

# Progress in the production and sharing of core environmental indicators

in countries of South-Eastern and Eastern Europe, Caucasus and Central Asia



The European Neighbourhood Partnership Instrument -  
Shared Environmental Information System (ENPI-SEIS) project



## Note



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# Acknowledgment



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# Foreword



There has been much discussion lately about the global “data revolution” necessary to ensure sustainable development and monitor progress in achieving the goals and targets of the soon to be agreed sustainable development goals (SDGs). This publication shows that the data revolution is well underway in the South Eastern European, Eastern European, Caucasus and Central Asian countries.

UNECE, in collaboration with its partner the European Environment Agency (EEA), and thanks to donors such as the European Union, Norway, Switzerland and the Russian Federation, has been working with 17 target countries<sup>1</sup> to produce and share environmental data in areas such as water, air pollution, ozone depletion and climate change. This publication analyzes progress of our work on the production and sharing of a core set of eight environmental indicators. It reveals that the vast majority of the target countries produce indicators that are compliant with the international standards and formats that they agreed upon in the UNECE Joint Task Force on Environmental indicators. Moreover, between May and November 2014 alone the number of indicators published online has increased by 22.1 %. This proves that all

target countries are striving to share all indicators they produce while improving the content and user-friendliness of the websites where information on the indicators is shared.

All of this is good news for the future monitoring and reporting on the SDGs at the global level and the establishment of a regular environmental reporting process at the pan European level. It is clear that more remains to be done to expand this core set and eventually publish online the entire set of agreed environmental indicators in the UNECE Revised Indicator Guidelines. But it is also evident that the continued hard work of the target countries, as well as the strengthened cooperation of organizations working on environmental data and assessments in the region, will ensure that the establishment of a Shared Environmental Information System in the pan European region will become a reality.

The process for the production and sharing of indicators engaged both environmental authorities and statistical agencies to carry out joint tasks; I believe it is an example that could be replicated elsewhere and for other environmental issues. Indeed, the target countries deserve a great deal of credit for their perseverance and dedication and I take this opportunity to congratulate them for their

<sup>1</sup>Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Republic of Moldova, Russian Federation, Serbia, Tajikistan, the former Yugoslav Republic of Macedonia, Turkmenistan, Ukraine and Uzbekistan.

<sup>2</sup> In May 2014 the 13 target countries that submitted data overall published 70.2% of the core indicators online, while in November 2014 92.3% were published.

achievements. UNECE stands ready to continue working with EEA and our other partners to fulfil the ambitious agenda we have set for ourselves

and the region in the area of environmental monitoring and assessment.



Christian Friis Bach

Executive Secretary

Economic Commission for Europe

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# Part I Introduction



The countries of South-Eastern and Eastern Europe, Caucasus and Central Asia<sup>2</sup> have been working together since 2009 in the United Nations Economic Commission for Europe (UNECE) Joint Task Force on Environmental Indicators (Joint Task Force) to enhance the comparability of environmental statistics between each other and within the entire pan-European region. The group serves as a forum for joint work on improving environmental data collection, reporting and assessment. In their efforts to achieve the above-mentioned goals, the countries have reviewed and agreed to apply a set of 42 environmental indicators contained in the Revised Guidelines on the Application of Environmental Indicators (Indicator Guidelines).<sup>3</sup> The countries have the common ambition to produce and share all the indicators and their underpinning datasets in the near future, which is an important step towards establishing a Shared Environmental Information System (SEIS).

Environmental indicators are important to help policy makers at national and international levels to better understand the undergoing changes to the environment, to compare the results with neighbouring countries, and to take informed policy actions for safeguarding the environment. They also enable citizens to access comprehensive

information about the ambient environment in an effective manner.

The process focused on the production and sharing of the environmental indicators has accelerated since 2013 under the Joint Task Force.<sup>4</sup> The countries, in this process, have started working with eight indicators and eleven of their underpinning datasets referred to as 'core indicators'. They cover five thematic areas: air, climate change, water, biodiversity and waste (see table 1).

The countries requested that the review of their production and sharing of the environmental indicators be supported by an analysis prepared by the secretariat and presenting the status of production and sharing for each core indicator in every country. The analysis was presented and discussed at the Eighth Session of the Joint Task Force in May 2014 (CEP-CES/GE.1/2014/3). It helped to formulate a set of 14 tailor-made recommendations for the countries to guide them in strengthening the production and sharing of indicators (CEP-CES/GE.1/2014/4). The analysis was further updated to note progress made between May 2014 and November 2014 in implementing the agreed recommendations.

This publication contains this updated analysis on the progress of the target countries in the

<sup>2</sup> The target countries of the Joint Task Force on Environmental Indicators are the following: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Republic of Moldova, Russian Federation, Serbia, Tajikistan, the former Yugoslav Republic of Macedonia, Turkmenistan, Ukraine and Uzbekistan.

<sup>3</sup> <http://www.unece.org/env/indicators.html>

<sup>4</sup> As decided by the countries at the Seventh Session of the Joint Task Force.



production and sharing of the eight core indicators, status as of November 2014.

It is based on indicators, underpinning datasets and background information shared through national websites. Links to those websites were provided by the following thirteen target countries: Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Republic of Moldova, Russian Federation, Serbia, the former Yugoslav Republic of Macedonia and Ukraine.

In addition, Tajikistan confirmed that a number of the core indicators are produced and should be published online soon. Three other countries (Albania, Turkmenistan and Uzbekistan) have not provided clear indications to as of when they

would publish the core indicators.

This publication consists of an executive summary of the most importing findings of the analysis (chapter II) and the in-depth analysis of the production and sharing of indicators (chapter III). The section on indicator production presents the analysis of countries' performance in producing the indicators according to the methodologies stipulated in the Indicator Guidelines. Following this, the section on the online sharing of indicators assesses whether the information on the indicators is published on the national websites presented in a clear and informative manner. The publication closes with an outlook on future activities of the Joint Task Force.

Table 1: Eight environmental core indicators and eleven of their underpinning datasets.

| Indicators from the Indicator Guidelines                          | Sub-indicator   | Dataset   |
|---|---|---|
| 1. Emissions of pollutants into the atmospheric air (A1)          | 1.1 Emissions of sulphur dioxide per capita (1)   | (1) Emissions of SO <sub>2</sub>  |
|   | 1.2 Emissions of sulphur dioxide per square kilometre (2)   |   |
|   | 1.3 Emissions of nitrogen oxides per capita (3)   | (2) Emissions of NO <sub>x</sub>  |
|   | 1.4 Emissions of nitrogen oxides per square kilometre (4)   |   |
| 2. Ambient air quality (A2)                                       | 2.1 Annual mean concentration of nitrogen dioxide in the major city (5)   | (3) Mean concentration of NO <sub>2</sub>                                     |
| 3. Consumption of ozone-depleting substances (ODS) (A3)           | 3.1 Aggregated consumption of ODS (6)   | (4) Consumption of ODS  |
| 4. Greenhouse gas (GHG) emissions (B3)                            | 4.1 Emissions of carbon dioxide per capita (7)  | (5) GHG emissions   |
|   | 4.2 Emissions of carbon dioxide per unit of GDP (8)   |   |
| 5. BOD <sub>5</sub> and concentration of ammonium in rivers (C10) | 5.1 BOD <sub>5</sub> concentration in the major rivers (3 sampling points – upstream, downstream, intermediate) (9) | (6) BOD <sub>5</sub> concentration in the rivers                              |
|   | 5.2 Ammonium concentration in the major rivers (3 sampling points – upstream, downstream, intermediate) (10)        | (7) Ammonium concentration in the rivers                                      |
| 6. Nutrients in freshwater (C11)                                  | 6.1 Nitrates concentration in major water bodies (lake, reservoirs) (11)  | (8) Nitrates concentration in the major water bodies                          |
|   | 6.2 Total phosphorus concentration in major water bodies (lakes, reservoirs) (12)                                   | (9) Total phosphorus concentration in the major water bodies                  |
| 7. Protected areas (D1)   | 7.1 Share of total protected areas in the country area (13)   | (10) Areas under protection in total and broken down by regimes of protection |
| 8. Waste generation (I1)  | 8.1 Annual generation of municipal waste per capita (14)  | (11) Annual municipal waste generation  |



### *Production*

Many countries of South-Eastern and Eastern Europe, Caucasus and Central Asia achieved a considerable progress in the production and online sharing of the eight core UNECE environmental indicators. At the same time, for a number of countries it is pointed out in the analysis that further improvements are necessary.

The indicator production was assessed in terms of data structure, format and times series as recommended by the Indicator Guidelines. Furthermore, only indicators published on the national webpages were considered.

Thirteen of 17 target countries publish all or most

required parameters (i.e. the sub-indicators and/or the underpinning datasets) for the core indicators, while only a few countries did not provide some of the parameters. Overall, these countries fully meet the requirements of the Guidelines on the structure in 72.1% of the cases and partially meet them in 20.2% of the cases.<sup>5</sup> The percentage of indicators fully meeting the Guideline would further increase if, for all core indicators, the sub-indicators showing the relation to Gross Domestic Product (GDP), country area or population, would be provided. At the same time, in a few other cases, regular processes for data collection have to

#### *Factbox – Production of the core indicators*

- Thirteen target countries providing links to indicators fully meet the requirements of the Indicator Guidelines in more than 70% of the cases.
- Twelve of the 13 target countries providing data fully meet the requirements for indicator “Biochemical oxygen demand and concentration of ammonium in rivers” (C10).
- Eight target countries fully meet the requirements for indicator “Nutrients in freshwater” (C11) compared to only two countries earlier in the year.
- Five target countries only partially meet the Guidelines for the indicator “Emission of pollutants into the atmospheric air” (A1). In most cases this can be easily corrected by presenting data on emissions per capita and country area for stationary and mobile sources.
- The majority of the target countries produce additional datasets under the indicators “Emissions of pollutants into the atmospheric air” (A1), “Ambient air quality in urban areas” (A2) and “Nutrients in freshwater” (C11).

