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ASSESSMENT OF ALBANIA'S NATIONAL CAPACITIES ON ENVIRONMENTAL MONITORING



Assessment of Albania's National Capacities on Environmental Monitoring

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ACRONYMS

CBD	Convention on Biological Diversity
CESMA	Consultation of the Environmental Monitoring System in Albania
CS	Conservation Status
CSI	Core Set of Indicators
DCM	Decision of the Council of Ministers
DPSIR	Driving forces, Pressure, State, Impact, and Response
EEA	European Environment Agency
EIMMS	Environmental Information Management Monitoring System
EU	European Union
FE	Forest Europe
GHGs	Green House Gases
GIS	Geographical Information Systems
IBECA	Institution Building of the Ministry of Environment in Enforcing Environmental and Climate Acquis
INSTAT	National Statistical Agency
IPH	Institute of Public Health
LULUCF	Land Use, Land Use Change and Forestry
MEP	Monitoring and Evaluation Programme
MoE /MoEFWA	Ministry of Environment (ex Ministry of Environment and Forestry and Water administration)
NEA Agency)	National Environmental Agency (ex EFA Environmental and Forestry Agency)
OECD	Organisation for the Economic cooperation and Development
QA/QC	Quality Assurance / Quality Control
RoA	Republic of Albania
OS	Operational System
SELEA	Strengthening the Capacity of the Ministry of Environment in Albania for Law Drafting and Enforcement of National Environmental Legislation
SoER	State of Environment Report
StEMA	Strengthening Environmental Monitoring in Albania
ToR	Terms of reference
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
WFD	Water Framework Directive

1. Review of DMC in accordance with EU requirements

The Decision of the Council of Ministers (DCM) No 1189 “On rules and procedures for Drafting and Implementing the National Programme for Monitoring of Environment” was adopted at the end of 2009, based on Article 100 of the Constitution and point 8 of Article 53 of Law no. 8934, dated 5.9.2002 “On Environmental Protection”. It is an extended and revised version of the DCM No. 103 dated 31. 03. 2002 “On the environmental monitoring in the RoA”. The later was basically prepared and entered into force to support the data collection for the sake of reporting to the Barcelona Convention.

Originally (2002), the DMC was drafted before the start of transposition of EU Acquis in the national legislation and was meant to provide the “legal context” for RoA to develop its national environmental monitoring system. As the transposition of EU Acquis is advancing in all the environmental thematic areas, the DMC is becoming gradually, and at least partially, obsolete and redundant. The analysis of the provisions that derive from it will determine the framework and the limits of this system. The evaluation of the compliance degree of the DMC’s provisions to the *Acquis* and EU/EEA requirements will be done in order to assure that the monitoring system is capable to serve effectively and with efficiency the strategic national target of accession.

1.1 General Description

The DCM has 6 articles and an ANNEX that is containing the catalogue of the Indicators divided in 3 categories (state, impact and stress) and grouped by environmental theme. The first article (i. General) contains the terminology of the Decision. Environmental Indicators are segregated in those that providing information about the “state” and those that expressing “stresses”. The definition of the latter, as described in the DCM, is relating stress only with effects exerted on environment from sources of pollution. This definition is partial and does not cover other forms of environmental pressures that are caused from pressures other than pollution (e.g. overconsumption of a natural resource, climate change etc.). The first article also defines:

- The “Monitoring Institutions” as *“laboratories and scientific-research centres, in the framework of public universities or licensed private institutes and laboratories,*

outsourced by the Ministry to carry out the monitoring of the concrete indicators of natural phenomena, and the quality of environment components.”

- The “Environmental Data” as *“the average monthly, quarterly and annual values of environmental indicators of the state, impact and stress on environment”*. This definition of data is also “weak” as it does not comply with modern views for environmental monitoring that relate data with multiple attributes such as the geospatial reference.
- “Report on Environmental State” is defined as the final deliverable of the annual monitoring process. The definition of the Report is rather simple.

The section defines also the Ministry (of Environment) as the responsible authority and Minister as the leader for the drafting and supervisor of the procedures.

Article II (drafting and adoption of national programme for monitoring) sets the roles of the main participants. The article has 8 paragraphs defining:

1. The Coordinating authority (Agency for Environment and Forestry, now National Environment Agency) responsible for programming and the rest cooperative authorities (ministries, local government, institutions).
2. The use of indicators (listed in Annex 1) in all environmental sectors that will form the national monitoring programme.
3. The minister as responsible for expanding the set of indicators in order to enrich the national programme with the indicators used by EEA (European Environment Agency).
4. The frequency (annual), the time of approval of the Programme (September) and the publicity obligations.
5. - 6. The role of “monitoring Institutions” as contractors of monitoring tasks (based on the Programme) and their contracting procedure.
6. The function of the monitoring network.
7. The integration of data from individual monitoring plans that private (economic) activities are obligated to perform as part of their environmental permitting.

Article III (Implementation) segregates the responsibility to track every indicator according to the policy domain of each participant. The participants defined are:

1. The Ministry of Environment and the (now) National Environment Agency (air quality, biodiversity, stress indicators except waste management, overall supportive role)
2. The Ministry of Health, through the Institute of Public Health and public health directorates in the districts (microbiological indicators – waters),
3. The Ministry of Public Works, Transport and Telecommunications (now Ministry of Transport and Infrastructure) (solid waste)
4. The Ministry of Agriculture, Food and Consumer Protection, (now Ministry of

- Agriculture, Rural Development and Water Administration) through the Centre for the Transfer of Agricultural Technology (irrigation, soil, agro-pollutants)
5. The Ministry of Economy, Trade and Energy(now Ministry of Energy and Industry), through the Albanian Geological Service (groundwater, soil, erosion, coastal shores and benthos)
 6. The Ministry of Defence (stresses caused from enterprises and military installations within its system),
 7. The specialized monitoring institutions that will uptake according to their expertise monitoring processes through annual contracts,
 8. Private actors whose are responsible for monitoring stresses caused by their activities as part of their permitting.

Article IV (submission and processing of data) is providing guidance for the process of data acquisition, gathering and handling by the authorities. Three types of data gathering are described. The first is the submission of annual reports by cooperative ministries. The second refers to technical reports submitted by monitoring institutions as part of their contract or in urgent needs. The third type is concerning the gathering of data from economic activities by physical and legal persons through the Regional Environment Agencies. The article also institutes the obligation of storing the data to an electronic registry which shall be open to the public and defines the publication of an Annual report on the state of environment.

Article V (financial coverage) contains the budgeting conditions that shall be met from the ministry's budget (except from obligations that refers to environmental permission). Finally Article VI is referring to national legal adjustments.

The DCM contains one ANNEX that includes the list of indicators divided in three categories:

1. Environment indicators of the state of environment
2. Environmental indicators with an impact on the environment
3. Environment indicators of environment stress

1.2 Strategic vision on national environmental monitoring

Environmental monitoring is not a purpose per se. It is a means to get information on the quality and problems the country faces in each of the environmental media (air, water, soil), nature/biodiversity and forests. It is a means to support the policy making for improvements in those areas, and also to measure the degree of success with the policy implementation, in return. It is also a means to support the country's reporting to international conventions and agreements, and increasingly more to the EU and the EEA. In order such reporting is relevant, reliable, acceptable, and comparable and matching to the reporting of other countries, monitoring of each parameter should follow the same methodology.

Environmental monitoring is not a specific chapter of the EU environmental Acquis. There is no such EU act to cover all the environmental monitoring issues together, as the DCM does. Different environmental monitoring issues are covered under different acts of each specific thematic chapter. So, for example, under the air quality chapter of the Acquis there are certain directives that involve air quality monitoring. Now that such directives have been transposed into national legislation and the related acts have come into force, the EU requirements for air quality monitoring and the related techniques have become national legal obligation. They make it redundant for the specific air quality monitoring requirements provided under the DCM, which in the new light seem outdated. So is the case with other thematic areas which will be explained one by one in the table that shows the transposition of EU acts that bear monitoring requirements regarding the quality of different environmental media and/or regarding emissions thereto.

In the EU environmental Acquis and the related newly approved Albanian legislation, monitoring requirements are spread through different acts. They include the criteria, standards, methodology, site selection, frequency of measurements, sampling techniques, formulas to be used, etc. Wherever in the legislation there is a goal to be achieved, there is obviously a need for monitoring and reporting of the degree of achievement of that goal, too. Once such requirements have become part of the Albanian legislation, they are mandatory to be implemented. They ensure that the data monitored and indicators by them generated are policy relevant, reliable and comparable at the EU level. No other monitoring requests need to be invented. Thus, while RoA does transpose, implement and enforce EU environmental Acquis, including its requirements on monitoring, the need for this DCM and the relevance of the monitoring and reporting generated by it, weakens.

However, some of the newly approved legislation has given a transition period to start implementation. Such acts may have entered into power but take effect after a certain period of time, which is given to authorities, businesses and any other stakeholder to understand the new requirements, make related plans to adopt to them, i.e. rise the necessary human and financial capacities. Such is the case with the Law 162/2014 “On protection of ambient air quality” and the DCM No. 352, dated 29.4.2015 “On the ambient air quality assessment and the requirements for certain related pollutants”. They take effect as of January and July 2018 respectively. Given the fact that monitoring is an annual activity, this means that the relevant authorities must get ready to implement the new air quality monitoring requirements in the period January – December 2019 for the first time. Till then (i.e. for 2017 and 2018) they can continue with slight improvements of the existing air quality monitoring program.

As far as water monitoring is concerned, one can see from the table that a number of

directives have been transposed into Albanian legislation and are in force. Monitoring in water area can follow their requirements. Other acts are yet to be transposed and/or approved.

As for the costs related to monitoring of the quality of air, water, etc. The current budgets are too far low. Estimates made under SELEA project, show that the capital/one-off costs for implementation of the Directive 2008/50/EC on ambient air quality and cleaner air for Europe, alone, are 2.2 MEUR, which includes technical assistance project and train to the staff involved in air quality monitoring, assessment and planning and an annual budget of operating / recurrent costs of 182,000 EUR. A similar case appears with estimates made under INPAEL project for the monitoring under the Water Framework Directive, where capital / one-off costs are estimated at 3.582.600 EUR, including technical assistance project, equipment, training, monitoring and inter-calibration. Operating / recurrent costs are estimated at 283.600 EUR/year and include monitoring and reporting.

To be realistic, such figures are impossible to be obtained from the state budget, and what's also important, not immediately. Technical assistance projects should be arranged with the donor support. Such projects should be thematic specific, not one project covers all. The running UNDP project may be of great help, at least for one or more areas of monitoring that are deemed more urgent, as the legal bases obliges immediate implementation. However, more efficient use of the time and limited budget should be a concern for NEA.

Table 1 gives an organised view of the state (B), Impact (C) and Pressure (H) indicators requested by the DCM No 1189 dated 18.11.2009 "On rules and procedures for Drafting and Implementing the National Programme for Monitoring of Environment". The idea of the DCM was to provide the material for the DPSIR (Driving forces, Pressure, State, Impact, and Response) approach to be used for the preparation of the State of Environment Report. In fact, only 3 out of the 5 types of indicators of the DPSIR approach were requested by the DCM. Table 1 has organised such indicators according to the thematic and type. There are 101 state indicators, 31 impact indicators, 28 pressure indicators and no driving forces or response indicators at all, which makes impossible a proper use of DPSIR.

The indicators highlighted in green are the ones that are compatible with those used by EEA. Where a red highlighting is present, it means that the DCM 2009 has put them under the wrong focus indicator. E.g an impact indicator has been listed as a state indicator, or as a pressure indicator, or vice-versa. Those highlighted in purple are the ones that have been wrongly identified under two different focuses as state and impacts indicators. Those that have been stroked through are the ones not included in the long list of EEA indicators at all.

Table 1: State, impact and pressure indicators, as per DCM/2009

The indicators highlighted in green are the ones that are compatible with those used by EEA;

The indicators highlighted in red indicates that the DCM 2009 has put them under the wrong focus indicator;

The indicators highlighted in purple are the ones that have been wrongly identified under two different focuses as state and impacts indicators;

The indicators that have been stroked through are the ones not included in the long list of EEA indicators at all

No	State (B)	Impact (C)	Pressure (H)
	B1. Climate change	C1. Climate change	H1. Climate change
	B1a) average temperature of air	C1a) aptitude to change over time of all state indicators B1;	H1a) annual emission of CO ₂ , NO and CH ₄ ;
	B1b) level of the sea	C1b) phenological changes.	H1b) Split of emissions of CO ₂ , NO and CH ₄ per sectors of the economy like energy, transport, waste management, agriculture, industry.
	B1c) amount of atmospheric precipitations		
	B1d) level of underground waters		
	B2. Atmospheric precipitations	C2. Relative to the phenomenon of acidity in environment:	---
	B2a) content of SO ₂	C2a) content of sulfate ions in the lake.	---
	B2b) content of NO _x		---
	B2c) lead content		---
	B2d) radioactivity in atmospheric precipitations		---
	B3. Urban air	---	H2. Urban air
	B3a) content of total suspended matter in the air;	---	H2a) annual emissions in urban centers of SO ₂ , NO _x , CO ₂ , CO;
	B3b) ozone content, O ₃ , in the air;	---	H2b) distribution of emissions of SO ₂ and NO _x ; according to sectors of the economy;
	B3c) lead content, Pb, in the air;	---	H2c) annual emission of heavy metal;
	B3d) content of sulfuric dioxide, SO ₂ , in the air;	---	H2d) annual amount of radioactivity from atmospheric emissions;
	B3e) content of nitrate oxides, NO _x , in the air;	---	H2e) annual volume of precipitations.
	B3f) content of carbon monoxide, CO, in the air;	---	---
	B3g) content of hydro carbons in the air;	---	---
	B3h) level of noise;	---	---
	B3i) radioactivity in the atmosphere;	---	---
	B3j) electromagnetic non-ionic radiation in the atmosphere.	---	---
	---	---	H7. Industrial air emissions
	---	---	H7 a) annual emissions of CO ₂ , NO _x , CH ₄ , NH ₃ , SO ₂ , degree of darkness of smoke, volatile organic compounds, dioxins, furans, heavy metals in general;
	---	---	H7b) sectoral distribution of letter "a" as per the sectors of industry, energy, transports and services.

No	State (B)	Impact (C)	Pressure (H)
	B4. Waters:		
	B4.1. Water bodies (rivers, lakes):	C3. Water bodies	H4. Urban effluent discharge:
	B4.1. a) alkalinity;	C3a) quality and quantity of solid, suspended and sediment debit of rivers;	H4a) annual amount of discharge and distribution according to municipalities and regions;
	B4.1. b) specific conductivity;	C3b) erosion caused by rivers;	H4b) liquid waste properties such as pH, content of COD, content of BOD ₅ , alkalinity, acidity, sulfur content, ammonium content, phenol content, phosphorus content, nitrogen and heavy metal contents;
	B4.1. c) acidity;	C3a) solidity of river beds;	H6. Industrial effluent discharge:
	B4.1. d) scale of the chemical need for oxygen, COD	C3d) excesses of norms of quality indicators in B4.1.	H6a) annual discharge, pH;
	B4.1. e) scale of biochemical need for oxygen, BOD;	---	H6b) content of COD, content of BOD, alkalinity, acidity, sulfur, ammonium, phenol, and nitrogen content;
	B4.1. f) content of nitrogen and nitrates;	---	H6c) content of specific elements according to the nature of the industrial process: heavy metals, hydrocarbons, BTEX, durable organic pollutants;
	B4.1. g) content of phosphorus, P;	---	---
	B4.1. h) ammonium content, NH ₃ ;	---	---
	B4.1. i) value of pH;	---	---
	B4.1.j) value of natural radioactive stock and radioactivity of waters;	---	---
	B4.1. k) solidity of river beds;	---	---
	(B4.1.) bacterial indicators;	---	---
	B4.1. m) river flow;	---	---
	---	---	H 10. Water bodies:
	---	---	a) quality and quantity of solid, suspended and decanted substance carried by the rivers;
	B4.2. Sea and coast	C4. Quality of sea and coast:	---
	B4.2. a) biochemical need for oxygen in the sea waters, BOD;	C4a) movement of the coast line: erosion and accumulation;	---
	B4.2. b) chemical need for oxygen in the sea waters, COD;	C4b) communication between the sea and the lagoon;	---
	B4.2. c) microbiological parameters in marine waters and beaches;	C4c) dynamics of river deltas;	---
	B4.2. d) amount of phyto and zoo plankton;	C4d) degree of exposure of the population to the microbiological and chemical pollution on the sea and the beaches;	---
	B4.2. e) chlorophyll content and primary productivity;	C4e) excesses of norms of quality indicators in point B4.2.	---
	B4.2. f) content of heavy metals, persistent organic pollutants, and radioactivity in sea mussels;	---	---
	B4.2. g) water radioactivity;	---	---

No	State (B)	Impact (C)	Pressure (H)
	B4.2. h) communication of waters between the sea and the lagoon;	---	---
	B4.2. i) dynamics of river deltas;	---	---
	B4.2. j) morphology and topography of the sea shelf;	---	---
	Bk4.2.) coast morphology;	---	---
	B4.3. Underground waters:	C5. Underground waters:	H11. Underground waters:
	B4.3. a) pH;	C5a) zones of high saltness;	H11a) annual volume of exploitation in general and per basins;
	B4.3. b) hardness;	C5b) sensitive zones to voluminous waste;	H11b) annual coefficient of exploitation in general and per basin;
	B4.3. c) alkalinity;	C5c) degree of exposure of the population to the polluted underground waters;	---
	B4.3. d) acidity;	C5d) excesses of norms of quality indicators in point B4.3.	---
	B4.3. e) nitrogen content;	---	---
	B4.3. f) saltness;	---	---
	B4.4. Ground, underground and sea waters in areas of significant sources of industrial and agricultural pollution:	---	---
	B4.4.a) content of heavy metals;	---	---
	B4.4.b) pesticide content;	---	---
	B4.4.c) content of hydro carbon compounds;	---	---
	B5. Biodiversity:	C6. Biodiversity:	---
	B5a) genetic diversity of agriculture and livestock;	C6a) total and annual surface of destroyed forests;	---
	B5b) area under organic agriculture	C6b) total and annual surface of incinerated forests;	---
	B5c) diversity of ecosystems and habitats;	C6c) total and annual surface of diseased forests;	---
	B5d) diversity of ecosystems and habitats in the forests;	C6d) endangered species;	---
	B5e) diversity of ecosystems and habitats in the protected areas;	C6e) threatened species;	---
	B5f) diversity of ecosystems and habitats in water bodies;	C6f) disappeared species;	---
	B5g) territory, land and forest fragmentation	C6g) impact of anthropogenic and geological phenomena in the biological diversity;	---
	B5h) vicinity of transport infrastructure to the protected areas		---
	B5i) non-endemic species in rivers and lakes		---
	B5j) exposure of ecosystems to acidification, eutrication and ozone		---
	B5k) protected and threatened species		---
	B5l) species diversity		---

No	State (B)	Impact (C)	Pressure (H)
	B6. Forests	---	---
	B6a) Forest fund (according to ownership, governance, species, volumes)	---	---
	B6b) surface of forests according to age, species and volume classes	---	---
	B6c) forests health	---	---
	B6d) annual growth in forests classified according to governance and species	---	---
	B6e) annual amount of forest cut, exploited, split into working material and fuel wood	---	---
	B6f) amount of biomass in forests	---	---
	B6g) biomass removed from forests annually	---	---
	B6h) annual exploitation potential	---	---
	B6i) surface of forest fires	---	---
	B6j) surface damaged by other atmospheric factors such as storm, snow, etc.	---	---
	B6k) forests species endangered	---	---
	B6l) hot spots in forests	---	---
	B6m) sites of special importance for biodiversity, tourism, etc.	---	---
	B6n) diversity of ecosystems and habitats in forests	---	---
	B6o) diversity of ecosystems and habitats in protected areas	---	---
	B7. Pastures	---	---
	B7a) Pasture fund according to ownership and season (summer/winter)	---	---
	B7b) carrying capacity	---	---
	B7c) related flora	---	---
	B7d) pastures health	---	---
	B7e) surface burnt in fires	---	---
	B7f) hot spots in pastures	---	---
	B7g) sites of special importance for biodiversity and tourism in pastures	---	---
	B 8. Medicinal and aromatic plants	---	---
	B8a) BMET fund (surface, amounts, species, etc)	---	---
	B8b) annual amounts harvested by species (tons)	---	---
	B8c) amounts exported by species (tons)	---	---
	B8d) BMET threatened species, their state	---	---
	B8e) special hot spots in BMET surfaces	---	---
	B8f) sites of special importance for BMET, for biodiversity, tourism, scientific purposes, etc.	---	---
	B1.1. Soil/land:	C7. Soil/land and irrigation waters:	---
	B1.1. a) fertility;	C7a) levels of erosion and accumulation of the soil;	---

No	State (B)	Impact (C)	Pressure (H)
	B1.1. b) salt content: Na, Cl, SO ₄ -- in salty lands; content of nutritious elements in orphic lands; the ratio magnesium/calcium -- in magnesia lands; determination of acidity -- in acid lands;	C7b) annual land loss due to erosion by rivers and slides;	---
	B1.1. c) natural radioactivity of the soil.	C7c) surface of degraded land;	---
	B1.2a) heavy metal content (mercury, nickel, chromium, etc) in zones with significant industrial polluting potential	C7e) surface and location of soil polluted with heavy metal;	---
	B1.2 b) hydrocarbons content in zones with significant industrial polluting potential	C7f) surface and location of soil polluted with hydrocarbons;	---
	---	C7g) surface and location of soil polluted with chemicals and hazardous waste;	---
	---	C7h) degree of exposure of the population to soil pollution;	
	---	C7i) excesses of norms of quality indicators in point B 6.1 and B7.	
	B2. Irrigation waters:	---	---
	B2a) hardness;	---	---
	B2b) alkalinity;	---	---
	B2c) acidity;	---	---
	B2d) pesticide content;	---	---
	B2e) content of nitrogen and nitrate.	---	---
	---	---	H3. Urban solid waste;
	---	---	H3a) annual municipal waste generation
	---	---	H3b) distribution of waste according to municipalities and regions;
	---	---	H3c) content in percentage of polluting ingredients;
	---	---	H3d) merceological composition.
	---	---	H5. Solid, industrial waste and debris:
	---	---	H5a) annual emission of solid industrial waste in general;
	---	---	H5b) annual emission of solid industrial waste of every establishment;
	---	---	H5c) content in percentage of pollutants per each solid industrial emission;
	---	---	H5d) distribution of annual emission of solid industrial waste per various sectors of the economy: energy, transports, industry;
	---	---	H5e) volume of debris from the construction sector and distribution per municipalities and regions;
			H8. Annual amount of imported hazardous chemicals;
			H9. Annual amount of chemical fertilizers and chemicals used in agriculture.

1.3 Evaluation

The Decision provides a general framework for the development of the monitoring system. It is based on existing capacities and the given administrative structure, without reviewing the responsibilities of the parties involved, but also without proceeding to ambitious innovations that could prove unrealistic. Using therefore existing practices (such as the annual contracts with Institutes, or the separation of responsibility to different ministries) with any positive or negative those have (see UNECE 2012) the DCM can be characterised more “realistic” than “ambitious” or “innovative”. The obligations of annual reporting and programming are not considered as good practises because they are charging the executive structures with unnecessary workload cutting useful workdays from actual monitoring work.

As for the content completion, the Decision integrates the main principles reflected in the EU Framework, such as the obligation to inform the public, or the need of harmonization to European policies (*acquis communautaire*). The implementation processes and the cooperation / coordination procedures are briefly analysed without detecting a specific implementation plan or a “road map”.

The indicators system is organised in 3 categories a) State Indicators, b) Impact Indicators and c) Stress (Pressure) indicators. While some of the state indicators are actually Response Indicators (limited) there is a complete absence of Driving Forces Indicators. The absence of “D” and “R” indicators is a very important because they contain the information about what are the consequences or the benefits of development progress and policy on the Environment. Those Indicators should be integrated in order to upgrade the environmental monitoring as a Policy Evaluation tool.

The coordination provisions and the management practices are rather general. Omissions are, the absence of provisions regarding Quality Assurance / Quality Control and the exclusion of spatial integration of the information with the use of GIS technologies.

In terms of thematic coverage all the key environmental policies themes (that existed in 2009) are covered. In present, however, conditions, the indicators catalogue must be enhanced (partial or fully in some thematics) with indicators that will cover newly introduced Priority Policy Areas such as the “Adaptation to Climate Change”, “Energy Efficiency and RES (Climate Mitigation)”, “Marine Strategy”.

An analytical examination of each theme is following:

For Air all the main parameters defined by EU regulation (Directive2008/50/EC) are being included. Additionally, monitoring of radiation is also included. Water (inland and underground) indicators are showing also a good coverage of parameters that are subject to monitoring. But, although there are sufficient physiochemical and (some) biological

parameters, there is no synthesis provisions in order to create advanced indicators that will provide the overall picture of the state.

In the theme of biodiversity the choice of indicators in the Decision is unbalanced. As it is expected due to the importance of forests in the natural capital and the economy of Albania, Forestry indicators (state, health management) are dominating. Actually the Decision seems to incorporate pre-existing statistic forestry indicators. Wild life (Flora, Fauna, Habitats) and protected areas related indicators are defined more generally. This is reflecting the premature stage that the designation of natural environment areas was at the time the DCM was adopted. Since then as it will be analysed in Chapter 2 a lot of progress has been done. The re-definition of biodiversity indicators is a necessity in order to capture a clear picture of the ecological status of protected areas and species.

In the field of Waste Management there is an absence of indicators that will cover the monitoring of the implementation of the EU 2008/98/EC Directive. Specifically indicators for volume reduction, recycling and reuse of waste and treatment of special wastes (eg healthcare wastes) are not included and must be introduced.

Overall, the main weakness of DCM is the general approach of the concept of indicator that it is adopting. This definition is not incorporating the dimension of usability as described in EEA definition: *a measure, generally quantitative, that can be used to illustrate and communicate complex environmental phenomena simply, including trends and progress over time – and thus helps provide insight into the state of the environment'* (EEA, 2005). Consequently the Annex is containing a large number of “indicators” which are actually referring to the monitor of “scientific” parameters, which are useful to research, but provide limited usability to policy makers and the public. This leads to the absence of ease communicating indicators such as for example “quality of bathing waters”, although the fact that the list of indicators presented in the Annex of the DCM is containing the monitor of all microbiological parameters that are used to comply this indicator.

The programming provisions are also weak. Award of yearly contracts implies the danger of late starting of monitoring, which may result in incompatibility with international regulations (and quality dismissal of data from international databases).

Contrary the main strength of the DCM is that despite the fact that there is a need for improvement, its provisions are not setting any fundamental obstacle or incompatibility with EEA regulation and the EU Environmental Policy Framework. In the following table the general evaluation remarks for each article of the DCM are presented. A detailed compatibility and evaluation of every indicator contained of the DCM is also provided in table 1. The overall proposals for the review of the context of the DCM are presented in Chapter 6.

