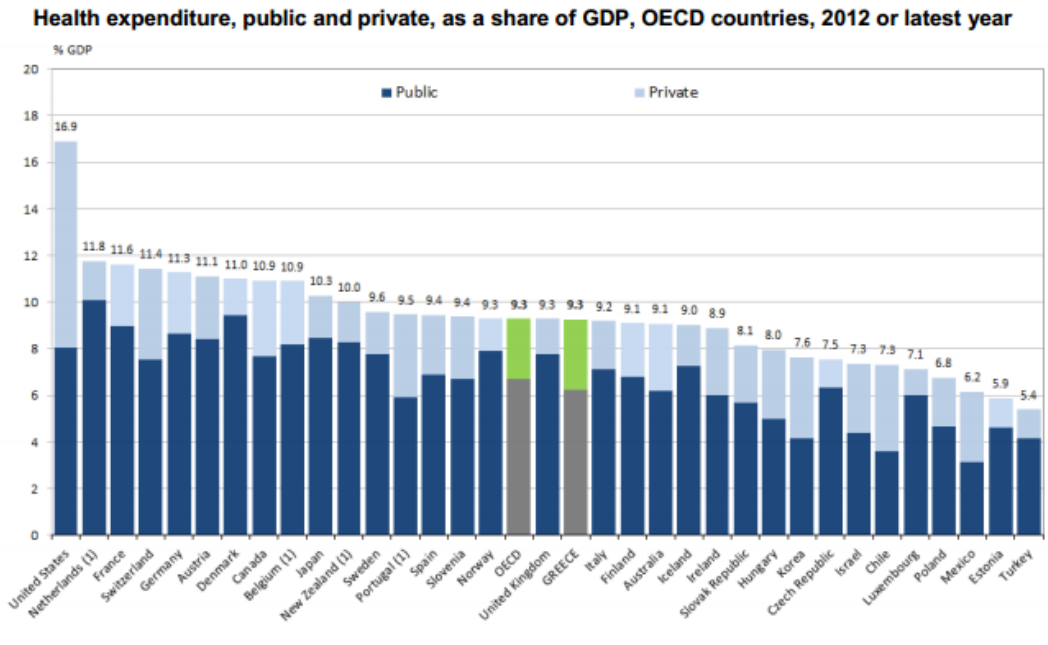
F.9.4 Health

GREECE

Health spending accounted[16] for 9.3% of GDP in Greece in 2012, equal to the OECD average, but down from a high of 10.0% of GDP in 2009. Health spending as a share of GDP is lower in Greece than in the United States (which spent 16.9% of its GDP on health in 2012) and in a number of European countries including the Netherlands, France, Switzerland and Germany (all allocating over 11%). In Greece, 67% of health spending was funded by public sources in 2012, below the average of 72% in OECD countries.

[16] http://www.oecd.org/

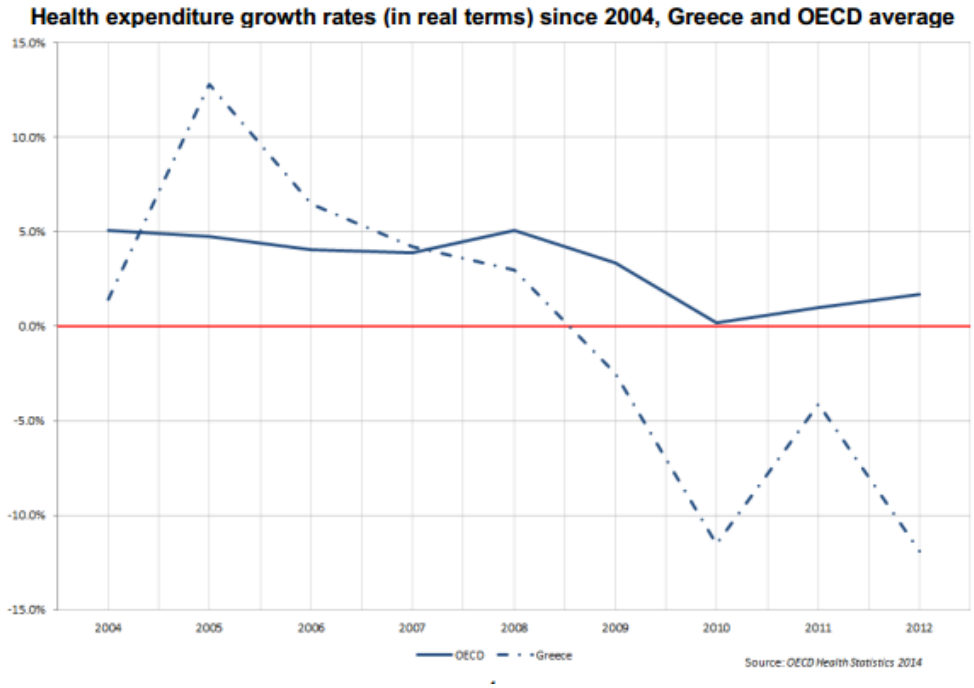
Figure 13: Health expenditure, public and private, as a share of GDP, OECD countries, 2012



Data source: http://www.oecd.org/

Health spending in Greece has dropped in each of the years since 2009, driven by a sharp reduction in public spending as part of government-wide efforts to reduce the large budgetary deficit. Greece saw double-digit percentage reductions in health expenditure in both 2010 and 2012, leaving the overall level of expenditure around 25% below its peak in 2008.

Figure 14: Health expenditure growth (in real terms) since 2014, Greece and OECD average



Data source: http://www.oecd.org/

fYROM

The fYROM health system[17] is insurance-based. Compulsory health insurance is the main source of health care revenue undertaken through the publicly owned Health Insurance Fund (HIF). It covers those employed in the public or private sectors, retired, students, disabled, and their dependents. The most acute problems of HIF can be seen in the segment of contributions collection and fluctuating debts in payments for health services, procurement and where pharmaceuticals count the bigger portion.

The main providers of health services in the country are public and private health organizations. The private health sector is continuously growing. With recent health reform the public primary health care (PHC) organizations were privatized.

There is a growing private hospital sector with an outflow of qualified medical personnel from public to private sector. For the time being, privatization has brought no significant changes to

[17] http://www.who.int/countryfocus/cooperation_strategy/ccsbrief_mkd_en.pdf

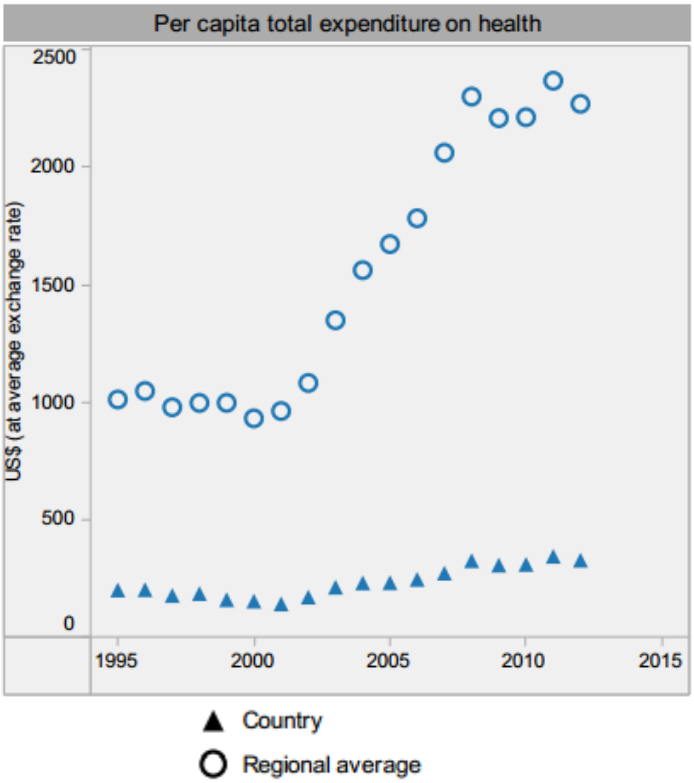
patients regarding services of PHC, which is contrary with services from private hospital where costs for users are significant if private hospital is not HIF contracted.

Average length of stay in hospital is 11.8 days, and bed occupancy rate is extremely low compared to European average (51.5% for all inpatient facilities, including long-stay and institutional care facilities).