<sup>5</sup> Considering that the 13 countries are reviewed in their performance on eight core indicators we look at 104 cases. Out of these in 75 cases the Guidelines are “fully met” and in 21 cases they are “partially met”.

be set up or improved to fully meet the requirements of the Guidelines.

When it comes to the progress between May and November 2014 (see table 2) gradual improvements can be noticed in meeting the requirements of the Guidelines on the production of the parameters. The ratio of meeting the Guidelines requirements by the 13 countries increased by 10,6 percentage points between May and November 2014: from 61.5% to 72.1% of requirements met. When considering the improvements in data production between May and November 2014, one must keep in mind that

for the analysis in May also data submitted in Excel sheets to the secretariat of the Joint Task Force were taken into account. In some cases not all datasets and sub-indicators that are produced are published online yet so that there are a few cases in which the assessment had to be lowered for November 2014. However, this means that an even better picture can be expected in the next months when all data produced are shared online.

The greatest progress between May and November 2014 is noted for the indicator “Nutrients in freshwater” (C11). The analysis in May 2014 showed gaps for many countries in the

Table 2: Progress between May and November 2014 (Production)

| Indicator  | ARM    | AZE    | BLR    | BIH   | GEO    | KAZ    | KGZ    | MNE    | MDA    | RUS    | SRB    | MKD    | UKR    |
|--|--------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| <b>Production of 8 Core Indicators<br/>(Based on submitted links or data sheets, May 2014)</b> |        |        |        |       |        |        |        |        |        |        |        |        |        |
| Emissions of pollutants into the atmospheric air (A1)  | Green  | Yellow | Green  | Red   | Green  | Green  | Green  | Green  | Yellow | Green  | Green  | Green  | Yellow |
| Ambient air quality in urban areas (A2)  | Green  | Green  | Green  | Green | Green  | Green  | Green  | Green  | Green  | Yellow | Green  | Green  | Red    |
| Consumption of ozone-depleting Substances (A3)   | Green  | Green  | Green  | Green | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Red    |
| Greenhouse gas (GHG) emissions (B3)  | Green  | Green  | Yellow | Green | Green  | Green  | Green  | Green  | Red    | Green  | Yellow | Green  | Yellow |
| BOD <sub>5</sub> and concentration of Ammonium in rivers (C10)                                 | Green  | Green  | Green  | Red   | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Red    |
| Nutrients in freshwater (C11)  | Red    | Red    | Yellow | Red   | Red    | Red    | Red    | Red    | Red    | Yellow | Green  | Green  | Red    |
| Protected areas (D1)   | Green  | Green  | Green  | Green | Green  | Yellow | Green  | Green  | Yellow | Green  | Green  | Green  | Red    |
| Waste generation (I1)  | Green  | Yellow | Yellow | Green | Red    | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Yellow |
| <b>Production of 8 Core Indicators<br/>(Based on submitted links, October 2014)</b>            |        |        |        |       |        |        |        |        |        |        |        |        |        |
| Emissions of pollutants into the atmospheric air (A1)  | Green  | Yellow | Green  | Red   | Green  | Yellow | Green  | Yellow | Green  | Yellow | Yellow | Yellow | Green  |
| Ambient air quality in urban areas (A2)  | Green  | Green  | Green  | Green | Green  | Green  | Green  | Green  | Green  | Yellow | Green  | Green  | Red    |
| Consumption of ozone-depleting Substances (A3)   | Green  | Yellow | Green  | Green | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Red    |
| Greenhouse gas (GHG) emissions (B3)  | Yellow | Green  | Green  | Green | Yellow | Green  | Yellow | Green  | Green  | Green  | Yellow | Green  | Yellow |
| BOD <sub>5</sub> and concentration of Ammonium in rivers (C10)                                 | Green  | Green  | Green  | Green | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Green  | Red    |
| Nutrients in freshwater (C11)  | Green  | Green  | Yellow | Green | Green  | Green  | Yellow | Green  | Yellow | Yellow | Red    | Green  | Red    |
| Protected areas (D1)   | Green  | Green  | Yellow | Green | Green  | Yellow | Green  | Green  | Yellow | Green  | Green  | Green  | Red    |
| Waste generation (I1)  | Green  | Green  | Green  | Green | Red    | Green  | Green  | Green  | Yellow | Green  | Green  | Green  | Green  |
| <b>Legend</b>  |        |        |        |       |        |        |        |        |        |        |        |        |        |
| Indicator Guidelines on data structure are fully met   | Green  |        |        |       |        |        |        |        |        |        |        |        |        |
| Indicator Guidelines on data structure are partially met                                       | Yellow |        |        |       |        |        |        |        |        |        |        |        |        |
| No links provided/Indicator Guidelines not met   | Red    |        |        |       |        |        |        |        |        |        |        |        |        |

provision of data on total phosphorus and nitrates in lakes for this indicator with only two countries fully meeting the guidelines. Back then a number of countries provided data on rivers only and not for lakes. Additional information provided after May 2014 shows more complete data on this indicator with eight countries fully meeting the requirements of the Guidelines.

Beyond the core datasets for the indicators, target countries publish additional parameters for the indicators “Emissions of pollutants into the atmospheric air” (A1), “Ambient air quality in urban areas” (A2) and “Nutrients in freshwater” (C11). For the two indicators on air pollution (A1, A2), these parameters include data on non-methane volatile organic compounds, ammonia, carbon monoxide and a number of additional pollutants. For the indicator on “Nutrients in

freshwater” (C11), the majority of countries produce additional data on phosphorous and nitrates in rivers and nitrates in groundwater.

Concerning the data format, it is found that the indicators are provided predominately in the units of measurement required by the Indicator Guidelines. In a few cases, however, there are inconsistencies with the requirements for some indicators.

When it comes to the time series produced, which should cover the years 1990, 1995, and 2000-2013, the analysis shows that for the majority of indicators a sufficiently long time series of data are available.<sup>6</sup> A significant number of countries already publish data for 2013 for many indicators: in 49 out of 96 cases (51.0%), the data were published for 2013.

## ***Sharing***

### *Factbox – Sharing of the core indicators*

- Thirteen target countries provided links for a total of 96 indicators (average: 7.4 indicators per country), compared to twelve target countries providing 73 indicators (average: 6.1 indicators per country) earlier in the year.
- Nine target countries share data on all eight core indicators.
- Seven target countries publish a total of 31 core indicators in an interactive format, compared to four countries submitting links to 11 indicators in an interactive format earlier in the year.
- Most target countries publish background information for the majority of their core indicators, while only four of them share such information for all published core indicators.

The number of indicators published online has significantly increased between May and November 2014. As shown in table 3, for the analysis conducted in May 2014 twelve of the target countries provided links for a total of 73 indicators (average: 6.1 indicators per country).

For the present analysis as of November 2014, 13 countries provided a total of 96 indicators (average: 7.4 indicators per country). Progress in sharing indicators is found for almost all target countries. In particular this is the case for Georgia, which - after not submitting any links to indicator

<sup>6</sup> This is in line with recommendation 6 endorsed at the Eighth Session of the Joint Task Force.

Table 3: Progress between May and November 2014 (Sharing)

| Indicator  | ARM | AZE | BLR | BIH | GEO | KAZ | KGZ | MNE | MDA | RUS | SRB | MKD | UKR |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>Sharing of 8 Core Indicators</b>                            |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>(Based on submitted links or data sheets, May 2014)</b>     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Emissions of pollutants into the atmospheric air (A1)          |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Ambient air quality in urban areas (A2)                        |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Consumption of ozone-depleting Substances (A3)                 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Greenhouse gas (GHG) emissions (B3)                            |     |     |     |     |     |     |     |     |     |     |     |     |     |
| BOD <sub>5</sub> and concentration of Ammonium in rivers (C10) |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Nutrients in freshwater (C11)                                  |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Protected areas (D1)   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Waste generation (I1)  |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>Sharing of 8 Core Indicators</b>                            |     |     |     |     |     |     |     |     |     |     |     |     |     |
| <b>(Based on submitted links, October 2014)</b>                |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Emissions of pollutants into the atmospheric air (A1)          |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Ambient air quality in urban areas (A2)                        |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Consumption of ozone-depleting Substances (A3)                 |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Greenhouse gas (GHG) emissions (B3)                            |     |     |     |     |     |     |     |     |     |     |     |     |     |
| BOD <sub>5</sub> and concentration of Ammonium in rivers (C10) |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Nutrients in freshwater (C11)                                  |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Protected areas (D1)   |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Waste generation (I1)  |     |     |     |     |     |     |     |     |     |     |     |     |     |

| Legend  |  |
|---|--|
| Indicators produced (fully or partially meeting the Indicator Guidelines) and shared online         |  |
| Indicators produced (fully or partially meeting the Indicator Guidelines) and but not shared online |  |
| No data submitted or data submitted not meeting the requirements of the Indicator Guidelines        |  |

websites in May 2014 - shares now seven indicators online, while the Republic of Moldova provided links to four additional core indicators. Azerbaijan as well as Bosnia and Herzegovina added three indicators to the set published online. With this nine of 13 target countries share data on all eight core indicators. Moreover, the vast majority of webpages presenting indicators are easily accessible from the respective national agency's main/home webpages (see figure 1). Many countries improved the accessibility of the indicators

between May and November 2014. The few websites on which the navigation is still difficult may be due to work-in-progress. All target countries that submitted links except of two publish their indicators on individual webpages (one indicator per page) or structured by thematic area. Furthermore, the analysis finds considerable progress in the efforts of many countries to publish indicators in an interactive file format (see figure 2). While in May 2014 only four countries submitted links on eleven indicators published in an interactive format, as of November 2014 seven