Table 2: DCM Evaluation Matrix

DMC Provision	Relative EU/EEA policy	Evaluation	Proposition / Actions
Artical I (general)	<p>There is no specific obligation for terminology by EU/EEA.</p> <p>There are although various definitions for indicators in EU official documents (EEA 2014).</p> <p>The EEA has adopted since 1999 (Eurostat 1999) the DPSIR model as the methodological framework for the design of environmental monitoring systems.</p>	<p>Partial</p> <p>The definitions are very periphrastic and partial in contrast to the EU/EEA terminology. The DCM is dividing indicators to "State" and "Stress" (at the Annex there is a Third category "impact" mainly recognized as "exceeding quality norms state of indicators".</p> <p>A fundamental part of the EEA definition of Environmental Indicators is that: "...can be used to illustrate and communicate complex environmental phenomena easy...". This notion is not integrated in the DCM. As a result the monitoring of physicochemical conditions (such as pH, salinity) that is very useful for scientists to monitor specific phenomena are included as indicators. In the contrary, EEA is mainly using aggregate indicators based on the physicochemical parameters in order to provide more «political» and public awareness evidences.</p> <p>This case is a common rule in EU policy also. For example in WFD the main indicators are referring to «good ecological / chemical condition» rather than to certain biochemical parameters.</p> <p>As for the adoption of a common methodological framework in practice although there is no direct reference both the Annual Monitoring Plans and SOER report are referencing and using the DPSIR model.</p>	<p>The adoption of the EEA definition of Indicators will support the usability of a/the monitoring system as a policymaking and award tool. It must be noted that this will lead (consequentially) to the review of Annex I.</p>
Article II (drafting and adoption of national programme for monitoring)	<p>The common practice in EU policy is to integrate the sets of indicators in the sectorial approach. This is giving the flexibility to update the monitoring system automatically with policy progress.</p>	<p>Adequate -</p> <p>The use of a predetermined set of indicators is ineffective. As it can be seen today, newer policy development (e.g. Climate change adaptation or new parameters for monitoring introduced by the new 2008/98 EC Waste Directive) are not included. The provision that authorises the Minister with the ability to expand and update the indicators list according to EEA requirements is giving adequate flexibility in order to have a mechanism of synchronisation.</p>	<p>Changing the structure needed to target monitoring of environmental and sustainability policies rather than (default) parameters</p>

DMC Provision	Relative EU/EEA policy	Evaluation	Proposition / Actions
Article III (Implementation)	The principals of subsidiary and proportionality are providing the freedom of States to specify the implementation processes according to their administrative and constitutional framework.	<p>Adequate -</p> <p>The monitoring plan is highly centralized and is giving limited responsibilities to Regional administration. This choice is probably justified from the fact that the administration capacity of regional environmental agencies is limited (UNECE 2012). Also the size of the country in terms of population (which is comparable to a medium Metropolitan European Region) is also in favor of this choice.</p> <p>The appointment of responsibilities is trying to exploit with the best possible way the current capacity of the administration. On the other hand the spread of responsibility on monitor indicators from to several administration units (e.g. waters) increases the need of coordination and limits the compatibility and usability of information.</p> <p>The process of annual awards of contracts is insufficient and ineffective.</p> <p>Another shortage of the DCM in implementation is the insufficient programming provisions. The Decision suggests in general an annual monitoring procedure without taking into account that not all the indicators are either affordable or useful to be assessed every year.</p>	<p>The notions of a medium term planning (5 or 6 year monitoring circles) with 3 years SOER that will summarize and present in a commonly understandable way the main finding of thematic monitoring and the aggregate and cumulative effects will make the monitoring more feasible, efficient and accordant to the EU practice.</p> <p>In this respect multiannual contracts for sectorial monitoring according to the procedures defined specially for each theme should be awarded.</p>
Article IV (submission and processing of data)	INSPIRE Directive, Better Regulation Initiative Policy Pack	<p>Partial - The description for the handling of the data is rather simple and insufficient. UNECE reported at 2012 that: "the dispersion of information, the lack of a proper mechanism for sharing, exchange and storage in well established and managed databases... the absent of motivation of the specialized institutes to develop and maintain advanced databases".</p> <p>Provisions for Quality Control are also missing. Finally the lack of provisions that will ensure the geographic coverage and the incorporation of geospatial data is very critical.</p>	<p>In practice many of the indefinites of implementation are dealing through Annual programming. QA/QO procedures have been introduced and the geographic coverage has been defined. The development or integration of a GIS based system in the Integrated Operational Environmental Monitoring System will be essential</p>
Article IV (delivery and processing of data)	<p>EU environmental legislation does not set any specific patterns for submission and process of the data.</p> <p>Technical and methodological guides of EEA, Eurostat, OECD and other organisations has to be followed to provide credibility.</p>	<p>Adequate -</p> <p>The implementation provisions generally imply the operation of an Integrated Information System for data upload and exchange that will connect Central and regional Agencies and third parties for the data gathering. Apart from the definition of NEA as the administrator of the Information System and the obligation of insuring public accession, no other provisions are stated.</p>	<p>The design and installation of a practical Information System is a key issue. It's importance relies on the fact that both SIEMA and CESMA projects included the development of the Information System as top priority.</p> <p>The Integration of GIS (and GIS tools) is essential and will help not only to «simply illustrate» the information, but to develop innovative management practices.</p>
Article V (financial provisions)	-	-	-

2. Comparative analysis between the EEA and national indicators (referring to the DCM)

Table 2 is built to show the concordance between the EEA long list of indicators and the indicators currently requested by the DCM/2009. An analysis follows with some

Table 3: Concordance of the EEA indicators (2014) and Albania's indicators as per the DCM/2009

The indicators highlighted in green are the ones that are compatible with those used by EEA;

The indicators highlighted in red indicates that the DCM 2009 has put them under the wrong focus indicator;

The indicators highlighted in purple are the ones that have been wrongly identified under two different focuses as state and impacts indicators;

The indicators that have been stroked through are the ones not included in the long list of EEA indicators at all

NO.	Policy area (according to EEA) Theme / Indicator name	Indicator focus	Albanian Indicator name and focus (B-state, C-Impact, H-pressure)	Comments
Air pollution indicators				
	Emission of acidifying substances	P	---	
	Emissions of ozone precursors	P	---	
	Emissions of primary particulate matter and secondary particulate matter precursors	P	B3a) content of total suspended matter in the air;	Not exactly the same name of indicator, and not the same definition. Albanian indicator focus is wrongly set as state indicator, instead of pressure indicator.
	Exceedance of air quality limit values in urban areas	S	---	
	Exposure of ecosystems to acidification, eutrophication and ozone	S	---	
	Sulphur dioxide (SO ₂) emissions	P	H2a) annual emissions in urban centers of SO ₂ , NO _x , CO ₂ , CO;	Not exactly the same name of indicator
	Nitrogen oxides (NO _x) emissions	P	H2a) annual emissions in urban centers of SO ₂ , NO _x , CO ₂ , CO;	Not exactly the same name of indicator
	Ammonia (NH ₃) emissions	P	---	
	Non-methane volatile organic compounds (NMVOC) emissions	P	H7a) annual emissions of CO ₂ , NO _x , CH ₄ , NH ₃ , SO ₂ , degree of darkness of smoke, volatile organic compounds, dioxins, furans, heavy metals in general;	
	Heavy metal (HM) emissions	P	H2c) annual emission of heavy metal;	The EEA and Albanian indicators match
	Persistent organic pollutant (POP) emissions	P	---	

Biodiversity indicators					
Status and trends of the components of biological diversity	Species of European interest	S	---		
	Designated areas	R	---		
	Species diversity	S	B5j) species diversity		The EEA and Albanian indicators match
	Abundance and distribution of selected species	S	---		
	Red List Index for European species	S	B5k) protected and threatened species		Not exactly the same name of indicator
	Ecosystem coverage	S	---		
	Habitats of European interest	S	---		
	Livestock genetic diversity	S	B5a) genetic diversity of agriculture and livestock;		Albanian indicator is larger than the EEA one
	Nationally designated protected areas	R	B5e) diversity of ecosystems and habitats in the protected areas;		Not exactly the same name of indicator. Albanian indicator focus is wrongly set as state indicator, instead of response indicator.
Threats to biodiversity	Sites designated under the EU Habitats and Birds directives	R	---		
	Critical load exceedance for nitrogen	P	---		
	Invasive alien species in Europe	P	B5i) non-endemic species in rivers and lakes		Not exactly the same name of indicator, and maybe not the same meaning. Albanian indicator focus is wrongly set as state indicator, instead of pressure indicator.
Ecosystem integrity and ecosystem goods and services	Impact of climate change on bird population	P	---		
	Marine trophic index of European seas	S	---		
	Fragmentation of natural and semi-natural areas	P	B5g) territory, land and forest fragmentation		Not exactly the same name of indicator, and maybe not the same meaning. Albanian indicator focus is wrongly set as state indicator, instead of pressure indicator.
	Nutrients in transitional, coastal and marine waters	P	---		
	Freshwater quality	P	---		

	Sustainable use	Forest: growing stock, increment and fellings	P	B6d) annual growth in forests classified according to governance and species	Not exactly the same name of indicator. Albanian indicator focus is wrongly set as state indicator, instead of pressure indicator.
		Forest: deadwood	S	---	
		Agriculture: nitrogen balance	P	---	
		Agriculture: area under management practices potentially supporting biodiversity	S	---	
		Fisheries: European commercial fish stocks	P	---	
		Aquaculture: effluent water quality from finfish farms	P	---	
		Ecological Footprint of European countries	P	---	
	Status of access and benefits sharing	Patent applications based on genetic resources	R	---	
	Status of resource transfers	Financing biodiversity management	R	---	
	Public opinion (additional EU focal area)	Public awareness	R	---	
Climate indicators					
		Production and consumption of ozone depleting substances	D	---	
		Greenhouse gas emission trends	P	H1a) annual emission of CO ₂ , NO and CH ₄ ; H1b) Split of emissions of CO ₂ , NO and CH ₄ per sectors of the economy like energy, transport, waste management, agriculture, industry.	Not exactly the same name of indicator
		Progress to greenhouse gas emission targets	P	---	
		Global and European temperature	S	B1a) average temperature of air	
		Atmospheric greenhouse gas concentrations	S	---	
		Mean precipitation	I	B1c) amount of atmospheric precipitations	Not exactly the same name of indicator. EEA measures the mean precipitation, Albanian measures the total precipitations. Albanian indicator focus is wrongly set as state indicator, instead of impact indicator.

Precipitation extremes	I	---	
Storms	I	---	
Air pollution by ozone and health	I	B3b) ozone content, O3, in the air, (though under the indicator area of Urban air)	Not exactly the same name of indicator and definitely not the same meaning. EEA indicator is an aggregated one. It requests the relationship between ozone incidence and health state, not just the ozone content in the air. Albanian indicator focus is wrongly set as state indicator, instead of impact indicator.
Glaciers	I	---	
Snow cover	I	---	
Greenland ice sheet	I	---	
Arctic and Baltic Sea ice	I	---	
Permafrost	I	---	
Global and European sea-level rise	I	B1b) level of the sea	This is the national indicator vs the global and European one. Albanian indicator focus is wrongly set as state indicator, instead of impact indicator.
Sea surface temperature	I	---	
Phenology of marine species	I	C1b) phenological changes.	Not exactly the same name of indicator. Albanian indicator is not specific to the marine species.
Distribution of marine species	I	---	
River flow	I	B4.1.m) river flow	The indicators match. Albanian indicator focus is wrongly set as state indicator, instead of impact indicator.
River floods	I	---	
River flow drought	I	---	
Water temperature	I	---	
Lake and river ice cover	I	---	
Distribution of plant species	I	---	
Plant and fungi phenology	I	---	
Distribution of animal species	I	---	
Animal phenology	I	---	
Species interaction	I	---	
Soil organic carbon	I	---	
Soil erosion	I	C7a) levels of erosion and accumulation of the soil.	The Albanian indicator is larger than the EEA one.
Soil moisture	I	---	
Growing season for agricultural crops	I	---	
Agrophenology	I	---	

	Water-limited crop productivity	I	---	
	Irrigation water requirement	I	---	
	Forest growth	I	B6d) annual growth in forests classified according to governance and species	The indicators match. Albanian indicator focus is wrongly set as state indicator, instead of impact indicator.
	Forest fires	I	B6h) surface of forest fires	Not exactly the same name of indicator. The Albanian indicator refers to surfaces only. While the EEA seems more general. It may also include fire incidences as well as locations. Albanian indicator focus is wrongly set as state indicator, instead of impact indicator.
	Extreme temperatures and health	I	---	
	Vector-borne disease	I	---	
	Damages from weather and climate-related events	I	---	
	Ocean acidification	S	---	
	Ocean heat content	S	---	
	Storm surges	I	---	
	Floods and health	I	---	
	Heating degree days	I	---	
	Production, sales and emissions of fluorinated GHGs (F-gases)	D	---	
Energy indicators				
	Final energy consumption by sector	D	---	
	Total primary energy intensity	R	---	
	Primary energy consumption by fuel	D	---	
	Renewable primary energy consumption	R	---	
	Renewable electricity consumption	R	---	
	Efficiency of conventional thermal electricity generation	D	---	
	Final energy consumption intensity	D	---	
	Share of renewable energy in final energy consumption	I	---	
	Overview of the European energy system	D	---	
	Progress on energy efficiency in Europe	R	---	
	Overview of the electricity production and use in Europe	D	---	
Transport indicators				
	Passenger transport demand	D	---	
	Freight transport demand	D	---	

	Use of cleaner and alternative fuels	R	---	
	Transport final energy consumption by mode	P	---	
	Transport emissions of greenhouse gases	P	---	
	Transport emissions of air pollutants	P	---	
	Exceedances of air quality objectives due to traffic	S	---	
	Traffic noise: exposure and annoyance	I	---	
	Fragmentation of land and ecosystems	S	---	
	Capacity of infrastructure network	D	---	
	Transport infrastructure investments	D	---	
	Real change in transport prices by mode	D	---	
	Fuel prices	D	---	
	Energy efficiency and specific CO ₂ emissions	P	---	
	Specific air pollutant emissions	P	---	
	Occupancy rates of passenger vehicles	D	---	
	Load factors for freight transport	D	---	
	Size of the vehicle fleet	P	---	
	Average age of the vehicle fleet	D	---	
	Proportion of vehicle fleet meeting certain emission standards	D	---	
Water indicators				
	Use of freshwater resources	P	H11a) annual volume of exploitation in general and per basins; H11b) annual coefficient of exploitation in general and per basin.	
	Oxygen consuming substances in rivers	S	B4.1. d) scale of the chemical need for oxygen, COD B4.1. e) scale of biochemical need for oxygen, BOD ₅	Not exactly the same name of indicator
	Nutrients in freshwater	S	B4.1. f) content of nitrogen and nitrates; B4.1. g) content of phosphorous, P _T	Not exactly the same name of indicator, but similar meaning.
	Nutrients in transitional, coastal and marine waters	S	---	
	Bathing water quality	S	B4.2. c) microbiological parameters in marine waters and beaches;	Not exactly the same name of indicator, but similar meaning.
	Chlorophyll in transitional, coastal and marine waters	S	B4.2. e) chlorophyll content and primary productivity;	Not exactly the same name of indicator, but similar meaning.
	Urban waste water treatment	R	---	

Hazardous substances in marine organisms	P	B4.2. f) content of heavy metals, persistent organic pollutants, and radioactivity in sea mussels;	Not exactly the same name of indicator, but similar meaning. Though referring to a single specific marine organism. Albanian indicator focus is wrongly set as state indicator, instead of pressure indicator.
Emission intensity of agriculture in Europe	P	---	
Emission intensity of domestic sector in Europe	P	---	
Emission intensity of manufacturing industry in Europe	P	---	
Fisheries, land, soil, waste, household consumption and green economy			
Waste			
Municipal waste generation	P	H3a) annual municipal waste generation	The indicators match.
Waste electrical and electronic equipment	R	---	
Land			
Land take	P	---	
Soil			
Progress in management of contaminated sites	R	---	
Household consumption			
Household expenditure on consumption categories with differing environmental pressure intensities	D	---	
Green economy			
Number of organisations with registered environmental management systems according to EMAS and ISO 14001	R	---	
Fisheries			
Status of marine fish stocks	S	---	
Aquaculture production	P	---	
Fishing fleet capacity	P	---	
Environmental scenarios			
GDP — Outlook from OECD	D	---	
Total population – Outlook from UNSTAT	D	---	

Table 4: Comparative numbers of indicators EEA CSIs vs. Albanian Indicators

Areas	EEA Indicators						ALBANIAN Indicators as per DCM.....					
	Total	D	P	S	I	R	Total	D	P	S	I	R
Air pollution	11	--	9	2	--	--	22	--	7	14	1	--
Biodiversity	27	--	11	10	--	6	19	--	--	12	7	--
Climate change	46	2	2	4	38	--	8	--	2	4	2	--
Energy	11	6	--	--	1	4	--	--	--	--	--	--
Transport	20	10	6	2	1	1	--	--	--	--	--	--
Water	11	--	5	5	--	1	54	--	8	33	13	--
Waste	3	--	1	--	--	1	11	--	11	--	--	--
Land	1	--	1	--	--	--	2	--	--	--	2	--
Soil	1	--	--	--	--	1	11	--	--	5	6	--
Household consumption	1	1	--	--	--	--	--	--	--	--	--	--
Green economy	1	--	--	--	--	1	--	--	--	--	--	--
Fisheries	3	--	2	1	--	--	--	--	--	--	--	--
Environmental scenarios	2	2	--	--	--	--	--	--	--	--	--	--
Forests	--	--	--	--	--	--	15	--	--	15	--	--
Pastures	--	--	--	--	--	--	7	--	--	7	--	--
Medicinal and aromatic herbs	--	--	--	--	--	--	6	--	--	6	--	--
Irrigation water	--	--	--	--	--	--	5	--	--	5	--	--
Total	137	21	37	24	40	15	160	--	23			--

It is evident that the number of the Albanian indicators exceeds the long list of EEA indicators by 23. Meantime, only 33 of the Albanian indicators are compatible, or quasi-compatible with those of the EEA. The rest is not. However, it has to be noted that, not necessarily the rest of 127 Albanian indicators are to be considered as not useful.

Each country is free to choose the indicators that are relevant to its own policy making. A certain number of indicators should necessarily be nationally relevant and express the specificity of national environmental problems and the related policy making, but in order to be cost-efficient, given the limited annual budget for monitoring, national indicators should overlap as much as possible with those requested by different EU directives and the EEA indicators.

This approach would reduce the costs for monitoring and reporting at EU level. As Albania approaches the EU and the EEA membership, reporting on the implementation of EU directives (containing monitoring and reporting requirements) and on the State

of Environment will increase drastically. Therefore the number of national indicators that overlap with those of EEA should increase.

The DCM on Environmental Monitoring is quite outdated. A thinner version of it was approved in 2002 and then revised in 2009, so it does not refer neither the language (E.g. what in the EEA indicator areas is called “Atmospheric pollution” in the Albanian DCM comes as “Atmospheric precipitations” and “Urban air”) nor the definition, meaning and methodology for the development of indicators.

There are conceptual mistakes in the DCM. The same Albanian indicator appears as both state and impact indicator (those highlighted in purple). Some examples are given below: (B4.1. k) “solidity of river beds” and C3c) “solidity of river beds”; B4.2.h) “communication of waters between the sea and the lagoon” and C4b) “communication between the sea and the lagoon”; B4.2. i) “dynamics of river deltas”; and C4c) “dynamics of river deltas”, etc.

The DCM provides a long list of indicators in multiple areas of policy without relating to any policy document or relevant legislation. Meantime, there are numerous new legal acts that have increasingly given the specific policy context together with legal monitoring requirements, such as the new Law 162/2014 “On protection of ambient air quality” and the related DCM No. 352, dated 29.4.2015 “On the ambient air quality assessment and the requirements for certain related pollutants” that together have fully transposed the requirements of the two main EU directives on air quality: Directive 2008/50/EC on ambient air quality and cleaner air for Europe; and 4th daughter Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. The two directives, and therefore the new national acts referred above set the requirements and rules for monitoring and assessing ambient air quality.

The monitoring and assessment methodology is not given in the DCM but in the National Environmental Monitoring Program and in the contracts the NEA signs with third parties for specific monitoring. Such programs may overlap and/or be inconsistent with the monitoring requirements, methodologies, definitions and approach introduced through the newly approved legislation, with the draft legislation expected to be approved soon, or with the one to be prepared which transpose the relevant acts of the EU Acquis.

The DCM may have served the environmental monitoring so far, but under the perspective of the new and evolving environmental legislation, it has become outdated. Therefore, a thorough revision of it is not recommendable. It should be abolished

gradually each time a new monitoring related legislation is approved or takes legal effect, until it is fully abolished. And article paragraph 1 of 41 of the Law Nr. 10 431, dated 9.6.2011 “On environmental protection” should be replaced by a simple paragraph saying that “monitoring of each environmental component shall be regulated by specific legislation on that topic”.

The budget for the implementation of the DCM on monitoring, will then be part of the budget provided for the implementation of specific legislation, e.g. the law and DCM on air monitoring and assessment, the law on water and the Draft DCM “On the Content, Development and Implementation of National Water Strategies, of River Basin District Management Plans and of Flood Risk Management Plans”, the Draft DCM on the marine environment strategy, etc.

The legal request for an annual State of Environment Report (SoER) at the national level (that needs to be prepared and also translated into English) exceeds by far the human and financial potential of the NEA. Besides, the DCM on Environmental Monitoring and the Law Nr. 10 431, dated 9.6.2011 “On environmental protection” does request the SoER, but they do not give any indication on its methodology. This brings as a result SoERs, which are simple summaries of the monitoring results.

In order to have a good SoER which shows the changes to the Albanian environment, the DPSIR approach of the EEA should be introduced. This will make the SoER of Albania easy to compare and match with those of the other EU/EEA countries. As neither the DCM on Environmental Monitoring, nor the Law Nr. 10 431, dated 9.6.2011 “On environmental protection” have requested the approval of the methodology for the State of Environment Report, the solution is to amend the law by inserting a new paragraph that sets the legal base for a by-law on the approval of the DPSIR approach for the State of Environment Report.

2.1 Albania’s CSI (Core Set of Indicators) reporting to the EEA

No matter the difficulties, Albania, together with Bosnia and Herzegovina, Serbia, Kosovo under the UN SCR 1244/99 and FYR of Macedonia, is a cooperating country to the EEA. As such, it participated in the preparation and publication of the first “West Balkan environmental core set of indicators 2012, a publication of Zoi Environment Network, produced in close cooperation with the EEA and other cooperating countries. This publication includes 12 out of 37 CSIs of the EEA of that time.

The list of EEA CSIs covered in this publication are given in table below:

Table 5: EEA CSIs developed by Albania in 2012.

No.	Area	CSI
	Agriculture	Area under organic farming
	Biodiversity	Protected areas
	Climate change	Consumption of ozone-depleting substances
	Energy	Final energy consumption by sector
		Total primary energy intensity
		Primary energy consumption by fuel
		Renewable primary energy consumption
	Transport	Passenger transport demand
		Freight transport demand
	Waste	Municipal waste generation
	Water	Use of freshwater resources
		Urban wastewater treatment

2.1 Progress with the environmental legislation

Albania is progressively transposing its environmental legislation in line with the *Acquis*. Table 5 below gives an indication of the EU *Acquis* and the related Albanian acts (newly approved or drafted and waiting to be approved) that have set monitoring requirements. It is followed by a descriptive summary of each of them for the monitoring under each sub-chapter of the Environmental *Acquis*. The summary is given just to make Ministry of Environment and NEA, and other monitoring institutes aware of the multitude of recent acts that should be the bases of the future monitoring. The legislation mentioned below is by far more detailed than this summary and should be considered in all its details when preparing the National Monitoring Program.

NEA, Albanian Geological Survey, Institute of Public Health and other monitoring institutes that are/ have been involved in monitoring of specific environmental media or component have got equipment and training through different projects like STEMA, CEMSA, INPAEL, SELEA, IBECA, etc. However, considering the continuous staff reshuffling and the new and growing legislation that impacts their work, one can easily assume that specialized training is needed for the implementation of the monitoring requirements of each of the new legislation. First of all, the staff involved with monitoring, sampling, analysis, reporting etc. need to be updated on the advancement of the related legislation. Implementation of each of the new acts that involve environmental monitoring requirements needs to start through specific technical assistance projects.

Table 6: Current Progress of Albanian Legislation in EU environmental Policy

EU Acquis	Albanian act or draft act	Status of implementation of the Albanian act
INSPIRE directive 2007/2/EC	Yet to be transposed	
Air Quality		Takes legal effect
<ul style="list-style-type: none"> • Directive 2008/50/EC on ambient air quality and cleaner air for Europe; and • 4th daughter Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air. 	<ul style="list-style-type: none"> • Law 162/2014 "On protection of ambient air quality" • DCM No. 352, dated 29.4.2015 "On the ambient air quality assessment and the requirements for certain related pollutants". 	<ul style="list-style-type: none"> • Enters into force 3 years after publication in the official gazette (1 January 2018) • The DCM takes effect as of 1 July 2018.
Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants	Yet to be transposed	---
Climate Change		
Regulation EU/525/2013 on Monitoring and Reporting Mechanism together with its implementing regulation 749/2014/EC	Drafting on going through IBECA project	---
Regulation 601/2012/EC on the monitoring and reporting of greenhouse gas emissions	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Regulation 2015/757 on the monitoring, reporting and verification of carbon dioxide emissions from maritime transport	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Regulation 1014/2010 on monitoring and reporting of data on the registration of new passenger cars	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Emission standards for new cars Regulation 443/2009/EC	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Emission standards for new vans Regulation EC/510/2011	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Consumer Information Directive 1999/94/EC	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Directive 2003/87/EC Emission Trading, consolidated	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Directive 2009/31/EC Geological storage of CO2	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
F-Gases Regulations	Legal bases prepared under the draft Law on Climate Change	Drafting not started yet.
Ozone Depleting Substances Regulations	Yet to be transposed.	Drafting not started yet.
Directive 2009/30/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions ...	Legal bases prepared under the draft Law on Climate Change. Planned to be transposed soon.	Drafting not started yet.
LULUCF Decision 529/2013/EU	Legal bases prepared under the draft Law on Climate Change.	Drafting not started yet.

EU Acquis	Albanian act or draft act	Status of implementation of the Albanian act
Waste Management		
Waste Framework Directive 2008/98/EC	Law No.10463, dated 22.09.2011 "On integrated waste management"	In force.
	DCM No. 418, dated 25.6.2014 "On the separate collection of waste at source"	In force.
	DCM No. 608, dated 17.9.2014 "On the definition of the necessary measures for the collection and treatment of bio waste and the criteria and deadlines for their reduction"	In force.
	DCM no.798, dated 29.9.2010 "On the approval of regulation "On hospital waste administration"	In force.
	DCM no.575, dated 24.06.2015 "On the approval of requirements for inert waste management"	In force.
	DCM No. 229, dated 23.4.2014 "On the approval of rules for non hazardous waste transfer and the information that should be included at the transfer note"	In force.
	DCM No. 371, dated 11.6.2014 "On the approval of rules on the consignment of hazardous waste and their consignment note"	In force.
Batteries Directive 2006/66/EC	Transposed (fully) through DCM No. 866, dated 4.12.2012 "On batteries, accumulators and their waste"	In force.
Packaging Waste Directive 94/62/EC	Transposed (fully) through DCM no.177, dated 06.03.2012 "On packaging and packaging waste"	In force.
WEEE Directive 2012/19/EU	Transposed (fully) through DCM No. 957, dated 19.12.2012 "On electric and electronic equipment waste"	In force.
End-of-Life Vehicles 2000/53/EC	Transposed (fully) through DCM No. 705, dated 10.10.2012 "On end of life vehicle waste management"	In force.
PCB/PCT Directive 96/59/EC	Transposed partially through DCM No. 387, dated 6.5.2015 "On the approval of rules on controlling the PCBs disposal, decontamination or disposal of equipment containing PCBs and/or the disposal of waste from used PCBs"	In force.
Sewage Sludge Directive 86/278/EEC	Transposed fully through DCM no.127 dated 11.02.2015 "On the requirements of the use of sewage sludge in agriculture"	In force.
Shipments of Waste Regulation EC/1013/2006	Transposed (partially) through DCM No. 641, dated 1.10.2014 "On the approval of rules for waste export and transit of non hazardous and inert waste"	In force.
Mining Waste Directive 2006/21/EC	Law no.10 304, dated 15.7.2010 "On the mining sector in the RoA"	In force.
Waste Statistics Regulation EC/2150/2002	DCM "On the approval of the rules for keeping, updating, and publication of the waste statistics"	Takes effect as per 1 January 2019.
Water Management		
Water Framework Directive 2000/60/EC	Transposed through: <ul style="list-style-type: none"> Law 111/2012, dated 15.11.2012 "On integrated management of water resources" Draft DCM "On the Content, Development and Implementation of National Water Strategies, of River Basin District Management Plans and of Flood Risk Management Plans" 	<ul style="list-style-type: none"> In force. In force.
Marine Strategy Directive 2008/56/EC	Transposed through the Draft DCM on the marine environment strategy	Prepared by SELEA project but not adopted yet.
Environmental quality standards Directive 2008/105/EC	Transposed (fully) through DCM No. 246, dated 30.4.2014 "On the definition of environment quality norms for superficial waters"	In force.
Priority Substances Directive 2013/39/EC	Transposed (fully) through DCM No. 267, dated 7.5.2014 "On the approval of priority substances list for the water environment"	In force.

EU Acquis	Albanian act or draft act	Status of implementation of the Albanian act
Bathing Water Directive 2006/7/EC	Transposed (fully) through DCM No.797, dated 29.9.2010 "On the approval of the sanitary regulation "For the bathing water quality management"	In force.
Urban Waste Water Treatment Directive 91/271/EEC	Draft DCM "On urban waste water treatment".	Prepared by INPAEL project but not adopted yet.
Decision 93/481/EEC concerning formats for the presentation of national programmes as foreseen by Article 17 of Council Directive 91/271/EEC Concerning Urban Waste Water Treatment	Draft Ministerial Order on the Format for the Reporting on the National Programme for the Implementation of DCM "On Urban Waste Water Treatment"	Prepared by INPAEL project but not adopted yet.
Groundwater Directive 2006/118/EC	Draft DCM "On the Content, Development and Implementation of National Water Strategies, of River Basin District Management Plans and of Flood Risk Management Plans"	Prepared by INPAEL project but not adopted yet.
Quality Assurance/Quality Control Directive 2009/90/EC	Transposed through the Draft DCM "On The Content, Development and Implementation of National Water Strategies, of River Basin District Management Plans and of Flood Risk Management Plans"	Prepared by INPAEL project but not adopted yet.
Floods Directive 2007/60/EC	Transposed through the Draft DCM "On the Content, Development and Implementation of National Water Strategies, of River Basin District Management Plans and of Flood Risk Management Plans"	Prepared by INPAEL project but not adopted yet.
Nitrates Directive 91/676/EEC	Yet to be transposed	---
Commission Decision 2010/477/EU on Standards on good environmental status	---	---
Nature Protection		
Wild Birds Directive 2009/147/EEC	Transposed through: <ul style="list-style-type: none"> • Law "On the protection of wild fauna", No. 10006, date 23.10.2008 • Law "On hunting", No. 10253, date 11.3.2010 • DCM No. 546, dated 7.7.2010 "On hunting season in the Republic of Albania", • DCM No. 547, dated 7.7.2010 "On the approval of the list of huntable species in Albania", • Draft Order of Minister "On the approval of the list of particularly vulnerable bird species in Albania" • Draft Law "On some amendments and addenda to Law No. 10253 of 11.3.2010 "On hunting" 	<ul style="list-style-type: none"> • In force. • In force. • In force. • In force. • In force. • Prepared under SELEA Project, but not adopted yet • Not adopted yet
Habitats directive 92/43/EEC, as amended	Transposed (partially) through DCM No. 866 of 10.12.2014 "On the approval of natural habitat types, plants, animals and birds of interest for the European Union".	
Industrial Pollution, Risk and Accident Management		
<ul style="list-style-type: none"> • Large Combustion Plants Directive 2001/80/EC • Integrated Pollution Prevention and Control Directive 2008/1/EC 	Transposed together through the Law no. 10448, dated 14.7.2011, "On environmental permits", amended.	In force.
Noise Protection		
Environmental Noise Directive 2002/49/EC	<ul style="list-style-type: none"> • Law No. 9774 of 12.07.2007 "On the assessment and management of environmental noise", • Guideline No.1037/1, dated 12.4.2011 "On the assessment and management of environmental noise" 	In force.

2.3 Thematic analysis

Air quality monitoring and assessment

Law No. 162/2014 “On ambient¹ air quality protection sets the framework for:

1. Defining and establishing limit, threshold and target values for certain pollutants² in the air;
2. Defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole;
3. Assessing³ the ambient air quality on the basis of European methods and criteria;
4. Obtaining information on ambient air quality in order to help reduce air pollution and nuisance and to monitor long-term trends and improvements resulting from national and international measures.
5. Ensuring that such information on ambient air quality is made available to the public;
6. Maintaining air quality where it is good and improving it in other cases through emission reduction from both mobile and fix sources;
7. Promoting increased cooperation with other countries in reducing air pollution.

It also opened the legal base for the approval of the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”. The new rules and requirements for air quality monitoring and assessment will impose a huge jump in the quality of work that has been done so far in with regard to air quality monitoring. These are rules applied by all the EU member states which ensure comparison between the assessments done in different countries. They provide a sound bases for the preparation of e EU level air quality assessment report.

Beginning of implementation of this legislation in Albanian implies that the necessary human and measurement/monitoring capacities and infrastructure is in place by mid 2018, i.e. two years from the time this report is written. In other words, it implies that the staffs of both Ministry of Environment and NEA at that date are very well informed and trained to do the old job following completely new rules. Implementation of this law and the related Decision pose a real challenge to the both Ministry and NEA.

The law applies to following air pollutants:

1 “Ambient air’ shall mean outdoor air in the troposphere, excluding workplaces, meaning the place intended to house workstations on the premises of the undertaking and/or establishment and any other place within the area of the undertaking and/or establishment to which the worker has access in the course of his/her employment, where provisions concerning health and safety at work apply and to which members of the public do not have regular access.

2 “Pollutant” shall mean any substance present in ambient air and likely to have harmful effects on human health and/or the environment as a whole.

3 “Assessment” shall mean any method used to measure, calculate, predict or estimate levels.

Group one

- 1) Sulphur dioxide (SO₂).
- 2) Nitrogen dioxide (NO₂).
- 3) Nitrogen oxides (NO_x).
- 4) Particulate matter (PM₁₀ and PM_{2,5}).
- 5) Lead (Pb).

Group two

- 6) Ozone (O₃).

Group three

- 7) Benzene.
- 8) Carbon monoxide / carbon monoxide (CO).
- 9) Polycyclic aromatic hydrocarbons (PAHs).
- 10) Cadmium (Cd).
- 11) Arsenic (As).
- 12) Nickel (Ni).
- 13) Mercury(Hg).

The Law No. 162/2014 “On ambient air quality protection” has defined the Competent authorities as below:

Ministry of Environment is the competent authority for:

- a. the approval of measurement systems (methods, equipment, networks and laboratories);
- b. inter-institutional coordination on different issues regarding air quality;
- c. international cooperation on different issues regarding air quality .

NEA is the competent authority for

- a. the monitoring and assessment of ambient air quality;
- b. for ensuring the accuracy of measurements;
- c. analysis of assessment methods;

NEA is responsible for the division of the territory of the country into zones and agglomerations. Then this division shall be approved by the Minister of Environment. All zones and agglomerations shall be subject to air quality assessment, according to the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants” and air quality management plans.