There are potential inequalities in health care delivery. The established structures have been characterized by a degree of inefficiencies in performance, as they are forced to operate in an environment that has been deprived of adequate resources for a long period of time. The delivery of health care systems at regional level cannot be ensured without a proper monitoring and controlling system in place.

The total expenditure on health per capita is shown in the diagram below:

Figure 15: Expenditure on health per capita in the fYROM



Data source: http://www.who.int/gho/countries/mkd.pdf?ua=1

F.10 Cultural Heritage

The eligible area is characterized by attractive natural touristic (i.e. mountains, forests, lakes, geothermal and mineral waters, waterfalls) and appropriate climate conditions and cultural heritage (i.e. churches and monasteries, archeological sites).

In the eligible area there is a combination of significant areas of natural beauty, rich historical and cultural heritage.

In the Region of Central Macedonia is characterized as traditional a small part of its settlements.

The traditional settlements in the Region of Central Macedonia are presented below:

Table 27: Traditional settlements in Central Macedonia

Region, NUTS III	Traditional settlement
THESSALONIKIS	Ano Poli, Rentina
PELLAS	Agios Athanasios, Aetochorion, Archagggelos, Garefi, Kromni, Lagkadia, Notia, Pal. Xanthogeia, Perikleia
SERRES	Alistrati, Emmanouil Pappas, Iliokomi, Kosmista, Mikro Soulion, Proti, Rodolivos

The cultural heritage in Central Macedonia is particularly rich and diverse and covers all stages of the Hellenic civilization from the Paleolithic era to the modern times. The diachronic presence of the humans in the Macedonian area is enriched with numerous monuments, residential complexes, artwork or other creations that cover all the historical range. Prehistory - Ancient - Classical - Hellenistic - Early Christian - Byzantine - Metabyzantine –recent periods.

Major archaeological sites in the illegible area are: Aiges – Vergina, Dion and Archaeological Site of Olympia, Pella, Amphipolis,

Florina, is characterized by diversity of ecological zones and rarely for the Greek area lake systems, including impressive picturesque villages, particularly around the Small and Big Prespa. Near the lakes are important traditional settlements, the most important of whom are Agios Germanos, Psarades, Lemos, Mikrolimni, Kallithea, Karyes and Vrontero.

Architectural interesting are the churches. The older churches except the old church of Agios Germanow (early 11th century) to the late 16th or early 17th century. In the village Psarades, there are hermitages along the Great Prespa hosting rare paintings.

Noteworthy is also the Byzantine castles of the county, such as the Castle of Setina very close to Achlada.

The paleochristian and Byzantine Monuments of Thessaloniki and Mount Athos are included in the World Heritage List of UNESCO. Among its Christian monuments are fine churches, some built on the Greek cross plan and others on the three-nave basilica plan. Constructed over a long period, from the 4th to the 15th century, they constitute a diachronic typological series, which had considerable influence in the Byzantine world. The mosaics of the Rotonda, Ag. Dimirios and Osios David are among the great masterpieces of early Christian art..

The Agio Oros is also a recognized artistic site. The layout of the monasteries (about 20 of which are presently inhabited by some 1,400 monks) had an influence as far afield as Russia, and its school of painting influenced the history of Orthodox art.

The fYROM has a rich history with heritage especially from ancient, medieval and Ottoman period. In the illegible area of the fYROM there is the natural and cultural heritage of the Ohrid region, included in the World Heritage List of UNESCO, which is situated on the shores of Lake Ohrid, the town of Ohrid is one of the oldest human settlements in Europe. Built mainly between the 7th and 19th centuries, it has the oldest Slav monastery (St Pantelejmon) and more than 800 Byzantine-style icons dating from the 11th to the end of the 14th century. After those of the Tretiakov Gallery in Moscow, this is considered to be the most important collection of icons in the world. The town of Ohrid also is a UNESCO protected city.

G. ENVIRONMENTAL IMPACT ASSESMENT

G.1 Introduction

Having regard, the Directive 2001/42/EC, Annex I &Joint Ministerial Decision 107017/28.8.2006 (GG 1225/B/5-9-2006): "Assessment of the environmental effects of certain plans and programs, in compliance with the provisions of Directive 2001/42/EC " Annex III on the assessment of the effects of certain plans and programs on the environment " of the European Parliament and of the Council of 27th of June 2001", the following data should be included in the Strategic Environmental Impact Assessment:

- Outline of the contents, main objectives of the plan or Programme and its relationship with other relevant plans and programs,
- Relevant aspects of the current state of the environment and its probable evolution without the implementation of the plan or program,
- Environmental characteristics of areas that are likely to be significantly affected,
- Existing environmental problems which are relevant to the plan or program including, in particular, those relating to any areas of particular environmental importance, such as areas subject to the provisions of Directives 79/409/EEC on the conservation of wild birds and 92/43 / EEC on the conservation of natural habitats and of wild fauna and flora,
- Environmental protection objectives, established at international, Community or Member State level, that are relevant to the plan or program and the way those objectives and any environmental considerations have been taken into account during its preparation,
- Potential significant impacts on the environment, including aspects such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and their interaction,
- Measures provisioned to prevent, reduce and where possible offset any significant adverse impacts on the environment caused by the implementation of the plan or program,
- Outline of the reasons for selecting the alternatives that were examined, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information,
- Description of the measures provisioned concerning monitoring,
- Non-technical summary of the information provided under the above issues.

The structure of the Strategic Environmental Impact Assessment of IPA II Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" will include the following sections (Table 4):

Table 4:SEA Contents of IPA IICBC Programme "Greece-the former Yugoslav Republic of Macedonia 2014-2020"

SEA CONTENT OF IPA II CROSS BORDER COOPERATION PROGRAMME "GREECE-THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA 2014-2020"	
A.	NON TECHNICAL SUMMARY
B.	GENERAL INFORMATION
B.1	Managing Authority of the Programme
B.2	Eligible area
B.3	Author of SEA
C.	SCOPE AND OBJECTIVES OF THE PROGRAMME
C.1	Description of the SEA Process
C.2	Analysis of objectives
C.3	Environmental issues
C.4	Legislative and regulatory framework
C.5	Interconnection with other Programmes
D.	DESCRIPTION OF THE PROGRAMME
D.1	Geographic coverage
D.2	Content
D.3	Interventions/projects as outputs during its implementation
E.	ALTERNATIVES
E.1	Zero solution
E.2	Alternative solutions
E.3	Reasons for choosing alternative solutions
E.4	Environmentally documented reasons for selecting the proposed Programme, comparing to other alternative solutions
F.	DECRIPTION OF THE CURRENT ENVIRONMENTAL SITUATION
F.1	Atmospheric environment
	F.1.1 Air
	F.1.2 Acoustic Environment – Noise
F.2	Climate conditions
F.3	Aquatic environment
F.4	Natural – geographical characteristics
F.5	Biodiversity - Flora - Fauna
	F.5.1 Flora
	F.5.2 Fauna
	F.5.3 Biodiversity
F.6	Environmental Infrastructure
	F.6.1 Wastewater management

SEA CONTENT OF IPA II CROSS BORDER COOPERATION PROGRAMME "GREECE-THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA 2014-2020"	
	F.6.2 Waste Management
F.7	Natural Risks
F.8	Population
F.9	Social - Economic environment
	F.9.1 Gross Domestic Product (GDP) - Income
	F.9.2 Employment
	F.9.3 Energy
	F.9.4 Health
	F.9.5 Cultural Heritage
G.	ENVIRONMENTAL IMPACT ASSESSEMENT
G.1	Introduction
G.2	Methodology
G.3	Potential impacts of the Programme
	G.3.1 Biodiversity
	G.3.2 Population – Human Health
	G.3.3 Soil
	G.3.4 Water
	G.3.5 Air
	G.3.6 Climate conditions
	G.3.7 Material Assets
	G.3.8 Cultural Heritage
	G.3.9 Landscape
	G.3.10 Cumulative Impacts
H.	ELEMENTS OF THE REGULATORY ACT
H.1	Environmental Objectives
H.2	Proposals/measures/guidelines for preventing significant environmental impacts
H.3	Monitoring system of significant environmental impacts
I.	BASIC STUDIES& RESEARCHES
J.	ANNEXES

G.2 Methodology

The Environmental Report shall form an annex to the ex-ante evaluation report, also including:

- a non-technical summary of the information provided in the Environmental Report, as foreseen by Annex I(j) of the Directive 2001/42/EC;
- general description of the Programme;
- the description of eventual measures decided concerning monitoring foreseen in Articles 9(1)(c) and 10 of the mentioned Directive;
- information on the consultations with the public and the environmental authorities concerned, in compliance with Articles 6 and 7 of the Directive 2001/42/EC;
- description of the current environmental situation of the eligible area;
- identification assessment and evaluation of the likely significant (especially primary and secondary, cumulative, synergistic, short-, medium- and long-term, permanent and temporary, positive and negative) effects in areas such as:
    - biodiversity,
    - population,
    - human health,
    - fauna,
    - flora,
    - the ground,
    - waters,
    - the air,
    - climate conditions,
    - cultural heritage, including architectural and archaeological heritage,
    - the landscape, and
    - the connection between these factors.