Figure 1: Indicators easily accessible from the main page of the responsible agency

- Number of indicators easily accessible (May 2014)
- Number of indicators easily accessible (November 2014)

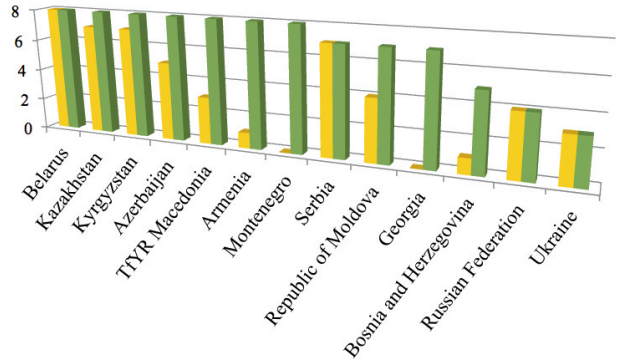


Figure 2: Indicators published in an interactive file format

- Number of indicators presented in an interactive file format (May 2014)
- Number of indicators presented in an interactive file format (November 2014)

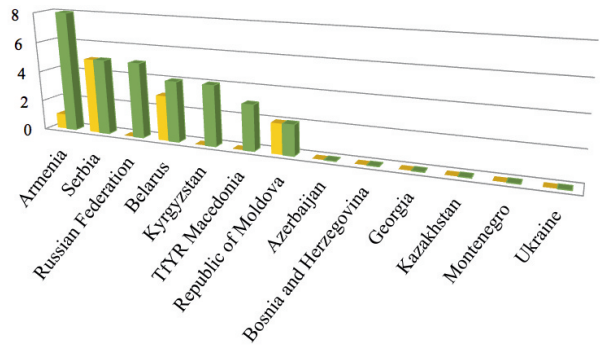
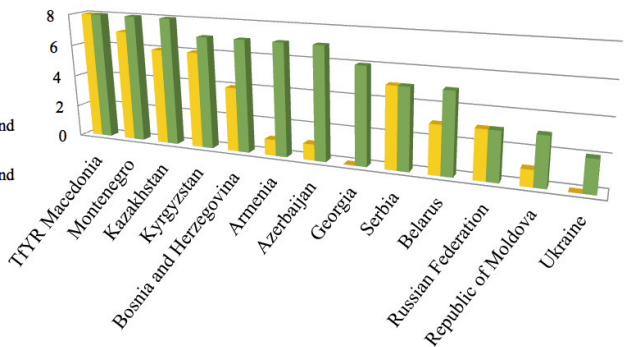


Figure 3: Indicators published with full background information

- Number of indicators provided with full background information (May 2014)
- Number of indicators provided with full background information November 2014)



target countries publish a total of 31 core indicators in interactive formats (32.3% of all submitted indicators). Three of the target countries already publish more than half of the eight core indicators in an interactive format: Armenia (8 indicators), Serbia (5 indicators), and the Russian Federation (5 indicators).

The analysis of the content of webpages sharing indicators shows also improvements in terms of providing basic background information on methodology as well as information on policy targets and a brief analysis of the data (see figure 3). As of November 2014 most countries publish such information for the majority of their core

indicators. However, only four countries (Bosnia and Herzegovina, Kazakhstan, Montenegro and the former Yugoslav Republic of Macedonia) share background information for all published core indicators. A number of countries have also included a note on the time of the last update of content to their webpages.<sup>7</sup>

In terms of the languages in which information on indicators is published, the current analysis confirms the finding of May 2014 that almost all countries present their indicators in the national or official language and a second language (Russian or English).

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<sup>7</sup>This is in line with recommendation 13 endorsed at the Eighth Session of the Joint Task Force.

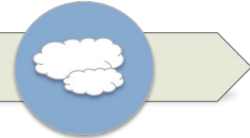
## Part III

# In-depth analysis of the production and sharing of indicators



### 3.1 Production

#### 3.1.1 Emissions of pollutants into the atmospheric air (A1)



This core indicator provides a measure of the pressure on environment in terms of total emissions of pollutants into the atmospheric air from stationary and mobile sources, which are regulated in the Protocols of the UNECE Convention on Long-range Transboundary Air Pollution.

The current analysis considers data on sulphur dioxide (SO<sub>2</sub>) emission per capita (sub-indicator 1.1) and per unit of country area (km<sup>2</sup>) (sub-indicator 1.2), as well as nitrogen oxides (NO<sub>x</sub>) emissions per capita (sub-indicator 1.3) and per unit of country area (km<sup>2</sup>) (sub-indicator 1.4). Countries achievements in this regard are summarized in table 4 together with respective links.

#### *1. Optimal level of indicator production*

##### *Structure*

For the optimal production of indicator A1, the calculation of total emissions of pollutants should include data from stationary and mobile sources for the following air pollutants:

- (a) Sulphur dioxide (SO<sub>2</sub>),
- (b) Nitrogen oxides (NO<sub>x</sub>), shown as nitrogen dioxide (NO<sub>2</sub>).

Also, as agreed at the Eighth Session of the Joint Task Force and noted in recommendation 2, countries should gradually produce data on the following parameters:

- (a) Non-methane volatile organic compounds (NMVOCs)
- (b) Ammonia (NH<sub>3</sub>)
- (c) Carbon monoxide (CO)
- (d) Hydrocarbons (CH)
- (e) Persistent organic pollutants (POPs)
- (f) Heavy metals
- (g) Particulate matter (PM<sub>10</sub> and/or PM<sub>2.5</sub> and/or total suspended particulates (TSP)).

The countries' achievements in producing these additional parameters are summarized in table 5. For the review of these additional parameters, information presented by countries at the Ninth Session of the Joint Task Force was taken into account. It is expected that countries will gradually share all available data on the additional parameters online.

For the calculation of sub-indicators 1.1, 1.2, 1.3,



1.4, the following parameters are to be used:

- (a) Population of a country;  
 (b) Area of a country.

*Format*

Pollutants: the parameters are to be provided in thousands of tons, tons, or kilograms of the respective pollutant; area of a country – in km<sup>2</sup>; population – in millions of people.

## 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

Table 4: Production of indicator A1 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia (SO<sub>2</sub> and NO<sub>x</sub>)

| Country                                   | Structure                                     | Format        | Times Series           | Link  |
|---|---|---------------|------------------------|---|
| Armenia                                   | Fully met (stationary and mobile sources)     | Fully met     | 1990; 1995; 2000-2013  | <a href="http://armstatbank.am/">http://armstatbank.am/</a>   |
| Azerbaijan                                | Partially met (stationary and mobile sources) | Fully met     | 1995; 2000-2013        | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>  |
| Belarus                                   | Fully met (stationary and mobile sources)     | Fully met     | 2005-2013              | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayushchaya-sreda/sovmetnaya-sistemam-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayushchaya-sreda/sovmetnaya-sistemam-ekologicheskoi-informatsii2</a>   |
| Bosnia and Herzegovina                    | <i>No links provided for this indicator</i>   |               |                        |   |
| Georgia                                   | Fully met (stationary and mobile sources)     | Fully met     | 2000-2012              | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>   |
| Kazakhstan                                | Partially met (stationary sources)            | Fully met     | 1990; 1995; 2000-2013  | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyium2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyium2jg7_118</a>   |
| Kyrgyzstan                                | Fully met (stationary and mobile sources)     | Fully met     | 1995; 2000-2013        | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a> ;<br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a>  |
| Montenegro                                | Partially met (stationary and mobile sources) | Partially met | 1990-2010              | <a href="http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora</a>   |
| Republic of Moldova                       | Fully met (stationary and mobile sources)     | Fully met     | 2001-2013              | <a href="http://statbank.statistica.md/pxweb/Database/EN/01%20GEO/GEO03/GEO03.asp">http://statbank.statistica.md/pxweb/Database/EN/01%20GEO/GEO03/GEO03.asp</a> ;<br><a href="http://date.gov.md/ckan/en/data/set/11449-volumul-de-emisii-a-poluantilor-in-aerul-atmosferic-de-la-sursele-stationare">http://date.gov.md/ckan/en/data/set/11449-volumul-de-emisii-a-poluantilor-in-aerul-atmosferic-de-la-sursele-stationare</a><br><a href="http://www.statistica.md/pageview.php?l=en&amp;id=3845&amp;idc=462">http://www.statistica.md/pageview.php?l=en&amp;id=3845&amp;idc=462</a> |
| Russian Federation                        | Fully met (stationary and mobile sources)     | Fully met     | 2000-2013              | <a href="http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/environment/#/">http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistics/environment/#/</a> ;<br><a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf</a>  |
| Serbia                                    | Partially met                                 | Partially met | 2012-2013              | <a href="http://www.sepa.gov.rs/index.php?menu=202&amp;id=203&amp;akcija&gt;ShowXlinked">http://www.sepa.gov.rs/index.php?menu=202&amp;id=203&amp;akcija&gt;ShowXlinked</a>   |
| The former Yugoslav Republic of Macedonia | Partially met                                 | Partially met | 2002-2010 <sup>1</sup> | <a href="http://www.moepg.gov.mk/?page_id=746&amp;lang=en">http://www.moepg.gov.mk/?page_id=746&amp;lang=en</a>   |
| Ukraine                                   | Fully met (stationary and mobile sources)     | Fully met     | 1990-2013              | <a href="http://www.ukrstat.gov.ua">www.ukrstat.gov.ua</a>  |

<sup>1</sup> Please note that for several indicators, the former Yugoslav Republic of Macedonia has provided more recent data inserted in Excel files in May and October 2014. It is expected that the relevant webpages will be updated soon so that current data will be available online.