The Ministry of Environment shall make air quality information routinely available to the public and to appropriate interested organisations. Such information shall include:

- a. Ambient air quality related to all pollutants covered under this law in accordance with the requirements of the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”;
- b. Information on any postponement on any deadline for conformity with limit values, in accordance with the requirements of the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”;
- c. Information about any exemptions on any deadline for conformity with limit values, in accordance with the requirements of the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”;
- d. Air quality plans;
- e. Short term action plans (including, as appropriate, their feasibility, content and implementation of these plans);
- f. Measures taken for not exceedance of the target values defined in the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”;
- g. Any exceedance of the target values during the year, the reasons for and the area of such exceedance;
- h. A brief assessment of the target values and their effects on health and environment.

Every year, starting from the date the **DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”** takes effect, i.e. on 1 July 2018, the NEA shall prepare an annual report on ambient air quality assessment. Such report shall follow the questionnaires approved by the Minister for this purpose. The deadline for this report shall be not later than 30 June of the following year. The first report shall be prepared by 30 June 2019. It shall be made available to the public.

The annual air quality report shall include data on pollutants covered by the law, according to the requirements of the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”. Such data shall include:

- a. Details of all cases where levels of pollutants have exceeded limit values, and where appropriate, the limit values plus the margin of tolerance;
- b. Details of all cases where levels of pollutants have exceeded target values or the critical levels;
- c. Details of all cases where levels of pollutants have exceeded long term objectives;
- d. Details of all cases where levels of pollutants have exceeded information thresholds;
- e. Details of all cases where levels of pollutants have exceeded alert thresholds;
- f. A summary assessment of the effects of the cases referred to in bullets (a) to (e) above.
- g. Information requested in bullets (a) to (e) includes also:

- i. The list of zones and agglomerations (in the first report) or the changes made to them (from the second report and on)
- ii. The list of zones and agglomerations where there has been one or more exceedance.
- iii. The area of exceedance;
- iv. Concentration values of pollutants in these areas;
- v. Reasons for exceedance and the contributing sources;
- vi. Population exposed to such exceedance ;
- vii. Measures taken for not exceedance of the target values defined in the DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants”.

The annual report may also include, where appropriate,

- a. an assessment on contributions from natural sources and from re-suspension of particulates following winter-sanding or -salting of roads to the levels assessed,
- b. further information and assessments on forest protection.

DCM No. 352, dated 29.4.2015 “On ambient air quality assessment and requirements for certain related pollutants” was meant to establish limit, threshold and target values for certain pollutants in the air, as well as objectives for sound ambient air quality; define methods and criteria for ambient air quality measurement and assessment and promote increased cooperation between different stakeholders within the country as well as with other countries.

One chapter of the Decision is dedicated to the sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter, lead, benzene and carbon monoxide. It has set the rules and requirements for assessment of ambient air quality in relation to these pollutants. It has also adopted the assessment thresholds, assessment criteria and helps to define the location and numbers of sampling points needed for air quality monitoring in relation to them, together with the reference measurement methods.

Another chapter is dedicated to the assessment of ambient air quality in relation to ozone. This chapter has set the assessment criteria specific for ozone, the rules and requirements how to define the sampling points for ozone and which reference measurement methods to use for ozone.

Another chapter is dedicated to the assessment of ambient air quality in relation to arsenic, cadmium, nickel, mercury, benzo(a)pyrene and other polycyclic aromatic hydrocarbons. This chapter has defined the assessment thresholds, the assessment criteria, the data quality objectives for such pollutants as well as the rules and

requirements on how to define the location and number of sampling points together with the reference methods for sampling. This chapter also set the rules for monitoring of polycyclic aromatic hydrocarbons and how to perform background monitoring.

This decision has a specific chapter on the obligations in relation to limit values, target values, thresholds and levels. It sets the limit values and alert thresholds for the protection of human health; target values for arsenic, cadmium, nickel, mercury, benzo(a)pyrene and other polycyclic aromatic hydrocarbons. It also sets the critical levels for the protection of vegetation, long term objectives for ozone. It also sets the rules on how to consider and measure the contributions from natural sources and the exceedances attributable to winter-sanding or winter-salting of roads. This chapter sets the thresholds that should be considered for the purpose of information of the population but also for making it alert when air quality has deteriorated.

This Decision has also introduced new concepts in the Albanian legislation such as the one on national exposure reduction for PM_{2,5} for the protection of human health. It sets the average exposure indicator for PM_{2,5} together with the PM_{2,5} national exposure reduction target.

A new concept is also that on Data Quality Objectives for ambient air quality assessment for Sulphur dioxide, nitrogen dioxide and oxides of nitrogen and carbon monoxide Benzene Particulate matter (PM₁₀/PM_{2,5}) and lead Ozone and related NO and NO₂, and for each of them the acceptable percentage of uncertainty, of minimum data capture, Minimum time coverage for both urban background, traffic and industrial sites, etc.

On the bases of the data gathered from the monitoring of each of the air pollutants in the ambient air, an air quality assessment report shall be prepared. The following information shall be compiled for zones and agglomerations within which sources other than measurement are employed to supplement information from measurement or as the sole means of air quality assessment:

- a. a description of assessment activities carried out,
- b. the specific methods used, with references to descriptions of the method,
- c. the sources of data and information,
- d. a description of results, including uncertainties and, in particular, the extent of any area or, if relevant, the length of road within the zones and agglomerations over which concentrations exceed any limit value, target value or long-term objective plus margin of tolerance, if applicable, and of any area within which concentrations exceed the upper assessment threshold or the lower assessment threshold,
- e. the population potentially exposed to levels in excess of any limit value for protection of human health.

This Decision requests a quality assurance / data validation to be carried for the ambient air quality.

The air quality assessment report shall be accompanied by the documentation and review of site selection. The site-selection procedures shall be fully documented at the classification stage by such means as compass-point photographs of the surrounding area and a detailed map. Sites shall be reviewed at regular intervals with repeated documentation to ensure that selection criteria remain valid over time.

The annexes of the Decision give details on the work to be done on proper and correct monitoring of air pollutants such as:

- Determination of requirements for assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM₁₀ AND PM_{2,5}), Lead, benzene and carbon monoxide in ambient air within a zone or agglomeration including the upper and lower assessment thresholds for each of them and the determination of exceedances of upper and lower assessment thresholds
- Criteria for determining minimum numbers of sampling points for fixed measurement of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM₁₀, PM_{2,5}), lead, benzene and carbon monoxide in ambient air including Macroscale and microscale siting of sampling points. Documentation and review of site selection is always requested. These criteria are given specifically to assess compliance with:
 - limit values for the protection of human health and alert thresholds in zones and agglomerations where fixed measurement is the sole source of information, for both diffuse sources and point sources
 - the PM_{2,5} exposure reduction target for the protection of human health
 - critical levels for the protection of vegetation in zones other than agglomerations
- Measurements at rural background locations irrespective of concentration, including objectives, substances, siting.
- National exposure reduction target, target value and limit value for **PM_{2,5}**, including average exposure indicator, national exposure reduction target, exposure concentration obligation, target value, limit value
- Information and alert thresholds for all the pollutants
- Critical levels for the protection of vegetation from SO₂ and NO_x during specific periods of the year.
- Reference methods for assessment of concentrations of sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter (PM₁₀ and PM_{2,5}), lead, benzene, carbon monoxide, and ozone
- Ozone target values and long-term objectives
- Criteria for classifying and locating sampling points for assessments of ozone

- concentrations, including macroscale siting (urban, sub-urban, rural, rural background) and microscale siting
- Criteria for determining the minimum number of sampling points for fixed measurement of concentrations of ozone
 - Measurements of ozone precursor substances. These shall include at least nitrogen oxides (NO and NO₂), and appropriate volatile organic compounds (VOC). A list of volatile organic compounds recommended for measurement is also given in the annex.
 - Limit values for the protection of human health
 - Target values for arsenic, cadmium, nickel and benzo(a)pyrene
 - Determination of requirements for assessment of concentrations of arsenic, cadmium, nickel and benzo(a)pyrene in ambient air within a zone or agglomeration, setting both upper and lower assessment thresholds and determination of exceedances to them
 - Criteria for determining numbers of sampling points for fixed measurement of concentrations of arsenic, cadmium, nickel and benzo(a)pyrene in ambient air
 - Location and minimum number of sampling points for the measurement of concentrations in ambient air and deposition rates
 - Data quality objectives and requirements for air quality models
 - Requirements for air quality models
 - Requirements for objective estimation techniques
 - Standardisation
 - Reference methods for assessment of concentrations in ambient air and deposition rates including: reference method for the sampling and analysis of arsenic, cadmium and nickel, polycyclic aromatic hydrocarbons, mercury in ambient air and reference method for the sampling and analysis of the deposition of arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons, together with the reference air quality modelling techniques

Monitoring of emissions of air pollutants into the atmosphere

Law No. 10448, dated 14.7.2011, “On environmental permitting” sets the rules for the setting of Emission Limit Values for SO₂, NO_x and dust from the burning of any kind of fuel (solid, liquid and gaseous). It also provides the method for setting emission limit values for plants with a multi-firing unit as well as methods of measurement of emissions from Large Combustion Plants.

‘Emission limit value’ means the permissible quantity of a substance contained in the waste gases from the combustion plant, which may be emitted into the air during a given period; it shall be calculated in terms of mass per volume of the waste gases

expressed in mg/Nm³, assuming an oxygen content by volume in the waste gas of 3 % in the case of liquid and gaseous fuels, 6 % in the case of solid fuels and 15 % in the case of gas turbines.

Annex 2 of the law gives an indicative list of the main polluting substances, which must be taken into account if they are relevant for fixing emission limit values. They are given below.

Air

1. Sulphur dioxide and other sulphur compounds.
2. Oxides of nitrogen and other nitrogen compounds.
3. Carbon monoxide.
4. Volatile organic compounds.
5. Metals and their compounds.
6. Dust.
7. Asbestos (suspended particulates, fibres).
8. Chlorine and its compounds.
9. Fluorine and its compounds.
10. Arsenic and its compounds.
11. Cyanides.
12. Substances and preparations which have been proved to possess carcinogenic or mutagenic properties or properties which may affect reproduction via the air.
13. Polychlorinated dibenzodioxins and polychlorinated dibenzofurans.

All operators that have been issued an environmental permit under this law, have the obligation to self-monitor their own air emissions and water discharge and provide all the resulting information to NEA/REA. Again, NEA is the competent authority in charge of the collection and verification of all the measurements of air emissions into the atmosphere.

Climate change

A DRAFT Law “On climate change” is under preparation by IBECA project. The main monitoring and reporting requirements under this draft law relate to the national inventory and projections of GHG anthropogenic emissions by sources and removals by sinks, as well as to the measures undertaken to respond to climate change. Therefore, indicators for this purpose will be needed to develop.

Between other things the draft law “On climate change” aims to open the legal base for future transposition of EU climate Acquis. A number of Decisions of Council of Ministers

will be drafted in this bases, related to the monitoring and reporting of GHG emissions from a list of operators/activities, aviation operators, maritime transport operators, new vehicles, summing up at the reporting at the national level. Though the legislation in the area of climate change is only at its beginning, it is obvious how monitoring and reporting will happen: each of the operators involved in the paragraph above will report to the relevant REA and line ministry, which will sum up the emission at the Regional and sector level, respectively. Then the line ministries will report to NEA, which will sum up the emission at the national level.

A draft DCM “On a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change” is under preparation and planned to be approved by 2017. This DCM will transpose Regulation (EU) no 525/2013 of the European Parliament and of the Council of 21 May 2013 with the same title.

This draft Decision shall request indicators as below that shall be developed at the macro/national level or at the level of each relevant sector/industry:

1. Total CO₂ intensity of GDP, t/million euro
2. Energy-related CO₂ intensity of GDP, t/million euro
3. CO₂ emissions from passenger cars, kt
4. Number of kilometres by passenger cars, Mkm
5. Energy-related CO₂ intensity of industry, t/million euro
6. Specific CO₂ emissions of households, t/dwelling
7. CO₂ intensity of the commercial and institutional sector, t/million euro
8. CO₂ intensity of the commercial and institutional sector, t/million euro
9. Specific CO₂ emissions of public and auto producer power plants, t/TJ
10. CO₂ emissions from freight transport on road, kt
11. Freight transport on road, Mtkm
12. Total CO₂ intensity — iron and steel industry, t/million euro
13. Energy-related CO₂ intensity — chemical industry, t/million euro
14. Energy-related CO₂ intensity — glass, pottery and building materials industry, t/million euro
15. Specific CO₂ emissions of iron and steel industry, t/t
16. Specific energy-related CO₂ emissions of cement industry, t/t
17. Specific diesel related CO₂ emissions of passenger cars, g/100 km
18. Specific petrol related CO₂ emissions of passenger cars, g/100 km
19. Specific CO₂ emissions of passenger cars, t/pkm
20. Specific air-transport emissions, t/passenger
21. Energy-related CO₂ intensity — food, drink and tobacco industry, t/million euro
22. Energy-related CO₂ intensity — paper and printing industry, t/million euro

23. Specific CO₂ emissions of households for space heating, t/m²
24. Specific CO₂ emissions of commercial and institutional sector for space heating, kg/m²
25. Specific CO₂ emissions of public power plants, t/TJ
26. Specific CO₂ emissions of auto producer plants, t/TJ
27. Carbon intensity of total power generation, t/TJ
28. Carbon intensity of transport, t/TJ
29. Specific energy-related CO₂ emissions of paper industry, t/t
30. CO₂ emissions from the industry sector, kt
31. Total final energy consumption from industry, PJ
32. CO₂ emissions from households, kt
33. Total final energy consumption from households, PJ

Waste

According to the principle of extended producer responsibility, adopted through the **Law No.10463, dated 22.09.2011 “On integrated waste management”** any person who professionally develops, manufactures, processes, treats, sells or imports products (the producer of the product) has extended producer responsibility. This is meant to strengthen the re-use and the prevention, recycling and other recovery of waste. Producers should accept returned products and the waste that remains after those products have been used, as well as the future management of the waste and the financial responsibility for such activities.

DCM No. 418, dated 25.6.2014 “On the separate collection of waste at source”

Each LGU reports annually, within 31 January, to the NEA the data on the separate collection of waste streams and the respective objectives achieved in the territory under its jurisdiction. Such data include:

1. waste data generated per each waste stream in the course of the reporting,
2. the overall weight per waste stream collected in a differentiated manner,;
3. the overall weight per waste stream by material type component,.
4. type of waste collected,
5. how is waste collected,
6. who collects the waste,
7. how often is the waste collected,
8. identification of the contractors involved in waste collection,
9. destination of waste,
10. quantity of treated / processed waste and relation with the collected quantity.

NEA processes the data at the national level regarding the total amounts of waste collected separately and the degree of achieved objectives. It keeps records of the:

1. description of methods of waste collection,
2. description of methods of recording amounts of waste streams,
3. assembled data and information collected by all LGUs;
4. general assessment on the waste streams achieved targets.

Such data are registered in the NEA register established for this purpose and reports them to the Ministry of Environment within 28 February each year. It also includes them into the State of Environment Report.

DCM No. 608, dated 17.9.2014 “On the measures necessary for the collection and treatment of bio-waste and the criteria and deadlines for their reduction”

Every year within December, each LGU reports to the relevant Council of Qark the data on the collection of bio-waste and the objectives for their treatment, as part of their reporting regarding the implementation of the integrated waste management local plan. Then, within February, the Council of Qark reports to the NEA the data collected from all LGUs under their jurisdiction.

The information recorded at the local level includes:

1. waste data generated per bio waste in the course of the reporting
 - a. the overall weight of separately collected bio waste;
 - b. the overall weight per bio-waste by material type component.
2. how is bio-waste collected;
3. who collects the bio-waste
4. how often is the bio-waste collected
5. identification of the contractors involved in bio-waste collection
6. destination of bio-waste
7. quantity of treated/processed bio-waste and relation with the collected quantity

NEA processes the data on the total weight of the bio-waste collected separately as well as the degree of the objectives achieved at the national level and records them in the register established for this purpose. The registered information at NEA includes:

1. description of methods of bio-waste collection;
2. description of methods of recording amounts of bio-waste;
3. assembled data and information collected by all LGUs;
4. general assessment on the bio-waste achieved targets.

NEA includes the information collected on bio-waste in the State of Environment Report and also delivers it to the Ministry of Environment within end of March, each year. The Ministry uses such information for the preparation of the Report on the implementation of the Law on integrated waste management, which is then published in its official website and is made publicly available.

DCM No.575, dated 24.6.2015 “On the approval of requirements for the inert waste management”

According to this decision, holders and operators of inert waste landfills complete the transfer note and record its data to the Register of Individual Transfers. Operators of inert waste landfills / temporary dumpsites have the obligation to report at the relevant LGU and at the NEA the data on the waste they treat. LGUs within January each year, submit to the Ministry in charge of public infrastructure the annual data on the waste treated in the landfills/ temporary dumpsites of the inert waste.

DCM No. 765, dated 7.11.2012 “On the approval of the rules for the separate collection and treatment of used oils”

According to this decision the monitoring of waste oil management is part of the National Environmental Monitoring Program. As part of the hazardous waste monitoring it aims the continuous assessment of implementation of the rules and requirements for the used oils management.

Every operator who has been issued an environmental permit and licence of III.2.B sub-category is obliged to self-monitor its activity regarding the:
types and amounts of used oils generated, collected, treated and disposed as per the requirements of this decision;
types and amounts of waste generated during treatment and disposal of used oils;
The operator records such data in the register established for such purpose, following an approved format. At the end of each calendar year, holders of used oils report their data to the relevant REA and LGU.

On the bases of these data within the first trimester of each year the REA, prepares the annual report on used oils for the relevant qark. Such report contains data on the activities generating used oils, the amounts and types of used oils for each activity of the qark; amounts and types of used oils sent for treatment and for disposal; etc.

All REA submit their reports to the NEA, which in turn established and keeps a State Register for Used Oils, following an approved format.

Every 3 years the Ministry of Environment, prepares the National Report on the Used Oils Management, as part of the State of Environment Report.

Ministerial Order No. 893, dated 4.10.2013 “On the approval of the model of registers of the operators that generate, collect and recycle used oils”

Such registers include

- 1.1 The register for the producers and importers of lubricant oils;
- 1.2 The register for the generators of used oils;
- 1.3 The register for the licences managers for collection and recycling of used oils;
- 1.4 The label “To be kept in special packaging” for the collectors of used oils and lubricants.
- 1.5 Documents for the consignment of used oils.

DCM No.229, dated 23.4.2014 “On the approval of the rules for the transfer of non-hazardous waste and information to be included in the transfer document”

According to this decision the generator, collector, and receiver of waste keep in their own registers of Individual Transfers and also deliver to the NEA and the State Environment and Forests Inspectorate information on the non hazardous waste transferred at least once per year. NEA establishes the National Register for the data related to the Transfer of the Non Hazardous Waste.

DCM No. 371, dated 11.6.2014 “On the approval of the rules for the consignment of hazardous waste and their Consignment Notes”

According to this decision the consigner delivers to the NEA and the State Environment and Forests Inspectorate a copy of the consignment note signed by both the consigner, carrier and consignee. Data from the consignment note are recorded in the Register of Individual Transfers and also in the NEA’s National Register of the Hazardous Waste Consignment.

DCM No. 177, dated 6.3.2012 “On packaging and packaging waste”

Following the producer extended responsibility, the producers of packaged goods and producers of packaging to be filled at the selling point, and whoever acts on their behalf, shall fill detailed forms given in annex to this decision and keep in their own registers data (by weight) on the packaging material put in the market, collected and sent for recycling.

Within 31 January of each year, they shall report such data to the relevant Local Government Unit (LGU) recorded from the previous year. LGUs sum up the packaging data collected from all producers and sellers within the territory of their jurisdiction

and keep such data in their own registers established for such purpose. Then, within 28 February they report their aggregate data to the NEA.

Within 28 February of each year the General Customs Directorate reports to the NEA the amounts (in weight) of the packaging goods and packaged goods recorded from the previous year.

NEA sums up and records in its own registers/database established for such purpose the data of the overall packaging waste collected separately in the country in total and per each type of packaging material. The percentage of packaging weight collected each year shall be included in the State of Environment Reports and made available in the official website of the Ministry of Environment.

DCM No. 705, dated 10.10.2012 “On the End-of-Life Vehicles”

Each operator who produces or imports vehicles professionally, following a certain approved format, shall report annually to the ministry responsible for transport and the ministry responsible for environment on their achievement of the objectives for reuse, recycling and recovery of the ELV set under this decision.

The ministry responsible for transport and the ministry responsible for environment report annually to the Council of Ministers the total number of the vehicles de-registered and the overall achievement of the objectives for reuse, recycling and recovery of the ELV set under this decision.

DCM No. 957, dated 19.12.2012 “On waste electric and electronic equipment (WEEE)”

This decision sets the minimum mandatory objectives for the separate collection and treatment of the WEEE by each producer. Each producer of Electric and Electronic Equipment (EEE), or any third party acting on their behalf shall measure and record in their own registers established for this purpose, the weight of each EEE, WEEE and their parts and materials when they get in and out of the recovery/recycling/treatment plants. They calculate the percentage of amounts collected and treated to check the degree of achievement of the objectives. Within 31 January each year, they report to the relevant LGU on the total weight of EEE and WEEE collected/treated and the related percentage of achieved objectives for the previous year.

LGUs calculate the total weight of EEE and WEEE collected in the territory under their jurisdiction and the related percentages for the previous year and keep it recorded in their own registers established for this purpose. They report each year within end of April, the results of their calculations to the NEA.

General Directory of Customs reports each year within March to the NEA the imports of EEE and exports of WEEE for the previous year.

NEA calculates the total amount (in weight) of the EEE and WEEE and the percentages of collection/treatment achieved in the country for the previous year. They keep such data in their register established for this purpose. NEA keeps annual data for the amounts of each category of EEE put into market by each producer, as well as the data on the amounts of WEEE collected, reused, recycled and recovered in the territory of Albania and those exported. When measuring of the EEE and WEEE by weight is not possible, the producers and the General Directory of Customs report by numbers.

DCM No.866, dated 4.12.2012 “On the batteries, accumulators and their waste”

According to this decision, each year the producers, deliverers of batteries and accumulators and third parties acting on their behalf record their sales (by weight) as per the related documentation, as well as the waste batteries and accumulators collected by them. The General Directory of Customs records the imports and exports. They calculate the percentage of collected waste, as per requirements of this decision and report annually within 31 January for the previous year to the relevant LGU. LGUs calculate the percentage of batteries and accumulators collected in the territory of their jurisdiction during the previous calendar year and keep the data on their registers established for this purpose. Then, LGUs report to the NEA within April, the percentage of waste batteries and accumulators collected in their territories. The General Custom Directorate reports to NEA within March, each year, the imports of batteries and accumulators and the exports of their waste for the previous year.

NEA calculates the percentage of waste batteries and accumulators collected in the territory of the country and records the data in the register established for this purpose. It includes such data in the State of Environment Reports and the Ministry of Environment makes them publicly available in its official website.

Draft DCM “On the approval of rules for the management of animal by-products, that is not intended for human consumption”

According to this decision, operators that transfer/consign or receive animal by-products or products obtained from them shall keep a special register for their deliveries and the related commercial documents or health certificates.

DCM No. 387, dated 6.5.2015“On the approval of rules for the control and disposal of PCBs, rehabilitation or disposal of equipment containing PCBs, and/or the disposal of waste of used PCBs”

According to this decision, within 30 June 2016, holders of equipment, objects, materials and liquids containing PCB shall submit to the NEA a self-declaration containing data on the:

- holder's name and address
- location and description of the equipment
- amount of PCB contained in the equipment
- dates and types of treatment or replacements made or planned to be made

Within 2016, based on the self-declarations, NEA compiles the Preliminary Inventory regarding equipment containing PCB.

Within March 2019, the holders of equipment, objects, materials and liquids containing more PCB submit the final self-declarations, on which base the NEA compiles the Final Inventory regarding equipment, objects, materials and liquids containing PCB. Such inventory is updated each year within 15 January. NEA submits the preliminary and final self-declarations to the SEFI respectively on 31 March 2017 and 30 June 2019.

DCM No.127, dated 11.2.2015 “On the requirements for the use of sewage sludge in agriculture”

According to this decision both the generator and the user have monitoring and reporting obligations.

The generator of the sewage sludge has the obligation to keep a register with data as below and report them within 30 June of each year to the Competent Authority:

- a. the quantities of sludge produced and the quantities supplied for use in agriculture;
- b. the composition and properties of the sludge having regard to the parameters referred to in Annex II A of this decision;
- c. the treatment which the sludge has undergone having regard to the treatment referred to in paragraph 2 (b);
- d. the name and address of each user of the sludge and the location of each site where the sludge is to be used.

The user of sewage sludge in agriculture has the obligation to keep the register with data as below and report them within 30 June of each year to the Competent Authority:

- a. the quantities of sludge used in agriculture;
- b. the surface and location of the agricultural land where sludge is used;
- c. name and address of the facility that has produced the sludge.

The competent authority (NEA/Center for the Transfer of Agriculture Technology)

establish, keep and update the National Register for the Use of Sewage Sludge in Agriculture, following an approved format, where they aggregate the data provided by both producers and users.

Law No. 10 304, dated 15.7.2010“On the mining sector in the RoA”

According to this law the responsible structure on mining, is also in charge of the monitoring of the mining waste deposits of the activities which have been abandoned, closed or are under a conservation regimen.

DCM No. 742, dated 9.9.2015 “On the functioning and management of the Pollutants Release and Transfer Register (PRTR), approval of the list of activities and pollutants subject to this register, and of the declaration form of data for the release and transfer of pollutants from the operator”.

According to this decision NEA shall establish an integrated pollutant release and transfer register (PRTR) in the form of a publicly accessible electronic database. The DCM defines the relevant lists of activities, capacity thresholds, pollutants, emission limit values, minimum amount of waste).

The operators (relevant to this DCM) shall report the amounts annually to NEA, along with an indication of whether the information is based on measurement, calculation or estimation, of the:

- releases to air, water and land of any pollutant for which the applicable threshold value is exceeded;
- off-site transfers of given amounts of hazardous waste and non hazardous waste;
- off-site transfers of pollutants in waste water destined for waste-water treatment.

Based on the approved format, the operator shall prepare an annual report for NEA and submit it before the 1st April of the following year. He shall keep also available for EFA the records of the data from which the reported information was derived for a period of five years, starting from the end of the reporting year concerned. These records shall also describe the methodology used for data gathering.

NEA shall establish, and publish the PRTR presenting both aggregate and non-aggregate data so that the emissions and discharges to air, water and soil can be searched for and identified from different points of view per:

- a. facility, including the facility’s parent company where applicable, and its geographical location, including the river basin;
- b. activity;

- c. pollutant or waste, as appropriate;
- d. each environmental medium (air, water, land) into which the pollutant is released;
- e. off-site transfers of waste and their destination, as appropriate;
- f. off-site transfers of pollutants in waste water;
- g. diffuse sources;
- h. facility owner or operator.

DCM No.687 dated 29.7.2015 “On the approval of rules for keeping, updating and publishing waste statistics”

LGUs have the obligation to complete the reporting format for annual statistics on waste generated within their territory of jurisdiction. Each year, within 31 January, they submit such forms to the relevant Council of Qark, to the NEA and to the ministry on charge of infrastructure.

This decision sets obligations for the ministry in charge of agriculture, on infrastructure, on health and on industry to complete forms with data on the waste statistics from the sectors of their competence. They submit such forms to the NEA within 10 February each year. NEA collects keeps and updates waste statistics and reports them to the Ministry of Environment, within 28 February each year. Ministry of Environment uses the data to produce the 3 annual report on waste statistics at the national level. Such report shall be made publicly available through the ministry’s official website.

DCM No. 641, dated 1.10.2014 “On the approval of rules on export of waste and the transit of non hazardous waste and inert waste”

According to this decision, the person who exports waste keeps data on every load that is exported:

- a. up to 1 year after the validity date of the authorization for export of non-hazardous waste for recovery and
- b. up to 3 years after the validity date of the authorization for export of hazardous waste for disposal or recovery and of the authorization for export of non-hazardous waste for disposal.

The operators involved in the export of waste report the data every 6 months, during the validity time of the authorization to the Ministry of Environment, which establishes a database for the waste export and transit data. They report such data to the NEA and SEFI upon the written request.

Law No. 111/2012, dated 15.11.2012 “On integrated water resources management”

The main purpose of integrated water management is to establish a framework for protection of –water resources, which between other things ensures the monitoring of the water status, the rational use and pollution reduction.

This law has brought new concepts and definitions as compared to previous water related legislation. They are on the bases of the water monitoring that needs to be done to comply with it. Below there are some definitions, which are very important for those engaged in water monitoring.

“Environmental water quality norm” means the concentration of a particular pollutant or group of pollutants in water, sediment or biota, which should not be exceeded in order to protect human health and the environment.

“Groundwater quality norm” means an environmental, technical and health norm expressed as the concentration of a particular pollutant, group of pollutants or indicator of pollution in groundwater, which should not be exceeded in order to protect human health and the environment.

“Ecological status” is an expression of the quality of the structure and functioning of aquatic ecosystems associated with surface waters, classified in accordance with specific legal acts.

“Good ecological status” means the ecological status achieved by a body of surface water when assessed as ‘good’ as set out in specific legal acts.

“Good groundwater status” means the status achieved by a groundwater body when both its quantitative status and its chemical status are assessed as at least ‘good’ as set out in approved state standards.

“Good surface water status” means the condition achieved by a surface water body when both its ecological condition and its chemical condition are assessed as at least ‘good’ as set out in approved state standards.

“Good groundwater chemical status” means the chemical status of a body of groundwater as set out in approved state standards.

“Good surface water chemical status” means the chemical status required to meet the environmental objectives for surface waters as set out in approved state standards.

“Good groundwater quantitative status” means the quantitative status of a body of groundwater when assessed as ‘good’ as set out in approved state standards.

“Groundwater status” is the general expression of the status of a body of groundwater, determined by the status referred to the maximum limits of standards as set out in approved state standards.

“Surface water status” is the general expression of the-condition of a body of surface water, determined by its poorest ecological, quality and chemical status.

“Quantitative status” is an expression of the degree to which a body of groundwater is affected by direct and indirect abstractions.

The law has opened the legal bases for the approval of the DCM “On National Water Strategy and River Basin District Management Plans”. This DCM has been prepared by INPAEL project but has not been approved yet. It provides the technical specifications and standardised methods related to the monitoring programme.

The law asks for the classification of:

- surface waters according to their chemical and ecological status
- groundwater according to their quantitative and chemical status.

Water classification shall be determined by the Council of Ministers, acting on a proposal of the Minister. Following the Law “On Environmental Permitting” all operators that have been issued such a permit, including those involved with wastewater treatment, have the obligation to self-monitoring of their own effluent discharges and report them to the NEA and make public the results of their self-monitoring.

2.3.1 Monitoring of ground and underground water status and protected areas

Each River Basin Council shall establish and implement a programme for the monitoring of water status in order to establish a coherent and comprehensive overview of the water status in the river basin district. The surface waters programme shall cover and treat:

- a. The volume and level or rate of flow to the extent relevant for ecological and chemical status and ecological status; and
- b. The ecological and chemical status and ecological potential.

The groundwater programme shall cover and treat the monitoring of the chemical and quantitative status.

The protected areas programme shall be supplemented by monitoring requirements set out in specific legislation on relevant protected areas.

The underground water programme should cover and treat the monitoring of the chemical and quantitative status.