The environmental impact assessment for each environmental aspect, will be based on the following criteria:

- Probability
- Scale
- Frequency
- Reversibility
- Cross border dimension
- Uncertainty
- Sequence and
- Interconnection.

Specific symbols will be used in order to assess the environmental impact of IPA II Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020", for each of the prementioned criteria:

- Positive: +

- Negative: -
- No Impact: 0

The completion of the environmental impact assessment will be summarized for each Priority Axis, in Table 1.

Table 1: Environmental Impact Assessment

PRIORITY AXIS:									
THEMATIC PRIORITY:									
SPECIFIC OBJECTIVE:					POTENTIAL INDICATIVE ACTIONS:				
ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora									
Population / Human health									
Soil									
Water									
Air									
Climate conditions									
Cultural heritage									
Landscape									
Connection between the above aspects									

The assessment and evaluation of the effects of IPA II Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" on the environment, will be finalized with the introduction of proposals for the addressing and monitoring of environmental impacts.

More specifically, the necessity for elaboration of control/prevention measures will be evaluated, towards controlling the negative impacts, and by maximizing the environmental benefits from the positive effects. The proposed measures by environmental aspect will be presented in tabular form as illustrated in Table 2.

Table 2: Control/prevention measures for environmental impacts

A/A	ENVIRONMENTAL ASPECT	PROBABLE IMPACTS	CONTROL/PREVENTION MEASURES

Following the determination of the control/prevention measures the monitoring of the significant environmental impacts of the implementation of IPA II Cross Border Cooperation Programme "Greece-The former Yugoslav Republic of Macedonia 2014-2020" will be based on periodic reports, using Table 3.

Table 3: Monitoring System of Important Environmental Impacts

A/A	ENIRONMENTAL ASPECT	ENVIRONMENTAL INDICATOR	MONITORING AUTHORITY	ENVIRONMENTAL PARAMETERS	MONITORING FREQUENCY

G.3 Potential impacts of the Programme

In general terms, environmental outcomes would be significant in scenarios where the momentum of activity generates positive cumulative impacts or alternatively where activities may generate negative unforeseen or mismanaged environmental impact.

The appraisal which is performed in the following Table illustrates that the programme demonstrates a clear compatibility with the objectives of the Europe 2020 Strategy and the proposed Seventh EU Environmental Action Programme. Moreover, the programme has adopted environmental sustainability as an horizontal principle. Nevertheless, there are inevitably uncertainties in terms of the form and significance of potential impacts and how effective the programme will be in securing positive outcomes.

With regard to significant positive environmental effects, in a scenario where programme implementation is very successful, the potential environmental benefits could be long-term and cumulative in nature.

Table 28: Environmental Impact Assessment

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: a. Promoting employment, labor mobility and social and cultural inclusion across borders

SPECIFIC OBJECTIVE: 1.1.Promotion of employment and mobility of human resources

POTENTIAL INDICATIVE ACTIONS:
- Initiatives to encourage support of unemployed and self employed or managers to innovation, creativity and entrepreneurship;
- Awards on innovative ideas
- University Students' mini-companies (competitions)
- Business, guidance and counseling services (e.g. mentor support and business coaching, YE online portals and web sites, etc.);
- Support to joint market initiatives and networking, incl. promotion and marketing campaigns for entrepreneurs.
- Planning of integrated actions to support the creation of jobs and enterprises to promote tourism and protect environment in the cross border area
- Networking of public services, authorities and nongovernmental initiatives for the exchange of know-how and the support of employment and entrepreneurship

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	+	+	0	+	+	0	+	+	Implementation of the above mentioned actions are expected to have direct positive impact related to Biodiverstiy/Fauna/Flora
Population / Human health	+	+	+	+	+	0	+	+	Positive effects are expected with regards to population and human health since these measures strengthen entrepreneurship and competitiveness of enterprises, support the employment. Unemployment indicators are expected to be improved and so would be the quality of life of the population in the cross-border area in general. Positive effects are expected to be of large scale and have cross-border dimension with direct results during the implementation of the indicative actions.

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: a. Promoting employment, labor mobility and social and cultural inclusion across borders

SPECIFIC OBJECTIVE: 1.1.Promotion of employment and mobility of human resources

POTENTIAL INDICATIVE ACTIONS:
- Initiatives to encourage support of unemployed and self employed or managers to innovation, creativity and entrepreneurship;
- Awards on innovative ideas
- University Students' mini-companies (competitions)
- Business, guidance and counseling services (e.g. mentor support and business coaching, YE online portals and web sites, etc.);
- Support to joint market initiatives and networking, incl. promotion and marketing campaigns for entrepreneurs.
- Planning of integrated actions to support the creation of jobs and enterprises to promote tourism and protect environment in the cross border area
- Networking of public services, authorities and nongovernmental initiatives for the exchange of know-how and the support of employment and entrepreneurship

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Soil	+	0	0	0	+	0	+	+	Indirect positive impacts are expected, as the actions promote and protect the environment
Water	+	0	0	0	+	0	+	+	Indirect positive impacts are expected, as the actions promote and protect the environment
Air	+	0	0	0	+	0	+	+	Indirect positive impacts are expected, as the actions promote and protect the environment
Climate conditions	+	0	0	0	+	0	+	+	Indirect positive impacts are expected, as the actions promote and protect the environment

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: a. Promoting employment, labor mobility and social and cultural inclusion across borders

SPECIFIC OBJECTIVE: 1.1.Promotion of employment and mobility of human resources

POTENTIAL INDICATIVE ACTIONS:
- Initiatives to encourage support of unemployed and self employed or managers to innovation, creativity and entrepreneurship;
- Awards on innovative ideas
- University Students' mini-companies (competitions)
- Business, guidance and counseling services (e.g. mentor support and business coaching, YE online portals and web sites, etc.);
- Support to joint market initiatives and networking, incl. promotion and marketing campaigns for entrepreneurs.
- Planning of integrated actions to support the creation of jobs and enterprises to promote tourism and protect environment in the cross border area
- Networking of public services, authorities and nongovernmental initiatives for the exchange of know-how and the support of employment and entrepreneurship

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Cultural heritage	+	+	0	+	+	0	+	+	The implementation of the actions promotes the cultural heritage of the eligible area
Landscape	+	0	0	0	+	0	+	+	Positive impacts are expected, as the actions promote the environment.
Connection between the above aspects	+	0	0	0	+	0	+	+	The interaction and connection between the above aspects, as assessed will be positive.

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: a. Promoting employment, labor mobility and social and cultural inclusion across borders

SPECIFIC OBJECTIVE: 1.2 Improvement of health and social investments and services for the support of vulnerable population groups

POTENTIAL INDICATIVE ACTIONS:
- Cross-border initiatives aimed at combating poverty and social exclusion;
- Mobile units to provide health and social care at rural areas for vulnerable groups, children and the elderly
- Promotion of early childhood care and promotion of equal opportunities for mothers
- Communities development initiatives to support social and family care;
- Supporting vulnerable groups to participate in social life and promote towards the labour market those who are capable to work
- Cross-border initiatives for promotion of health and well-being of young people;
- Promotion of people's participation in social care
- Preventive health programmes
- Networking of services in order to create integrated family care and counseling
- Supply of equipment for health care and social care centers

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	0	0	0	0	0	0	0	0	No impact is expected
Population / Human health	+	+	+	+	+	0	+	+	Positive effects are expected with regards to population, human health and tangible assets since these measures improve the health and support social investments and services for vulnerable population groups. Unemployment and health indicators are expected to be improved and so would be the quality of life of the population in the cross-border area in general. Positive effects are expected to be of large scale and have cross-border dimension with direct results during the implementation of the indicative actions.