### Structure

Armenia, Belarus, Georgia, Kyrgyzstan the Republic of Moldova, the Russian Federation and Ukraine provide data which fully meet the requirements of the Indicator Guidelines. They publish the total of emissions, distinguishing stationary and mobile sources, as well as values for SO<sub>2</sub> and NO<sub>x</sub> emissions from stationary and mobile sources per capita and per country area.

Azerbaijan provides NO<sub>x</sub> emission data both for stationary and mobile sources and SO<sub>2</sub> emission data for stationary sources only. The NO<sub>x</sub> emission data distinguished by stationary and mobile sources per capita and per country area were also presented. At the same time, the data on SO<sub>2</sub> emissions from mobile sources is not provided per capita and per country area, while such data for stationary sources are published.

Kazakhstan has calculated all four sub-indicators, however only for emissions from stationary sources.

Serbia and the former Yugoslav Republic of Macedonia provided data on SO<sub>2</sub> and NO<sub>x</sub> emissions, but do not clearly distinguish between stationary and mobile sources, and do not present these data per capita and per country area.

Montenegro also did not provide data on SO<sub>2</sub> and NO<sub>x</sub> per country area and capita. Furthermore, it is not specified if data on emission are from

mobile or stationary sources. However, for 2010 data are broken down by sectors (e.g. energy production and distribution, road transport, etc.).

Bosnia and Herzegovina has not provided links for this indicator.

In terms of the additional parameters that should be produced gradually for this indicator, the analysis shows that data on NMVOCs, NH<sub>3</sub> and CO are already available for all target countries that submitted a link on this indicator. At the same time, data on CH, POPs, a number of heavy metals, and PM are available for most of those countries.

### Format

All countries providing data measure the indicators in units according to the required data format. However, Belarus does not have emission data per country area (km<sup>2</sup>), and Montenegro, Serbia, and the former Yugoslav Republic of Macedonia have not presented the emission data per capita (kg/capita) and per country area (km<sup>2</sup>).

Table 5: Production of additional parameters for indicator A1 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country    | NMVOCs | NH <sub>3</sub> | CO | CH | POPs | Heavy metals       | PM |
|------------|--------|-----------------|----|----|------|--------------------|----|
| Armenia    | X      | X               | X  | X  |      | X (Pb, Hg, As, Ni) | X  |
| Azerbaijan | X      | X               | X  | X  |      |                    |    |
| Belarus    | X      | X               | X  | X  | X    | X (Pb, Cd, Hg, As) | X  |

| Country                                   | NMVOCs | NH <sub>3</sub> | CO | CH | POPs | Heavy metals           | PM |
|---|--------|-----------------|----|----|------|------------------------|----|
| Bosnia and Herzegovina                    |        |                 |    |    |      |                        |    |
| Georgia                                   | X      | X               | X  |    | X    |                        |    |
| Kazakhstan                                | X      | X               | X  | X  | X    | X (Pb, Cd, Hg, Cu, As) | X  |
| Kyrgyzstan                                | X      | X               | X  | X  |      |                        | X  |
| Montenegro                                | X      | X               | X  | X  | X    | X (Pb, Cd, Hg, Ni, As) | X  |
| Republic of Moldova                       | X      | X               | X  | X  | X    | X (Pb, Cd, Hg, Ni, As) |    |
| Russian Federation                        | X      | X               | X  | X  | X    | X (Pb, Cd, Hg, Ni, As) | X  |
| Serbia                                    | X      | X               | X  |    | X    | X (Pb, Cd, Hg, Ni, As) | X  |
| Tajikistan                                | X      | X               | X  |    |      | X (Pb)                 |    |
| The former Yugoslav Republic of Macedonia | X      | X               | X  |    | X    | X (Pb, Cd, Hg, Ni, As) | X  |
| Ukraine                                   | X      | X               | X  |    | X    | X (Pb, Cd, Hg, Ni, As) | X  |

### 3.1.2 Ambient air quality (A2)



This core indicator is an indicator of the state of environment and on impact of air pollution on the population in urban areas.

The analysis shows the annual mean concentration of nitrogen dioxide (NO<sub>2</sub>) in urban areas (sub-indicator 2.1). Countries achievements in this regard are summarized in table 6 together with respective links.

#### 1. Optimal level of indicator production

##### Structure

For the optimal production of indicator A2,

concentrations of NO<sub>2</sub> in urban areas are to be provided. As a minimal requirement, the average annual concentration of NO<sub>x</sub> and/or number of days with exceeded daily limit value for NO<sub>x</sub> in the capital city should be provided.

Also, as agreed at the Eighth Session of the Joint Task Force and noted in recommendation 2, countries should gradually produce data on the following parameters:

- (a) Sulphur dioxide (SO<sub>2</sub>)
- (b) Ground-level ozone (O<sub>3</sub>).

The countries' achievements in producing these additional parameters are summarized in table 7. For the review of these additional parameters, information presented by countries at the Ninth Session of the Joint Task Force was taken into account. It is expected that countries will gradually share all available data on the additional parameters online.

### Format

For this indicator the following units of measurement are to be used: concentration of pollutants in micrograms ( $\mu\text{g}$ ) per  $\text{m}^3$  of ambient air, and/or number of days with exceeded daily limit value for the pollutant.

## 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia.

Table 6: Production of indicator A2 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                                   | Structure                                   | Format        | Times Series               | Link   |
|---|---|---------------|----------------------------|--|
| Armenia                                   | Fully met (3 cities)                        | Fully met     | 1990; 1995; 2000-2013      | <a href="http://armstatbank.am/">http://armstatbank.am/</a>  |
| Azerbaijan                                | Fully met (7 cities)                        | Fully met     | 2003-2013                  | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>   |
| Belarus                                   | Fully met (12 cities)                       | Fully met     | 2005-2013                  | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2</a>  |
| Bosnia and Herzegovina                    | Fully met (1 city)                          | Fully met     | 1990; 1995; 2000-2012      | <a href="http://www.flmzbih.gov.ba/bilten/2013-bilten.pdf">http://www.flmzbih.gov.ba/bilten/2013-bilten.pdf</a>  |
| Georgia                                   | Fully met (1 city)                          | Fully met     | 1995; 2000-2006; 2008-2012 | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>  |
| Kazakhstan                                | Fully met (1 city)                          | Fully met     | 2000-2013                  | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3Fadf.ctrl-state%3Dyiuam2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3Fadf.ctrl-state%3Dyiuam2jg7_118</a>  |
| Kyrgyzstan                                | Fully met (1 city)                          | Fully met     | 1990; 1995; 2000-2013      | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a> ;<br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a>                                     |
| Montenegro                                | Fully met (2 cities)                        | Fully met     | 2009-2012                  | <a href="http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora</a>  |
| Republic of Moldova                       | Fully met (3 cities)                        | Fully met     | 1995; 2000-2013            | <a href="http://date.gov.md/ckan/en/dataset/11688-calitatea-aerului-atmosferic-in-localitatile-urbane">http://date.gov.md/ckan/en/dataset/11688-calitatea-aerului-atmosferic-in-localitatile-urbane</a>  |
| Russian Federation                        | Partially met                               | Partially met | 2011                       | <a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202011%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202011%20god.pdf</a><br><a href="http://www.voikovmgo.ru/images/stories/publications/ejegovodnik_zagr_atm_2011_color.pdf">http://www.voikovmgo.ru/images/stories/publications/ejegovodnik_zagr_atm_2011_color.pdf</a> |
| Serbia                                    | Fully met (4 cities)                        | Fully met     | 2010-2012                  | <a href="http://indicator.sepa.gov.rs/pretraga/indikatori/allfind/92bce6cbff2a41a2bbce8d97cdd5b73b">http://indicator.sepa.gov.rs/pretraga/indikatori/allfind/92bce6cbff2a41a2bbce8d97cdd5b73b</a>  |
| The former Yugoslav Republic of Macedonia | Fully met                                   | Fully met     | 2004-2011                  | <a href="http://www.moep.gov.mk/?page_id=746&amp;lang=en">http://www.moep.gov.mk/?page_id=746&amp;lang=en</a>  |
| Ukraine                                   | <i>No links provided for this indicator</i> |               |                            |  |

### Structure

The following countries provide data which fully meet the requirements of the Indicator Guidelines: Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Republic of Moldova, Serbia and the former Yugoslav Republic of Macedonia.