Regulation and requirements for such monitoring programmes shall be established by DCM, upon proposal of the minister of Environment. The regulation shall specify the parameters to be monitored, as well as the procedures and technical measures necessary including but not limited to sampling and analysis requirements for each

parameter, quality control, laboratory practice and data recording and management.

These programmes should be enforced within 6 years after the approval of this law.

Ministry in charge of water management shall establish, manage and update the (electronic) National Water Resources Cadastre, which contains data on:

- a. surface waters, classified according to their chemical and ecological status;
- b. protected areas;
- c. heavily modified water bodies;
- d. environment permits for exercising the activity of discharging wasted waters in body waters;
- e. areas prone to eutrophication and areas vulnerable to nitrates;
- f. sanitary protected areas;
- g. emergency protected areas;
- h. special protection areas;
- i. health hazardous areas;
- j. bodies of water used for the extraction of drinking water.

Each institution that has responsibilities on water contributes to the National Water Resources Cadastre inserting its own data.

Register of licenses, authorisations, permits and concessions for water use

Each River Basin Council shall maintain a register of all licenses, authorisations, permits, concessions - issued in the territory of its jurisdiction in conformity with this law and relevant by laws.

On the bases of the data submitted from the registers of River Basin Councils, the Ministry in charge of water management shall maintain, manage and update the National Register of all licenses, authorisations, permits, concessions. Registers shall contain and put in evidence:

- a. data and details of all applications for new licenses, authorisations, permits, concessions or changes, renovation, or withdrawal from existing ones, as required by this law; and
- b. enforcement procedures regarding such licenses, authorisations, permits;

Draft DCM on The Content, Development and Implementation of National Water Strategies, of River Basin District Management Plans and of Flood Risk Management Plans

This Decision transposes: Directive 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy, as amended by Directive 2008/32/EC and Directive 2009/31/EC; Directive 2009/90/EC Laying Down Technical Specifications for Chemical Analysis and Monitoring of Water Status; Directive 2006/118/EC On the Protection of Groundwater Against pollution and Deterioration; and Directive 2007/60/EC On the Assessment and Management of Flood Risks.

A chapter of the draft DCM is dedicated to monitoring of water status. It requests that each River Basin Council shall establish a programme for the monitoring of water status, which then shall be approved by the National Water Council before being made operational. It shall cover:

For surface waters:

- a. The volume and level or rate of flow to the extent relevant for ecological and chemical status and ecological potential;
- b. The ecological status;
- c. The chemical status; and
- d. The ecological potential.

For groundwater:

- a. The chemical status; and
- b. The quantitative status.

For protected areas the monitoring programme shall be supplemented by such specifications as are contained in the legislation establishing those protected areas.

More specifically such monitoring programs shall cover:

1. SURFACE WATER STATUS
 - 1.1. Quality elements for the classification of ecological status
 - 1.1.1. Rivers
 - 1.1.2. Lakes
 - 1.1.3. Transitional waters
 - 1.1.4. Coastal waters
 - 1.1.5. Artificial and heavily modified surface water bodies
 - 1.2. Normative definitions of ecological status classifications
 - 1.2.1. Definitions for high, good and moderate ecological status in rivers
 - 1.2.2. Definitions for high, good and moderate ecological status in lakes
 - 1.2.3. Definitions for high, good and moderate ecological status in transitional waters
 - 1.2.4. Definitions for high, good and moderate ecological status in coastal waters

- 1.2.5. Definitions for maximum, good and moderate ecological potential for heavily modified or artificial water bodies
- 1.2.6. Procedure for the setting of chemical quality standards
- 1.3. Monitoring of ecological status and chemical status for surface waters
 - 1.3.1. Design of surveillance monitoring
 - 1.3.2. Design of operational monitoring
 - 1.3.3. Design of investigative monitoring
 - 1.3.4. Frequency of monitoring
 - 1.3.5. Additional monitoring requirements for protected areas
 - 1.3.6. Standards for monitoring of quality elements
- 1.4. Classification and presentation of ecological status
 - 1.4.1. Comparability of biological monitoring results
 - 1.4.2. Presentation of monitoring results and classification of ecological status and ecological potential
 - 1.4.3. Presentation of monitoring results and classification of chemical status
- 2. GROUNDWATER
 - 2.1. Groundwater quantitative status
 - 2.1.1. Parameter for the classification of quantitative status
 - 2.1.2. Definition of quantitative status
 - 2.2. Monitoring of groundwater quantitative status
 - 2.2.1. Groundwater level monitoring network
 - 2.2.2. Density of monitoring sites
 - 2.2.3. Monitoring frequency
 - 2.2.4. Interpretation and presentation of groundwater quantitative status
 - 2.3. Groundwater chemical status
 - 2.3.1. Parameters for the determination of groundwater chemical status
 - 2.3.2. Definition of good groundwater chemical status
 - 2.4. Monitoring of groundwater chemical status
 - 2.4.1. Groundwater monitoring network
 - 2.4.2. Surveillance monitoring
 - 2.4.3. Operational monitoring
 - 2.4.4. Identification of trends in pollutants
 - 2.4.5. Interpretation and presentation of groundwater chemical status
 - 2.5. Presentation of groundwater status
- 1. SURFACE WATER STATUS
 - 1.1. Quality elements for the classification of ecological status
 - 1.1.1. Rivers
 - (a) Biological elements

- Composition and abundance of aquatic flora
- Composition and abundance of benthic invertebrate fauna
- Composition, abundance and age structure of fish fauna

(b) Hydromorphological elements supporting the biological elements

- Hydrological regime
- quantity and dynamics of water flow
- connection to groundwater bodies
- River continuity
- Morphological conditions
- river depth and width variation
- structure and substrate of the river bed
- structure of the riparian zone

(c) Chemical and physico-chemical elements supporting the biological elements

(i) General

- Thermal conditions
- Oxygenation conditions
- Salinity
- Acidification status
- Nutrient conditions

(ii) Specific pollutants

- Pollution by all priority substances identified as being discharged into the body of water
- Pollution by other substances identified as being discharged in significant quantities into the body of water

1.1.2. Lakes

(a) Biological elements

- Composition, abundance and biomass of phytoplankton
- Composition and abundance of other aquatic flora
- Composition and abundance of benthic invertebrate fauna
- Composition, abundance and age structure of fish fauna

(b) Hydromorphological elements supporting the biological elements

- Hydrological regime
- quantity and dynamics of water flow
- residence time
- connection to the groundwater body
- Morphological conditions

- lake depth variation
- quantity, structure and substrate of the lake bed structure of the lake shore

(c) Chemical and physico-chemical elements supporting the biological elements

(i) General

- Transparency
- Thermal conditions
- Oxygenation conditions
- Salinity
- Acidification status
- Nutrient conditions

(ii) Specific pollutants

- Pollution by all priority substances identified as being discharged into the body of water
- Pollution by other substances identified as being discharged in significant quantities into the body of water

1.1.3. Transitional waters

(a) Biological elements

- Composition, abundance and biomass of phytoplankton
- Composition and abundance of other aquatic flora
- Composition and abundance of benthic invertebrate fauna
- Composition and abundance of fish fauna

(b) Hydro-morphological elements supporting the biological elements

- Morphological conditions
- depth variation
- quantity, structure and substrate of the bed structure of the intertidal zone
- Tidal regime
- freshwater flow wave exposure

(c) Chemical and physico-chemical elements supporting the biological elements

(i) General

- Transparency
- Thermal conditions
- Oxygenation conditions
- Salinity
- Nutrient conditions

(ii) Specific pollutants

- Pollution by all priority substances identified as being discharged into the body

- of water
- Pollution by other substances identified as being discharged in significant quantities into the body of water

1.1.4. Coastal waters

(a) Biological elements

- Composition, abundance and biomass of phytoplankton
- Composition and abundance of other aquatic flora
- Composition and abundance of benthic invertebrate fauna

(b) Hydromorphological elements supporting the biological elements

- Morphological conditions
- depth variation
- structure and substrate of the coastal bed structure of the intertidal zone
- Tidal regime
- direction of dominant currents
- wave exposure

(c) Chemical and physico-chemical elements supporting the biological elements

(i) General

- Transparency
- Thermal conditions
- Oxygenation conditions
- Salinity
- Nutrient conditions

(ii) Specific pollutants

- Pollution by all priority substances identified as being discharged into the body of water
- Pollution by other substances identified as being discharged in significant quantities into the body of water

1.1.5. Artificial and heavily modified surface water bodies

The quality elements applicable to artificial and heavily modified surface water bodies shall be those applicable to whichever of the four natural surface water categories above most closely resembles the heavily modified or artificial water body concerned.

The draft DCM also gives the technical specifications and standardised methods for analysis and monitoring of water status. The laboratories shall apply quality management system practices in accordance with EN ISO/IEC-17025.

Each River Basin Council shall carry out a preliminary flood risk assessment based on available or readily derivable information, such as records and studies on long-term developments, and in particular the impacts of climate change on the occurrence of floods.

The National Water Council, acting on a proposal from the relevant River Basin Council and on the basis of the preliminary flood risk assessment shall, for each river basin district, designate those areas where potential flood risks exist or may be likely to occur. The River Basin Councils shall prepare flood hazard maps and flood risk maps, at the most appropriate scale, for the flood risk areas.

Draft DCM “On marine strategy”

This Decision transposes the Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

After the entry into force of this decision NEA shall

- within two years - perform an initial assessment of the current environmental status of the waters concerned and the environmental impact of human activities thereon
- within four years - determine the environmental status for the waters concerned
- within four years - establish a series of environmental targets and associated indicators
- within four years - establish and implement a monitoring programme for ongoing assessment and regular updating of targets

Determination of the characteristics of good environmental status shall be made by taking into account the indicative lists of such elements:

- a. physical and chemical features, habitat types, biological features and hydro-morphology,
- b. pressures or impacts of human activities in each marine region or sub-region, including .
 - Physical loss
 - Physical damage
 - Other physical disturbance
 - Interference with hydrological processes
 - Contamination by hazardous substances
 - Systematic and/or intentional release of substances
 - Nutrient and organic matter enrichment
 - Biological disturbance

The Minister, by ministerial guideline, approves the criteria and methodological standards to be used for the assessment

DCM no. 246, dated 30.4.2014 “On environmental quality norms for surface water bodies”

This decision transposes Directive 2008/105/EC on Environmental Quality Standards in the Field of Water Policy. The scope is to establish environmental quality norms for bodies of surface waters for 38 priority substances, with the aim of achieving good surface water chemical status and in accordance with the environmental objectives set out in the Law “On Integrated Water Resources Management”.

This decision requests the NEA to carry out long-term trend analysis of the priority substances that tend to accumulate in sediment and/or in biota, based on monitoring of water status. The NEA shall also monitor every 3 years the sediment and/or biota to provide sufficient data for a reliable long-term trend analysis. It shall establish inventories, including maps of emissions, discharges and losses of all the priority substances including their concentrations in sediment and biota, as appropriate.

DCM no. 267, dated 7.5.2014 “On the List of Priority Substances in the Field of Water Policy”

This decision transposes Annex X of Directive 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy, as amended by Directive 2008/105/EC. The scope is to establish the list of priority substances, including priority hazardous substances, which present a significant risk to or via the aquatic environment. 21 priority hazardous substances have been approved in this decision.

DCM No.797, dated 29.9.2010 “On the approval of the sanitary regulation on the bathing water quality management”

The goal of this decision is to set sanitary and health criteria for the bathing water quality so that they ensure public health from any kind of pollution, keep, protect or improve environmental quality as well as set the rules for monitoring, classification and management for bathing water quality and public information in that regard.

It sets the quality criteria for microbiological and physical-chemical parameters for the bathing water, including relevant reference analytical methods to be used:

The microbiological analysis includes intestinal enterococci and the E-coli and coli form bacteria for inland, coastal and transitional waters.

The physical-chemical parameters include:

- pH
- colour
- mineral oils mg/l
- surface active substances that are active with blu metilen mg/l
- (Laurylsulphate)
- Phenols mg/l
- (Phenols indicator) C6 H5 OH
- Transparency m
- Dissolved Oxygen % O2
- Bituminous waste and floating material, like: wood, plastic and glass bottles, etc, garbage and debris.
- Ammonia mg/l NH4
- Nitrogen Kjeldahl mg/l N

This decision gives also the criteria for the classification of the bathing water quality under 4 categories: weak, sufficient, good and excellent.

Monitoring and analysis are the responsibility of the Public Health Institute.

Draft DCM “On Urban Waste Water Treatment”

This Decision transposes Directive 91/271/EEC Concerning Urban Waste Water Treatment, as amended by Directive 98/15/EC, Regulation EC/1882/2003 and Regulation EC/1137/2008.

The NEA shall monitor discharges from urban wastewater treatment plants to verify compliance with the requirements of the environmental permit and the requirements of this decision.

The NEA shall also monitor the waters subject to discharges from urban waste water treatment plants and direct discharges of biodegradable industrial waste.

The Minister, by way of Ministerial Order shall adopt guidelines on the monitoring of discharges and of the receiving water.

Draft Ministerial Order on the Format for the Reporting on the National Programme for the Implementation of DCM “On Urban Waste Water Treatment”

This Ministerial Order transposes Decision 93/481/EEC concerning formats for the presentation of national programmes as foreseen by Article 17 of Council Directive 91/271/EEC Concerning Urban Waste Water Treatment. It has numerous monitoring and reporting requirements to be implemented by NEA.

Law No. 9587, dated 20.7.2006 “On protection of biodiversity”

This law is meant to support the implementation of the Convention on Biodiversity in Albania. It has set requirements for the monitoring and inventory of biodiversity. It has requested the establishment of a monitoring and inventory network of biodiversity in Albania, as the main source of information for related decision-making at all levels. Criteria, procedures and the manners of functioning of such a network together with the related obligations and institutions shall be approved by the Council of Ministers, upon request of the Minister of Environment. This network is also meant for the research, inventory and monitoring of the implementation of the conservation status of the registered species in the country.

Law No. 68/2014 “On some additions and changes to the Law No. 9587, dated 20.7.2006 “On protection of biodiversity”, changed

This law has fully transposed Article 2 (point 2 and 3), article 3 (point 1 and 2), article 4 (point 1), article 6 (point 2), article 11, article 12 (point 4), article 14 (point 1) and article 17 (point 1) of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, amended by Council Directive 97/62/EC of 27 October 1997 adapting to technical and scientific progress Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003, Council Directive 2006/105/EC of 20 November 2006 Council Directive 2013/17/EU of 13 May 2013.

The Ministry of Environment shall establish the monitoring system for the occasional capture and killing of certain species, referred in the letter “c” of article 17/4. It carries further research or takes measures as requested, trying to avoid the negative impacts on the related species.

Law No.10 006, dated 23.10.2008 “On the protection of wild fauna” requests the protection of threatened and endemic species of wild fauna. Such species have been defined in the “Red List of wild fauna and flora”, which has been lately approved by Ministerial Order no. 1280, dated 20.11.2013.

The populations of such species are subject to continuous monitoring of their status and progress, quality and quantity of species, habitats and breeding conditions. This is part of the Bio monitoring Program, prepared and coordinated by the Ministry of Environment together with universities and, NGOs.

An inventory of the wild fauna, is requested, involving the counting of the wild fauna populations with methods, techniques and formats approved by the Minister of Environment, similar to those defined in the EU *Acquis*. It offers information on the concrete

situation of the related population, the quantity and density of its individuals in a given habitat. Such inventory is organised by the Ministry of Environment with the participation of research and monitoring institutes and NGOs in the biodiversity field.

NEA monitors specific indicators of wild fauna. It also collects, processes, keeps and publishes the data on the wild fauna, in cooperation with universities, research institutes, establish a database that aims to approximate with the biomonitoring systems used by the European Environment Agency and the EU directives. Rules and procedures for preparing and implementing the biomonitoring program shall be approved by ministerial guidance. Ministry of Environment sets the objectives for the monitoring of protected areas, organises and implements the work and publishes the monitoring results. The ministry may outsource this job through tendering procedures.

DCM No. 866, dated 10.12.2014 “On the approval of the lists of nature habitats types, plants, animals and birds, for which the European Community has an interest”

This decision transposes fully Annex I, II, IV and V, of Directive 92/43/EEC amended by Directive 97/62/EC, Directive 2006/105/EC and the Regulation (EC) 1882/2003; Annex V of the Directive 2009/147/EC for the conservation of wild species. In 6 annexes it has approved very detailed lists of:

1. natural habitat types of community interest whose conservation requires the designation of special areas of conservation;
2. animal and plant species of community interest whose conservation requires the designation of special areas of conservation;
3. animal and plant species of community interest in need of strict protection;
4. animal and plant species of community interest whose taking in the wild and exploitation may be subject to management measures;
5. the list of vulnerable species that need special conservation measures;
6. identification of species to be the subject of research on the protection and management of wild birds.

The lists also identify the habitats, plants, animals and birds that are found in the territory of the RoA. The national biomonitoring program should cover them as well.

Law No.9774, dated 12.7.2007 “On the environmental noise assessment and management”

This law has partially transposed Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise - Declaration by the Commission in the Conciliation Committee on the Directive relating to the assessment and management of environmental noise.

The goal of the law is to protect public health and environment from noise. It sets requirements for noise monitoring, assessment, mapping, etc. Noise monitoring, both at the source and in the environment together with the negative impacts on health and environment is a must. Noise monitoring is an integral part of the monitoring program. Certified experts perform noise self-monitoring at the expenses of the operators. This law has requested IPH to establish a new sector on noise, as a reference unit for the noise measurement and assessment. NEA does the quality check and quality control for the measurements and collects, processes and keeps the noise monitoring data at the national, regional and local level and per each economic sector in a noise register. The Minister of Environment shall approve the format of the noise register.

Noise mapping at the national and local level and the noise strategic maps should follow the Guidance on specific methodologies and program that should be approved by the Minister of Environment. The LGUs prepare the local noise maps following the Ministerial Guidance and in accordance with their action plans.

Ministerial Guideline No.1037/1, dated 12.4.2011 “On the environmental noise assessment and management” has been approved base on the above law. It has set the noise indicators and the methods how to get them as well as the noise assessment methods.

Noise indicators L_dpn and L_nate (plus other complementary indicators) shall be used for the preparation and review of the noise strategic maps.

The guideline also provides the methods how to get the L_dpn and L_nate values. It also provides the dose-response relationship that shall be used to assess the damaging effects of noise.

Strategic noise maps that comply with the requirements of this guideline shall be prepared within 5 years from the approval of the ministerial guideline for all the agglomerations of more than 250 000 inhabitants, and in the territories of such agglomerations for the:

- large roads visited by more than 6 million vehicles per year,
- large railroads visited by more than 60 000 trains per year
- large airports .

3. Review and evaluation of current monitoring mechanisms

This section is reviewing and evaluating current applications of environmental monitoring systems. The overview of existing monitoring systems, reports, or assessments will help to appreciate the current progress of environmental monitoring in the country. This investigation will draw a picture of what already exists and how it has been developed. This picture will allow also to identify shortages (between DCM and EEA provisions) and to prevent duplication of effort (and unnecessary spending of financial resources).

3.1 Presentation of existing reports

The environmental monitoring in Albania has been developed mainly with the support of international projects. Three main categories of monitoring systems can be recognised:

- 1. The Development of national scale Integrated Environmental Monitoring System (IEMS).** The operation of an IEMS was stated (briefly) in the DCM. The overall structure and main components of a monitoring system were firstly outlined in the 2006-2008 EU-funded project, Strengthening of the Environmental Monitoring System in Albania (StEMA). StEMA provided the technological resources currently operating for the monitoring of Air pollution and physico-chemical conditions waters. StEMA also connected Albanian Monitoring procedures with EIONET. However, the implementation of IEMS as designed by the StEMA project has proven to be slow and weak after the project completion due to the complexity of the monitoring system against the existing environmental status, the institutional framework for monitoring and economic constraints (UNECE 2012). The IPA founded project Consolidation of the Environmental Monitoring System in Albania (CEMSA), was followed. CEMSA launched in 2010 and ran until 2013 without any actual progress. The overall result of StEMA and CESMA is imprinted in the State of Environment Reports (SOER) that are the final deliverable of the IEMS. The latest version is the 2014 SOER. **The National Accounting - monitoring reports in International Treaties or agreements.** Thematic monitoring (in national scale) is being conducted as a part of national obligations in International treaties. This is referring to:
 - The National Communication for the UNFCCC (the 3rd Report is in progress from UNDP- Albania)

- The Report for the Convention on Biological Diversity (the 5th report was completed at 2014)
 - The ForestEurope report (2010)
- 2. The Site-specific monitoring systems.** Integrated monitoring systems have been designed for some of the most important natural reserves areas of Albania. In 2010 a monitoring system was designed for the purposes of the project “Identification and implementation of adaptation response measures to Drini - Mati River Deltas” by UNDP- Albania. At the same time UNDP /GEF financed the Integrated Ecosystem Management in Prespa Lakes which contained an overall monitoring system for the lakes. The application has been very limited due to the lack of financial resources and of capacities to perform such activity.

3.2 Description of current monitoring mechanisms.

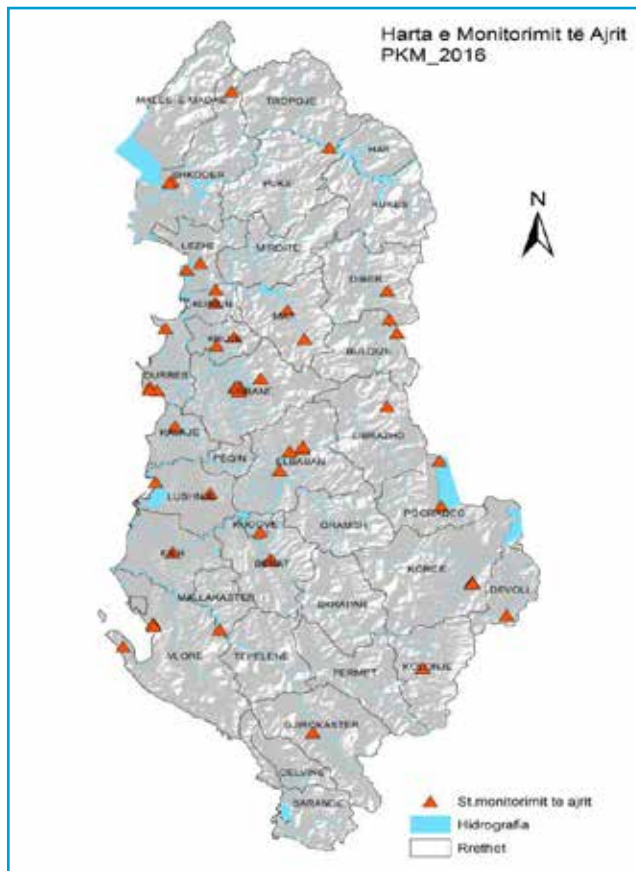
The indicators included in Annex I of the Decision can be categorized into 15 general topics. Although data flow is presented for all major categories, the intensity, geographical coverage and timeliness and the quality of data shows great variation. Generally the overall structure and main components of the existing monitoring procedures were established by StEMA, where priority for implementation was given only to air and water, for which partial developments have been achieved (UNECE 2012).

Generally, the current progress in each theme is presented at the following tables.

Table 7: Current Air Pollution Monitoring Scheme in Albania

Theme / Thematic coverage:	Air Pollution
National / International Policy reference:	Law 162/2014 “On protection of ambient air quality” and DCM No. 352, dated 29.4.2015 “On the ambient air quality assessment and the requirements for certain related pollutants”. Air Quality Directives (2004/107/EC and 2008/50/EC), as defined in the Commission Implementing Decision (2011/850/EU)
Geographic coverage of data:	Six Urban Centres (until 2014), proposed expansion to 113 sampling stations in 2016
Indicator(s):	SO ₂ , NO ₂ (NO _x), CO, O ₃ , Benzene, PM ₁₀ (PM _{2.5}) and heavy metals
Responsible Authorities / Institutions:	EFA (now NEA) and Institute of Public Health (IPH)
Frequency and timeline availability:	6 Automatic Stations are installed in fixed positions and Monitor with automatic equipment on a 24 hour basis without interruption, generating hourly data on the basis of which monthly averages are calculated. Those will monitor the full list of the above parameters. Passive tubes are useful to monitoring of Benzene (C ₆ H ₆), O ₃ , SO ₂ , NO ₂ shall be organized in four campaigns (one in each season) during 2-3 week periods. Semi-automatic stations will be used for monitoring PM10 (and HM consecration) in various sites the analysis of their result will be assisted by 9 laboratories.

Figure 1: Proposed network for monitoring air pollution and atmospheric conditions.



Particularly important is the progress of air pollution. Automatic stations (24-hour) covering the six largest cities (with a population of over 81,000 residents) of the country. Given the absence of large urban centers (since only Tirana exceed 500,000 inhabitants) the development of the network is satisfactory. The 2016 strategic plan for monitoring focuses to the expansion of the knowledge about the overall atmospheric conditions by introducing the deployment of a network of sampling stations to urban, rural or forest areas.

Specifically according to the 2016 Monitoring Plan approximately 113 new sampling points (figure 1) will be covered by semiautomatic / passive tube measuring stations. The pollutants that will be measured are: SO_2 , NO_2 (NO_x), CO , O_3 , Benzene, PM_{10} ($\text{PM}_{2.5}$) and heavy metals. Monitoring shall be performed through automatic stations, including mobile laboratories (9), semi-automatic stations (4) and passive tubes. Monitoring with passive diffusion tubes shall be organized in four campaigns (one in each season) during 2-3 week periods.

Table 8: Current Noise Monitoring Scheme in Albania

Theme / Thematic coverage:	Noise
National / International Policy reference:	<ul style="list-style-type: none"> • Law No. 9774 dated 12.07.2007 "On the assessment and management of environmental noise", • and Guideline No.1037/1, dated 12.4.2011 "On the assessment and management of environmental noise" Directive 2002/49/EC
Geographic coverage of data:	On eight Urban Centres (until 2014), proposed expansion to 10 in 2016, 51 sampling points
Indicator(s):	Leq, L10, L90
Responsible Authorities / Institutions:	NEA
Frequency and timeline availability:	14 days/24 hours. Corresponding day and night values per day. Average bi-weekly day and night values
Cost:	

Environmental noise measurements (night/day) will cover 10 cities with 51 sampling stations at 2016. In SOER 2014 there is not any relevant information.

Table 9: Current Water Monitoring Scheme in Albania

Theme / Thematic coverage:	Inland Waters (lakes, rivers, lagoons)
National / International Policy reference:	Law 111/2012, dated 15.11.2012 "On integrated management of water resources"; DCM No. 267, dated 7.5.2014 "On the approval of priority substances list for the water environment" DCM No. 246, dated 30.4.2014 "On the definition of environment quality norms for superficial waters" WFD, Directive 2006/44/EC of the European Parliament and of the Council of 6 September 2006 on the quality of fresh waters needing protection or improvement in order to support fish life
Geographic coverage of data:	Coverage is relative. Generally six rivers and three lakes monitored regularly, but not covered every year. A spatial display of the network is needed in order to evaluate its consistency and adequacy
Indicator(s):	TOC, pH, P-total, NO ₃ ⁻ , NO ₂ ⁻ , NH ₄ ⁺ , BOD ₅ , COD, PO ₄ , salinity, conductivity suspended matter, dissolved oxygen Microbiological analyses (Faecal Coli, Faecal, Streptococcus)
Responsible Authorities / Institutions:	NEA and Institute of Public Health (IPH)
Frequency and timeline availability:	Several times a year, at least 4 times a year (each season)

The 2014 SOER mentions that the assessment of water quality in the rivers of Drin, Buna, Mat, Erzen, Ishem, Shkumbin, Seman and Vjosa was made based on the results of physical and chemical parameters (temperature, transparency, pH, alkalinity, electrical conductivity, dissolved oxygen, COD, BOD5, nitrites, nitrates, ammonium, Ptotal) in 18 stations. The 2016 monitoring plan expands the monitoring points to 151 stations without specifying where they will be placed and which shall be the sequence of the samplings. It is also not clear if the proposed stations are including the 35 stations that at 2011 were monitoring the disposal of treated wastewater.

The 2016 plan is containing the operation of 35 sampling stations at lakes and 33 in lagoons. It has to be mentioned that at the 2014 SOER only Butrint Lake was reported to be monitored. Earlier, at 2011 seven stations was reported in monitoring lake waters (2 in Ochrid, 4 in Shkodra, 1 in Great Prespa).

Table 10: Current groundwater Monitoring Scheme in Albania

Theme / Thematic coverage:	Ground waters
National / International Policy reference:	WFD, Directive 2006/118/EC on the protection of groundwater against pollution and deterioration
Geographic coverage of data:	The monitoring program for underground waters shall be carried out in 39 stations.
Indicator(s):	The parameters to be measured in 2016 are: pH, temperatures, TOC, PD, nutrients (N, P), heavy metals, basic organic parameters and microbiology. The analysis of basic parameters, chloride compositions, and PCBs, as well as pesticides and PAHs are included.
Responsible Authorities / Institutions:	Albanian Geological Service
Frequency and and timeline availability:	Several times a year, at least 4 times a year (each season)

Monitoring of Groundwater quality is one of the environmental fields with relative long-time tradition of monitoring, due to the involvement of Albanian Geological Service. There is a rather stable number of sampling stations on operation (40 at 2011, 39 or 47? station for 2016) covering seven catchment basins for quaternary gravel aquifers - Shkodra, Lezha - F.Kuqe, Tirana - F. Kruje, Elbasan - Lushnje, Korca, Gjirokastra -Kafaraj - Novosel, Vurg - Mursi and Oriku. The parameters that are being monitored are sufficient in order to provide a basis to determine the “chemical condition” as defined in Annex 5 of WFD (60/2000/EC).

The monitoring of parameters that are referring to soil and irrigation waters are not monitored at a regular base. The Agricultural University of Tirana is referenced at 2012 for performing sampling surveys but neither the 2014 SOER report nor the 2016-monitoring programme is providing any measurements or information. The intensity of usage of fertilizers and pesticides is being monitored (through statistic service) expressing the Driving force in soil and irrigation waters pollution

Theme / Thematic coverage: Soil / Soil erosion / Land Slide

The phenomenon of soil erosion is based on theoretical assessment on the potential erosion level in agricultural lands and the use of 4 experimental stations that are used to update the theoretical funds well monitored by the use of complex indexes. Land sliding is monitored in areas that the phenomenon has been detected (affecting mainly housing or infrastructure). The parameter of soil quality (not referenced in 2014 report)

is included in the 2016 Strategy Programme. Also the monitoring of erosion in forest soils is in plan.

There is no specific obligation for monitoring soil parameters in EU environmental Policy, but soil erosion and quality can integrate in monitoring Climate Change Adaptation policies.

Theme / Thematic coverage: Solid waste

Solid waste monitoring is limited only to the recording of the production of urban wastes. The anticipated completion of the first (sanitary) landfill sites will provide the chance of measuring an indicator such as “percent of urban solid waste safely disposed”. The monitoring of other parameters (and much more the setting and the monitoring of the targets of 2008/98/EC Waste Directive) require the installation of reuse, recycle, recover management schemes and the adoption of minimizing policies that are currently absent.