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: a. Promoting employment, labor mobility and social and cultural inclusion across borders

SPECIFIC OBJECTIVE: 1.2 Improvement of health and social investments and services for the support of vulnerable population groups

POTENTIAL INDICATIVE ACTIONS:
- Cross-border initiatives aimed at combating poverty and social exclusion;
- Mobile units to provide health and social care at rural areas for vulnerable groups, children and the elderly
- Promotion of early childhood care and promotion of equal opportunities for mothers
- Communities development initiatives to support social and family care;
- Supporting vulnerable groups to participate in social life and promote towards the labour market those who are capable to work
- Cross-border initiatives for promotion of health and well-being of young people;
- Promotion of people's participation in social care
- Preventive health programmes
- Networking of services in order to create integrated family care and counseling
- Supply of equipment for health care and social care centers

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Soil	0	0	0	0	0	0	0	0	No impact is expected
Water	0	0	0	0	0	0	0	0	No impact is expected
Air	0	0	0	0	0	0	0	0	No impact is expected
Climate conditions	0	0	0	0	0	0	0	0	No impact is expected
Cultural heritage	0	0	0	0	0	0	0	0	No impact is expected

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: a. Promoting employment, labor mobility and social and cultural inclusion across borders

SPECIFIC OBJECTIVE: 1.2 Improvement of health and social investments and services for the support of vulnerable population groups

POTENTIAL INDICATIVE ACTIONS:
- Cross-border initiatives aimed at combating poverty and social exclusion;
- Mobile units to provide health and social care at rural areas for vulnerable groups, children and the elderly
- Promotion of early childhood care and promotion of equal opportunities for mothers
- Communities development initiatives to support social and family care;
- Supporting vulnerable groups to participate in social life and promote towards the labour market those who are capable to work
- Cross-border initiatives for promotion of health and well-being of young people;
- Promotion of people's participation in social care
- Preventive health programmes
- Networking of services in order to create integrated family care and counseling
- Supply of equipment for health care and social care centers

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Landscape	0	0	0	+	0	0	0	0	No impact is expected
Connection between the above aspects	+	0	0	0	0	0	0	+	The interaction and connection between the above aspects, as assessed will be positive

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: d. Encouraging tourism and cultural and natural heritage

SPECIFIC OBJECTIVE: 1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area

POTENTIAL INDICATIVE ACTIONS:

- ICT facilities developed/upgrade;
- Establishment of info-centers and/or kiosks to guide potential visitors;
- Development of joint GIS platforms;
- Joint actions on potential niche tourism activities and/or on the demand for new tourist destinations and experience;
- Joint activities to identify tourist products with potential for cross-border branding;
- Development of local brand/s based on natural, historical and cultural heritage of the region;
- Support for the development of new and innovative touristic products and services to be delivered on sites;
- Creating knowledge networks for tourism innovations in the border area;
- Multi-lingual on-line touristic platforms;
- Visualization of local brands, incl. 3D visualization, mobile applications, social networks, tailor-made internet platforms, and other innovative tools;
- Identification and application of best practices in tourism promotion;
- Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.).
- Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management;
- Surveys on domestic and international demand for cross-border tourism
- Experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: d. Encouraging tourism and cultural and natural heritage

SPECIFIC OBJECTIVE: 1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area

POTENTIAL INDICATIVE ACTIONS:

- ICT facilities developed/upgrade;
- Establishment of info-centers and/or kiosks to guide potential visitors;
- Development of joint GIS platforms;
- Joint actions on potential niche tourism activities and/or on the demand for new tourist destinations and experience;
- Joint activities to identify tourist products with potential for cross-border branding;
- Development of local brand/s based on natural, historical and cultural heritage of the region;
- Support for the development of new and innovative touristic products and services to be delivered on sites;
- Creating knowledge networks for tourism innovations in the border area;
- Multi-lingual on-line touristic platforms;
- Visualization of local brands, incl. 3D visualization, mobile applications, social networks, tailor-made internet platforms, and other innovative tools;
- Identification and application of best practices in tourism promotion;
- Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.).
- Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management;
- Surveys on domestic and international demand for cross-border tourism
- Experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	+	+	+	0	+	0	+	+	Predicted actions are possible to have positive effects on biodiversity, flora and fauna. In general actions to some extent include environmental protection while aiming to protect natural and cultural heritage. Consequently, predicted actions have cross-border dimension with direct results during their implementation. Protection of biodiversity is expected to have cumulative positive results in the protection of cultural and natural resources and the improvement of quality of life of the population.

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: d. Encouraging tourism and cultural and natural heritage

SPECIFIC OBJECTIVE: 1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area

POTENTIAL INDICATIVE ACTIONS:
- ICT facilities developed/upgrade;
- Establishment of info-centers and/or kiosks to guide potential visitors;
- Development of joint GIS platforms;
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- Development of local brand/s based on natural, historical and cultural heritage of the region;
- Support for the development of new and innovative touristic products and services to be delivered on sites;
- Creating knowledge networks for tourism innovations in the border area;
- Multi-lingual on-line touristic platforms;
- Visualization of local brands, incl. 3D visualization, mobile applications, social networks, tailor-made internet platforms, and other innovative tools;
- Identification and application of best practices in tourism promotion;
- Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.).
- Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management;
- Surveys on domestic and international demand for cross-border tourism
- Experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Population / Human health	+	0	+	0	+	0	+	+	Indirect positive effects are also expected in population, human health and tangible assets considering the actions for the protection and valorization of cultural resources. The predicted actions would have positive cross-border dimension with direct results during their implementation.
Soil	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	No particular impacts are expected on soil.
Water	+	0	+	0	+	0	0	+	Indirect positive impact is expected on water

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: d. Encouraging tourism and cultural and natural heritage

SPECIFIC OBJECTIVE: 1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area

POTENTIAL INDICATIVE ACTIONS:

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- Support for the development of new and innovative touristic products and services to be delivered on sites;
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- Identification and application of best practices in tourism promotion;
- Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.).
- Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management;
- Surveys on domestic and international demand for cross-border tourism
- Experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Air	+	0	+	0	+	0	0	+	Indirect positive impact is expected on air quality
Climate conditions	+	0	+	0	+	0	0	+	Indirect positive impact is expected on climate conditions

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: d. Encouraging tourism and cultural and natural heritage

SPECIFIC OBJECTIVE: 1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area

POTENTIAL INDICATIVE ACTIONS:

- ICT facilities developed/upgrade;
- Establishment of info-centers and/or kiosks to guide potential visitors;
- Development of joint GIS platforms;
- Joint actions on potential niche tourism activities and/or on the demand for new tourist destinations and experience;
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- Development of local brand/s based on natural, historical and cultural heritage of the region;
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- Creating knowledge networks for tourism innovations in the border area;
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- Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.).
- Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management;
- Surveys on domestic and international demand for cross-border tourism
- Experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Cultural heritage	+	+	+	+	+	0	+	+	Planned actions are expected to have a positive effect on the protection of cultural heritage since this priority axis aims towards this direction. Positive effects are expected to be of large scale and have cross-border dimension with direct results during the implementation of the proposed actions. Protection and promotion of cultural and natural resources is expected to have cumulative positive results also in the protection of biodiversity and the improvement of quality of life of the population.
Landscape	+	+	+	+	+	0	+	+	Environmental protection actions would have a positive effect on landscape and long-term results.