Armenia publishes the average concentration of NO<sub>2</sub> for 3 cities and, Kazakhstan for one city. Both countries have also published the maximum average daily concentration. Belarus publishes the annual concentration of NO<sub>2</sub> as well as the number of days with exceeded daily limit values for the pollutant for 12 cities and Kyrgyzstan for one city. Georgia has provided the average annual concentration of NO<sub>2</sub> for one city and for the last 3 years the maximum average daily concentration and days with exceeded daily limit values). Azerbaijan publishes data on average concentrations of NO<sub>2</sub> for seven cities, Serbia for four cities, Republic of Moldova, for three cities, Montenegro for two cities, and Bosnia and Herzegovina and Georgia for one city.

The former Yugoslav Republic of Macedonia does not distinguish between different cities, showing the share of the total population exposed to exceeded daily limit values of pollutants and the average annual concentration of NO<sub>2</sub> for all stations in urban areas.

For the Russian Federation data on average annual concentration of NO<sub>2</sub> in the most polluted cities are shown not in absolute values, but in comparison with the set standard of Maximum Permissible Concentration (MPC) and expressed in terms of exceeding these standards (for example, 2 MPC).

In terms of the additional parameters that should gradually be produced for this indicator the

analysis shows that all target countries that submitted a link on this indicator also publish data on SO<sub>2</sub> and six countries also produce data on O<sub>3</sub>. Ukraine has not provided links for this indicator.

### Format

All countries, which provided data on this indicator, except the Russian Federation, use units of measurement according to the required data format (NO<sub>2</sub> – in micrograms per m<sup>3</sup> of air), and/or number of days with exceeded daily limit value for the pollutant. The Russian Federation has used multiples of MPC (Maximum Permissible Concentration) as a unit of measurement.

Table 7: Production of additional parameters for indicator A2 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                                   | SO <sub>2</sub> | O <sub>3</sub> |
|---|-----------------|----------------|
| Armenia                                   | X               | X              |
| Azerbaijan                                | X               |                |
| Belarus                                   | X               |                |
| Bosnia and Herzegovina                    | X               |                |
| Georgia                                   | X               | X              |
| Kazakhstan                                | X               |                |
| Kyrgyzstan                                | X               |                |
| Montenegro                                | X               | X              |
| Republic of Moldova                       | X               | X              |
| Russian Federation                        | X               |                |
| Serbia                                    | X               | X              |
| Tajikistan                                | X               |                |
| The former Yugoslav Republic of Macedonia | X               | X              |
| Ukraine                                   | X               |                |

### 3.1.3 Consumption of ozone depleting substances (A3)



This core indicator is an indicator of environmental pressure. It shows the amount of ozone-depleting substances (ODS), consumed in a country.

ODS are regulated by the Vienna Convention for the Protection of the Ozone Layer, its Montreal Protocol on Substances that Deplete the Ozone Layer as well as by Montreal Protocol Amendments enacted in London, Copenhagen, Beijing and Montreal.

The total consumption of ODS is defined as the production of ODS plus imports minus exports of ODS (sub-indicator 3.1). Countries achievements in this regard are summarized in table 8 together with respective links.

#### 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

Table 8: Production of indicator A3 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                | Structure     | Format    | Times Series            | Link  |
|------------------------|---------------|-----------|-------------------------|---|
| Armenia                | Fully met     | Fully met | 1995; 2000-2013         | <a href="http://armstatbank.am/">http://armstatbank.am/</a>   |
| Azerbaijan             | Partially met | Fully met | 2006-2013               | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>  |
| Belarus                | Fully met     | Fully met | 2009-2013               | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2</a>             |
| Bosnia and Herzegovina | Fully met     | Fully met | 2003-2013               | <a href="http://www.bhas.ba/?option=com_content&amp;view=article&amp;id=226">http://www.bhas.ba/?option=com_content&amp;view=article&amp;id=226</a>   |
| Georgia                | Fully met     | Fully met | 1995; 2000-2012         | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>   |
| Kazakhstan             | Fully met     | Fully met | 1990; 1995; 2000-2013   | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afriLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyiuam2jg_118">http://stat.gov.kz/faces/homePage/ecolog?_afriLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyiuam2jg_118</a>   |
| Kyrgyzstan             | Fully met     | Fully met | 2005-2013               | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru;http://nd.nature.gov.kg/">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru;http://nd.nature.gov.kg/</a> |
| Montenegro             | Fully met     | Fully met | 1995 ; 2000 ; 2004-2012 | <a href="http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora</a>                                     |
| Republic of Moldova    | Fully met     | Fully met | 1995; 2000-2013         | <a href="http://date.gov.md/ckan/en/dataset/11693-consumul-de-substante-care-distrug-stratul-de-ozon">http://date.gov.md/ckan/en/dataset/11693-consumul-de-substante-care-distrug-stratul-de-ozon</a>   |

| Country                                   | Structure                                   | Format        | Times Series     | Link  |
|---|---|---------------|------------------|---|
| Russian Federation                        | Partially met                               | Partially met | 2010-2012        | <a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf</a>   |
| Serbia                                    | Fully met                                   | Fully met     | 1995 ; 2010-2012 | <a href="http://indikator.sepa.gov.rs/pretrazivanje-indikatora/indikatorilat/allfindu/8bfea7520d994b9f9111d02afa3db17b">http://indikator.sepa.gov.rs/pretrazivanje-indikatora/indikatorilat/allfindu/8bfea7520d994b9f9111d02afa3db17b</a> |
| The former Yugoslav Republic of Macedonia | Fully met                                   | Fully met     | 2004-2013        | <a href="http://www.moep.gov.mk/?page_id=831&amp;lang=en">http://www.moep.gov.mk/?page_id=831&amp;lang=en</a>   |
| Ukraine                                   | <i>No links provided for this indicator</i> |               |                  |   |

### Structure

Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, the Republic of Moldova, Serbia and the former Yugoslav Republic of Macedonia provide data which fully meet the requirements of the Indicator Guidelines.

Armenia and Bosnia and Herzegovina currently consume only HCFCs. Kazakhstan provided data for CFCs, HCFCs, methylbromide and brominechloromethane. Georgia, Kyrgyzstan and the former Yugoslav Republic of Macedonia provided data for different CFCs, HCFCs, as well as methyl bromide. Montenegro publishes data on CFCs, tetrachloromethane and HCFCs consumption. Serbia shows data for the consumption of halons, carbon tetrachloride, 1,1,1-trichloroethane (methyl chloroform), HCFCs, and methyl bromide. At the same time, the Republic of Moldova provided data on CFCs and HCFCs consumption. Azerbaijan showed only the total amount of ODS in the country

without distinguishing different substances and without reference their ODP.

Belarus shows the consumption of HCFCs, including their ODP, as well as a maximum level for the country's consumption of ODP.

The Russian Federation has shown data of production, export and import of ODS, but not the total consumption.

Ukraine has not provided links for this indicator.

Data of ODS consumption for all the analysed countries between 1990 and 2013 are available on the website of the Vienna Convention for the Protection of the Ozone Layer ([http://ozone.unep.org/en/ods\\_data\\_access\\_centre/](http://ozone.unep.org/en/ods_data_access_centre/)).

### Format

All countries, which provide data, with the exception of the Russian Federation, measure the indicators in units according to the required data format. The Russian Federation provides data on production, export and import of ODS in metric tons.

## 3.1.4 Greenhouse gas (GHG) emissions (B3)



This core indicator is a measure of anthropogenic emissions of greenhouse gases (GHGs) included in Annex A to the Kyoto Protocol to the United

Nations Framework Convention on Climate Change (UNFCCC).

The indicator should show the total emissions of

GHGs as well as emissions per capita (sub-indicator 4.1) and per GDP (sub-indicator 4.2). Countries achievements in this regard are summarized in table 9 together with respective links.

## 1. Optimal level of indicator production

### Structure

To reach the optimal level of the production of indicator B3, the following parameters should be included in the calculation of the total GHG emissions: carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), methane (CH<sub>4</sub>), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>), as well as emissions/removals by sources and sinks through land use, land use change and forestry (LULUCF).

In addition, for the determination of the sub-indicators 4.1 and 4.2 the following parameters

should be included:

- (a) Population of the country
- (b) GDP

### Format

The following units of measurement should be applied:

- (a) GHGs: parameters presented in tones of CO<sub>2</sub> equivalent or millions of tons of CO<sub>2</sub> equivalent;
- (b) Population: presented in million people;
- (c) GDP: presented in international dollars in purchasing power parity (PPP);
- (d) Emissions per GDP: in tones of CO<sub>2</sub> equivalent / 1000 dollars.