Theme / Thematic coverage: Hazardous - Toxic Wastes

14 sites (hot spots) of unsafe disposal of hazardous wastes have been recognised in the 2014 SOER report. The Monitoring of those sites and of the results of the Environmental Impact Assessment and Rehabilitation Action Plan (UNDP project) is a discrete and specialized monitoring task that has to be integrated as a “special issue” in the national programme. Extremely costly

Theme / Thematic coverage: Biodiversity

Albania has a rich and globally significant biological heritage (about 3,200 higher plants and 2,350 lower plants; and 15,600 species of invertebrates and vertebrates (including insects, mollusks, crustaceans, fish, amphibians, reptiles, birds and mammals). Albania has 91 globally threatened species, some with special regional significance (Dalmatian Pelican, *Pelecanus crispus*, Pygmy Cormorant, *Phalacrocorax pygmeus*, and Sturgeon, *Acipenser sturio*).

Monitoring of biodiversity conditions in Albania can be divided in two major categories. The First is concerning Forestry and the second other types of ecosystems / species.

Forest monitoring is done primarily in the management of forests and forestry and follows the standards of the Pan-European Criteria and Indicators for Sustainable Forest Management established by the UN. Parameters monitored include: total forest land (by region for the years 1990, 2000, 2005, 2010), the forest production (volume lumber) and estimates of total biomass, the composition, structures of age-classes and

diametrical distribution (terms of managed forests), etc. Production index is to assess sequestration of carbon in the forest biomass. In connection with the threats reported data for fires, grazing etc.

The monitoring indicators is including in six criteria which are:

- (C1). "Maintenance, Improvement and Increase of Forest Sources, Their Contribution to Global Carbon Cycles".
- (C2). Preservation of Forest's ecosystems, Multiplication of Forests.
- (C3). Maintenance and encouragement of production functions in forests.
- (C4). Maintenance, Conservation, and Improvement of Biological Diversity of Ecosystems in Forests.
- (C5). Maintenance, improvement and stimulation of protecting functions in the management of forests.
- (C6). Maintenance of other socio-economic functions and conditions

Based on this rational framework, the National Monitoring Programme for 2016, will focus on the pan-European C2 and C4 criteria in the monitoring process, which shall be implemented with the engagement of the NEA staff and, in the case of acquiring extra financial support, for C2.1 indicator, the disposal of the air pollutants, C2.2, the state of the soil, and for C4.2, with the involvement of third parties (scientific public and private entities).

Their development shall make possible the updating of information in the framework of the fulfilment of the immediate and medium terms objectives of efficiency in the regeneration of forests and the prognosis of the forest state and health.

Other Protected Areas / Species

The SOER 2014 Report does not present any significant information about biodiversity. Equally the 5th CBD report is missing any quantitative information to describe the current conservation status, apart from a general reference for the update of the Red Book.

Protected species of Albania according to the new Red List of wild fauna and flora approved in December 2013, by Ministerial Order no. 1280 of 20.11.2013. Protected flora species (405) have increased by 44 from the previous Red List of 2007, showing that the research to establish basis values in order to create a monitoring system are still under completion. Protected fauna species: 575 species – the same number, no changes since 2007 on fauna species.

All sources indicate that the extend of monitoring (and management) of biodiversity was mainly depended from the financial contributions of international projects. This practice although it enhanced capacity building and provide an amount of knowledge did not guaranteed their continuation. The results of these projects (financed mainly from pre-accession instruments and the UN) will have to be collected and evaluated in total. Today their results and information are dispersed among various institutions or agencies and hinders the homogeneity, compatibility, quality, reliability and comprehensiveness of available data.

Published data from such projects are containing precious information for the integration of biodiversity information in the Environmental Monitoring System. In particular in Prespa International Protected Park, through GEF/UNDP “Integrated Ecosystem Management in the Prespa Lakes Basin of Albania, FYR-Macedonia and Greece” was adopted a transborder monitoring system that was set to pilot operation in 2010. At this pilot phase the following parameters were monitored: fish and fisheries, Aquatic Vegetation (Reedbed), forest and Terrestrial Habitats, Waterbirds (IWC).

Another application of a monitoring system in a protected area was developed during the same period by UNDP Albania in Drini - Mati River Deltas. The Integrated Monitoring System of DMRD is focusing on impacts of Climate Changes on coastal ecosystem aiming to help (i) understand ecosystem respond, effect of climate changes on habitats, plant and animal species, and how ecosystem and its constituents elements are adapting to those changes through establishment of a set of indicators, sub indicators and parameters to be monitored, and (ii) design and implementation of protection and management measures and monitor effectiveness of those measures.

The main themes of indicators and sub indicator or parameters of the DMRD Monitoring system are:

Meteorological: Air pressure, temperature and humidity, precipitation, wind (velocity and its direction), solar radiation (if it's possible the total UV and visible radiation)

Hydrological: Sea water level, water level and discharge of the rivers, ground water level, water changing sea-lagoon regime.

Physical: Temperature; conductivity and transparency, Total Suspended Solids (TSS), salinity

Chemical: pH; acidity; alkalinity; dissolved oxygen; COD; BOD5; nitrogen (NH₄, NO₂, NO₃, total organic nitrogen); phosphorus; total organic carbon; Heavy metal, organic substances and pesticides.

Hydrobiological: Phytoplacton, Phytobenthos, Zooplancton, Zoobenthos, Fish Biodiversity: Habitats (habitats listed in the EU Habitat Directive) Priority species (plants and animals, including alien species) Phenological changes in selected plant and animal species.

The lagging (according to the *Acquis*) in biodiversity monitoring is justified, to the degree that the protection policy is still under a “development” phase. It is significant that in the last decade 2005-2015 the extension of the representative network of Protected Areas, was increased from 5.8 % to 15, 83 % of the Country’s territory and is still not compatible (in technical terms) with the EU characterisation.

The establishment of a complete (and compatible) monitoring system requires the implementation of Article 17 of the Habitat Directive. This requires Member States to report every six years about the progress made with the implementation of the Habitats Directive. As the main focus of the directive is on maintaining and/or restoring a favourable conservation status for habitat types & species of community interest, monitoring & reporting under the directive is focusing on that.

Monitoring of conservation status is an obligation arising from Article 11 of the Habitats Directive for all habitats (as listed in Annex I) and species (as listed in Annex II, IV and V) of Community interest. Consequently this provision is not restricted to Natura 2000 sites and data need to be collected both in and outside the Natura 2000 network to achieve a full appreciation of conservation status. The main results of this monitoring have to be reported to the Commission every six years according to Article 17 of the directive.

Theme / Thematic coverage: Greenhouse Gases

The monitoring of GHG’s is not integrated in the SOER 2014 report despite the fact that following of indicators such as “distribution of direct emissions of CO₂, N₂O and CH₄ emissions for various economic sectors such as Fuel Combustion Technologies (energy and transport), waste management, agriculture, Land Use Change & Forestry and Industrial Processes” are included in the DCM. Monitoring of GHG is provided in a four year basis through the National Communication (NC) to UNFCCC.

The GHG inventory is compiled and submitted in accordance with Articles 4 and 12 of the Climate Change Convention, and the relevant decisions of the Conference to the Climate Change Secretariat (CCS). These submissions are made in accordance with the reporting requirements adopted under the Convention, such as The UNFCCC Reporting Guidelines for the preparation of national communications for non-Annex I Parties (decision 17/CP.8). The inventory data are provided in the annual GHG inventory submissions by Annex I Parties and in the national communications under the Convention by non-Annex I Parties (Case of Albania).

The estimation of GHG emissions is mainly based upon the INSTAT statistical data on economic activities, the transportation statistics and the final consumption of energy and natural resources. The most recent 3rd NC is under finalisation and the preliminary was published from UNDP.

CSI reporting to the EEA

Albania, together with Bosnia and Herzegovina, Serbia, Kosovo under the UN SCR 1244/99 and FYR of Macedonia, is a cooperating country to the EEA. As such, it participated in the preparation and publication of the first “West Balkan environmental core set of indicators 2012, a publication of Zoi Environment Network, produced in close cooperation with the EEA and other cooperating countries. This publication includes 12 out of 37 CSIs of the EEA of that time.

The list of CSI covered in this publication include:

No.	Area	CSI
1	Agriculture	Area under organic farming
2	Biodiversity	Protected areas
3	Climate change	Consumption of ozone-depleting substances
4	Energy	Final energy consumption by sector
5		Total primary energy intensity
6		Primary energy consumption by fuel
7		Renewable primary energy consumption
8	Transport	Passenger transport demand
9		Freight transport demand
10	Waste	Municipal waste generation
11	Water	Use of freshwater resources
12		Urban wastewater treatment

3.3 Evaluation of current monitoring systems

Although in many environmental themes either there is a lack of appropriate indicators, or of data availability and consequently lack of measurements, it seems that expertise has already been acquired in the area of monitoring in certain themes. In general the use of indicators to meet national needs, or serve national policy, can be considered in the early stages.

The SOER covers main environmental themes (water, air, forestry). Limited evidence based on information about economic sectors or their impact on the environment is provided. Neither is there a cross-sectorial analysis. The DPSIR framework for analysis is systematically applied but is focusing mainly on describing the current state of the environment. The report had included an extra chapter to describe the general economic and development situation. Consequently, the report is mainly a description of the current situation rather than an analysis of the policy circle, having limited relevance and input to the policymaking process.

The following table is presenting the compatibility and fulfilment of EEA / EU policy requirements in institutional (DCM) and operational level.

Table 11: Evaluation of the degree of fulfillment

POLICY Theme / Policy	Evaluation remark
Air Quality Directives (2004/107/EC and 2008/50/EC), as defined in the Commission Implementing Decision (2011/850/EU)	Good both institutional and operational state. Further progress need to be made to expand the network both in major cities and in cities with population more than 50,000 inh.
Reporting under the Industrial Emissions Directive(2010/75/EU), as defined in the Commission Implementing Decision (2012/795/EU)	Insufficient. Although the DCM is referring to parameters that are relevant to industrial emissions, there is no data published in reports
Environmental Noise Directive (2002/49/EC)	Good, although the need to produce Noise Maps for major urban centres is present.
Waters	
Water Framework Directive (2000/60/EC).	Limited, the monitoring system is limited mostly in the measurement of physiochemical parameters without resulting to complex indicators of chemical or ecological condition
Urban Waste Water Treatment Directive(91/271/EEC)	Limited. The first indicators that are relating with the UWWT Directive is the coverage (%) of Priority A, B and C Settlements with sewerage and treatment plans
Underground waters Directive 2006/118/EC	Good.
Drinking Water Directive (98/83/EC)	Good / limited. Parameters are monitored but there is no data relating to the population which is covered with sufficient good water quality
Marine Strategy Framework Directive (2008/56/EC)	Absent. The monitoring framework of the directive has to be introduced
Bathing Water Directive (2006/7/EC)	Good, the main parameters are monitored. Further progress need to be made to expand the network of sampling stations due to the importance of coastal tourism for the Development of the Country
Biodiversity	
Habitats Directive (92/43/EEC)	Limited, Assessment of the conservation status of species and habitat types in Albania has to apply in order to determine the base values of the monitoring status. Until today only partial species or habitats (eg. black pine) have been assessed in regular base.
Birds Directive (79/409/EEC)	
Climate Change Mitigation	
Greenhouse Gas Monitoring Mechanism (Regulation 525/2013/EU)	Good, under the UNFCCC inventory
CO2 emissions from light commercial vehicles(Regulation 510/2011/EU)	In accordance to GHG emissions from Road Transport in line with the UNFCCC methodology
CO2 emissions from passenger cars (Regulation 443/2009/EC)	No data
Emissions Trading Directive (2003/87/EC)	No data
Energy Efficiency Directive 2012/27/EU	The first National Plan (2010-2018) is in force, evaluation and appraisal will produce monitoring evidence
Renewable Energy Directive 2009/28/EC	
Climate Change Adaptation	
Floods Directive (2007/60/EC)	Good/ Limited. Some phenomena that are associated with floods are being monitored. An integration of parameters should occur along with the design of Management Plans
Others	
INSPIRE Directive (2007/2/EC)	Absent. There is no provision for the application of geospatial data
IPPC Directive (2008/1/EC)	Insufficient. The introduction of the directives in the National framework must be done in order to activate protocols for monitoring.
SEVESO III Directive (2012/18/EU)	
Large Combustion Plants Directive (2001/80/EC)	
Solvent Emissions Directive (1999/13/EC)	Not applicable
Waste Incineration Directive (2000/76/EC)	
Waste Directive (2008/98/EC)	Limited, only quantities parameters regarding solid waste production and final disposal are monitored.

4. Monitoring and Evaluation Plan

The design of the Monitoring and Evaluation Plan (MEP) will be based on the following guiding principles:

- 1. Political Context:** Primary target of MEP is to assist national authorities and decision makers to achieve the sustainable development policy goals. Those include both the National commitments and the Development targets, together with the EU integration goal of the country. In order to do so, it is needed to select the most appropriate elements (indicators) that on the one hand are covering the commitments, while on the other hand contain information that is useful to policy makers to promote the developing agenda.
- 2. Purpose:** It will link “what we monitor” with “how we monitor” and “how we intent to use it’s results (learn, account or/and adapt management)”. Here, the use of the **DPSIR** and **MDIAK** logical frameworks will be used to create those links.
- 3. Scale:** It will set the limits that will determine the effort that will have to be put.

4.1 Strategy and principals

The political Context

A simple definition of **Monitoring** is referring to the: Systematic collection of information that enables stakeholders to check whether an initiative is on track or achieving set objectives.

Political Context is the main source that determines those objectives. Broader policy context relates to national environmental policy and sustainable development frames and provides the guidelines to design the suitable monitoring system. General or specific targets or policies addressing sustainable development may be in place and may include a mandate for monitoring.

Main instrument to detect the political context in Albania is the DCM on monitoring. The Decision set as primary target for the monitoring, which is the effective implementation of the national environmental protection policy, as defined in Law no.10431, dated 9.6.2011 “On Environmental Protection”. Additionally, by providing the provision to expand the national environmental monitoring system to meet the EU/EEA requirements, the Decision denotes a second political guideline. This guideline is referring to the national strategic target of Accession which is connected with the adoption and compatibility of the EU policy (*Acquis Communautaire*).

Key principals for the design of the monitoring system are:

- To continue transposing EU *Acquis* that sets rules and requirements on environmental monitoring in different areas.
- to abrogate parts of the text of the DCM dealing with what to monitor and how to monitor, as it is now part of the new legislation that has transposed the related EU *Acquis* and continue to do so in parallel with each new transposition of monitoring requirements through other pieces of *Acquis* in the future).
- to assist national authorities and decision makers to achieve the sustainable development policy goals by providing reliable, solid and update information about the results that the implementation of policies have on the Environment.
- to promote adaptive management and learning of public administration.
- to fulfill international standards (EEA requirements) and be able to provide information easily digestible to international inventories
- to give priority to environmental sectors with classified importance according to the unique national characteristics and the national sustainable development agenda
- to involve and motivate enterprises and public and promote awareness-raising
- to having both the ability to provide the overall “picture” of environmental state and focus on special subject or zoom to special areas of interest.
- to take advantage of all the existing capacity and knowledge with no excessive use of the financial resources.

Purpose:

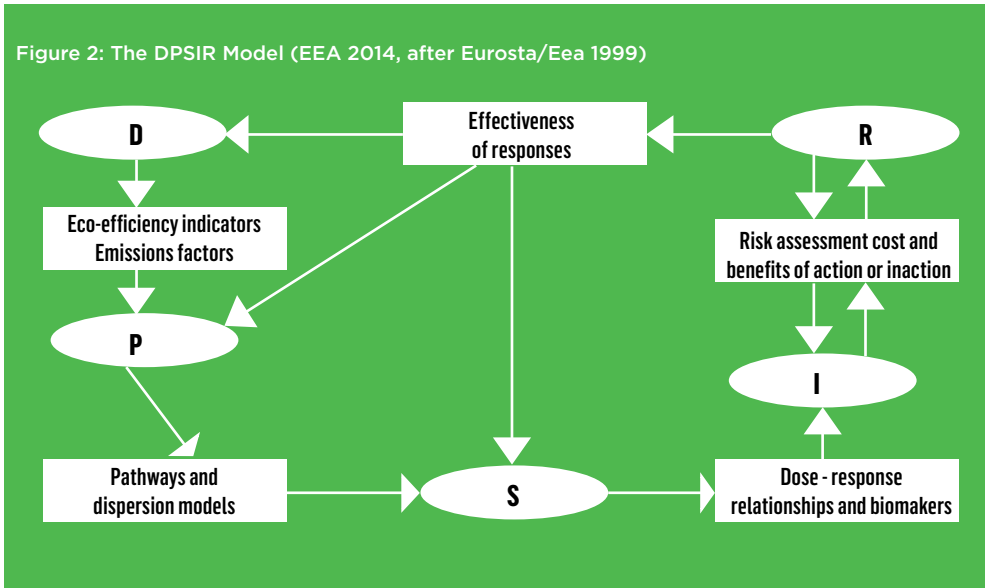
The definition of Purpose is at the core of the monitoring system: It is important to agree on a clear definition of the purpose and on the intended use of monitoring results early in the development of the system. The main quest for finding the purpose is to link “what and how we monitor “ with “how we intent to use its results”. Three are the main uses of the results (which may apply simultaneously) :

- learn,
- account,
- and adapt management

DPSIR provides a logical framework to apply links between “what” and “how”. This model (adopted as the main environmental monitoring model by EEA since 1999) connects social and economic developments drive (D) changes that exert pressure (P) on the in the state (S) of the environment, which lead to impacts (I) on human health, ecosystem functioning and the economy. Finally, societal and political responses (R) affect earlier parts of the system, directly or indirectly.

From a policy perspective, and in order to establish the links there is a clear need for indicators on all parts of the DPSIR chain (EEA, 2010),

Figure 2: The DPSIR Model (EEA 2014, after Eurosta/Eea 1999)



Scale:

Identifying the levels of application and aggregation will help to define the scope of the monitoring system and ensure that all relevant stakeholders are involved in its development and implementation.

The level of application of a system refers to the level at which results are expected to appear, e.g. at national, sub-national, or local level. The level of application may be specified in the mandate to develop the system.

Aggregation is about summarizing the data to the appropriate scale. There are two levels of aggregation:

Horizontally (across thematic areas and sectors): Priority sectors might be identified in a policy or plan, and/or in sectorial assessments or evaluations. The national GHG inventory for example aggregates all sectorial emissions inventories in order to determine overall indexes.

Vertically (across geographic scales): This is necessary where a system needs to take into account data that exists at more local scales, for example from municipal governments, communities, management bodies. Vertical aggregation is mainly useful in spatial-based monitoring such as in biodiversity or water quality assessment.

Aggregation is not restricted to quantitative analysis but can also refer to synthesizing qualitative results.

Another dimension of scale is this of the timescale. Timescale and time- scheduling are very important in multivariate monitoring systems when the under investigation phenomena having differential rates of change. There are occasional circumstances in which time has to be taken account in the programming process of a monitoring system:

- Measurement and data aggregation time: In many cases in order to describe reliable a natural phenomenon the time of measurement or sampling is of upmost importance. Meteorological phenomenon for example needs continuous monitoring and annual (or seasonal / monthly/ daily) aggregation in order to provide useful information. On the other hand monitoring of species might be useful at certain periods.
- Reporting Frequency: monitoring is expressing a change (or stability) of a current situation in a space of time. A rather less frequent imprint of the situation may miss intermediate fluctuations. A more frequent imprint will spend financial and human resources without providing anything useful or unknown.

4.2 System design

In accordance with the principals that have being analysed above the proposed plan is suggesting a medium term (six years) - circular environmental monitoring programme (monitoring circle) that will be programmed, according to the needs, possibilities and accountability obligations for monitoring and reporting in each Theme.

THEME	Proposed accounting and measurement Frequency
Air Quality	Continues monitoring, annually reporting
Noise	Monthly samples 3 year reporting
Waters (inland, surface)	Seasonal monitoring, Every 3 years. Yearly Reports, 12 to 24 minimum samples for 91/271/EC installations
Waters (underground)	Seasonal monitoring, Every 3 years
Waters (sea, bathing)	Monthly monitoring (in bathing season), Every year
Climate Change Mitigation	Reporting to UNFCCC (NC every 4 years, BURs every 2 years)
Climate Change Adaptation	3 years*
Biodiversity	biannual reporting after the determination of base condition, after six years after the full application of Habitats Directive (annual reports in Designated Areas)*
Forests	Annual accounting, 6 years reporting**
Solid Waste Management	Yearly accounting / reporting
GDP, Population, Fisheries, Agriculture, transportation	Annual reporting**

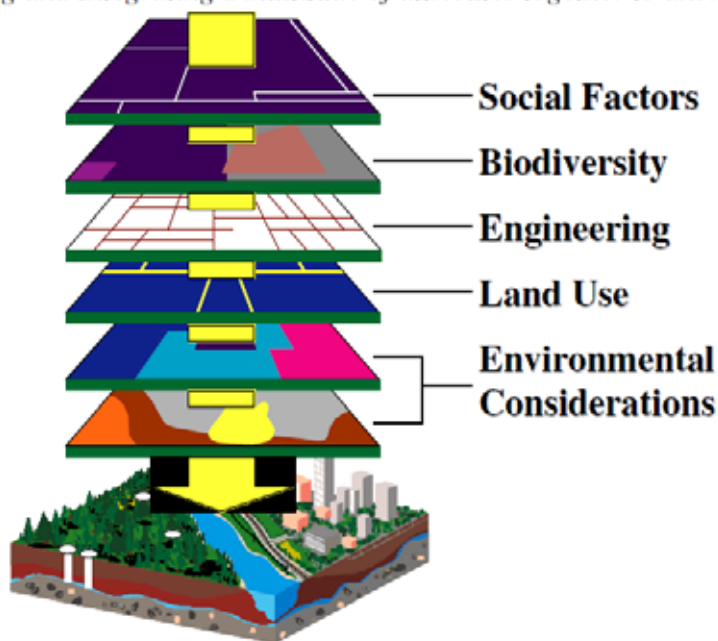
* will be more accurate determined when a CCA national plan be adopted.

** Data are usually accounted or estimated by national statistical yearbooks.

Figure 3: GIS Models (UoE FAF 2012)

Could it be....?

Measuring and Integrating a multitude of attributes together to answer a common question



The publication of SOER could be an every three year task incorporating the year after year progress on monitoring without obligations of yearly update of the overall data.

Next step for the design of the monitoring plan is to define the Information System. Technically, a monitoring information system involves the following steps:

1. A communication task which takes data from an information source (an automatic sensor or manual registry) and communicates it to a receiving monitoring system;
2. Pre-processing the data using steps such as calibration, checking, and formatting;
3. Storing the data in some sort of database;
4. Presenting the data in an appropriate form to users.

Almost all environmental data we have today can be classified as spatial data. Spatial data tells us what is happening where, are easy understandable from the public and easy to communicate in policy decision making processes. The transition to a GIS Information System is proposed.

Spatial Data are Vector Data. They contain geospatial references, such as point coordinates

or shapes of physical areas, but they actually includes many additional attributes. In this respect, spatial data provides the glue and the context of environmental information, essential for understanding and assessing what is happening. GIS technology allows to work with spatial data that comes from a wide range of sources. Some come from satellite imagery (remote sensing), some come from automatic sensors and others by manual log linking the monitoring programmes on the ground. Newer technologies can be collected by citizens using e.g. mobile phone applications.

In order to have a functional GIS based monitoring information system several conditions have to be met. First requirement is the technological. The proper hardware and software has to be installed and connected. Those are referred in relation to the central system that will receive, store, manage and process the data, to the peripheral systems that will be used to entry and to view data by the participants and the networking. Second condition is the creation of “entry” and “QA/QC” protocols that will certify the quality and compatibility of the data. Third condition is the training (and certification) of users. and fourth is the creation of the appropriate background.

Since a GIS monitoring system is installed there are the main functions

- Data analysis: spatial analysis of geo-data for assessment or modelling of processes and situations
- Data management: storage and systematization of vast volumes of monitoring data, development of databases and applied computer systems
- Data presentation: publication of maps and scientific results in digital and paper form

The EU directive INSPIRE (INfrastructure for SPatial InfoRmation in Europe) requires sharing of 34 different spatial data themes through a network of ‘services’. INSPIRE also requires the adoption of ‘Implementing Rules’ which set out how the system will operate.⁴

QA is a set of activities for ensuring quality in the processes by which the data are developed. While QC is a set of activities for ensuring the quality of the data and its activities focus on identifying defects in the actual products produced. An assessment of QA/QC procedures is necessary to determine for each dataset and in total which are the quality measures that will ensure the credibility of the monitoring system. The result of such an assessment will conclude to the definition of logging Protocols that will contain the procedures and rules referring to :

- Which are the exact attributes that will be recorded?

4 <http://www.inspire-geoportal.eu/>

- How and with which standards the information will be measured and recorded?
- How and with which standards the information should be inserted in the database?
- Which are the meta-data that must accompany the primary information?

Quality policy is ensuring accuracy and credibility of the data / sampling collection, physical or laboratory process, storing and entry procedures. As it will be presented furthermore most of the sampling and laboratory procedures are standardized through ISO or other International Organisation. For not standardised procedures and operations protocols should be developed.

For the QC as the draft National Monitoring Plan of 2016 refers “National Environmental Agency (AKM) will perform the quality control of the data taken from the monitoring institutions and checks and assesses the monitoring procedures.

The purpose of monitoring data quality assessment is:

1. To prevent use of wrong data in the evaluation of the status of environment and activities related to it.
2. That the monitoring data, taken from various institutions and at different times are comparable. This means that the quality of data should be comparable or at least public.
3. The monitoring data taken in the framework of the National Environmental Plan should be of comparable quality with those of other countries and in conformity with the requirements of international organizations (in particular, with the requirements for environmental indicators).
4. To select the institution that shows to be more reliable in terms of the quality of monitoring outcomes.

The design of the monitoring system intends to assist the efforts of the Albanian National Authorities to operate an Integrated Environmental Monitoring System, covering all components: air, waters, soil, forests and biodiversity in the form of a set of monitoring stations for each component, accompanied by a set of indicators that need to be reported on. Such networks are defined in accordance with the EU acquis requirements..

Planning is based on the forecasts of the DCM and brings in the existing mechanisms and programming attempts. The main objective is to exploit the hitherto effort in a revised framework which will ensure functionality (functional - compatible indicators), effectiveness (useful to design and evaluate policy) and efficiency (taking into account the technical capacities and budget resources).

Main features of this approach are:

- Reorientation of the thematic classification of the DCM annex in order to place indicators in line with EU policy themes and to incorporate newer policy developments.
- Conversion of monitoring parameters to indicators that provide easily communicated information and the definition of additional indicators that can be calculated by combining existing data.
- Full expansion of indicators list to the DPSIR model in order to provide a policy evaluation framework.
- Integration of parallel mechanisms (UNFCCC, CBD)
- Determination of adequate monitoring frequency for each indicator in order to ensure that unnecessary spending would not occur.

The main themes of indicators and sub indicator or parameters of Monitoring system are:

Climate change (adaptation and mitigation) / Energy / Transport:	Average air temperature / Heat waves, Sea level, rainfalls / storms, Level of underground waters, Final energy consumption by sector / Primary energy consumption by fuel, Greenhouse gas emissions from transport, Green House Gases inventory of 5 basic sectors, LULUCF inventory, Share of renewable energy in final energy consumption, Energy Efficiency (Transport, Domestic, industry)
Air Pollution, Atmospheric conditions and Noise:	Passenger /Freight transport demand, atmospheric precipitations (SO ₂ , NO _x , Pb), Urban Air pollutants Emissions (PM, SO ₂ , NO _x , O ₃ , CO, HC), Urban Air pollutants Emissions Heavy Metal (Pb, As, Mn, Ni, cu, Zn, Cd), Noise Levels
Inland and Freshwaters:	Biological and ecological Condition of Inland Waters (phytoplankton and zooplankton, chlorophyll, Fishes), Emission intensity of agriculture in Europe, Morphological Condition of Inland Waters (flow, area, dynamics of the estuaries), Emission intensity of domestic sector (liquid urban discharges)
Marine waters and maritime:	Bathing Water Quality, Overnight stays in Hotels, Hazardous substances in marine organisms, Coastal morphology
Biodiversity:	Species /Habitats of European Interest, Designated Areas, Species Diversity, Fragmentation of natural and semi-natural areas, Agriculture: area under management practices potentially supporting biodiversity
Forestry:	(C1). Maintenance, Improvement and Increase of Forest Sources, Their Contribution to Global Carbon Cycles, (C2). Preservation of Forest's ecosystems, Multiplication of Forests, (C3). Maintenance and encouragement of production functions in forests, (C4). Maintenance, Conservation, and Improvement of Biological Diversity of Ecosystems in Forests, (C5). Maintenance, improvement and stimulation of protecting functions in the management of forests, (C6). Maintenance of other socio-economic functions and conditions
Other:	Solid Waste (generation, recycling, diversion from landfill), Pollutant releases to air, water and waste from industrial facilities, land take, GDP, total population, Fisheries, Progress in management of contaminated sites

The parameters that will be used and the compatibility of each indicator with the EEA system and the DCM is presented in the following table.