PRIORITY AXIS: 1. Development and Support of Local Economy

THEMATIC PRIORITY: d. Encouraging tourism and cultural and natural heritage

SPECIFIC OBJECTIVE: 1.3 Promotion and protection of natural and cultural heritage to improve the attractiveness and encourage tourism in the cross-border area

POTENTIAL INDICATIVE ACTIONS:

- ICT facilities developed/upgrade;
- Establishment of info-centers and/or kiosks to guide potential visitors;
- Development of joint GIS platforms;
- Joint actions on potential niche tourism activities and/or on the demand for new tourist destinations and experience;
- Joint activities to identify tourist products with potential for cross-border branding;
- Development of local brand/s based on natural, historical and cultural heritage of the region;
- Support for the development of new and innovative touristic products and services to be delivered on sites;
- Creating knowledge networks for tourism innovations in the border area;
- Multi-lingual on-line touristic platforms;
- Visualization of local brands, incl. 3D visualization, mobile applications, social networks, tailor-made internet platforms, and other innovative tools;
- Identification and application of best practices in tourism promotion;
- Organization (and participation in) of fairs and related activities(i.e. exhibitions, conferences, seminars, road shows, presentations, etc.).
- Organization of networking events, incl. online forums, for exchange of good practices in sustainable tourism management;
- Surveys on domestic and international demand for cross-border tourism
- Experiences; surveys on quality of services, projects to monitor thematic tourism development and related services, etc.;

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Connection between the above aspects	+	+	+	+	+	0	+	+	Interaction and interrelation of the above factors with regards to the expected impact of each different aspect would be positive.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: c. Promoting sustainable transport, IC networks & services and investing in cross-border water, waste & energy systems and facilities

SPECIFIC OBJECTIVE: 2.1 Improvement of public infrastructures and reduction of isolation by improved access to transport, information and communication networks and services

POTENTIAL INDICATIVE ACTIONS:
- ICT systems and equipment to improve check point services and facilities
- Improving cross-border road access and mobility
- Improving cross border custom and safety infrastructure and equipment
- Improving energy efficiency of public buildings and infrastructure

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	0	0	0	0	0	0	0	0	In regard to infrastructure the effect is not significant as it is related to interventions on existing infrastructure, where there is no significant biodiversity detected and the potential impact on flora and fauna will involve disturbance during project implementation
Population / Human health	+	+	+	+	+	0	+	+	Positive effects are also expected from the promotion of sustainable infrastructure, transport. A large scale positive effect is also expected thanks to the cross-border dimension with direct results during the implementation of the indicative actions.
Soil	0	0	0	0	0	0	0	0	No negative impact is expected.
Water	0	0	0	0	0	0	0	0	No negative impact is expected.
Air	+	0	+	+	+	0	+	+	The improvement of road network will indirectly contribute in the improvement of air quality, by facilitating mobility of vehicles which produce significant amounts of air pollutants. Consequently, large-scale positive effects are expected. The predicted actions would have cumulative positive results and cross-border dimension. The results are expected to have a permanent positive effect.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: c. Promoting sustainable transport, IC networks & services and investing in cross-border water, waste & energy systems and facilities

SPECIFIC OBJECTIVE: 2.1 Improvement of public infrastructures and reduction of isolation by improved access to transport, information and communication networks and services

POTENTIAL INDICATIVE ACTIONS:
- ICT systems and equipment to improve check point services and facilities
- Improving cross-border road access and mobility
- Improving cross border custom and safety infrastructure and equipment
- Improving energy efficiency of public buildings and infrastructure

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Climate conditions	+	+	+	+	+	0	0	+	Predicted actions are expected to have a positive effect on climate conditions. Improving energy efficiency of public buildings and infrastructures as well as traffic management contribute to climate change mitigation.
Cultural heritage	0	0	0	0	0	0	0	0	No negative impact is expected
Landscape	+	0	+	0	+	0	+	+	Improved access networks have large-scale positive effect on the landscape with long-term results.
Connection between the above aspects	+	+	+	+	+	0	+	+	Interaction and interrelation of the above factors, as it evaluated with regards to the expected impact of each different aspect would be positive.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: c. Promoting sustainable transport, IC networks & services and investing in cross-border water, waste & energy systems and facilities

SPECIFIC OBJECTIVE: 2.2 Sustainable management, treatment and recycling of wastes

POTENTIAL INDICATIVE ACTIONS:
- Integrated management and volume reduction of solid wastes
- Recycling and reuse wastes
- Treatment and reuse of municipal, industrial and agricultural wastes
- Monitoring, early warning and decision support systems for the sustainable management of solid and liquid wastes

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	+	+	+	+	+	0	+	+	Potential actions are likely to have large-scale positive effects on biodiversity, flora-and fauna. The actions have a cross-border dimension with direct results. Sustainable management, treatment and recycling of wastesare expected to have positive cumulative effects also in the protection of natural resources (soil, water, climate, landscape, and air) while improving quality of life of the population.
Population / Human health	+	+	+	+	+	0	+	+	Positive effects are expected in the case of population, human health and tangible assets as a result of the sustainable management, treatment and recycling of wastes.
Soil	+	+	+	+	+	0	+	+	Waste management (solid waste and liquid waste) as well as recycling and reuse of solid have a large-scale positive effect on soil which already suffer from intenseenvironmental pressure, ground pollution and desertification. The positive effect has a cross-border dimension with direct results during the implementation of the indicative actions. Soil protection is expected to have cumulative positive results also in the protection of other natural resources (water, climate, landscape, air) and biodiversity, while an improvement if quality of life of the population is also expected.
Water	+	+	+	+	+	0	+	+	Management of liquid and solid waste would have a large-scale positive effect in the protection of water pollution. Cumulative positive effect is expected in all the examined fields while cross-border and long-term positive effects are also expected from the implementation of the actions predicted.
Air	+	+	+	+	+	0	+	+	Positive effects are expected. The predicted actions would have cumulative positive results and cross-border dimension. The results are expected to have a permanent positive effect.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: c. Promoting sustainable transport, IC networks & services and investing in cross-border water, waste & energy systems and facilities

SPECIFIC OBJECTIVE: 2.2 Sustainable management, treatment and recycling of wastes

POTENTIAL INDICATIVE ACTIONS:
- Integrated management and volume reduction of solid wastes
- Recycling and reuse wastes
- Treatment and reuse of municipal, industrial and agricultural wastes
- Monitoring, early warning and decision support systems for the sustainable management of solid and liquid wastes

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Climate conditions	+	0	0	+	+	0	0	+	Planned actions are expected to have an indirect positive effect on climate conditions
Cultural heritage	+	0	0	+	+	0	0	+	Planned actions would have an indirect positive effect in the protection of cultural heritage. Positive effects are long-term ones since environmental protection, waste management, pollution prevention and improvement of accessibility infrastructure promote cultural heritage.
Landscape	+	0	0	+	+	0	0	+	Environmental protection actions, waste management, pollution prevention have large-scale positive effect on the landscape with long-term results.
Connection between the above aspects	+	+	+	+	+	0	+	+	Interaction and interrelation of the above factors, as it evaluated with regards to the expected impact of each different aspect would be positive

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: b. Protecting the environment & promoting climate change adaptation & mitigation, risk prevention & management

SPECIFIC OBJECTIVE: 2.3 Sustainable management of protected areas, ecosystems and biodiversity

POTENTIAL INDICATIVE ACTIONS:
- Sustainable management, conservation and restoration of protected areas, threatened ecosystems and species
- Environmental education and awareness for the protection of the environment
- Sustainable usage of ecosystems services

ICT systems for environmental protection, monitoring and management

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	+	+	+	+	+	0	+	+	Potential actions are likely to have large-scale positive effects on biodiversity, flora-and fauna. In general actions include sustainable management of protection areas Sustainable exploitation of ecosystems services. Consequently it has a cross-border dimension with direct results during the implementation of the indicative actions. Protecting ecosystems and biodiversity is expected to have positive cumulative effects also in the protection of natural resources (soil, water, climate, landscape, and air) while improving quality of life of the population.
Population / Human health	+	+	0	+	+	0	0	+	Positive effects are expected in the case of population, human health and tangible assets as a result of the protection of the natural environment and natural resources from contamination and overuse. A large scale positive effect is also expected thanks to the cross-border dimension with direct results during the implementation of the indicative actions.
Soil	+	+	+	+	+	0	+	+	Sustainable management of protected areas, ecosystems and biodiversity a positive effect on soil. The positive effect has a cross-border dimension with direct results during the implementation of the indicative actions.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: b. Protecting the environment & promoting climate change adaptation & mitigation, risk prevention & management

SPECIFIC OBJECTIVE: 2.3 Sustainable management of protected areas, ecosystems and biodiversity

POTENTIAL INDICATIVE ACTIONS:
- Sustainable management, conservation and restoration of protected areas, threatened ecosystems and species
- Environmental education and awareness for the protection of the environment
- Sustainable usage of ecosystems services