## 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

Table 9: Production of indicator B3 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                | Structure     | Format        | Times Series          | Link   |
|------------------------|---------------|---------------|-----------------------|--|
| Armenia                | Partially met | Fully met     | 1990; 1995; 2000-2010 | <a href="http://armstatbank.am/">http://armstatbank.am/</a>  |
| Azerbaijan             | Fully met     | Partially met | 2000-2013             | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>   |
| Belarus                | Fully met     | Partially met | 2005-2012             | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2</a>                              |
| Bosnia and Herzegovina | Fully met     | Fully met     | 1990-2001             | <a href="http://www.bhas.ba/tematskibilteni/Okolis%20bos%20-%20konacan%201.pdf">http://www.bhas.ba/tematskibilteni/Okolis%20bos%20-%20konacan%201.pdf</a>  |
| Georgia                | Partially met | Fully met     | 1990; 1995; 2000-2011 | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>  |
| Kazakhstan             | Fully met     | Fully met     | 1990; 1995; 2000-2012 | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyuam2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyuam2jg7_118</a>  |
| Kyrgyzstan             | Partially met | Fully met     | 2000-2005             | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a><br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a> |
| Montenegro             | Fully met     | Fully met     | 1990-2010             | <a href="http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora</a>  |
| Republic of Moldova    | Fully met     | Fully met     | 1990-2010             | <a href="http://www.clima.md/doc.php?l=ro&amp;id=82&amp;id=3471">http://www.clima.md/doc.php?l=ro&amp;id=82&amp;id=3471</a>  |



| Country                                   | Structure     | Format        | Times Series                | Link   |
|---|---------------|---------------|-----------------------------|--|
| Russian Federation                        | Fully met     | Fully met     | 1990; 2000; 2005; 2007-2011 | <a href="http://www.gks.ru/wps/wcm/connect/rosstat/main/rosstat/ru/statistics/environment/#">http://www.gks.ru/wps/wcm/connect/rosstat/main/rosstat/ru/statistics/environment/#</a> ;<br><a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf</a> |
| Serbia                                    | Partially met | Partially met | 1990; 1998                  | <a href="http://indicator.sepa.gov.rs/pretrazivanje-indikatora/indikatorilat/allfindp/b71ede578ca84639910d49c76d3f4780">http://indicator.sepa.gov.rs/pretrazivanje-indikatora/indikatorilat/allfindp/b71ede578ca84639910d49c76d3f4780</a>  |
| The former Yugoslav Republic of Macedonia | Fully met     | Fully met     | 1990; 1995; 2000-2009       | <a href="http://www.moep.gov.mk/?page_id=746&amp;lang=en">http://www.moep.gov.mk/?page_id=746&amp;lang=en</a>  |
| Ukraine                                   | Partially met | Partially met | 2004-2012                   | <a href="http://www.ukrstat.gov.ua">www.ukrstat.gov.ua</a><br><a href="http://www.seia.gov.ua/seia/doccatalog/document?id=138881">http://www.seia.gov.ua/seia/doccatalog/document?id=138881</a>  |

### Structure

Kazakhstan's data fully met the requirements of the Indicator Guidelines. The data contains all required parameters (CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, HFC, PFC, SF<sub>6</sub>, LULUCF), as well as emissions distinguished by economic sectors (energy, industry, agriculture). Belarus also provided data on the amount of GHG emissions including LULUCF, and distinguishing emissions by economic sectors.

The Russian Federation and the Republic of Moldova have emission data on all GHGs, also provided as an equivalent of CO<sub>2</sub>. Complete data on emissions of CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub>, and LULUCF is provided by Azerbaijan, Bosnia and Herzegovina, Serbia and the former Yugoslav Republic of Macedonia. Georgia and Montenegro also provide data based on the calculation of the three main GHGs, but emissions/removals through LULUCF are not provided. Data on total GHG emissions in CO<sub>2</sub> equivalent without specifying emissions/removals through LULUCF are provided by, Kyrgyzstan and Ukraine.

The respective webpage of Armenia shows the emissions of CO<sub>2</sub>, N<sub>2</sub>O, CH<sub>4</sub> (the last two as CO<sub>2</sub> equivalent) without specifying LULUCF.

All above mentioned countries have also shown data on GHG emissions per capita and GDP with the exception of Serbia and Ukraine.

Belarus, the Russian Federation and Ukraine are listed in Annex 1 to the UNFCCC. These countries have agreed to follow special obligations for the limitation of GHG emissions. Each country has prepared five national communications on climate change and more communications are currently prepared. Other countries, which are not included in Annex 1 to the UNFCCC, mainly are in the process of preparing their third national communication, which will include more recent data on GHGs. Serbia is currently preparing its second national communication. The current national communications to the UNFCCC for all target countries are available online at the website of the UNFCCC ([http://unfccc.int/national\\_reports/items/1408.php](http://unfccc.int/national_reports/items/1408.php)).

### Format

The majority of countries which provide data have measured the indicators in units according to the required data format. GHGs are either calculated in CO<sub>2</sub> equivalent using appropriate recalculation factors or provided as CO<sub>2</sub> equivalent.

Azerbaijan and Belarus show emissions per unit of GDP in tons of CO<sub>2</sub> per national currency, and not per international dollars (PPP).

Serbia and Ukraine have not included the GDP and the country's population in the analysis.

### 3.1.5 Biochemical oxygen demand (BOD) and concentration of ammonium in rivers (C10)



This core indicator provides a measure of the state of rivers in terms of biochemical oxygen demand (BOD) and ammonium (NH<sub>4</sub>).

The analysis shows the production of data on average annual BOD in major rivers (sub-indicator 5.1) and NH<sub>4</sub> concentration in major rivers (sub-indicator 5.2). Countries achievements in this regard are summarized in table 10 together with respective links.

#### 1. Optimal level of indicator production

##### Structure

To reach the optimal level of production of the indicator C10, river water samples from at least

one river with a minimum of three sampling points (upstream and downstream) need to be taken and analysed for the concentrations of BOD and ammonium.

##### Format

To produce the indicator the following units of measurements are to be used:

- (a) The annual average BOD after five days of incubation (BOD<sub>5</sub>) expressed in mg of O<sub>2</sub>/litre.
- (b) Average annual ammonium concentration, which is measured in mg/litre.

#### 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

Table 10: Production of indicator C10 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                | Structure             | Format    | Times Series          | Link   |
|------------------------|-----------------------|-----------|-----------------------|--|
| Armenia                | Fully met (8 rivers)  | Fully met | 1990; 1995; 2000-2010 | <a href="http://armstatbank.am/">http://armstatbank.am/</a>  |
| Azerbaijan             | Fully met (2 rivers)  | Fully met | 2000-2013             | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>   |
| Belarus                | Fully met (10 rivers) | Fully met | 2005-2013             | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayushchaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayushchaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2</a>                            |
| Bosnia and Herzegovina | Fully met (3 rivers)  | Fully met | 2006-2012             | <a href="http://www.bhas.ba/index.php?option=com_content&amp;view=article&amp;id=226">http://www.bhas.ba/index.php?option=com_content&amp;view=article&amp;id=226</a>  |
| Georgia                | Fully met (1 river)   | Fully met | 1990; 1995; 2000-2012 | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>  |
| Kazakhstan             | Fully met (1 river)   | Fully met | 1990; 2000-2013       | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afzLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyuam2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afzLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyuam2jg7_118</a>  |
| Kyrgyzstan             | Fully met (1 river)   | Fully met | 1990; 1995; 2000-2013 | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a><br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a> |

| Country                                   | Structure                                   | Format    | Times Series    | Link  |
|---|---|-----------|-----------------|---|
| Montenegro                                | Fully met (13 rivers)                       | Fully met | 2009-2012       | <a href="http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju- zivotne-sredine-nabazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju- zivotne-sredine-nabazi-indikatora</a>   |
| Republic of Moldova                       | Fully met (2 rivers)                        | Fully met | 1995; 2000-2013 | <a href="http://date.gov.md/ckan/en/dataset/11686-consumul-biochimic-de-oxigen-la-5-zile">http://date.gov.md/ckan/en/dataset/11686-consumul-biochimic-de-oxigen-la-5-zile</a>   |
| Russian Federation                        | Fully met (5 rivers)                        | Fully met | 2012-2012       | <a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf</a><br><a href="http://www.ghi.aaanet.ru/node/10">http://www.ghi.aaanet.ru/node/10</a><br><a href="http://www.ghi.aaanet.ru/node/9">http://www.ghi.aaanet.ru/node/9</a> |
| Serbia                                    | Fully met (4 rivers)                        | Fully met | 2003-2012       | <a href="http://indicator.sepa.gov.rs/pretraga/indikator/allfind/14e3c0ae18d44660982472556c1d3dc8">http://indicator.sepa.gov.rs/pretraga/indikator/allfind/14e3c0ae18d44660982472556c1d3dc8</a>   |
| The former Yugoslav Republic of Macedonia | Fully met (3 rivers)                        | Fully met | 2002-2011       | <a href="http://www.moepg.gov.mk/?page_id=746&amp;lang=en">http://www.moepg.gov.mk/?page_id=746&amp;lang=en</a>   |
| Ukraine                                   | <i>No links provided for this indicator</i> |           |                 |   |

### Structure

The following countries have provided data which fully meet the requirements of the Indicator Guidelines: Armenia (8 river), Azerbaijan (2 rivers), Belarus (10 rivers), Georgia (1 river), Kazakhstan (1 river), Kyrgyzstan (1 river), Montenegro (13 rivers), Serbia (4 rivers), the former Yugoslav Republic of Macedonia (3 rivers), the Russian Federation (5 rivers). Additionally to these ten countries that had shared data on this indicator before May 2014, now also Bosnia and Herzegovina (3 rivers) and the Republic of Moldova (2 rivers) submitted links to data published online, which are fully meeting the requirements of the Indicators Guidelines.