Table 12: Proposed Monitoring System

Theme	Indicators	Sub indicator	Parameters / Datasets	Focus	Secondary Indicators	EEA Clas.	DCM
Climate change	Average air temperature		1	S	Heat Waves (I)	CSI	Y
	Sea level		1	I			Y
	Quantity of atmospheric rainfalls		1	I	Storms, Extreme Rainfall		Y
	Level of underground waters		6 / per catchment	I			Y
	Final energy consumption by sector / Primary energy consumption by fuel		2	DF			
	Greenhouse gas emissions from transport		1	P	Transport final energy consumption by mode		
	GHG emissions inventory of 5 basic sectors (Energy, Solvents, Industrial processes, Agriculture, Waste)	Greenhouse gas emission trends	1	P	Primary energy consumption by fuel		
	GHG emissions inventory of Land Use, Land Use Change and Forestry		1	P			
	Share of renewable energy in final energy consumption	Hydro/Solar/Wind/ geothermic	1	R	Renewable electricity consumption	CSI	
	Energy Efficiency (Residential and Service, Transport, industry)		1	R			
Air Pollution, Atmospheric conditions and Noise	Passenger /Freight transport demand		1 or per city	DF		CSI	
	Atmospheric precipitations (SO ₂ , NO _x , Pb)		3 X 7 to 15 stations	P			Y
	Urban Air pollutants Emissions (PM, SO ₂ , NO _x , O ₃ , CO, HC)	Emissions PM	1	P	% of urban population exposed to air pollution	CSI (total)	Y
		Emissions SO ₂	1	P			Y
		Emissions NO _x	1	P			Y
		Emissions O ₃	1	P			
		Emissions HC	1	P			Y
	Urban Air pollutants Emissions Heavy Metal (Pb, As, Mn, Ni, cu, Zn, Cd)	Emissions Pb	2	P			Y
Noise Levels		2	P	Exposed population		Y	

Theme	Indicators	Sub indicator	Parameters / Datasets	Focus	Secondary Indicators	EEA Clas.	DCM	
Freshwaters	Physio - Chemical Condition of surface Waters (alkaline, conductivity, acidity, COD / BOD5, nutrients PO4, NO3 and NH4, pH)	Oxygen consuming substances in rivers	2	S	Trend in chemical status		Y	
		Nutrients in freshwater	4	S		CSI	Y	
		Nutrients in transitional, coastal and marine waters	4	S			Y	
	Biological and ecological Condition of Inland Waters (phytoplankton and zooplankton, chlorophyll, Fishes)		4	S	Trend in ecological status	CSI / CSI (Second Ind.)	Y	
	Emission intensity of agriculture		1	P			Y	
	Physio - Chemical Condition of Under-ground Waters (alkaline, conductivity, acidity, COD / BOD ₅ , nutrients PO ₄ , NO ₃ and NH ₄ , pH)		1	S	Trend in chemical status			
	Morphological Condition of Inland Waters (flow, area, dynamics of the estuaries)		3	P			Y	
	Emission intensity of domestic sector (liquid urban discharges)		1	P			Y	
Marine environment	Bathing Water Quality		1	S	Blue Flags awarded	CSI	Y	
	Overnight stays in Hotels		1	DF				
	Hazardous substances in marine organisms		1	P		CSI	Y	
	Coastal morphology		1	I				
	Fisheries	Status of marine fish stocks		1	S			
		Aquaculture production		1	P			
Fishing fleet capacity			1	P				
Biodiversity	Species /Habitats of European Interest	Habitats, Flora, Fauna, sea /land	2 to 8	S		CSI	Y	
	Designated Areas		1	R		CSI		
	Species Diversity		1	S			Y	
	Fragmentation of natural and semi-natural areas		1	I		CSI	Y	
	Agriculture: area under management practices potentially supporting biodiversity		2	R	Agriculture areas under Natura 2000		Y	

Theme	Indicators	Sub indicator	Parameters / Datasets	Focus	Secondary Indicators	EEA Clas.	DCM	
Forestry	C1 Maintenance, Improvement and Increase of Forest Sources, Their Contribution to Global Carbon Cycles		4	S		FE	Y	
	C2 Preservation of Forest's ecosystems, Multiplication of Forests		3	S		FE	Y	
	C3 Maintenance and encouragement of production functions in forests		2	R		FE	Y	
	C4 Maintenance, Conservation, and Improvement of Biological Diversity of Ecosystems in Forests.		1	I		FE	Y	
	C5 Maintenance, improvement and stimulation of protecting functions in the management of forests.		1	I		FE	Y	
	C6 Maintenance of other socio-economic functions and conditions		1	P		FE	Y	
Other	Pollutant releases to air, water and waste from industrial facilities		3	P		CSI	Y	
	Solid Waste:	Waste Generation	1	P		CSI	Y	
		Waste recycling	1	R		CSI		
		Diversion of waste from landfill	1	R		CSI		
	Environmental Scenarios	GDP			DF		CSI	
		Total population	1		DF	Urban / rural population	CSI	
	Soil	Progress in management of contaminated sites (waste dumps)		1	R			

4.3 Selected Indicators Technical sheets

Each Indicator is presented in a Technical Sheet (TS) that follows the EEA indicator format (EEA 2014) with reference to any technical / methodological papers. The TS in particular contains: Identification (title; code) and classification (DPSIR; typology; EEA themes), Rationale — justification for indicator selection; scientific references, Definition; units, Policy Context and Targets, related policy documents (with appraisal of national development feasibility), Methodology — methodology for indicator calculation; methodology for gap filling; methodology references ⁵, Responsibility and ownership and Uncertainties.

Climate change (adaptation and mitigation)

The set of climate change include indicators related both adaptation (CCA) and mitigation (CCM) policies.

In this theme are also incorporated a number of key indicators that are originally used (in EEA typology) as discrete thematic categories such as energy and transport. This retraction is necessary as the specialization and implementation of national policies in those areas are not developed to the extent that will allow first of all discrete monitoring and secondly efficient mechanisms that will produce affordable data. Apart from Climate Change, Transport and Energy consumption are associated with other environmental pressures and impacts such as noise, air and water pollution, ecosystem fragmentation etc. The monitoring of those effects are also incorporated to the associated themes (air quality, water quality, biodiversity ect.)

As climate change affects many environmental parameters and thematic, general indicators listed in state or pressure of Climatic parameters (eg meteorological data) should be considered also for the evaluation of all relevant thematic policies (eg Waters, Biodiversity).

5. The methodological description will be brief in cases that there adequate technical papers. The majority of methodological references are available at the EEA site

Indicators name:	Average air temperature
Classification	State
Definition and Rationale	
<p>Temperature is one of the most decisive climatologic conditions, it is easily recognized by the public and simple to measure. The average temperature refers to a specific timescale (hourly, daily, monthly).</p> <p>The inter temporal trend of change of average monthly temperature in a certain location is indicative to the intensity of Global warming at this place. Since climate is determined by many factors the tense (and impacts) of global warming are not uniform and the indicator must be monitored in various locations.</p> <p>Apart from the association with climate change average air temperature can provide information for the interpretation of other physical phenomenon and processes.</p>	
Policy context and Targets	CLIMATE CHANGE (A)
Methodology	
Automatic Meteorological stations provide continuous measurements, data loggers and telecommuting connection can provide automatic recording of data.	
Measurement Frequency	Geographic coverage - development
Day/Night, Daily, Monthly	Whole country – network of stations in urban Centres and in rural areas.
Additional indicators that can be produced from the set of primary data:	
<p>Heat waves (EEA CSI): Number of Combined tropical nights (>20°) and hot days (>35°) per year (I).</p> <p>This Indicator expresses the impact of climate change at living conditions (especially in urban centres)</p>	
Responsible authority	Military Meteorological Service has a functional network of stations.

Indicators name:	Sea level
Classification	State
Definition and Rationale	
Sea level is an important indicator of climate change because it is associated with significant potential impacts on settlements, infrastructure, people and natural systems. It acts on time scales much longer than those of indicators that are closely related to near-surface temperature change. Even if greenhouse gas concentrations were stabilised immediately, sea level would continue to rise.	
Policy context and Targets	CLIMATE CHANGE (A)
Methodology	
Sea-level changes are measured manual using tide gauges or which high sensitivity GPS devices and remotely from space using altimeters	
Measurement Frequency	Geographic coverage - development
Seasonal (winter / summer)	Coastal zone
Additional indicators that can produce from the set of primary data:	
-	
Responsible authority	NEA. The data can be provided by EEA which is monitoring the whole European territory.
Uncertainties	Changes in global average sea level result from a combination of several physical processes. Changes in water density are not expected to be spatially uniform, and changes in ocean circulation also have regionally different impacts. At any particular location there may also be a vertical movement of the land in either direction for example due to local groundwater extraction.

Indicators name:	Quantity of atmospheric rainfalls
Classification	State
Definition and Rationale	
<p>The annual and seasonal levels of rainfall is another decisive factor for the climatological and ecological conditions. Rainfall defines the aquatic circle in a territory. The climatic influence of rainfall is not associated as much with the absolute quantity of rainfall as it is by the chronological distribution of it.</p> <p>Apart from the association with climate change rainfall can provide information for the interpretation of other physical phenomenon and processes.</p>	
Policy context and Targets	CLIMATE CHANGE (A)
Methodology	
Automatic Meteorological stations provide continuous measurements, data loggers and telecommuting connection can provide automatic recording of data.	
Measurement Frequency	Geographic coverage - development
Continues measurement. Aggregation of data in Monthly and yearly level is required for comparison	Whole country - network of stations, segregation in types of areas according to the height.
Additional indicators that can produce from the set of primary data:	
<ul style="list-style-type: none"> • Rainfall rate (mm³/hr) has also to be monitored in order to determine annual events of storms (EEA CSI -I) • Number of days per month is a helpful indicator in order to identify dry seasons (S) 	
Responsible authority	Military Meteorological Service has a functional network of stations.
Uncertainties	none

Indicators name:	Soils erosion
Classification	State
Definition and Rationale	
<p>Soil erosion by water has substantial on-site as well as off-site effects. By removing fertile topsoil, erosion reduces soil productivity and, where soils are shallow, may lead to the loss of the entire soil body. Soil removed by run-off, for example during a large storm, will create mudflows that will accumulate below the eroded areas, in severe cases blocking roadways or drainage channels and inundating buildings. Erosion can lead to restrictions on land use and land value, damage to infrastructure, pollution of water bodies, and negative effects on habitats and biodiversity.</p> <p>Climate change will influence soil erosion processes, mainly triggered by extreme rainfall events and droughts. Excess water due to intense or prolonged precipitation can cause tremendous damage to soil through sheet wash, gully erosion and even landslides. However, if soils are managed well, resistance to erosion by water and/or wind can be improved considerably.</p>	
Policy context and Targets	CLIMATE CHANGE
Methodology	
<p>Estimates of erosion are based on modelling studies. Most models contain a rainfall erosivity factor and a soil erodibility factor that reflect average precipitation conditions. Typical values for these factors may inadequately represent the impact of extreme rainfall. EEA is calculating the indicator for the whole European Continent using the (Bosco et al. 2014) a macroscopic soil erosion model at European scale.</p> <p>Models for monitoring smaller areas (river basins) are also available. G2 model (JRC 2014, Panagos et al. 2014) is also using satellite images - GIS technologies. The application of G2 model has already been tested in Albania (Ishmi-Erzeni watershed (2,200 Km²) - Pixel size: 300m, temporal coverage: 2011-2012).</p> <p>The formula of G2 is:</p> $E=(R/V)*S*(T/I)$	
Where:	
E: erosion (t ha ⁻¹)	
R: rainfall erosivity (original USLE formulas or alternatives developed by reference stations) (MJ mm ha ⁻¹ h ⁻¹) V: vegetation retention (developed by G2 using Biopar data or equivalent and land use/management databases, e.g. CORINE) (dimensionless; V>=1) S: soil erodibility (original USLE formulas or modified USLE by JRC, 2012) (t ha h MJ ⁻¹ ha ⁻¹ mm ⁻¹)	
T: topographic influence (USLE modifications, 1996; strict implementation of USLE terms) (dimensionless; T>0)	
I: slope intercept (developed by G2 using satellite data; corrective to T; partially analogous to P of USLE) (dimensionless; 1 =< I=<2)	
G2 employs harmonized standard input data from European and global databases, such as the LUCAS soil database, the European Soil Database (ESDB), the Topsoil Organic Carbon (TOC), BioPar products of geoland2, Image 2006 imagery, CORINE LC, Landsat TM, the ASTER DEM datasets, and other large public datasets. As a data-oriented model, the cartographic scale of a G2 implementation is determined by the spatial resolution of the input data.	
Measurement Frequency	Geographic coverage - development
Every 4 to 8 years	Whole country
Additional indicators that can produce from the set of primary data:	
Impact of coastal erosion on protected land, can be used for monitoring the pressures of climate change in biodiversity,	
Responsible authority	Geological Survey

Indicators name:	Level of underground waters
Classification	State, Impact
Definition and Rationale	
<p>Level of underground water expresses both the state of water deposits and the condition of aquifers (S) and the sustainability of water uses (I). Rapid or continues decrease of levels can lead to loss of productive land, desertification, erosion and other Impacts.</p> <p>Data referring to underground waters and water bodies are part of the EEA waterbase that contains timely, reliable and policy-relevant data collected from EEA member countries through the WISE-SoE data collection</p>	
Policy context and Targets	CLIMATE CHANGE (A) / WATERS
Methodology	
Measurement are automatic with use of (portable or steady) contact Gaussens.	
Measurement Frequency	Geographic coverage – development
Seasonal (2 to 4 annual measurements in the same sites are sufficient)	Ideally several places in every catchment are needed.
Additional indicators that can produce from the set of primary data:	
-	
Responsible authority	Geological Survey
Uncertainties	

Indicators name:	Greenhouse gas emissions from transport	
Classification	Pressure	CSI 010/CLIM 050
Definition and Rationale		
<p>The indicator analyses the long-time trend in greenhouse gas emissions from transport. It aims to evaluate the trend in transport related emissions and to analyse the relative importance of different greenhouse gases and contributions from each different mode of transport.</p>		
Policy context and Targets	CLIMATE CHANGE (M)	
Methodology		
<p>The official data submission is made to the UNFCCC and EEA Monitoring mechanism. The compilation of emissions is based on a combination of sectoral activity data, calorific values and carbon emissions factors. Recommended methodologies for the estimation of emissions data are compiled in the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, supplemented by the 'Good Practice Guidance and Uncertainty Management in National Greenhouse gas Inventories' and UNFCCC Guidelines.</p> <p>Total greenhouse gas emissions from transport, including CO₂, CH₄ and N₂O, are analysed in this indicator. Emissions are split into road transport, rail transport, navigation, domestic aviation, international aviation and maritime transport. In accordance with UNFCCC rules, the global warming potential values used in this indicator are those taken from IPCC AR4, for the post-2015 period. The data has been weighted according to the following global warming potentials for each greenhouse gas to give total emissions in million tonnes of CO₂ equivalent (MtCO₂e): CO₂ = 1, CH₄ = 25, N₂O = 298.r.t.</p> <p>For passenger transport, the specific emissions are calculated by dividing the CO₂ emissions of each mode (i.e. road, rail, maritime and air transport) by the respective passenger-kilometres.</p> <p>For freight transport, the specific emissions are calculated by dividing the CO₂ emissions of each mode (i.e. road, rail, inland shipping and maritime transport) by the respective tonne-kilometres.</p>		
Measurement Frequency	Geographic coverage - development	
In the present state the obligation to NC to UNFCCC is every four years.	Whole country	
The EEA Monitoring mechanism collects yearly data.		
Additional indicators that can produce from the set of primary data:		
Responsible authority	NEA from data that are in disposal of the Ministry in charge of Transport / INSTAT and Ministry in charge of Commerce (freight, fuels consumption, transportation load etc).	
Uncertainties	The indicator is estimated by statistical data of movements and commerce. The quality of those data is essential for the overall credibility of the estimation.	

Indicators name: GHG emissions inventory of 5 basic sectors (Energy, Solvents, Industrial processes, Agriculture, Waste)

Classification Pressure UNFCCC

Definition and Rationale

In order to prevent the most severe impacts of climate change, countries (referred to as 'Parties') having signed up to the United Nations Framework Convention on Climate Change (UNFCCC), agreed to cooperate with a view of limiting the increase in global average temperature and the resulting climate change. In this context, countries need to periodically (according to the industrialisation state) prepare and submit precise and regularly updated inventories of greenhouse gas (GHG) emissions.

The indicator provides information on emissions from the main anthropogenic GHG sources, distributed by main emitting sectors, according to the IPCC nomenclature.

Policy context and Targets CLIMATE CHANGE (M)

Methodology

The official data submission is made to the UNFCCC and EEA Monitoring mechanism. The compilation of emissions is based on a combination of sectorial activity data, calorific values and carbon emissions factors. Recommended methodologies for the estimation of emissions data are compiled in the Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories, supplemented by the 'Good Practice Guidance and Uncertainty Management in National Greenhouse gas Inventories' and UNFCCC Guidelines.

EEA is providing specialised technical guidance for the preparation of emissions inventories, The EMEP/EEA air pollutant emission inventory is structured according to the Nomenclature for Reporting (NFR), which was first developed in 2001-2002 by the Convention's TFEIP, further improved in 2006-2007, and revised again in 2013 as part of the revision of the Guidelines for Reporting Emission Data under the Convention on Long-range Transboundary Air Pollution (hereafter referred to as the LRTAP Reporting Guidelines)

The most common estimation approach is to combine information on the extent to which a human activity takes place (called activity data or AD) with coefficients that quantify the emissions or removals per unit activity, called emission factors (EF). The basic equation is therefore:

$$\text{Emissions} = \text{AD} \times \text{EF}$$

Simple (Tier 1) methods are given for all the sources and substances which the countries that have ratified Convention protocols need to report. More advanced (Tier 2) methods are given for key categories. Further information is given for advanced (Tier 3) approaches for key categories where suitable methods are available.

Greenhouse gas emissions are expressed in 'million tonnes CO₂-equivalent' (Mt CO₂-eq.)

Measurement Frequency **Geographic coverage - development**

In the present state the obligation to NC to UNFCCC is every four years. Whole country

The EEA Monitoring mechanism collects yearly data.

Additional indicators that can produce from the set of primary data:

Greenhouse gas emission trends (CSI010): indicator shows the past and projected GHG emissions in the ETS and non ETS sector, in accordance with the EU legal scheme

Responsible authority Activity Data are at the disposal of the Ministries in charge of each sector and INSTAT as National Accounts. NEA is responsible for the validation of calculations .

Uncertainties The quality of those data is essential for the overall credibility of the estimation.

Indicators name:	GHG emissions inventory of Land Use, Land Use Change and Forestry (LULUCF)
Classification	Pressure UNFCCC
Definition and Rationale	
LULUCF inventory is estimating GHGs emissions and removals relating to Land Use, Land -Use Change and Forestry. The inventory covers anthropogenic emissions and removals of GHGs resulting from changes in terrestrial carbon stocks. It covers the carbon pools of living biomass (above and below ground), dead organic matter (dead wood and litter) and organic soil carbon for specified land categories (forest land, cropland, grassland, wetland, urban land and other land)	
Policy context and Targets	CLIMATE CHANGE (M)
Methodology	
The LULUCF calculation is mainly based in modelling. Various models and approaches have been used in EU level during the last 20 years (GLOBIOM, G4M, CAPRI).	
The calculation in all approaches are using as main variables the land cover (CORINE) and statistical data referring to Cropland, Grassland, Livestock numbers, Production quantities, Demand quantities, Initial prices. Emissions from forestry activities are also included by calculating biomass emissions from Afforestation Deforestation, Forest management (Forest land remaining Forest land) and Emissions from harvested wood products.	
Measurement Frequency	Geographic coverage - development
In the present state the obligation to NC to UNFCCC is every four years.	Whole country
The EEA Monitoring mechanism collects yearly data.	
Additional indicators that can produce from the set of primary data:	
Responsible authority	Activity Data are at the disposal of the Ministries in charge of each sector and INSTAT as National Accounts. Corine is provided by EEA in every 6 year basis, covering the whole of the European Continent. NEA is responsible for the validation of calculations .
Uncertainties	The quality of those data is essential for the overall credibility of the estimation.

Indicators name:	Share of renewable energy in final energy consumption
	Final energy consumption by sector / Primary energy consumption by fuel

Classification	Response / Driving Force
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Definition and Rationale

The share of renewable energy in gross final energy consumption is identified as a key indicator for measuring progress under the Europe 2020 strategy for smart, sustainable and inclusive growth.

The indicator is relied in renewable energy sources include wind power, solar power (thermal, photovoltaic and concentrated), hydroelectric power, tidal power, geothermal energy, biomass and the renewable part of waste. The use of renewable energy has many potential benefits, including a reduction in greenhouse gas emissions, the diversification of energy supplies and a reduced dependency on fossil fuel markets (in particular, oil and gas). The growth of renewable energy sources may also have the potential to stimulate employment, through the creation of jobs in new 'green' technologies.

Policy context and Targets	CLIMATE CHANG (M)
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Methodology

The share of renewable energy sources is defined as the ratio between energy produced from renewable energy sources and gross national consumption. Energy produced from renewable energy sources comprises electricity generation from hydropower plants (excluding pumping), as well as electricity and heat generated from biomass / waste, wind, solar and geothermal installations.

The share of renewable energies in the fuel consumed by the transport sector is calculated on the basis of energy statistics, according to the methodology as described in Directive 2009/28/EC. The contribution of all biofuels is included within the calculation for this indicator until 2010. From 2011 the data for biofuels in transport are restricted only to biofuels compliant with Directive 2009/28/EC (in other words satisfying the sustainability criteria).

(for further analysis see Regulation 1099/2008 on energy statistics)

Measurement Frequency	Geographic coverage - development
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Every 3 years	Whole country
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Additional indicators that can produce from the set of primary data:

Responsible authority	NEA from data of the regulatory energy authority/ Ministry in charge for energy
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Uncertainties	The indicator is estimated by statistical data of movements and commerce. The quality of those data is essential for the overall credibility of the estimation.
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Indicators name:	Energy Efficiency (Transport, Residential/Service, industry)
Classification	Response
Definition and Rationale	
<p>Energy efficiency promotion policies are a vital part for the Climate Change Mitigation strategy. Energy efficiency and energy consumption are intrinsically linked. Increased energy efficiency can lead to significant reductions in energy consumption provided that measures are in place to discourage the occurrence of rebound effects. Reducing energy consumption as a result of energy efficiency progress and behavioural changes can lead to significant reductions in the environmental pressures associated with energy production and consumption. Energy efficiency can be achieved by various ways, use of new technologies, alternation of energy sources mixes, coproduction of heat-power etc.</p> <p>In EU policy context monitoring of Energy Efficiency performance is associated with the application of National Energy Efficiency Action Plans (EED 2012/27/EU)</p>	
Policy context and Targets	CLIMATE CHANG (M)
Methodology	
<p>In EU level ODEX is been used in order to monitor the indicator. The ODEX index measures energy efficiency progress by the main sectors (industry, transport and households), as well as for the whole economy (all final consumers). For each sector, the index is calculated as a weighted average of sub-sectoral indices of energy efficiency progress; the sub-sectors are the industrial or service sector branches or end-uses for households or transport modes.</p>	
Measurement Frequency	Geographic coverage - development
Every 3 years	Whole country
Additional indicators that can produce from the set of primary data:	
Responsible authority	NEA from data of Ministry in charge of Energy
Uncertainties	The indicator is estimated by statistical data of movements and commerce. The quality of those data is essential for the overall credibility of the estimation.

Air pollution

The indicators chosen have no significant differences compared with the existing monitoring scheme. The monitoring of air pollution had been the subject which was given the highest priority in the past and due to this fact main objective is to support the expansion and the modernisation of this system to meet the new standards. The introduction of an impact indicator that combines elements of the measuring system with the population data suggested in order to produce policy making evidence.

In the medium term, along with the development of the measuring station network indicators related to driving forces (transport, energy) and Responses (fuel quality) could be added depending on the setting of national policies.

Indicators name:	Atmospheric precipitations (SO₂, NOx, Pb)
Classification	State
Definition and Rationale	
The concentration of pollutants in rainwater causing the contamination of fresh waters and the soils and expresses amongst other the transnational pollution.	
The concentration of these pollutants in rainwater and their precipitation causes degradation of water and soil. Due to the movement of pollutants through the clouds, the index persuaded used for transboundary pollution assessment as regulated by the Gothenburg Protocol under the Convention on Long-range Transboundary Air Pollution (LRTAP Convention).	
Policy context and Targets	AIR POLLUTION
Methodology	
Chemical analysis of samples (spectrophotometer)	
Measurement Frequency	Geographic coverage - development
Analysis of rainfall water samples (>5mm)	One to two stations
Additional indicators that can produce from the set of primary data:	
Responsible authority	NEA
Uncertainties	

Indicators name:	Urban Air pollutants Emissions (PM, SO₂, NO_x, O₃, CO, HC)
Classification	Pressure
Definition and Rationale	
<p>Photochemical pollutants are the main source of air pollution in Urban areas, caused mainly from transport and energy production (heating). These indicators have mainly been developed to provide information on performance in reducing emissions to air. In the EU context they are described in Directive 2008/50/EC. The monitoring is recording the following parameters:</p> <ul style="list-style-type: none"> • Hourly / Daily / Annual average concentration (µg/m³) • Annual number of Days exceeding the limits 	
Policy context and Targets	AIR POLLUTION
Methodology	
<p>Measurement of contaminants shall be done continuously over the course of 24 hours. The response time of the automatic analyzers is of the order of one minute, ie. Each analyst gives a value approximately every minute. With a microprocessor and /or datalogger, which shall be placed in any connected auto station, the automatic analyzers calculated each time the average hourly values for pollution.</p> <p>Micrograms (mg) of pollutant per cubic metre for PM_{2.5}, PM₁₀, O₃, NO_x and SO₂.</p> <p>The collected values are transferred to the database server by a modem and thus allow the continuous recording of air pollution levels in an urban area.</p> <p>Generally the methods used in automatic stations are:</p> <p>NDIR (CO), chemiluminescence (NO_x), IR absorption (O₃), fluorimetric (SO₂), β radiation or gravimetric (PM), gas chromatography (HC).</p> <p>Surveillance monitoring stations can be used also to record the air pollution in more areas in order to provide data for better understanding of the spatial patterns of pollution (smaller urban areas, forest, rural areas near major transportation axis or industrial areas).</p>	
Measurement Frequency	Geographic coverage - development
Continuous in cities, sampling to "investigation sites".	Large Urban Centres / other areas
Approximately 110 Surveillance monitoring stations per year shall be covered with 4 sampling campaigns	
Additional indicators that can produce from the set of primary data:	
- exceedance of air quality limit values in urban areas	
Responsible authority	Today there is a common responsibility between NEA and Institute of Public Health (IPH). It is proposed the unification of the responsibility under one Authority (NEA)
Uncertainties	-

Indicators name:	Urban Air pollutants Emissions (Heavy Metal (Pb,As,Mn,Ni,cu,Zn,Cd))
Classification	Pressure
Definition and Rationale	
<p>Heavy metals are absorbed in PM and can cause damage to human health through their inhalation. In rural and natural areas Heavy Metals can infect crops or resources.</p> <p>The indicator provides information about energy production and distribution; energy use in industry ; industrial processes; road transport; non-road transport (especially referring to the quality of fuels); commercial, institutional and households; solvent and product use; agriculture; waste;</p> <p>The indicator is associated with the following policies:</p> <ul style="list-style-type: none"> - the 1998 Aarhus Protocol on Heavy Metals (to the 1979 UNECE Convention on Long-range Transboundary Air Pollution (LRTAP)) targets three particularly harmful substances: cadmium, mercury and lead. - the EU Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants (LCP Directive) aims to limit heavy metal emissions via dust control and absorption of heavy metals. - the EU Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) 	
Policy context and Targets	AIR POLLUTION
Methodology	
<p>Consecration of Heavy Metals is measured upon the PM, which is collected either automatically (automatic stations, see above), or manually through semi-automatic stations or passive tubes..</p> <p>Passive or diffusive tubes absorb the pollutants exposed to them are used for sampling collection. Heavy metal test is performed with samples of PM10/PM2.5 through the method of fluorescence of X radiation with energy dispersion.</p> <p>Surveillance monitoring stations should be used in order to record the air pollution in non urban areas also (smaller settlements, forests, rural areas near major transportation axis or industrial areas).</p>	
Measurement Frequency	Geographic coverage - development
Approximately 110 Surveillance monitoring stations per year shall be covered with 4 sampling campaigns	Sampling stations shall cover the whole territory
Additional indicators that can produce from the set of primary data:	
-	
Responsible authority	Today there is a common responsibility between NEA and Institute of Public Health (IPH). It is proposed the unification of the responsibility under one Authority (NEA)
Uncertainties	-

Indicators name:	Exceedance of air quality limit values in urban areas	
Classification	Pressure	CSI 004
Definition and Rationale		
<p>Commuting and energy use related to living and economic activities in High population densities urban areas results in increased emissions of air pollutants, which in turn lead to higher ambient concentrations of these pollutants and exposure to them.</p> <p>The rationale for selection of pollutants and corresponding WHO Guidelines review on the health effects of air pollution (WHO, 2013) concludes that there is new scientific information on the adverse health effects of particulate matter (PM), ozone (O₃) and nitrogen dioxide (NO₂) observed at levels commonly present in Europe</p>		
Policy context and Targets	AIR POLLUTION	
Methodology		
<p>The calculation of the indicator is based on the same data collected by the monitoring scheme. Stations in the air quality database are spatially joined with urban areas in a Geographical Information System in order to select those stations that fall within the boundaries of the cities.</p> <p>The urban population is estimated at 1,566,588 (2013) inhabitants and is spread in 10 urban centres¹. The selected stations include station types classified as 'urban traffic', 'sub-urban traffic', 'urban background' and 'sub-urban background'. Stations classified as 'industrial' are influenced by other local emissions and such environments are generally not representative for residential areas. The industrial stations are therefore not selected for the indicator calculations. Percentage of the urban population is being used to express the results of the indicator. Tracking of the indicator can be done for the overall urban population and for each urban centre in order to describe spatial differences.</p>		
Measurement Frequency	Geographic coverage - development	
Continues monitoring	10 urban Centres	
Additional indicators that can produce from the set of primary data:		
-		
Responsible authority	NEA	
Uncertainties	<p>Since monitoring stations are covering today only 6 out of the 10 cities with automatic stations, the calculation of the indicator should be adjust to the covered area, until new areas be introduced.</p> <p>The quality of the results is depending on the density of the station network.</p>	

Indicators name:	Noise Levels
Classification	Pressure
Definition and Rationale	
<p>The monitor of Noise is referring to the levels of exposure of population in noise sources such as transport, construction and industry.</p> <p>Particular parameters that are investigate in noise surveys are the equivalent continuous sound level (L_{eq}), maximum noise level (L_{max}) the 10% and 90% percentile levels (L_{10}, L_{90}). The noise monitoring can be separated in day and night measurements / levels due to the importance of sleeping quality conditions to human health.</p> <p>Although EU legislation does not set any limits on noise exposure (EC 2002/49/EC), the WHO recommends night noise levels not higher than 40 dB L_{night} in order to protect public health.</p>	
Policy context and Targets	Urban Environment and Living conditions
Methodology	
<p>The measurements are easy by the use of portable automatic equipment. The creation of noise maps is associating the levels of noise to the affected (residential) area and attendant to the population exposed.</p>	
Measurement Frequency	Geographic coverage - development
<p>Hourly measurements in 24 hour basis for a predetermined number of days (14) Corresponding day and night values per day.</p> <p>Average bi-weekly day and night values.</p>	<p>Urban Centres, Industrial zones near urban areas, Transportation nodes that are neighbouring residential areas (airports, highways, railways and ports).</p>
Additional indicators that can produce from the set of primary data:	
L_{night}	
Responsible authority	NEA
Uncertainties	

Water and Sea.

The indicators for the water mainly adapted to WFD implementation integrating existing monitoring scheme. The effective implementation (including monitoring), however, requires developing and implementing of the required River Basin Management Plans (RBMP) that will set the current situation and targets in detail. Thus the proposed adjustment should be considered as an intermediate monitoring scheme that will be finalised by the RBMPs.

Indicators related to the sea are examined apart. This distinction is based on the (current) existence of a separate policy framework for the marine environment (in relation and addition to the WFD). This Framework is defined by the Marine Strategy policy and it is specialised in the area from the Adriatic - Ionian Macro regional Sea Strategy (EUSAIR). Quality of marine environment is considered as a crucial factor for the prospects of “blue growth” and implementation of the EUSAIR development agenda is expected to exploit the sustainable development prospects of coastal zone of Albania. In Sea Environment the Fisheries indicators have been also added.

Indicators name: Physio - Chemical Condition of Surface Waters (Alkaline, conductivity, acidity, COD / BOD₅, nutrients PO₄, NO₃ and NH₄, pH, pollutants and WFD priority substances)

- Oxygen consuming substances in rivers (CSI 020), Nutrients in freshwater (CSI 020), Nutrients in transitional, coastal and marine waters (CSI 021)

Classification

State - Pressure

Definition and Rationale

Water indicators providing information on the status of and pressures on freshwater, transitional, coastal and marine waters. Water monitoring is linked with various other themes because of importance of water quality, in human health, biodiversity conservation and climate change adaptation. From the European perspective this thematic area is a focus of indicator development with relevant directives, including the WFD and Directive 2008/56/EC.

Land-based and water-based anthropogenic activities, which outputs can reach directly or indirectly this environment can adversely affect the water quality in transitional, coastal and marine regions. Most pollution comes from land-based activities, through inland waterways, such as the application of agricultural fertilizers and animal farming, or the discharge of poorly or untreated wastewater. Pollution can however also be airborne, from emissions, although this is more relevant for marine off-shore waters. These activities may result in elevated nutrient (mostly nitrogen and phosphorus) concentrations leading to eutrophication and causing a chain of undesirable effects.