ICT systems for environmental protection, monitoring and management

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Water	+	+	0	+	+	0	0	+	Sustainable management of protected areas, ecosystems and biodiversity would have a positive effect on water. The positive effect has a cross-border dimension with direct results during the implementation of theindicative actions.
Air	+	0	0	+	+	0	0	+	The predicted actions would have cumulative positiveresults on air and cross-border dimension. The results are expected to have a permanent positive effect.
Climate conditions	+	+	+	+	+	0	+	+	Planned actions are expected to have strong positive effect on climate conditions through actions that support the adaptation and mitigation of climate change impacts on natural resources and environment Protection and management of natural resources as well as traffic arrangement contribute to climate change mitigation.
Cultural heritage	+	0	0	+	+	0	0	+	Predicted actions would have an indirect positive effect in the protection of cultural heritage. Positive effects are long-term ones since sustainable environmental management promotes cultural heritage.
Landscape	+	+	0	+	+	0	0	+	Environmental protection actions have large-scale positive effect on the landscape with long-term results.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: b. Protecting the environment & promoting climate change adaptation & mitigation, risk prevention & management

SPECIFIC OBJECTIVE: 2.3 Sustainable management of protected areas, ecosystems and biodiversity

POTENTIAL INDICATIVE ACTIONS:
- Sustainable management, conservation and restoration of protected areas, threatened ecosystems and species
- Environmental education and awareness for the protection of the environment
- Sustainable usage of ecosystems services

ICT systems for environmental protection, monitoring and management

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Connection between the above aspects	+	+	+	+	+	0	+	+	Interaction and interrelation of the above factors, as it evaluated with regards to the expected impact of each different aspect would be positive.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: b. Protecting the environment & promoting climate change adaptation & mitigation, risk prevention & management

SPECIFIC OBJECTIVE: 2.4 Prevention, mitigation and management of natural disasters, risks and hazards

POTENTIAL INDICATIVE ACTIONS:
- Improving the operational efficiency of public administration and public services in natural disasters management
- Mobilization of citizens and support of volunteering to increase disaster resilience and emergency preparedness
- Cross-border networks of co-operations for the effective prevention and management of natural disasters, risks and hazards
- Development of early warning and disaster management systems

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT	COMMENTS

	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Biodiversity / Fauna, Flora	+	+	+	+	+	0	+	+	Potential actions are likely to have large-scale positive effects on biodiversity, flora-and fauna. In general actions have a posistive impact as they support the prevention, the mitigation and the management of natural disasters, risks and hazards. Predicted actions have a cross-border dimension with immediate results during their implementation.
Population / Human health	+	+	+	+	+	0	+	+	Positive effects are expected in the case of population, human health and tangible assets thanks to the upgrade of the natural environment and the safeguarding of appropriate living conditions for the population in the cross-border region. The positive effect is has a cross-border dimension and immediate results during the implementation of indicative actions.
Soil	+	+	+	+	+	0	+	+	Prevention and protection from natural hazards has a large scale positive effect on soil that already faces intense environmental pressure from previous natural hazards (eg. Fires, floods). This effect would have a cross-border dimension with direct results during the implementation of the actions. Soil protection is expected tohave cumulative positive results also in the protection of other natural resources (water, climate, landscape, and air) and biodiversity, while an overall improvementin quality of life for the population is also expected.
Water	+	+	+	+	+	0	+	+	Potential actions are likely to have large-scale positive effects on water protection from natural disasters. Cumulative positive result in all theexamined aspects are expected, while this effect would have a cross-border dimension with long-term results during the implementation of the indicative actions.
Air	+	0	0	+	+	0	0	+	Prevention and management of natural disasters have indirect positive effect in air quality. Hence, large scale positive effects are expected. Actions would have cumulative positive results and cross-border dimension. The results are expected to have a permanent positive effect.
Climate conditions	+	0	0	+	+	0	0	+	The actions predicted have a positive indirect effect in climate conditions. Protection of biodiversity and natural resources from natural hazards contribute to climate change mitigation.

PRIORITY AXIS: 2. Protection of Environment - Transportation

THEMATIC PRIORITY: b. Protecting the environment & promoting climate change adaptation & mitigation, risk prevention & management

SPECIFIC OBJECTIVE: 2.4 Prevention, mitigation and management of natural disasters, risks and hazards

POTENTIAL INDICATIVE ACTIONS:
- Improving the operational efficiency of public administration and public services in natural disasters management
- Mobilization of citizens and support of volunteering to increase disaster resilience and emergency preparedness
- Cross-border networks of co-operations for the effective prevention and management of natural disasters, risks and hazards
- Development of early warning and disaster management systems

ENVIRONMENTAL ASPECTS	POTENTIAL IMPACT								COMMENTS
	Probability	Scale	Frequency	Reversibility	Cross border dimension	Uncertainty	Sequence	Interconnection	
Cultural heritage	+	0	0	+	+	0	0	+	The actions planned have a positive effect in the protection of cultural heritage. Positive effects are long-term while protection from natural disasters safeguardstheir integrity and preservation.
Landscape	+	+	0	+	+	0	0	+	Actions for the prevention and management of natural disasters have a direct positive effect on the landscape with long-term results.
Connection between the above aspects	+	+	+	+	+	0	+	+	Interaction and interrelation of the above factors, with regards to the expected impact of each different aspect would be positive.

Priority Axis 3 "Technical Assistance" is a tool for the enhancement of the programme management and is not expected to have a negative impact on the environment. Of course proper management and programme implementation enhances the efficiency of the relevant actions. In that sense Priority Axis 3 "Technical Assistance" can be seen as an horizontal action with an indirect positive potential impact on the environment.

G.3.1 Biodiversity

The cross-border region combines favorable natural resources (mountains, forests, lakes, biodiversity, unique natural forms, geothermal and mineral waters, waterfalls) and favorable climate conditions.

The overall impact of the IPA CBC Programme will be positive. This is due to the activities which are planned and expected to contribute directly or indirectly to the protection of thevery important habitats that exist in the area, as well as of the rare flora and fauna species that live there.

Unfortunately, EU environmental norms are sparsely implemented or not implemented at all, if subsequent regulatory framework simply missing in regards to management and protection of natural resources. The integrated approach for sustainable growth can mitigated the land environmental pressures suffered of the programme areas.

In case there are not implemented all necessary measures in terms of the institutional framework for the sustainable management of natural resources, the IPA CBC Programme may lead to adverse results.

G.3.2 Population – Human Health

The region is characterized by high level of unemployment rates, both in total active population and on youth. Unemployment rates raised significally during the greek economic crisis, and according to Eurostat, the unemployment rates have dramatically increased in Western and Central Macedonia reaching 30% and 26% respectively, in 2012. In former Yugoslav Republic of Macedonia, the unemployment tensions show a slight reduction in some regions like Vardar (30%) and Pelagonia (22%), and increase in others like Southeast (36.7%).

Expected positive effects due to the promotion of employment and mobility of human resources as well as due to the improvement of health and social investments and services for the support of vulnerable population groups.

Also expected positive effect because of any increase in income through the operations and business support of the supporting mechanisms.

G.3.3 Soil

Soil is the end product of the influence of the climate, relief (elevation, orientation, and slope of terrain), biotic activities (organisms), and parent materials (original minerals) interacting over time. Soil continually undergoes development by way of numerous physical, chemical and biological processes, which include weathering with associated. In the eligible area erosion and soil contamination have been observed in various areas and are mainly due to poor waste management in intensive cultivation. The desertification of the area is one of the main problems with consequences to the soil.

Positive effects are expected of actions of sustainable management of solid and water waste, the recycling, treatment and reuse of the wastes, which have a cross-border dimension with direct results during the implementation of the indicative actions.

Prevention and protection from natural hazards has a large scale positive effect on soil that already faces intense environmental pressure from previous natural hazards (eg. Fires, floods).

Soil protection is expected to have cumulative positive results also in the protection of other natural resources (water, climate, landscape, and air) and biodiversity, while an overall improvement in quality of life for the population is also expected.

G.3.4 Water

There is an overuse of water mainly for agricultural purposes and municipal waste water disposal.

The effective treatment and reuse of wastewater in the eligible area is one of the major issues of concern since the insufficient treatment of wastewater affects both the life quality of citizens and environmental quality. Industrial and urban wastewater is discharged as untreated or insufficiently treated to the Vardar/Axios river, whose pollution is affecting not only the country but also the Aegean Sea. Furthermore, the large cross-border lakes Ohrid, Prespa and Dojran, and on the Greek side the Vegoritis complex with Cheimaditida, Petron and Zazari Lakes are also threatened by wastewater discharges in the catchment areas.

On the other hand the increase in demand of water will accelerate the expansion of water supply systems, improving the quality of life of households, the increase in productive activities, the development of special interest tourism and increased seasonal and permanent population.