For each river, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Republic of Moldova, Serbia, the former Yugoslav Republic of Macedonia and the Russian Federation have shown the measurements of BOD<sub>5</sub> and NH<sub>4</sub> concentrations at least from three stations.

Ukraine has not provided links for this indicator.

In line with recommendation 3, the data provided by Armenia, Azerbaijan, Bosnia and Herzegovina and Georgia, contain maximum, minimum and

average concentrations for each sampling point. Kazakhstan and Kyrgyzstan publish data on mean annual values in each sampling point.

Azerbaijan, Belarus and Georgia provide averaged annual data of the indicator and, the Russian Federation have provided average and maximum concentrations.

### Format

All countries providing data measure the indicators in units according to the required data format.

### 3.1.6 Nutrients in freshwater (C11)



This indicator helps to assess the condition of water bodies by measuring nutrient concentrations in rivers, lakes, reservoirs, as well as in groundwater.

The indicator should include data on average annual concentrations of nitrates (NO<sub>3</sub>) in major water bodies (lakes, reservoirs) (sub-indicator 6.1) and the average annual total phosphorus (P<sub>total</sub>) in major water bodies (lakes, reservoirs) (sub-indicator 6.2). Countries achievements in this regard are summarized in table 11 together with respective links.

#### 1. Optimal level of indicator production

##### Structure

In order to achieve the optimal production of the indicator C11, the following measurements are to be taken: water samples should be taken in lakes and/or reservoirs and concentrations of NO<sub>3</sub>) and P<sub>total</sub> should be provided. In order to calculate the average concentration, data of all samples taken should be used.

Also, as agreed at the Eighth Session of the Joint Task Force and noted in recommendation 2,

countries should gradually produce data on phosphates and nitrates in rivers and on nitrates in groundwater. The countries' achievements in producing these additional datasets are summarized in table 12. For the review of these additional parameters, information presented by countries at the Ninth Session of the Joint Task Force was taken into account. It is expected that countries will gradually share all available data on the additional parameters online.

##### Format

The following units of measurements are to be used for this indicator:

- (a) Concentrations of nitrates in fresh water samples (lakes, rivers, groundwater) are measured in mg of NO<sub>3</sub>/litre;
- (b) Concentrations of total phosphorus in samples taken in lakes and concentrations of phosphates in samples taken in rivers are measured in mg of P/litre.

#### 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

Table 11: Production of indicator C11 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country    | Structure                | Format    | Times Series                 | Link  |
|------------|--------------------------|-----------|------------------------------|---|
| Armenia    | Fully met (1 lake)       | Fully met | 2000; 2002; 2004-2013        | <a href="http://armstatbank.am/">http://armstatbank.am/</a>   |
| Azerbaijan | Fully met (6 lakes)      | Fully met | 2005-2013                    | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>  |
| Belarus    | Partially met (19 lakes) | Fully met | 2005-2013 (total phosphorus) | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2</a> |

| Country                                   | Structure                                   | Format        | Times Series  | Link  |
|---|---|---------------|---|---|
| Bosnia and Herzegovina                    | Fully met (3 lakes)                         | Fully met     | 2002-2008 (1 lake); 2011-2012 (2 additional lakes)            | <a href="http://www.bhas.ba/index.php?option=com_content&amp;view=article&amp;id=226">http://www.bhas.ba/index.php?option=com_content&amp;view=article&amp;id=226</a>   |
| Georgia                                   | Fully met (1 lake)                          | Fully met     | 1990; 2000; 2001; 2005; 2007-2012                             | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>   |
| Kazakhstan                                | Fully met (1 lake and 1 reservoir)          | Fully met     | 1990; 2000; 2002-2004; 2006-2013                              | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afzLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyiuam2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afzLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyiuam2jg7_118</a>   |
| Kyrgyzstan                                | Partially met                               | Partially met | 2013-2014 (nitrates)  | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a><br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a>          |
| Montenegro                                | Fully met (1 lake)                          | Fully met     | 2008-2013   | <a href="http://www.epa.org.me/index.php/dokumenti/izvestaji">http://www.epa.org.me/index.php/dokumenti/izvestaji</a>   |
| Republic of Moldova                       | Fully met (2 lakes)                         | Fully met     | 1995; 2000-2013   | <a href="http://date.gov.md/ckan/en/dataset/11684-date-privind-nutrientii-in-ape-dulci">http://date.gov.md/ckan/en/dataset/11684-date-privind-nutrientii-in-ape-dulci</a>   |
| Russian Federation                        | Partially met                               | Partially met | 2010-2012   | <a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf</a><br><a href="http://www.ghi.aaanet.ru/node/10">http://www.ghi.aaanet.ru/node/10</a><br><a href="http://www.ghi.aaanet.ru/node/9">http://www.ghi.aaanet.ru/node/9</a> |
| Serbia                                    | Not met                                     | Not met       |   | <a href="http://indicator.sepa.gov.rs/pretrazivanje-indikatora/indikatorilat/allfind/73898ebbd52b436cbd06517c7892990a">http://indicator.sepa.gov.rs/pretrazivanje-indikatora/indikatorilat/allfind/73898ebbd52b436cbd06517c7892990a</a>   |
| The former Yugoslav Republic of Macedonia | Fully met (2 lakes)                         | Fully met     | 2004-2013 (total phosphorus); 2000-2006; 2012-2013 (nitrates) | <a href="http://www.mocpp.gov.mk/?page_id=855&amp;lang=en">http://www.mocpp.gov.mk/?page_id=855&amp;lang=en</a>   |
| Ukraine                                   | <i>No links provided for this indicator</i> |               |   |   |

### Structure

In the analysis of the submissions in May 2014 only two countries (Serbia and the former Yugoslav Republic of Macedonia) fully met the requirements of the Indicator Guidelines for this indicator. For the analysis in May 2014, Serbia had submitted data on total phosphorus and nitrates for one lake and one reservoir in an Excel sheet, but has not provided a link to this data published online. As for the updated paper only data published online were taken into account, Serbia is currently not meeting the guidelines for this indicator and it is recommended to publish the available information online.

However, for the current analysis seven additional countries provide data on the indicators that fully meet the requirements: Azerbaijan publishes data on average annual concentration of nitrate and

phosphorus in six lakes, Bosnia and Herzegovina and the Republic of Moldova on three lakes, Kazakhstan in one lake and one reservoir, Armenia, Georgia and Montenegro on one lake. Also, in the latest analysis Kyrgyzstan provided additional data compared to 2014, which is however only partially meeting the requirements of the guidelines as only data on nitrates in one reservoir is shown.

Submissions from Belarus, Kyrgyzstan and the Russian Federation partially contain the information required by the Indicator Guidelines: Belarus has shown data on the content of phosphate ion (in phosphorus equivalent) in 19 lakes. The Russian Federation has published reviews of the Russian surface water quality, showing nitrates concentration in a number of larger reservoirs.

In terms of the additional datasets that should gradually be produced for this indicator the analysis shows that data on nitrates in rivers are already produced by all countries that submitted links, and data on phosphates in rivers and nitrates in groundwater are produced by the majority of those countries. Ukraine has not provided links for this indicator.

*Format*

Armenia, Georgia and Kazakhstan publish their data in the required format showing the frequency of sampling and the number of samples.

In line with recommendation 3, the data provided by Armenia and Bosnia and Herzegovina contain maximum, minimum and average concentrations for each sampling point.

The Republic of Moldova provided the data in the required units of measurement, specifying the number of samples taken. Montenegro and the

former Yugoslav Republic of Macedonia has applied the required units of measurement without specifying the sampling period and the number of samples

Azerbaijan showed only average concentrations of nitrates and phosphorus without specifying sampling

frequency and the number of samples.

Belarus showed only average annual concentrations of phosphates, which are converted into total phosphorus, without specifying sampling frequency and the number of samples.

All other countries which provide data measure the indicators in units according to the required data format.

Table 12: Production of additional parameters for indicator C11 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia (nutrients in rivers and groundwater)

| Country                                   | Phosphates in rivers | Nitrates in rivers | Nitrates in groundwater |
|---|----------------------|--------------------|-------------------------|
| Armenia                                   | X                    | X                  | X                       |
| Azerbaijan                                | X                    | X                  | X                       |
| Belarus                                   | X                    | X                  | X                       |
| Bosnia and Herzegovina                    | X                    | X                  | X                       |
| Georgia                                   | X                    | X                  |                         |
| Kazakhstan                                |                      | X                  |                         |
| Kyrgyzstan                                | X                    | X                  |                         |
| Montenegro                                | X                    | X                  | X                       |
| Republic of Moldova                       | X                    | X                  | X                       |
| Russian Federation                        | X                    | X                  | X                       |
| Serbia                                    | X                    | X                  | X                       |
| The former Yugoslav Republic of Macedonia | X                    | X                  | X                       |
| Ukraine                                   |                      |                    |                         |



This core indicator is a response indicator, which shows the areas of land, water surfaces and adjacent air layer protected in compliance with the national legislation.

The indicator should include data on total area of protected areas in a country in km<sup>2</sup> and as a percentage of the total country area (sub-indicator 7.1). Countries achievements in this regard are summarized in table 13 together with respective links.