Usually a distinction is made between the direct and indirect effects of nutrient enrichment. The direct effects include high chlorophyll concentration in the water column, as a result of increased phytoplankton from increased primary production (refer to CSI023), and changes in species composition and functioning of the ecosystem (such as diatom to flagellate ratio, benthic to pelagic shifts, as well as bloom events of nuisance/toxic algal blooms)

The Priority Substances and Certain Other Pollutants according to Annex II of Directive 2008/105/EC have to be also monitored (every month in case of existence).

Policy context and Targets

WATER

Methodology

Hydrological and physicochemical parameters, e.g. water temperature, pH, dissolved oxygen, conductivity are measured in-situ using portable field instruments. At the same time, water samples are collected for the determination of nutrients, priority substances, pollutants and other chemical substances (Cd, Cu, Ni, Fe, Pb, Zn, Mn).

Sampling procedures are standardized under ISO5667-X:20XX protocols. Laboratory analysis can include filtration and photometry or Ion chromatography or other use of analytical chemical methods.

Measurement Frequency

Geographic coverage - development

Samples shall be taken in «surveillance» monitoring stations to be monitored once four years and stations included in «operational» monitoring and must be monitored annually.

A National Monitoring Water Network of : lake, river, coastal and transnational stations. The exact number should be determined.

The general physicochemical parameters and the General hydrological parameters (eg flow rate, water rate) should be measured by frequency of three times a year.

The analysis of pollutants and priority substances every 2 years.

Additional indicators that can produce from the set of primary data:

An aggregate indicator should be adopted in order to provide an easy understood information. According to WFD this Indicator is:

“% of water bodies in good chemical and ecological status”

Responsible authority

NEA / Albanian Geological Survey

Uncertainties

Indicators name:	Biological and ecological Condition of Inland Waters (phytoplankton and zooplankton, chlorophyll, Fishes)	
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Classification	S, P	CSI 023
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Definition and Rationale

Water quality in transitional, coastal and marine regions can be adversely affected by land-based and water-based anthropogenic activities, which outputs can reach directly or indirectly this environment. Most pollution comes from land-based activities, through inland waterways, such as the application of agricultural fertilizers and animal farming, or the discharge of poorly or untreated wastewater. Pollution can however also be airborne, from emissions, although this is more relevant for marine off-shore waters. These activities may result in elevated nutrient (mostly nitrogen and phosphorus) concentrations (see also CSI 021 Nutrients in transitional, coastal and marine waters) leading to eutrophication and causing a chain of undesirable effects.

Policy context and Targets Waters

Methodology

Sampling for biological, and analysis for biological, quality elements is being usually done at the same time with those that refer to chemical quality.

The biological analysis according to WFD is focusing in the following parameters:

- benthic macroinvertebrates (STAR-AQEM methodology or ISO 7828, 1985) method,
- fishes (electrofishing and identification and biometrical measurement).
- diatoms and macrophytes (weighted average equation)

The assessment of the physical nature and quality of the habitat at the sampling stations (RHS, QBR) will occur once for four years of the project. The characterization of Ecological status should be determined in water body level (not sampling site).

Measurement Frequency	Geographic coverage - development
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<p>Samples shall be taken in «surveillance» monitoring stations to be monitored once four years and stations included in «operational» monitoring and must be monitored annually.</p>	<p>A National Monitoring Water Network of : lake, river, coastal and transnational stations. The exact number should be determined.</p>
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Biological parameters that shall be monitored by biannual frequency in all the stations are benthic macroinvertebrates, fishes. diatoms and macrophytes could be monitored in subset stations in low and high drainage period and only low hydrological year additionally.

Additional indicators that can produce from the set of primary data:

An aggregate indicator should be adopted in order to provide an easy understood information. According to WFD this Indicator is: “% of water bodies in good chemical and ecological status”

Responsible authority NEA

Uncertainties

Indicators name:	Emission intensity of agriculture
Classification	Pressure
Definition and Rationale	
<p>The indicator is used to illustrate decoupling of economic growth (Gross Value Added-GVA) from the environmental impact (nutrient losses). The indicator displays the percentage of change in emission of nutrients from agriculture (expressed as nutrient balance) plotted together with the change in the gross value added (GVA) of the agriculture industry over the same period of time (between 2000-2011). Absolute decoupling occurs when the environmentally relevant variable is stable or decreasing while the economic driving force is growing. Relative decoupling occurs when the growth rate of the emission is positive, but less than the growth rate of the GVA.</p> <p>Furthermore, the indicator illustrates emission intensity of the agriculture sector expressed as the amount of nutrient balance in agriculture per unit of production of the agriculture sector (expressed as one million Euro of gross value added). The indicator illustrates both emission intensity based on total GVA (which includes subsidies) and emission intensity based on GVA, excluding subsidies.</p>	
Policy context and Targets	Waters
Methodology	
<p>Emission intensity is expressed in tonnes of pollutant per one million EURO (or ALL) of GVA.</p> <p>The calculation is based in data from the national accounts for the use of fertilizers and pesticides of Ministry of Agriculture and/or INSTAT.</p>	
Measurement Frequency	Geographic coverage - development
Annual	The indicator is calculated for whole of the country.
Additional indicators that can produce from the set of primary data:	
Responsible authority	Ministry of Agriculture
Uncertainties	

Indicators name:	Emission intensity of domestic sector (liquid urban discharges)
Classification	Pressure
Definition and Rationale	
<p>The consequences of economic activities with regard to water quality and quantity have been analysed under the WFD in the River Basin Management Plans. Research on the link between water status (quality and quantity), relevant pressures and their economic driving forces provides an important basis for decision making and the prioritisation of measures with regard to achieving the objectives of the WFD. Moreover, it can help to indicate whether the particular driver is decoupled from its environmental impact. Easily understandable indicators will be necessary to provide signals and measure progress in improving resource efficiency.</p> <p>The emission of nutrients from wastewater treatment plants provides an indication of potential water pollution. Human activity - the driver - is, in this indicator, represented by population size.</p> <p>The indicator is used to illustrate the emission intensity of the domestic sector (household plus services) expressed as the amount of discharged pollutant from wastewater treatment/ or discharged without treatment per inhabitant per year. Furthermore, the indicator shows a decoupling of the emission of nutrients (nitrogen and phosphorus) and population growth.</p> <p>Indicator can use but is not fully compatible with the DCM provision (Annex I, “ liquid urban discharges “). EEA Indicator is limiting the monitoring in N and P. DCM on monitoring is including extra parameters referring to the Ph , COD/BOD₅ , alkalinity, acidity, phenol and heavy metals. Those parameters should be maintained for the monitoring of the Treatment plans and the relevant sewage system and integrated as data to the WATER conditions indicators.</p>	
Policy context and Targets	WATERS
Methodology	
<p>For overall emission load the following formula is used:</p> $N_{tot}^{discharged} = N_{tot}^{(coll.system)} + N_{tot}^{(without\ treatment)} + N_{tot}^{(IAS)} + N_{tot}^{(primary)} + N_{tot}^{(secondary)} + N_{tot}^{(tertiary)}$ <p>(more information on EEA technical reports)</p> <p>It is a theoretical indicator that is estimated based on water treatment plans data (if treatment exists) and population data multiplied by coefficients related to living conditions and consumption practices. National assessment is required to determine the coefficients the monitoring stations of wastewater plants will provide data for the calculation,.</p>	
Measurement Frequency	Geographic coverage – development
Every 5 years (or with the progress of Waste Treatment plans installation)	Whole country
Additional indicators that can produce from the set of primary data:	
% of population covered with wastewater management treatment facilities	
Responsible authority	
Uncertainties	

Indicators name:		Chemical Condition of groundwater
Classification	State - Pressure	WEU 001
Definition and Rationale		
<p>The Water Framework Directive aims to ensure a balance between abstraction and recharge of groundwater quantity and the conservation of the chemical composition of the groundwater bodies. Furthermore, for achieving good quantitative status of a groundwater body «alterations to flow direction resulting from level changes may occur temporarily, or continuously in a spatially limited area, but such reversals do not cause saltwater or other intrusion, and do not indicate a sustained and clearly identified anthropogenically induced trend in flow direction likely to result in such intrusions».</p> <p>The indicator in WFD is set to monitor the status of Underground bodies from the following major threats:</p> <ul style="list-style-type: none"> - Saltwater intrusion as a result of groundwater over-exploitation is a major concern in many aquifers. - Nutrients and pesticides filtration from agricultural runoffs, urban and industrial sewage. 		
Policy context and Targets	WATER	
Methodology		
<p>The determination of the chemical condition of an aquifer is being assessed by chemical analysis of samples. Characterization of the status is being according to the Nitrates (91/676/EEC) and the Drinking Water Directive (98/ 83/EC).</p>		
Measurement Frequency	Geographic coverage - development	
<p>Samples shall be taken in «surveillance» monitoring stations to be monitored once four years and stations included in «operational» monitoring and must be monitored annually.</p> <p>The general physicochemical parameters and the General hydrological parameters (eg flow rate, water rate) should be measured by frequency of three times a year.</p> <p>The analysis of pollutants and priority substances every 2 years.</p>	<p>A National Monitoring Water Network of : lake, river, coastal and transnational stations. The exact number should be determined.</p>	
Additional indicators that can produce from the set of primary data:		
<p>An aggregate indicator should be adopted in order to provide an easy understood information. According to WFD this Indicator is:</p> <p style="text-align: center;">“% of water bodies in good chemical and ecological status”</p>		
Responsible authority	Geological Survey	
Uncertainties		

Indicators name:	Coastal Morphology (flow, area, dynamics of the estuaries)
Classification	State
Definition and Rationale	
<p>Water indicators providing information on the status of and pressures on freshwater, transitional, coastal and marine waters. Water monitoring is linked with various other themes because of importance of water quality, in human health, biodiversity conservation and climate change adaptation. From the European perspective this thematic area is a focus of indicator development with relevant directives, including the WFD and Directive 2008/56/EC. Coastal areas are vulnerable to climate change. Erosion (retreat of the coast line, towards the land) can be caused by the rise of sea level, the loss of groundwater volume, the desertification, and the deforestation or as an impact from an extreme flood.</p>	
Policy context and Targets	WATERS
Methodology	
<p>The use of Satellite images and Remote sensing are providing optical recognition of the coastal morphology. In a less macroscopic scale the use of mathematical models (Delft3D, MIKE21) that simulate physical, chemical or biological processes in coastal or marine areas coastal (seasonal wave movements and seabed composition) can provide data on rate of coastal erosion in particular Coastal segments..</p> <p>Analytical methodology is developed by the EUROSION PROJECT (2002),</p>	
Measurement Frequency	Geographic coverage - development
Continuous for flow, morphological parameters can be monitored every 6 years according to WFD.	At least one point in every system. Ideally sampling after every nod that alters the flow.
Additional indicators that can produce from the set of primary data:	
Responsible authority	Geological Survey
Uncertainties	

Indicators name:	Coastal morphology
Classification	State
Definition and Rationale	
The importance of coastal areas for the economy, ecology and society is very big. Since in coastal areas is concentrated the majority of the population and of economic and cultural activities.	
Policy context and Targets	CLIMATE CHANGE
Methodology	
Measurement Frequency	Geographic coverage - development
Every 4 to 8 years	Coastal area
Additional indicators that can produce from the set of primary data:	
Impact of coastal erosion on protected land, can be used for monitoring the pressures of climate change in biodiversity,	
Responsible authority	Geological Survey

Indicators name:	Bathing Water Quality
Classification	State
Definition and Rationale	
The quality of bathing water is essential for the prevention of sanitary threats. The indicator is associated with the sustainable tourism since bathing waters are an valuable resource for tourism. The excellent quality of bathing waters is commonly used in order to promote tourism development. The indicator is measuring the microbiological conditions meeting standards for parameters introduced by the New Bathing Water Directive (2006/7/EC), (intestinal enterococci and Escherichia coli).	
Policy context and Targets	Waters
Methodology	
Analysis of the microbiological load of samples and comparison to the limit values of the directive.	
The results are classified in the following categories:	
CI: Compliant with mandatory values of the Directive for the five parameters;	
CG: Compliant with mandatory and more stringent guide values of the Directive for the five parameters;	
NC: Not compliant with mandatory values of the Directive for the five parameters;	
NF: Bathing waters that are not sufficiently sampled (frequency criteria not satisfied);	
NS: Bathing waters that are not sampled due to external causes;	
B: Banned or closed.	
Measurement Frequency	Geographic coverage - development
Every month for all the swimming period.	Coastal Zone and lakes, at least in 100 stations.
Additional indicators that can produce from the set of primary data:	
«blue flags» is a international wide programme for the monitoring of both bathing waters and quality (and conformities) of beaches.	
Responsible authority	Institute of Public Health (IPH)
Uncertainties	

Indicators name:	Hazardous substances in marine organisms
Classification	Pressure
Definition and Rationale	
<p>Hazardous substances are emitted to fresh and marine waters via a number of pathways and can have detrimental effects on aquatic biota. Humans can be exposed to hazardous substances in water through the ingestion of contaminated drinking water and the consumption of contaminated freshwater fish and seafood. A wide range of legislation now exists in Europe to address the release of hazardous substances to the environment, including sea water.</p> <p>New challenges exist, however, including the issues of chemical mixtures and emerging pollutants.</p>	
Policy context and Targets	Waters
Methodology	
<p>Concentration of heavy metal and organic substances can be determined either from analysis of mussel's tissues or/and the chemical analysis of sediment. The monitoring parameters are referring to Cd, Hg, Pd, HCB, Lindane, DDT, RCB's Assessment and modelling tools help to link chemical contamination with observed deterioration of ecological quality in aquatic ecosystems. Such tools include innovative approaches to the evaluation of existing chemical and biological monitoring data, together with site-specific experimental techniques to establish cause-effect relationships</p> <p>EEA Technical Report no.8/2011</p>	
Measurement Frequency	Geographic coverage - development
Every 2 years	Coastal waters (until 40m dept), sampling points should be cover at least the areas of major rivers deltas and the areas affected by the disposal of urban wastewater or industrial liquid wastes. Pro-active monitoring should also cover areas of aquaculture (especially muscles)
Additional indicators that can produce from the set of primary data:	
Responsible authority	Institute of Public Health (IPH)
Uncertainties	

Indicators name:	Coastal Tourism
Classification	Pressure
Definition and Rationale	
Coastal tourism creates an import and	
Policy context and Targets	WATERS / OTHER
Methodology	
<p>Coastal tourism is a significant development opportunity for the Mediterranean countries. This development in terms and with the use of techniques that ensure high level of protection to the natural environment is necessary not only for the preservation of the natural capital but also to conserve the competitiveness of the tourism sector that is relays on the quality of natural (and cultural) resources..</p> <p>The index measures the intensity of tourism in the coastal area, which translates into a resource-intensive (water, space), the production of wastes, the competition with other uses or functions (agriculture use, ecosystem functions).</p> <p>The mapping of data can provide information of high intensity of tourism. Their correlation with other monitoring data such as morphology and length the coast, the boundaries of protected areas etc can give important information to formulate and implement sustainable tourism development strategies. The monitoring is also crucial for decision making in waste management planning.</p>	
Measurement Frequency	Geographic coverage - development
Annually	Coastal municipalities
Additional indicators that can produce from the set of primary data:	
Responsible authority	
Uncertainties	

Indicators name: Fisheries:
 – Status of marine fish stocks
 – Aquaculture production
 – Fishing fleet capacity

Classification Pressure

Definition and Rationale

Indicator is important for Albania because it is related with the blue growth potential.

Both the three sub- indicators are expressing the sustainability of fish stock and the pressures derived either from the over-exploitation, or the The Status of marine fish stocks assesses both the status of the commercial fish stocks in Europe’s regional seas and the level of pressure exerted by fisheries on those stocks against their sustainable reference levels. It also provides an overview of the availability of information to provide such analysis. To that end it reports on:

- The availability of information for assessing the status of the level of exploitation and the reproductive capacity. This is reflected by the proportion of the total landings (as a proxy of catch) from commercial fisheries per regional sea covered by quantitative stock assessments (i.e. providing information on the 2 indicators fishing mortality and spawning stock biomass and their sustainable reference levels).
- The status of the assessed marine fish and shellfish stocks based on the current level of exploitation and the reproductive capacity (i.e. the status of fishing mortality and spawning stock biomass compared to their sustainable reference levels).

Aquaculture, while generating valuable products and incomes, may modify ecosystem resilience, increase human health risks associated with food production safety issues, and affect the social and economic development of coastal communities. Aquaculture has documented impacts and may create problems on several biological levels - from genes to ecosystems, with known impacts on almost all aspects of habitats and ecosystems affecting geochemical characteristics of the (coastal) environment, plankton, benthos and benthic organisms, wild fish, and biodiversity. The precise level of impact, however, may vary according to production scale and management techniques, as well as to local and regional hydrodynamics and chemical characteristics. This indicator captures aquaculture production as a proxy of pressure, separating it by environment, type of production and coastal intensity.

Fishing capacity, defined in terms of tonnage and engine power and sometimes number of vessels, is one of the key factors that determine the fishing mortality caused by fishing fleets. The indicator is a measure of the size and capacity of the fishing fleet, including the average size of vessels, which in turn are assumed to approximate to the pressure on marine fish resources and the environment.

Policy context and Targets BIODIVERSITY

Methodology

Status of marine fish stocks is estimated at level of regional sea (Adriatic - Ionian) directly by the Scientific, Technical and Economic Committee for Fisheries STECF with respect to Good Environmental Status (GES), that refers to Mortality (F) and reproductive capacity (SSB) criteria. Calculation of the annual national aquaculture production (by species) is being provided by productivity statistics (Ministry of Agriculture / INSTAT).

The size of fishing fleet is presented as numbers of vessels, the capacity as the total engine power, given in kW and the gross tonnage (GT) given in tonnes. Average size is a derived measured given in GT/vessel.

Measurement Frequency **Geographic coverage - development**

Annual

Additional indicators that can produce from the set of primary data:

Responsible authority

Uncertainties

Biodiversity

The indicators for biodiversity are separated into two categories. The first concerns the species and habitat protection, and the other forestry.

Starting from the later, the reason for this separation has mainly done because forest wealth of Albania has a particularly high value either as natural and as development resource. Forestry and forests management have clearly a long tradition and are associated with current incomes in the mountainous area (which is the most of the country). More over the Forest monitoring is based in a Pan-European scheme of FORSET EUROPE high level Initiative that is set to develop in a voluntary base common strategies amongst 47 (46 countries and EU) participants.

At he other hand management and monitoring of natural ecosystems and species is still evolving (the proposed protected areas of the country had increased 3 times over the last decade). The adoption the European management and monitoring framework in protected areas (including forest habitats) needs further elaboration. Given those shortcomings in recording and policy evolution for biodiversity it is proposed the adoption of indicators that will support the approach processes which will gradually have to specialize in order to meet high requirements for monitoring as specified in Article 17 of the Directive for Habitats.

Indicators name:	Species /Habitats of European Interest
Classification	State
Definition and Rationale	
<p>The indicator shows changes in the conservation status of species of European interest. It is currently based on data collected under the obligations for monitoring under Article 11 of the EU Habitats Directive (92/43/EEC). The indicator directly indicates the implementation and success of the Habitats Directive. Therefore, it is highly relevant for EU nature conservation policy. Results are representative for the EU Member States and can be aggregated to EU level.</p> <p>States have to monitor and report the conservation status (CS) of species of European interest (Annexes II, IV, V of the Directive). The conservation status is illustrated in three 'traffic light' categories ('favourable' - green, 'unfavourable inadequate' - amber, 'unfavourable bad' - red, plus unknown) characterised by four parameters:</p> <ul style="list-style-type: none"> • trends and status of range, • trends and status of the overall population, • quality and extent of the habitat, • future prospects. <p>The indicator is based on the number of species in the three first CS categories and changes between categories in time.</p>	
Policy context and Targets	BIODIVERSITY
Methodology	
<p>Realistic the full application of Habitats Directive Monitoring Obligations will rather be a non feasible target in medium terms.</p> <p>In order to be able to reach in the future to a level that monitoring of parameters such as interaction, ecosystem structures and function, it is essential to apply a first basic monitoring and surveillance Programme (base survey) that will provide the base values for future development. This Programme will focus at:</p> <ul style="list-style-type: none"> • The cartographic imprint of habitats and species territories (priority species spread maps). • The recording of bio-communities and the relationships between species • A biannual evaluation of changes <p>The collection of the data will be mainly carried out by observation and recording research. A full research for the Current Status of Conservation (and maps) for every taxonomic class/ superclass has to be created in order to provide the basis for monitoring. According to the Class various technics of observation can be used (bird watching for birds, traps for small mammals, bates and photographic traps for large predators).</p>	
Measurement Frequency	Geographic coverage - development
The base survey will require approximately two years to complete.	EEA has specified a 10X10 klm reference grid. Albania is divided in 345 cells.
Regular Monitoring can start two years after the completion of base survey	
Additional indicators that can produce from the set of primary data:	
Red List Index for European species (S)	
Responsible authority	NEA
Uncertainties	

Indicators name:	Designated Areas
Classification	Response
Definition and Rationale	
This indicator demonstrates the change over time in one form of protection afforded to components of biodiversity. The indicator is expressing the evolution of natural areas protection in the country level and the political progress.	
Policy context and Targets	BIODIVERSITY
Methodology	
The indicator measures the total areas that is under protection and their relative change over time. The area is calculated in km ² , but the indicator can also be presented as % of the total country area.	
The import of the areas boundaries in a GIS database can result automatic calculation.	
Measurement Frequency	Geographic coverage - development
Annual	Whole country
Additional indicators that can produce from the set of primary data:	
Sites designated under the EU Habitats and Birds directives (R) can be used also as an indicator since the Directives incorporate in national framework.	
Responsible authority	NEA
Uncertainties	

Indicators name:	Species Diversity
Classification	State
Definition and Rationale	
The objective of this indicator is to produce a high-level generic indicator that will show the state and trends of biodiversity. Selection of the species and species groups is based primarily on the availability of data and the need to show trends for various species groups.	
Policy context and Targets	BIODIVERSITY
Methodology	
A selection was made of 24 common woodland bird species characteristic of a range of wooded habitats in Europe. The birds chosen are those characteristic of 'woodland' though many occur in other habitats such as gardens, hedges, scrub and so forth and make use of that habitat too.	
These birds all use these specific habitats during their breeding season and also have a large range across Europe. National monitoring coordinators provided with their own assessment - proportion of a species' national population breeding in a given habitat type in four categories (less than 25%, 25 to 50%, 50 to 75%, more than 75%).	
Measurement Frequency	Geographic coverage - development
yearly	Habitats type
Additional indicators that can produce from the set of primary data:	
Responsible authority	NEA
Uncertainties: The existence of species spread maps for a long timeline is essential for the credibility of the results. Thus the indicator require a long period of application in order to provide better results.	

Indicators name:	Fragmentation of natural and semi-natural areas (fragmentation of terrain, land and forests)
Classification	Pressure
Definition and Rationale	
<p>This indicator shows the proportion of and trends in natural and semi natural areas, on the basis of land cover maps. The indicator has a high relevance for biodiversity because it indicates changes in the patch size of natural and semi-natural areas of any type of ecosystem across Europe.</p> <p>The indicator is also connected with the protection of Landscape and the Coastal Zone Management as defined by the Protocol for the Mediterranean Coastal Zone Management</p>	
Policy context and Targets	BIODIVERSITY
Methodology	
It is produced by the mathematical calculations and GIS analysis on CORINE Land Cover (CLC) data.	
Measurement Frequency	Geographic coverage - development
Every 6 years (CORINE update)	Whole country
Additional indicators that can produce from the set of primary data:	
Responsible authority	NEA
Uncertainties	In many cases the CORINE data need verification with in situ sampling in order to access their fidelity.

Indicators name:	Agriculture: area under management practices potentially supporting biodiversity
Classification	Pressure
Definition and Rationale	
<p>This indicator is based on two sub-indicators and shows trends in area (as proportion of the total utilised area) of two categories of agricultural land that are not mutually exclusive:</p> <p>a. High nature value farmland area.</p> <p>b. Area under organic farming.</p> <p>a. High nature value farmland area' (ha) indicates the area where farming systems are sustaining a high level of biodiversity. They are often characterised by extensive farming practices, associated with a high species and habitat diversity or the presence of species of European conservation concern.</p> <p>b. Area under organic farming' (ha) indicates trends in the organic farming area and the share of the organic farming area in the total utilised agricultural area. Farming is only considered to be organic at the European Union (EU) level if it complies with Council Regulation (EC) No 834/2007, which provides a comprehensive framework for production of crops and livestock; labelling, processing and marketing of organic products; and the import of organic products into the EU.</p>	
Policy context and Targets	BIODIVERSITY
Methodology	
<p>a. High nature value farmland area:</p> <ol style="list-style-type: none"> 1) selection of land cover classes made up primarily of HNV land in the different environmental zones in Europe; 2) refinement of the map obtained in point 1) on the basis of additional expert rules and country specific information; 3) addition of the biodiversity data layers (NATURA 2000, IBA - on the basis of indicator species and selected habitats only); 4) testing/adding national biodiversity data sets. <p>b. Area under organic farming</p> <p>Calculation of the indicator per country/per region: Ministry of Agriculture holds the statistical data of the organic farming questionnaire.</p>	
Measurement Frequency	Geographic coverage - development
Every 6 years (CORINE update) for HNV, every yearly for organic farming	Whole country
Additional indicators that can produce from the set of primary data:	
Responsible authority	Ministry of Agriculture
Uncertainties	

Forests

Indicators name:	<p>(C1). Maintenance, Improvement and Increase of Forest Sources, Their Contribution to Global Carbon Cycles.</p> <p>b) Forestry areas according to classes of age, types and volumes;</p> <p>g) Quantity of biomass in forests;</p> <p>h) Biomass removed from forests each year;</p>
Classification	State
Definition and Rationale	
<p>The criterion is focusing on the contribution of forests to the global carbon Circle which can be determined through the area, the volume and the structure of forests. Growing stock is one of the basic statistics of any forest inventory and useful for various purposes. The standing volume of growing stock can by applying biomass expansion factors be converted into estimates of above and below-ground woody biomass. Data on growing stock, increment and fellings are crucial for the calculation of carbon budgets in the forest sector.</p> <p>Originally the criteria is containing the following indicators:</p> <p>Indicator 1.1 Forest area: Area of forest and other wooded land, classified by broadleaves and conifers, and by availability for wood supply, and share of forest and other wooded land in total land area</p> <p>Indicator 1.2 Growing stock Growing stock of forest and other wooded land, classified by broadleaves and conifers, and by availability for wood supply.</p> <p>Indicator 1.3 Age structure and/or diameter distribution of forest: Age structure and/or diameter distribution of forest and other wooded land, classified by forest type and by availability for wood supply.</p> <p>Indicator 1.4 Carbon stock: Carbon stock of woody biomass and of soils on forest and other wooded land.</p>	
Policy context and Targets	BIODIVERSITY / CLIMATE CHANGE
Methodology	
<p>The calculation of the area and the classification of Forest to types can be assessed by the use of Satellite Images (Remote Sensing). CORINE is already provides a general classification. Estimation on the volume requires sampling procedures and inventories creation in order to update former data.</p> <p>The estimates of total growing stock (m³) and growing stock density (m³/ha forest) by forest type and by availability for wood supply provide basic information for the assessment of the sustainability of forest management and can be determined by sampling.</p> <p>The data are collected according to the set of pan-European Criteria and Indicators for Sustainable Forest Management endorsed at the 4th Ministerial Conference (Forest Europe, formerly known as Ministerial Conference for the Protection of Forests in Europe) in Vienna, 2003.</p>	
Measurement Frequency	Geographic coverage - development
5 to 10 years	Forest areas
Additional indicators that can produce from the set of primary data:	
Forest: growing stock, increment and fellings and deadwood	
Responsible authority	NEA with cooperation of regional and local agencies
Uncertainties	

Indicators name:	<p>(C2). Preservation of Forest's ecosystems, Multiplication of Forests</p> <p>f) annual quantity re aped, utilized, divided in processing timber and fire logs</p> <p>k) Areas damaged from other atmospheric factors, such as storms, snow falls, etc;</p> <p>j) Areas burnt from fires;</p> <p>l) Types of endangered trees;</p> <p>m) Forest hot spots;</p>
Classification	Pressure
Definition and Rationale	
<p>Forest ecosystems are vulnerable to pollution (water and air), climate change phenomena, (fires, Floods, desertification), diseases, pasture, invention of alien species and human activities. The monitoring of those parameters is essential to ensure the sustainability of Forest Ecosystems.</p>	
Policy context and Targets	BIODIVERSITY
Methodology	
<p>The inventory of damage to forests can be realized by concentration of reports and incident reports from responsible forestry services. Forest and other wooded land with damage, should be classified by primary damaging agent (abiotic, biotic and humaninduced) and by forest type.</p> <p>The measurement is mainly in land units (Ha) . Observations for identification and measurement of infection level in woods caused by diseases and pests shall be carried out for the following types: Black pine, Mediterranean pine, White fir</p> <p>Chemical substances deposition (sulphur, nitrogen) shall be measured in samples taken below the forest canopy of intensive monitoring plots (kg/ha). The chemical composition of soil (pH, cation exchange capacity, C/N ratio, organic C) in forests and in other soils in relation to the acidity and soil eutrophication, classified according to the main soil types.</p> <p>The data are collected according to the set of pan-European Criteria and Indicators for Sustainable Forest Management endorsed at the 4th Ministerial Conference (Forest Europe, formerly known as Ministerial Conference for the Protection of Forests in Europe) in Vienna, 2003.</p>	
Measurement Frequency	Geographic coverage - development
Five to ten years	Sampling Areas
Additional indicators that can produce from the set of primary data:	
Responsible authority	NEA with cooperation of regional and local agencies
Uncertainties	

Indicators name: (C3). Maintenance and encouragement of production functions in forests

- i) annual capacity of exploitation;
- e) annual forest growths based on the form of governance and types;

Classification Response

Definition and Rationale

Timber and other forestry products are a very important source of income for local communities. By practicing forestry activities, humans are exerting a regulatory role in forest that in case of a sustainable management has beneficial results. On the contrary, overexploitation of timber, fragmentation and bad management can lead ecosystems to collapse.

The balance between increment and fellings highlights the sustainability of timber production over time as well as the current availability and the potential for future availability of timber. For a long-run sustainability the annual fellings must not exceed the net annual increment.

An increase in the growing stock, relative to forest area, is an indication of maturing forests. The balance between the growth and felling in production forests is the best indicator to understand both potential for wood production possibilities, and conditions of biodiversity, health, recreation and other functions of forests. The quality of this indicator with regard to biodiversity would improve considerably if suggestions for improvements (see below) would be implemented.

Policy context and Targets FORESTS

Methodology

Fellings of wood implies average annual standing volume (over bark) of all trees, living or dead, above 0 cm diameter at breast height, felled annually. Net annual increment signifies average annual volume of gross increment less that of natural losses on all trees to a minimum diameter of 0 cm (d.b.h.). The data are collected according to the set of pan-European Criteria and Indicators for Sustainable Forest Management endorsed at the 4th Ministerial Conference (Forest Europe, formerly known as Ministerial Conference for the Protection of Forests in Europe) in Vienna, 2003.

Roundwood comprises all wood obtained from removals, including wood recovered from natural, felling and logging losses. Roundwood can be sub-divided into industrial roundwood (wood in the rough), which is mainly used for construction and processed timber products, and wood fuel, which is increasingly important as a source of renewable energy. Roundwood production acts as an interface between the forestry and the timber sector: it provides income for forest owners, serves as resource for the timber sector and its added value, and contributes to the economy, especially in rural areas.