Positive impact on the water quality is expected from the improvement of wastewater treatment and the reduction of pressures and impacts on environment through the effective treatment and reuse of liquid and solid wastes.

G.3.5 Air

Agriculture and the energy sector are considered to be the main contributors to the total CO_2-eq emissions, more than 80%, in both Greece and former Yugoslav Republic of Macedonia. In the eligible area fuel combustion and industrial process represent the main sources of CO_2 emissions, waste represents the main source of CH_4 emissions, while the majority of N_2O is attributed to agriculture.

The improvement and the extension of road networks will lead to an increase in road transport and a further increase in air pollution.

The improvement of road network will indirectly contribute in the improvement of air quality, by facilitating mobility of vehicles which produce significant amounts and pollutants.

G.3.6 Climate conditions

The state of the atmosphere does not present any particular feature burden than particulate matter found in some areas, but not systematically monitored in addition to the positions of some facilities which will point pollution.

The increase / improvement of roads will lead to an increase in road travel and a further increase in air pollutants. However, the increase in air pollution is pervasive and upgrading / improvement of major roads will help reduce air pollution.

Positive impact on air quality is expected from environmentally friendly investments and the sustainable management of the wastes.

G.3.7 Material Assets

The expected improvement of economic indicators, the enhancement of natural environment, the improvement of employment rates and general the upgrade of the quality of life is expected to increase the value of assets.

Undoubtedly, during the construction of infrastructure in some cases the value of neighboring to the works properties will be reduced temporarily.

In any case this can be avoided if during the planning and implementation the works appropriate measures are taken.

G.3.8 Cultural Heritage

The cross-border region combines favorable natural resources (mountains, forests, lakes, biodiversity, unique natural forms, geothermal and mineral waters, waterfalls), favorable climate conditions, as well as cultural assets (existing cultural manifestations, festivals, carnivals; churches and monasteries; crafts, authentic local characteristic).

Tourism and recreation need to be developed in a sustainable way, minimizing direct disturbances of the natural ecosystems and pressures through water abstraction and wastewater discharges.

Planned actions are expected to have a positive effect on the protection of cultural heritage since this priority axis aims towards this direction. Positive effects are expected to be of large scale and have cross-border dimension with direct results during the implementation of the proposed actions. Protection and promotion of cultural and natural resources is expected to have cumulative positive results also in the protection of biodiversity and the improvement of quality of life of the population.

G.3.9 Landscape

The cross-border region combines favorable natural resources (mountains, forests, lakes, biodiversity, unique natural forms, geothermal and mineral waters, waterfalls) and favorable climate conditions.

Environmental protection actions, waste management, pollution prevention have large-scale positive effect on the landscape with long-term results.

Expected negative impact on the landscape will be due to transport infrastructure and other public infrastructure. These effects may change the urban and rural landscape, mainly because happen fragmentary and to a limited extent.

G.3.10 Cumulative Impacts

The high level of abstraction of this type of Programme hampers a detailed, quantitative and partially differentiated assessment of the potential effects of the CBC Programme GREECE – fYROM 2014-2020.

The assessment thus has been based on the verification how far the strategic approach and the individual specific objectives and their expected highly indirect results contribute to EU environmental objectives and the general EU environmental policy. The assessment of possible cumulative and synergetic effects follows this approach and restriction.

Due to the wide range of potential (indirect) contributions to EU environmental objectives and potential effects on environmental issues (all of the environmental issues are indirectly positive

affectedbytheProgramme,somebyseveralexpectedresult,someonlybyoneortwoonly)and the complexity of interrelations between the individual environmental issues the indirect cumulative effect of the Programme is notable. A successful implementation of the Programme establishes mechanisms and builds capacities with positive influences on realizing environmental protection more effectively in the future via improved regional policies and programmes. A more focused orientation of projects of PAs 1 and 2 and a stricter consideration of interrelations of the two Priority Axes (internal consistency of the Programme) could even strengthen the cumulative effect of the contributions.

By promotion environment and resource efficiency the Programme supports the protection of environmental factors as air, water, soil, biodiversity and landscape. Human health and human well-being is positivelyinfluencedbylesspollutedair,particularlyinurbanareas,butalsobybetterqualityofground and surface waters and landscape. It must be highlighted again, a strategic implementation of projects under the two Axes of the Programme could be made to increase the positive synergetic effects.

Effects on the environment of the Programme as a whole concerning the potential effects on the environment and contributions to the EU environmental objectives and general EU environmental policy, the Programme is differentiated into two parts:

- Priority Axis 1 show less direct and indirect effects and contributions, whereas
- Priority Axis 2can realize also direct and indirect effects and contributions but due to their explicit focus on environmental issues.

The risk of negative effects and contributions is very limited.

Summarizing the individual Axes, the assessment shows that all environmental issues can receive positive effects by the Programme. But type of interventions planned is even more important for the effect and contribution of the whole Programme as a whole as and the individual PAs. The improvement of framework conditions for more effective implementation of cross border cooperation programmes, policy learning and exchange of interregional experiences expands the scope of (positive) effects. Knowledge and capacities generally open opportunities for an effective consideration and integration of environmental issues in programming and implementation of cross border programmes.

The Programme can provide for the spreading of good practices and contribute to an increased understanding of the need but also benefits of low-carbon economy, resource efficiency and protection and development of natural and cultural heritage. This influence could be capitalized. A strict consideration of the horizontal principle 'sustainable development' is needed in all phases and in all Priority Axes during the implementation of the CBC Programme GREECE – fYROM 2014-2020.

H. ELEMENTS OF THE REGULATORY ACT

H.1 Environmental Objectives

An example of the international documents containing objectives relevant for the programme are :

- Johannesburg Declaration 2002, guiding principles on sustainable development; builds on earlier declarations made at the United Nations Conference at Stockholm in 1972, and the Earth Summit in Rio de Janeiro in 1992On EU level, the strategy Europe 2020 is of special importance:
- Strategy Europe 2020. The aims of the Lisbon Strategy (2000) could only partly be reached. Out of this reason, in June 2010 the "Strategy Europe 2020" was adopted. The strategy follows three priorities:
    - Smart growth: developing an economy based on knowledge and innovation.
    - Sustainable growth: promoting a more resource efficient, greener and more competitive economy.
    - Inclusive growth: fostering a high-employment economy delivering social and territorial cohesion

One sphere of European environmental policy that the actions of the CBC Programme could not neglect concern the biodiversity policy and action plans aimed at good status of habitats. Main applicable policy document here is the EU Biodiversity Strategy, adopted in 2012 "Our life insurance, our natural capital: the EU biodiversity strategy to 2020". The strategy is in line with the commitments made by the EU countries.

The strategy calls to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets, and 20 actions to help Europe reach its goal.

The six targets cover:

- Full implementation of EU nature legislation to protect biodiversity;
- Better protection of ecosystems, and more use of green infrastructure;
- More sustainable agriculture and forestry;
- Better management of fish stocks;
- Tighter controls on invasive alien species;
- A bigger EU contribution to averting global biodiversity loss.

Biodiversity conservation is related to the Natura 2000 areas governed by the Habitats and Birds Directive. Significant Natura 2000 areas are located in the eligible area and balanced management of these areas provides challenges and opportunities for the projects within the CBC Programme.

H.2 Proposals/measures/ guidelines for preventing significant environmental impacts

The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.