Measurement Frequency	Geographic coverage - development
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Additional indicators that can produce from the set of primary data:

Forest: growing stock, increment and fellings and deadwood

Responsible authority NEA with cooperation of regional and local agencies

Uncertainties

Indicators name:	(C4). Maintenance, Conservation, and Improvement of Biological Diversity of Ecosystems in Forests.
	o) diversity of ecosystems and habitats in forests;

Classification	State
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Definition and Rationale

The 4th Criterion is focusing on the habitats and the species composition of forest. The identification of the diversity of species and the focus on species of interest and their biota is the main target for the indicator. Forest biological diversity is a broad term that refers to all life forms found within forested areas and the ecological roles they perform. As such, forest biological diversity encompasses not just trees, but the multitude of plants, animals and micro-organisms that inhabit forest areas and their associated genetic diversity. It can be considered at different levels, including the ecosystem, landscapes, species, populations and genetics. Complex interactions can occur within and amongst these levels. In biologically diverse forests, this complexity allows organisms to adapt to continually changing environmental conditions and to maintain ecosystem functions. Other quality parameters that has been evaluated are the degree of physicality of forests and the introduction of foreign species.

Policy context and Targets	FORESTS/ BIODIVERSITY
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Methodology

The measurement of the indicator can be combined with the field works referring to “Species /Habitats of European Interest”. According to the current programming there is an on going project for “Monitoring of genetic forest resources and biodiversity in the fir and black pine populations”. Through this project observations and measurements shall be performed on a five-year periodicity basis in the SP network in 36 locations; the outcome shall be annual and comparable to the previous five years in the same stations.

Also a project for forest regeneration is expected to begin and to support the C4 criteria. Observations and measurements shall be performed on a five year basis in exploited, re-stumped and reforested areas in 61 locations (municipalities), and the outcomes shall be annual and comparable to the previous five year period.

Area of continuous forest and of patches of forest separated by non-forest lands can be measured through remote sensing and GIS by defining spatial criteria.

Measurement Frequency	Geographic coverage - development
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5 to 10 years	Samples Area
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Additional indicators that can produce from the set of primary data:

Responsible authority	NEA with cooperation of regional and local agencies
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Uncertainties

Indicators name:	(C5). Maintenance, improvement and stimulation of protecting functions in the management of forests.	
Classification	Response	
Definition and Rationale		
Ecosystem services by forests and other woodlands provide the prevention of soil erosion and floods, protection of water sources, climate regulation (especially peri-urban forests) and other valuable protecting functions. The criterion - indicator is aiming to provide information about those services and their differentiation over time. Protective forests – soil, water and other ecosystem functions - infrastructure and managed natural resources		
Policy context and Targets	BIODIVERSITY	
Methodology		
Area of forest and other wooded land designated to prevent soil erosion, preserve water resources, maintain other protective functions, protect infrastructure and managed natural resources against natural hazards is equal to the total forest area of the country.		
Measurement Frequency	Geographic coverage – development	
5 to 10 years		
Additional indicators that can produce from the set of primary data:		
Responsible authority	NEA with cooperation of regional and local agencies	
Uncertainties		

Indicators name: (C6). Maintenance of other socio-economic functions and conditions	a) Forestry fund (based on ownership, form of governance, types, volumes); n) sites of special importance for biodiversity, tourism, etc;	
Classification	P	
Definition and Rationale		
Forest are very important for the local development of mountain and semi mountain communities for multiple uses. Forestry provides income and jobs to those areas. Apart from wood and fruitage, ecosystem services are an asset for sustainable tourism development, leading to the (desirable) differentiation of rural productive systems. The criteria is including parameters such as:		
<ul style="list-style-type: none"> • Policies, institutions and instruments to maintain other socioeconomic functions and conditions • Forest holdings Contribution of forest sector to GDP • Net revenue • Investments in forests and forestry • Forest sector workforce • Occupational safety and health 		
Policy context and Targets	BIODIVERSITY	
Methodology	Measurement Frequency	Geographic coverage – development
The indicator is based mainly in the interpretation of statistical data of related economic activities	yearly	Whole country
Additional indicators that can produce from the set of primary data:		
Responsible authority	NEA with cooperation of regional and local agencies	
Uncertainties		

Other

Indicators name: Pollutant releases from industrial facilities

Classification

Pressure / Impact

Definition and Rationale

The manufacturing industries are responsible for large emission loads discharged in air, water and waste. The manufacture of products results in many and varied emissions, depending on the products being manufactured and the processes and chemicals used. Emissions to water include heavy metals (e.g. cadmium, mercury), organic micropollutants, suspended solids and organic matter, which affect the ecological and/or chemical status of water bodies. On air emissions apart from GHG gases and photochemical pollutants, toxic compounds as PAH's dioxins, furans(chlorinated hydrocarbons) may exist. As for wastes either large volume of organic wastes or large toxicity side-products can cause serious damage to waters and ecosystems. The Integrated Prevention Pollution Control Directive (IPPC) set the framework for monitoring at individual level. The Water Framework Directive (WFD) lays down a strategy against the pollution of water and requires further specific measures for pollution control and environmental quality standards (EQC). In accordance with WFD Article 4, Member States should implement the necessary measures with the aim of progressively reducing pollution from priority substances and ceasing or phasing out emissions, discharges and losses of priority hazardous substances. The consequences of economic activities with regard to water quality and quantity have been analysed under the WFD through the Member States' River Basin Management Plans. The study of the link between water status (quality and quantity), relevant pressures and their economic driving forces provides an important basis for decision making and the prioritisation of measures with regard to achieving the objectives of the WFD. Moreover, it can help to indicate whether economic growth in a particular industry/sector is decoupled from its environmental impact and thus whether the sector is moving towards higher resource efficiency. Easily understandable indicators will be necessary to provide signals and measure progress in improving resource efficiency.

Policy context and Targets

OTHER

Methodology

For Air pollution and toxic waste production, inventories rely on obligations of individual monitoring within the terms of Environmental permit. Regional Offices should consecrate the data. The EEA methodology about the coupling of industrial pollution is using a formula that combines findings from Water monitoring system and Branch Economic Accounts (National Statistics). The Formula used to calculate values for the indicator, according to EEA is:

$$X=E/Y$$

where E is the emission of aggregate heavy metals/nutrients into water and Y is the gross value added in basic prices.

The aggregation of nutrients is based on the LCA methodology, where the following equation has been used for the conversion of N_{tot} to P_{tot} equivalent,. Nutrient equivalent

$$(P) = L_N^* / 7,23 + L_p (P)$$

Where L_N = N_{tot} emission load and L_p = P_{tot} emission load

The aggregation of heavy metals is based on absolute sums of kg of pollutants released, weighted by factors corresponding to the reciprocal Predicted No Effect Concentrations (PNEC) values (1/PNEC) for each pollutant and made equivalent to one of the metals - here Mercury (Hg) has been chosen. If it is made equivalent to another metal, the diagram would look the same but have another scaling on the ordinate axis. This weighting was made in order to reflect the differences in the environmental impact of the four heavy metals on the Priority Substances List in the field of water policy.

Measurement Frequency

Every 5 years

Geographic coverage - development

Whole country

Additional indicators that can produce from the set of primary data:

Responsible authority

NEA in cooperation with the 12 REA

Uncertainties

Indicators name: Solid Waste: Waste Generation, Waste recycling, Diversion of waste from landfill

Classification Pressure

Definition and Rationale

The proposed EEA core set indicators (WST 004 waste generation, WST 005 waste recycling and WST 006 diversion of waste from landfill) on waste address relevant policy questions, referring to objectives and targets of the 2008 EU Waste Framework Directive (2008/98/EC) and other relevant directives, the 2011 Roadmap on a Resource Efficient Europe (COM(2011)571) and the 7th Environment Action Programme (EAP). These policy questions should be linked with the Waste Management infrastructures programme that is already in progress.

Policy context and Targets WASTES

Methodology

Inventories for the recording of quantities of wastes by disposal / management practise should be kept by local authorities / managers of infrastructures. The data are summarise by practice or by period the weighting logs that every certified in the Management System installation should have.

Measurement Frequency **Geographic coverage - development**

Annual Whole country

Additional indicators that can produce from the set of primary data:

Responsible authority Ministry of Interior with cooperation with local convergence.

Uncertainties In many cases corrections should be made in order to estimate quantities that are being managed outside the «official system». This include both «bad practises» (e.g. illegal disposal), or «good practices» (e.g. immediate reuse).

Indicators name:	Soil: Contaminated sites
Classification	Pressure
Definition and Rationale	
It is a descriptive indicator, which aims at presenting the evolution of the current situation and management practices for the decontamination of historically contaminated sites that particularly dangerous or toxic substances had deposited.	
Those are the 14 priority hot-spots recognised by UNDP project “On identification of priority polluted areas in Albania” that has defined that require emergent interventions in order to minimise the risk on environment and human health.	
Policy context and Targets	WASTES
Methodology	
Progress reports	
Measurement Frequency	Geographic coverage - development
Annual	14 hot-spots
Additional indicators that can produce from the set of primary data:	
Responsible authority	NEA
Uncertainties	

Indicators name:	GDP, Total Population
Classification	Driving Forces
Definition and Rationale	
Indicators that are expressing the general economic and social conditions	
Policy context and Targets	ENVIRONMENTAL SCENARIOS
Methodology	
Statistical measurements	
Measurement Frequency	Geographic coverage - development
Annual	Whole country
Additional indicators that can produce from the set of primary data:	
Responsible authority	INSTAT
Uncertainties	

4.4 Time scheduling

Environmental Monitoring in national scale should be a multiannual evolving framework according to the needs and the available funding. The overall timetable in a six year monitoring circle is presented in the next table.

Table 13: General timetable of the proposed monitoring system

		Reporting frequency	
		Annually	Long term
Data collecting frequency	Continues	Average air temperature, Quantity of atmospheric rainfalls, atmospheric precipitations, Urban Air pollutants Emissions (
	Seasonal sampling	sea level, Level of underground waters, Noise Levels, Bathing Water Quality	Morphological Condition of Inland Waters
	Yearly sampling / accounting	Energy consumption, Greenhouse gas emissions from transport, Share of renewable energy in final energy consumption, Passenger /Freight transport demand, Emission intensity of domestic sector, Overnight stays in Hotels, Solid Waste, Pollutant releases to air, water and waste from industrial facilities, GDP, fisheries	Emission intensity of agriculture, Agriculture: area under management practices potentially supporting biodiversity, Population, Designated Areas
	Long term sampling		Biological and ecological Condition of Inland Water, Hazardous substances in marine organisms, Species /Habitats of European Interest, , Species Diversity, Fragmentation of natural and semi-natural areas, C1,C2,C3,C4,C5,C6

In addition to the above Programme the following actions are proposed. The proposal is based on an hypothesis of economic recourses availability. Further development scenarios taking account the availability of financial resources will be further discussed in the next.

Table 14: Implementation Actions time plan

Action	Time
Establishment of a GIS based monitoring IS	
Procurement of Hardware, Software and networking of Geospatial Information System	2017-2018
Background setting - import of existing data and human resources training	2018
Data Development	
Assign and implement surveillance of the conservation status surveys for: 1. Habitats and Flora, 2 Mammals, 3 Reptiles, amphibians and Freshwater Fishes 3. Invertebrates, 4. Birds and 5. Sea species and Habitats	2017-2019
Accessing Bathing water quality to 100 sites	2017
First surveillance monitoring to meet WFD standards	2016-2018
Waste management statistics	2016
Process of transport and energy indicators based on national accounts	2017
Process indicators of indicators relative to fishes and coastal tourism	2017
Quality Policy Protocols	
Review of QA/QC and date entry protocols	2016

5. Coordination mechanism and Implementation Procedures.

According to the 2009 DCM on monitoring MoEFWA was appointed as the responsible authority for environmental monitoring in the country and, with the support of EFA (now NEA), supervises the monitoring activities carried out by relevant institutes. At the same time, it is the main beneficiary and custodian of the monitoring data collected.

According to the provisions of the 2011 Law on Environmental Protection, NEA will become the competent authority for the management of the National Monitoring Network for the Environment, which includes all institutions performing environment-related monitoring tasks.

- Other ministries involved in the DCM on monitoring are:
- Ministry of Agriculture, Rural Development and Water Administration
- Ministry of Defense (Weather Service)
- Ministry of Energy and Industry (Geology Survey)
- Ministry of Health (Institute of Public Health)
- Ministry of Transport and Infrastructure
- Ministry of Environment (NEA)
- Ministry of Interior (Local government - responsible for waste management)

Responsibilities and capacities of each authority / agency on monitoring according to recent legal developments are presenting at the table below:

Table 15: Evaluation of the institutional capacity in monitoring

Environmental Policy theme	Responsible for monitoring agencies	Evaluation remarks
Climate Change	MoE/NEA for policy specialisation and monitoring planning. The collection of data is need extensive cooperation with other agencies (mainly the Ministries of Commerce and Rural development). Ministry of defence is responsible for the functioning and data gathering of weather stations. Geological survey possesses the capacity for erosion monitoring procedures.	Enhancing NEA both quantitatively and qualitatively is needed to fill gaps. Upgrading the quality associated with the creation of a training session plan on environmental monitoring issues of executives. The establishment of co-operation and communication protocols between ministries and agencies for the collection of quality-approved data is the key not only for the fulfilment of monitoring obligations but also for the efficiency of financial allocation. High-level scientific expertise (e.g. for Universities) will be needed to set up the initial models (see Chapter 7).
Air quality / Noise	MoE/NEA for policy specialisation and monitoring planning.	Enhancing NEA both quantitatively and qualitatively is needed. Upgrading the quality is associated with the creation of a training session plan on environmental monitoring issues of executives. The responsibilities for maintain of stations can alternative be given to the municipalities. This will also require staff training.
Water	Join responsibility from Ministries of Agriculture, Rural Development and Water Administration and of Environment for specializing monitoring planning (?) / Geological Survey possess the capacity for survey of groundwater, Institute of Public Health (to some point) for microbiological analysis. Management bodies are (under the supervision of NEA) is also responsible for monitoring the outputs of wastewater plants	The implementation of the monitoring tasks according to the WDF provisions will require an update of the human resources and financial support. The existing experience is an asset and it should be used. In order to cover these expenses the cost of each operation is estimated in chapter 7. The budget will cover the needs for covering the scientific staff.
Bathing Waters	Ministry of public Health (IPH) is currently holds the capacity (both at human and technological resources)to apply the monitoring status. NEA is responsible for policy specialisation	IPH should take charge of a multiyear monitoring programme targeting to 100 monitoring stations. The resources can be covered by IPA instruments
Biodiversity / Forestry	MoE/NEA for policy specialisation and monitoring planning, Ministry of Rural development possess responsibilities regarding forestry and organic farming.	The biodiversity monitoring will need outsourcing in order to collect the primary data and perform country range assessment. The national and local authorities posses the human and technological resources to monitor forestry indicators (financial support needed).
Waste management	Ministry of interior is responsible for collecting and organise statistical data for urban waste management (from local authorities– Waste installations Management Bodies). Ministry of Public Health for medical wastes. NEA is responsible for all other categories of solid waste.	Monitoring is based on inventory counting, so as the technical plan of waste management facilities will progress, the easier the collection of data should be.
Industry	NEA and regional EA are responsible for gather data (provided by the owners) on industrial emissions	-

6. Costing and Budgeting

Given the necessity in fixed costs (equipment) and the need for background scientific work in order to document base values for monitoring, costing and budgeting of the monitoring information system is analyzed in a five years dept time.

The budget is consisted in “modules” that referring to separate processes (indicators or group of indicators) in order to enable an a la carte implementation, according to the each giving financial possibilities. This will support a flexible medium-term investment strategy and the exploitation of all the possible financial sources (that in most occasions are not synchronized). Two scenarios will be calculated:

- The first will contain all the necessary costs for the full implementation of the proposed Programme
- The second will be restricted to the most affordable budget by taking account i) the existing mechanism, ii) the development of national policy (and the implementation of the relevant plans/ infrastructures), the financial effort to keep each Indicator.

Between those two options, all the intermediate scenarios can be implement in accordance to the availability of resources and the intense of needs.

Ssubsequently the availability of financial sources will be presented for each module. The evaluation of the availability will be assigned not only in terms of “eligibility” but of “sustainability” also. The later is essential because it has being noticed that in many cases financing such actions through international programmes does not guarantee the continuation of monitoring or management actions after the end of financial support.

6.1 Costing of Actions and modules

Action I: Establishment of a GIS based monitoring IS.

The procurement, installation, development and training needed in order to establish the geospatial Information System for Environmental Monitoring and Management is listed at the following table:

Table 16: Costing of Information System

GIS monitoring system	Unit cost	Quantity	Total
I. Hardware and software acquisition and installation			
Servers (application & database incl. O.S.)	2.600 €	1	2.600 €
Computers (incl. OS)	1.100 €	14	15.400 €
Database software	15.000 €	3	45.000 €
GIS Server licence	20.000 €	2	40.000 €
Desktop GIS licences	2.500 €	12	30.000 €
Remote sensing software	3.500 €	2	7.000 €
Firewalls and protection		-	6.000 €
Networking			1.500 €
Tablets for on site data entry (plus software)	600 €	6	3.600 €
Consumables (per year)	2.000 €	5	2.000 €
Other (scanners, plotters, external hard disks etc)			10.000 €
II. Software development			
Modules for spatial analysis	1.000 €	12	12.000 €
web publishing software	2.500 €	2	5.000 €
III. Services (work months)			
Implementation assessment	2.200 €	6	13.200 €
Digitising and import of existing data	1.300 €	60	78.000 €
QA/QC and data entry protocols (including certification)	3.500 €	24	84.000 €
Set up of GIS platform	2.000 €	30	60.000 €
Training (work hours)	8 €	1200	9.600 €
Dissemination and Publicity			15.000 €
TOTAL			439.900 €

Action II: Data Development

Module a - Climate Change:

The measurement of Average temperature and the quantity of atmospheric rainfalls does not require any additional cost. The installation of automatic of automatic meteorological stations that will provide continues on line data is desirable but not necessary. A mean price for such a station (including data logger and GPRS modem) is estimated in 3.000 euro per station. The Level of underground waters is measured by (portable or steady) contact Gaussens. The responsible authority (geology Survey) possess the adequate equipment. The measurement of Sea level is being done by EEA for all seas that are surrounding the European Continent. GHGs Inventories according to the EU legislation and International Treaties (IPCC) will cover the needs for calculating the indicators referring to Final energy consumption and Greenhouse gas emissions. As it has already been stated the calculations are based in algorithms that elaborate statistical and spatial data concerning the national energy market, the mobility patterns,

the production of goods (primary and industrial), the land uses, the quality and quantitative characteristics of forests and pollution production of large industrial. Such calculations require the dedication of highly skilled scientific staff and it is suggested to be outsourced to an appropriate institution in order not to overcharge the function of NEA (that will keep the validation of the results responsibility). The costing for such an assignment is calculated in two parts, as following:

- Greenhouse Gas Inventory and reporting on implementation of European law and international conventions on the five key areas of human activities (energy, industrial processes, solvents, agriculture and waste).
- Greenhouse Gas Inventory and reporting on implementation of European law and international conventions on the sector Land Use, Land Use Changes, Forestry

It must be noted that the following cost is covering the full extent of national obligations to the implementation of UNFCCC and not only the Environmental Monitoring.

Table 17 Costing for climate change Mitigation Monitoring

Climate change	Workdays	Unit Cost	total
i. Equipment			
data loggers and modems for continues meteorological data	3000	10	30,000 €
ii. Green House Inventories (four year monitoring circle			
Part 1: Inventories for 5 basic sectors			(200.000 €)
Data collection and input from local and Central authorities	150	450	67,500 €
CRF tables that contain the calculations of emissions and relevant information, according to articles 7.1 and 7.2 of Regulation 525/2013	250	280	70,000 €
Report about the development of low emissions strategies (Article 4)	300	50	15,000 €
Report about the implementation of measures related with articles 12 and 13 of 525/2013 Regulation	300	40	12,000 €
National Inventory Report of GHGs	300	120	36,000 €
Part 2: LULUCF Inventory			(95.000 €)
Data collection from Central and local forest agencies	150	180	27,000 €
Inventory of emissions and absorption in accordance with Annex I to Decision 529/2013 / EU that imply in the categories afforestation, reforestation, forest management, cropland management, grazing land management	250	200	50,000 €
Annual account for emissions and removals	300	60	18,000 €
Total			- €
QA/QC procedures	250	60	5,000 €
National Communication completion	300	80	24,000 €
Modelling for transport emissions cluster indicator	300	25	7,500 €
Total			342,000 €

The **share of renewable energy in final energy consumption** should be available through the Energy regulatory authorities. **Energy Efficiency indicator** will be calculat-

ed in the annual report of National Action Plan Implementation (as it is defined in the EED 2012/27/EU and when it will be adopted).

Soils Erosion and **Coastal Erosion** monitoring are based on models that are using free data (LANDSAT images, CORINE BD, European Soil Geographical Database etc.) The cost for the production can be assessed from the number of working days needed to:

- gather, import and process the data,
- establish and calibrate the models
- and product the report

The overall working days needed for a 6 year monitoring circle are estimated to 700, and the total cost is calculated at 180,000 €

Module b - Air pollution.

The basic scenario is assuming that the Air pollution monitoring is based in the existing equipment. In this case the costs are referring to two basic categories a) maintain cost for the existing equipment, b) sampling and chemical analysis cost. The full implementation scenario is assuming the installation of 8 additional automatic stations that will cover at least 3 more points in Tirana (5 in Total) an additional station in Durres and in Vlora and coverage of the remain urban centres with population exceeding 50,000 inhabitants.

Table 18: Costing of Air monitoring module

Air Monitoring	OVERALL			BUDGET	
	Unit cost	Quantity	total	Quantity	Total
I. Equipment and Maintain Cost					
a. Automatic Stations					
Upgrade of Automatic stations (equipment, modems, data logger)	18.500,00 €	8	148.000,00 €		- €
Annual Maintain	4.500,00 €	15	67.500,00 €	7	31.500 €
Consumables and Functional cost (including power supply)	5.000,00 €	15	75.000,00 €	7	35.000 €
Labour costs (technician) per work Hour	8,00 €	350	2.800,00 €	200	1.600 €
b. semi automatic Stations / passive tubes					- €
Annual Maintain	2.500,00 €	4	10.000,00 €	4	10.000 €
semi-automatic stations consumables and Functional Cost	3.000,00 €	4	12.000,00 €	4	12.000 €
Labour costs (technician) per work Hour	5,00 €	50	250,00 €	50	250 €
Annual filter weighing costs for gravimetric PM10 monitoring	80,00 €	113	9.040,00 €	113	9.040 €
Analysis of HM (per sample)	20,00 €	400	8.000,00 €	400	8.000 €
II. Sampling cost			- €		- €
Staff Cost (per diem) in workdays	40,00 €	455	18.200,00 €	455	18.200 €
Travel cost (per mission)	50,00 €	40	2.000,00 €	40	2.000 €
Data analysis and reporting (workdays)	120,00 €	50	6.000,00 €	50	6.000 €
TOTAL			352.790,00 €		127.590 €

Module c - Surface, underground waters chemical and biological analysis / Bathing waters.

Costing of this category is depending largely at the availability of fully equipped Chemical and Biological Laboratories, capable to perform the needed tests and measurements. Tacking account the size of the country it is estimated that at least 2 Water laboratories are required. Those must be equipped with various types of spectrophotometer, ionic chromatographer systems, atomic absorption systems, various microscopes, aelge analysers and other analytical chemistry and supportive (freezers, ovens ect) equipment. Biological analysis equipment contains Laminar flow chambers, incubators, UV lamps, DNA analysers ect. The cost of a fully equipped laboratory depending on the equipment is estimated from 500,000 to 800,000 euros.

Apart from laboratory equipment, water quality monitoring is require portable equipment to measure field base parameters such as flow, temperature, dissolved O₂, etc. Assuming that there will be 247 sampling stations (2016 monitoring plan: 151 for rivers, 35 for lakes, 33 for lagoons, 28 for transition waters) it is estimated that 6 sampling teams will be required to perform the annual monitoring programme required by WFD (for surface waters), 4 of which will also sample for biological monitoring (biannual). One additional teams will be needed for groundwater monitoring and two more for bathing water quality.

Per diem has been estimated to 5,500 ALL (apr. 40 euro) per person and the mean travel cost is estimated at 63 euro

The total number of samplings / samplers that will be collected at annual base is estimated bellow:

Table 19: Required Number of water samplings per water type

	Stations	Annual number of samples per station	Total
Surface waters	247	2	494
Groundwater	39	2	78
Bathing waters	100	4	400
Total	386		972

The categories of annual cost for a six year period monitoring circle is presented in the following table. In this costs it is not included the development of the quality assurance and control policy that will be required

Table 20: Costing of water monitoring module

	Unit cost	Quantity	total
Surface Waters			
i. Equipment			
Portable meters (pH, dissolved O2, salinity, Temp)	800 €	6	4,800 €
Electrofishers	7,500 €	4	30,000 €
Gaugers and underwater samplers	800 €	2	1,600 €
Total (annual cost is estimated 1/5)			7,280
ii. water Sampling			
per diem (mission = 3 stations per day X 3 persons)	120 €	42	5,040 €
per diem (mission = 3 stations per day X 2 persons)	80 €	283	22,640 €
consumables per sampling (gloves, sample transfer boxes and packaging containers)	9 €	972	8,748 €
Travel cost (per mission - including samples conservation)	63 €	325	20,475 €
			56,903 €
iii. Water analysis (surface and groundwater)			
Chemical status	90 €	572	51,480 €
Priority Substances and Pollutants	150 €	572	85,800 €
Fishes (only surface - biannual)	120 €	124	14,880 €
diatoms and macrophytes (only surface - biannual 50% of stations)	80 €	62	4,960 €
benthic macroinvertebrates (only surface - biannual)	150 €	124	18,600 €
microbiological analysis of groundwater	120 €	78	9,360 €
			298,886 €
iv. Bathing waters			
per diem (mission = 8 stations per day X 2 persons)	80 €	13	1,040 €
consumables per sampling (gloves, sample transfer boxes and packaging containers)	9 €	100	900 €
Travel cost (per mission)	50 €	10	500 €
microbiological analysis	120 €	400	48,000 €
			50,440 €
			413,509

The assessment to calculate the indicator “Emission intensity of domestic sector (liquid urban discharges)” is pricing at **15,000** euro.

Module d - Biodiversity.

Biodiversity monitoring is mainly calculated at terms of work months and it is considered that will be outsourced. The unit cost is estimated at 120 euro per day in all cases except from sea species and Habitats that the cost is estimated to 350 euro per workday due to the special equipment that is required. Interior water fishes are not included in the calculations, since their diversity will be investigated in Water quality assessment. The biodiversity surveillance-monitoring Programme is expected to last 3 years.

Table 21: Costing of biodiversity module

biodiversity -Surveillance of the conservation status surveys	Unit cost	Quantity	total
Habitats and Flora ²	150,00 €	2,000	225,000 €
Mammals	150,00 €	2,200	330,000 €
Reptiles, amphibians	150,00 €	1,000	150,000 €
invertebrates	150,00 €	1,000	150,000 €
Birds	150,00 €	3,500	525,000€
Sea species and Habitats	350,00 €	1,500	525,000€
Total Cost			1,980,000€
Annual cost			990,000 €

Module e. - Forestry.

National Monitoring Program (PKM) for 2016, provides for pan-European C2 and C4 criteria in the monitoring process, which shall be implemented with the engagement of the AKM staff and, in the case of having financial support, for C2.1 indicator, the disposal of the air pollutants, C2.2, the state of the soil, and for C4.2, with the involvement of third parties (scientific public and private entities). Their development shall make possible the updating of information in the framework of the fulfillment of the immediate and medium terms objectives of efficiency in the regeneration of forests and the prognosis of the forest state and health.

The estimated budget for those assignments is **255.000 euro**.

Module f. - Waste management / industrial emissions

The cost of statistics on waste management will be absorbed by the obligation of the participants on monitoring and reporting. In order to have trustful and reliable data it shall be envisaged to create protocols on data quality policy covering the collection, reporting and aggregation of the Data.

Module g. - Tourism and Fisheries

Not any additional spending is required to calculate the indicators

Action III: Quality policy protocols and training

For each module the following cost is estimated that it will be assigned for covering quality related expenses, concerning both the design of protocols and the training.

Table 22: QA/QC cost

	Protocol Design	Staff training
Module a	5,000	2,000
Module b	5,000	5,000
Module c	20,000	20,000
Module d	25,000	25,000
Module e	5,000	5,000
Module F and G	10,000	2,000
TOTAL	70,000	59,000

6.2 Budget and Financial Scenarios

As at has already stated the are two basic financial scenarios.

The first calculates the complete implementation of the proposed plan (without calculating any need for new chemical laboratory installments) on a six year monitoring circle.

Table 23: Overall budget - Complete implementation scenario

	2016	2017	2018	2019	2020	2021	
Establishment of a GIS based monitoring IS	175,960	263,940					439,900
Data Development							0
Module a	160,500	145,500	145,500	85,500			537,000
Module b	358,790	210,790	210,790	210,790	210,790	210,790	1,412,740
Module c	428,509	413,509	413,509	413,509	413,509	413,509	2,496,054
Module d		660,000	660,000	660,000			1,980,000
Module e	255,000		25,500		25,500		306,000
Module f							0
Quality policy protocols and training	70,000	59,000					129,000
	1,448,759	1,752,739	1,455,299	1,396,799	649,799	624,299	7,300,694

The second is provide a budget solution with is built with the following assumptions:

- canceling of all Indicators that are not referred to the EEA Indicators list,
- cancelling the procurement of new air quality monitoring stations,
- limiting the water quality sampling by 70%.
- cutting the expenses on GIS equipment in half,
- spreads the biodiversity surveillance at four years instead of three.

Table 24: Overall budget - Minimum implementation scenario

	2016	2017	2018	2019	2020	2021	
Establishment of a GIS based monitoring IS	65,985	65,985	87,980				219,950
Data Development							0
Module a	85,500	85,500	85,500	115,500	60,000	30,000	462,000
Module b	127,590	127,590	127,590	127,590	127,590	127,590	765,540
Module c	289,456	289,456	289,456	289,456	289,456	289,456	1,736,738
Module d		49,000	49,000	49,000	49,000		196,000
Module e	255,000						255,000
Module f - g							0
Quality policy protocols and training	50,000	30,000					80,000
	873,531	647,531	639,526	581,546	526,046	447,046	3,715,228

6.3 Financial Sources

There are two main financial sources. The National Budget and International Development Assistance. The second includes:

The IPA II Albania 2014-2020 Programme, with funding allocation of €649.4 million. The Programme is including a Priority Axe for “Environment and climate action” with budget €68 million. Main target of the Priority Axe is the Alignment with EU law and standards; better treatment of waste and water; controlling air pollution. Monitoring activities in fields related with the alignment of EU Environmental Framework (WFD, HABITATS DIRECTIVE) is eligible and can be financed by the IPA II. In addition the installation of the Information System can be also financed from IPA II 2014-2020 under the same priority.

Another funding opportunity especially for the coastal zone related monitoring

activities (sea biodiversity, fisheries, bathing quality) is the EUAIR 2014-2020 Territorial Cooperation Programme.

Funding opportunities from Cross Border Cooperation Programmes (Greece - Albania, Italy - Albania-Montenegro) can focus on i) Transboundary river basin management, ii) Common renewable energy plans, iii) Management of Transboundary Protection Parks.

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