The main points that need to be addressed, so that the environmental effectiveness of the Programme is enhanced and the maximum results are accomplished, are summarized below:

A/A	ENVIRONMENTAL ASPECT	PROBABLE IMPACTS	CONTROL/PREVENTION MEASURES
1	**Biodiversity**	The overall impact of the IPA CBC Programme will be positive. This is due to the activities which are planned and expected to contribute directly or indirectly to the protection of the very important habitats that exist in the area, as well as of the rare flora and fauna species that live there. There will be a slight negative impact because of the establishment of new business actions. Due to the abundance of ecosystems in the border region is expected that there will be cases where such areas will be affected, either by the construction of infrastructure in or near such areas. The infrastructure projects are small scale and in all cases will be provided environmental protection measures to avoid negative consequences.	The prevention, reduction and control of environmental impacts of the Programme are achieved through two main mechanisms: c) the environmental licensing of projects and activities as applicable and d) specification for special conditions, provisions and / or conditions that will be applied in the implementation of program and will be incorporated into management processes (assessment instruments, integration projects). Individual actions proposed within each mechanism are described below: a) Environmental licensing projects and activities. ■ Compliance with the specific emission limit values of pollutant loads and concentrations for air, water and soil in accordance with the applicable provisions ■ Compliance with the specific limit values for noise. ■ Compliance with the provisions for the management of waste in each country. ■ Taking all necessary measures provided by the two countries legislation in relation to the prevention and reduction of pollution of protected areas, aquatic environment and forest in accordance with the relevant legislation. b) Specific measures to protect the environment. ■ Indicate directions, preconditions, restrictions and recommendations beyond compliance with licensing procedures aimed at avoiding the cumulative impacts that may be caused by the implementation of various projects. ■ maximize the environmental outcome of the CBC Programme.
2	**Population – Human Health**	Activities that aim at the increase of the employment and the enhancement of the entrepreneurship of the area have the most important contribution to the population –human health. Human health will be improved through actions of promotion the accessibility to health care services.	
3	**Soil**	The overall effect is positive in soil due to implementation of sustainable integrated management systems, treatment and recycling of waste. A slight negative impact is expected due to investment in development activities and infrastructure projects.	
4	**Water**	The improvement of wastewater treatment and the reduction of pressures and impacts on environment through the effective treatment and reuse of liquid and solid wastes will support the improvement of water quality.	
5	**Air**	The improvement and the extension of road networks will lead to an increase in road transport and a further increase in air pollution.	

A/A	ENVIRONMENTAL ASPECT	PROBABLE IMPACTS	CONTROL/PREVENTION MEASURES
			As a main principle for determining the measures to be proposed is recognized the principle of prevention.
6	**Climate conditions**	The joint and coordinated environmental actions in the border region contribute to the reduction of GHG emissions and carbon/water footprint and to the reduction of the impacts of climate change on ecosystems.	
7	**Material Assets**	It is predicted that there will be an increase in the value of assets in the border area because of improved accessibility and improved infrastructure. Unfortunately there will be possible value reduction due to the proximity to infrastructure, noise and soil and air pollution. It is assessed that there may be adverse impacts during the construction of infrastructure.	
8	**Cultural heritage**	The planned actions for the promotion and protection of cultural heritage will have strong positive impact. Support for the development of new and innovative touristic products and services to be delivered as well as supporting the protection and promotion of cultural heritage, will also have a positive impact on the protection and promotion thereof.	
9	**Landscape**	Due to the abundance of wide areas of unique landscape, it is likely some of the infrastructure, and development activities, to adversely affect the landscape with land occupation, division and aesthetic degradation.	
10	**Cumulative Impacts**	The interaction and relationship between the above factors, as estimated by the direction of the impact of each factor separately, will be positive.	

H.3 Monitoring system of significant environmental impacts

According to the *guideline* of the European Commission, the monitoring system presents the following items (non comprehensive list)[18]:

- Monitoring covers in principle the **environmental effects included in the environmental report**. It may, however, focus on some environmental effects or include additional aspects which were not apparent.
- It is useful to identify and select the environmental information which is necessary for monitoring the relevant environmental effects. Environmental effects may also be indirectly monitored through the monitoring of the causes of the effects. **Indicators** or a **set of questions** may provide a framework which helps to identify the relevant environmental information. They also help to condense environmental data to understandable information.
- Sources of environmental information can be found **at project level**. Environmental information at project level addresses pressure factors and environmental effects. **General environmental monitoring** systems provide environmental data detecting changes in the environment. These data help to verify the achievement of environmental objectives and targets, but they allow only to a limited extent the changes in the environment to be attributed to the implementation of the plan or programme.
- Monitoring can be integrated in the **planning system**. Efficient monitoring demands a determination of the responsible authority/ies, as well as the time and frequency of monitoring measures. Monitoring arrangements should also include the **evaluation of the environmental information**.
- It may be useful to use the **criteria for the consideration of remedial action**. Remedial action can be undertaken on planning level and implementation level.

Regardless of the monitoring measures frequency, a **mid-term review** will be necessary to assess the relevance and the efficiency of the monitoring system.

Having considered the above mentioned guideline of the EU, in the table that follows there are proposed for each environmental aspect, respective environmental indicators, the monitoring body, the environmental parameters and the monitoring frequency.

[18] IMPLEMENTATIONOFDIRECTIVE2001/42ONTHEASSESSMENTOFTHEEFFECTSOFCERTAINPLANSANDPROGRAMMESONTHEENVIRONMENT

A/A	ENIRONMENTAL ASPECT	ENVIRONMENTAL INDICATOR	MONITORING AUTHORITY	ENVIRONMENTAL PARAMETERS	MONITORING FREQUENCY
1	Biodiversity	▪ Habitat alteration and land conversion from natural state ▪ Number and / or extent of protected areas ▪ Number of endemic and protected species ▪ Area of key ecosystems ▪ Protected areas as % of national territory and by type of ecosystem	▪ Management bodies of protected areas ▪ Responsible Public Authorities	▪ Habitat alteration and land conversion from natural state ▪ Number and / or extent of protected areas ▪ Number of endemic and protected species ▪ Area of key ecosystems ▪ Protected areas as % of national territory and by type of ecosystem	Annually
2	Population – Human Health	▪ Life expectancy ▪ Work accidents ▪ Percentage of population living under the line of poverty	▪ Responsible Public Authorities	▪ Life expectancy ▪ Work accidents ▪ Percentage of population living under the line of poverty	Annually
3	Soil	▪ Percentage of degraded land ▪ Quantities of waste disposed in landfills ▪ Production Waste % recycling (paper, glass, aluminum)	▪ Responsible Public Authorities	▪ Percentage of degraded land ▪ Quantities of waste disposed in landfills ▪ Production Waste ▪ % recycling (paper, glass, aluminum)	Annually
4	Water	▪ Population connected to secondary and/or tertiary sewage treatment plant ▪ Quality of surface water ▪ Quality of groundwater ▪ Water use by sector ▪ Percentage of recycling water ▪ Quality of seas	▪ Responsible Public Authorities ▪ Ministries of Environment	▪ BOD5/COD in inland waters ▪ Concentration of N & P in inland waters ▪ Heavy metals ▪ Organic compounds ▪ pH ▪ Microbiolgical parameters	The frequency is defined according to the monitoring systems of the water in the countries
5	Air	▪ Days exceeded air quality limits ▪ Emissions by Source	▪ Responsible Public Authorities ▪ Responsible Regional Authorities	▪ SOx, NOx, PM10, CO ▪ GHG, ▪ Pb	The frequency is defined according to the monitoring systems of the air in the countries
6	Climate conditions	▪ Greenhouse gas emissions by source (%) ▪ Shift of energy demand ▪ Energy production by	▪ Ministries of Environment	▪ CO2 emissions ▪ CH4 emissions ▪ N2O emissions ▪ PFC, HFC, SF6 missions	Annually

A/A	ENIRONMENTAL ASPECT	ENVIRONMENTAL INDICATOR	MONITORING AUTHORITY	ENVIRONMENTAL PARAMETERS	MONITORING FREQUENCY
		source			
7	Material Assets / Cultural heritage/ Landscape	▪ Number of restored buildings ▪ Number of restored monuments ▪ Urban green space per capita	▪ Responsible Public Authorities	▪ Number of restored buildings ▪ Number of restored monuments ▪ Urban green space per capita	Annually

I. BASIC STUDIES & RESEARCHES

For the implementation of the SEA is required a series of studies and surveys that should be elaborated prior to approving projects which will be co-financed by the IPA II CBC Programme.

For the environmental authorization is required, according to the national legislative framework a series of studies or environmental assessments, depending on the spatial object and the type of the project or activity. The technical specifications of these studies would specify the type of studies and additional work considered necessary for the elaboration of the Environmental Impact Assessment of each project.

The key studies and surveys including:

- geotechnical studies and surveys,
- surveys mapping the atmospheric and the meteorological environment,
- noise level studies,
- systematic recording of protected species of flora and fauna habitats (ecological study base) especially if the region of study is characterized as of high environmental interesting (sites included in the Lists of NATURA 2000, CORINE, Convention Ramsar, SPA, National Forest, etc.).

Environmental measurement data (eg water quality, air quality, etc.) are also needed. The collection of the data requires a coordinated effort, research on a wide range and long term. It is required the collection and statistical analysis in a common database for the entire eligible area.

Necessary considered a study surveying and define the baselines of the environmental indicators.

J. ANNEXES

J.1.1 Bibliography

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