### 1. Optimal level of indicator production

#### Structure

In order to reach the optimal level of production for indicator D1, data on the total protected areas in km<sup>2</sup> and as a percentage of the total country

area are necessary. Additionally, the indicator can be further broken down by the categories of natural areas as classified by the International Union for Conservation of Nature (IUCN), and for the national categories of protected areas to demonstrate their respective extent and share in the total area of a country.

#### Format

The indicator is calculated as the total area of a country's protected areas in hectares (ha) or km<sup>2</sup>. Total country areas should be provided in hectares or km<sup>2</sup> and protected areas relative to the country's total area should be expressed as a percentage.

## 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

Table 13: Production of indicator D1 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                | Structure     | Format        | Times Series          | Link   |
|------------------------|---------------|---------------|-----------------------|--|
| Armenia                | Fully met     | Fully met     | 1990; 1995; 2000-2013 | <a href="http://armstatbank.am/">http://armstatbank.am/</a>  |
| Azerbaijan             | Fully met     | Fully met     | 1990; 1995; 2000-2013 | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>   |
| Belarus                | Partially met | Partially met | 2005-2013             | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovmevnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovmevnaya-sistema-ekologicheskoi-informatsii2</a>                                |
| Bosnia and Herzegovina | Fully met     | Fully met     | 1990; 1995; 2000-2012 | <a href="http://www.bhas.ba/index.php?option=com_content&amp;view=article&amp;id=226">http://www.bhas.ba/index.php?option=com_content&amp;view=article&amp;id=226</a>  |
| Georgia                | Fully met     | Fully met     | 1995; 2000-2012       | <a href="http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864">http://moe.gov.ge/index.php?lang_id=ENG&amp;sec_id=242&amp;info_id=2864</a>  |
| Kazakhstan             | Fully met     | Fully met     | 1990; 1995; 2000-2013 | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3Fadf.ctrl-state%3Dyiuam2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afLoop=2472405389346701#%40%3Fadf.ctrl-state%3Dyiuam2jg7_118</a>  |
| Kyrgyzstan             | Partially met | Partially met | 2000-2013             | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a><br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a> |

| Country                                   | Structure                                   | Format    | Times Series           | Link  |
|---|---|-----------|------------------------|---|
| Montenegro                                | Fully met                                   | Fully met | 1990-2012              | <a href="http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azzs/388-izvjestaj-o-stanju-zivotne-sredine-nabazi-indikatora</a> |
| Republic of Moldova                       | Partially met                               | Fully met | 2012                   | <a href="http://www.statistica.md/pageview.php?l=ro&amp;id=3242&amp;idc=350">http://www.statistica.md/pageview.php?l=ro&amp;id=3242&amp;idc=350</a>   |
| Russian Federation                        | Partially met                               | Fully met | 1992-2012              | <a href="http://www.mnr.gov.ru/upload/iblock/ccf/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/ccf/gosdoklad%20za%202012%20god.pdf</a>   |
| Serbia                                    | Fully met                                   | Fully met | 1990; 1995 ; 2000-2010 | <a href="http://biodiverzitet-chm.rs/information/indikatori-biodiverziteta">http://biodiverzitet-chm.rs/information/indikatori-biodiverziteta</a>   |
| The former Yugoslav Republic of Macedonia | Fully met                                   | Fully met | 2002-2008              | <a href="http://www.mocpp.gov.mk/?page_id=746&amp;lang=en">http://www.mocpp.gov.mk/?page_id=746&amp;lang=en</a>   |
| Ukraine                                   | <i>No links provided for this indicator</i> |           |                        |   |

### Structure

Armenia, Azerbaijan, Bosnia and Herzegovina, Georgia, Kazakhstan, Montenegro, Serbia and the former Yugoslav Republic of Macedonia provide data which fully meet the requirements of the Indicator Guidelines. These countries publish data on both total area of protected areas and their percentage relative to the country's total area. Besides, Armenia, Georgia, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia and Serbia provide data distinguishing the IUCN categories of protected areas.

The Republic of Moldova and the Russian Federation have shown the total area of protected areas, their number and the category of each protected area, but do not calculate the share of protected areas in the country's total area.

The Russian Federation only publishes the area of protected areas on the federal level.

Belarus and Kyrgyzstan have published on their website only information about the percentage of protected areas in the total area of the country.

### Format

Serbia provides data on the protected areas both in hectares and thousands of km<sup>2</sup>. Armenia, Montenegro, Republic of Moldova, Russian Federation and the former Yugoslav Republic of Macedonia measure the protected areas in hectares. Azerbaijan, Bosnia and Herzegovina, and Georgia use thousands of km<sup>2</sup> and Azerbaijan and Kazakhstan use km<sup>2</sup> as a unit of measurement for this indicator.

## 3.1.8 Waste generation (I1)



This core indicator shows the total amount of all generated wastes in the country.

The analysis contains data on annual municipal waste generation per capita (sub-indicator 8.1).

Countries achievements in this regard are summarized in table 14 together with respective links.



## 1. Optimal level of indicator production

### Structure

In order to reach the optimal production of indicator I1, the calculation should include the amount of waste generated per capita. This can be expressed as waste collected by municipalities and/or as total waste generated by source.

For the calculation of sub-indicator 8.1, also the following parameter has to be considered: population of the country.

## 2. Analysis of indicator production in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia.

Table 14: Production of indicator I1 in the countries of South-Eastern and Eastern Europe, Caucasus and Central Asia

| Country                                   | Structure                                   | Format        | Times Series | Link   |
|---|---|---------------|--------------|--|
| Armenia                                   | Fully met                                   | Fully met     | 2000-2013    | <a href="http://armstatbank.am/">http://armstatbank.am/</a>  |
| Azerbaijan                                | Fully met                                   | Fully met     | 2000-2013    | <a href="http://www.stat.gov.az/source/environment/index.php">www.stat.gov.az/source/environment/index.php</a>   |
| Belarus                                   | Fully met                                   | Fully met     | 2005-2013    | <a href="http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2">http://belstat.gov.by/ofitsialnaya-statistika/otrasli-statistiki/okruzhayuschaya-sreda/sovместnaya-sistema-ekologicheskoi-informatsii2</a>  |
| Bosnia and Herzegovina                    | Fully met                                   | Fully met     | 2008-2011    | <a href="http://www.bhas.ba/tematskibilteni/Okolis%20bos%20-%20konacan%201.pdf">http://www.bhas.ba/tematskibilteni/Okolis%20bos%20-%20konacan%201.pdf</a>  |
| Georgia                                   | <i>No links provided for this indicator</i> |               |              |  |
| Kazakhstan                                | Fully met                                   | Fully met     | 2005-2012    | <a href="http://stat.gov.kz/faces/homePage/ecolog?_afLLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyium2jg7_118">http://stat.gov.kz/faces/homePage/ecolog?_afLLoop=2472405389346701#%40%3F_adf.ctrl-state%3Dyium2jg7_118</a>  |
| Kyrgyzstan                                | Fully met                                   | Fully met     | 2009-2013    | <a href="http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru">http://nature.kg/index.php?option=com_content&amp;view=category&amp;layout=blog&amp;id=33&amp;Itemid=70&amp;lang=ru</a><br><a href="http://nd.nature.gov.kg/">http://nd.nature.gov.kg/</a>   |
| Montenegro                                | Fully met                                   | Fully met     | 2009-2012    | <a href="http://www.epa.org.me/index.php/component/content/article/87-azs/388-izvjestaj-o-stanju-zivotne-sredine-na-bazi-indikatora">http://www.epa.org.me/index.php/component/content/article/87-azs/388-izvjestaj-o-stanju-zivotne-sredine-na-bazi-indikatora</a><br><a href="http://www.monstat.org/eng/page.php?id=512&amp;pageid=64">http://www.monstat.org/eng/page.php?id=512&amp;pageid=64</a>   |
| Republic of Moldova                       | Partially met                               | Partially met | 2001-2013    | <a href="http://statbank.statistica.md/pxweb/Database/EN/01%20GEO/GEO04/GEO04.asp">http://statbank.statistica.md/pxweb/Database/EN/01%20GEO/GEO04/GEO04.asp</a>  |
| Russian Federation                        | Fully met                                   | Partially met | 2005-2012    | <a href="http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistika/publications/catalog/doc_1138698314188">http://www.gks.ru/wps/wcm/connect/rosstat_main/rosstat/ru/statistika/publications/catalog/doc_1138698314188</a><br><a href="http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf">http://www.mnr.gov.ru/upload/iblock/cef/gosdoklad%20za%202012%20god.pdf</a>   |
| Serbia                                    | Fully met                                   | Fully met     | 2006-2013    | <a href="http://webrzs.stat.gov.rs/WebSite/repository/documents/00/00/61/97/Statistika_otpada.pdf">http://webrzs.stat.gov.rs/WebSite/repository/documents/00/00/61/97/Statistika_otpada.pdf</a><br><a href="http://webrzs.stat.gov.rs/WebSite/repository/documents/00/01/46/23/ZS60_203_eng_2013kor.pdf">http://webrzs.stat.gov.rs/WebSite/repository/documents/00/01/46/23/ZS60_203_eng_2013kor.pdf</a> |
| The former Yugoslav Republic of Macedonia | Fully met                                   | Fully met     | 2003-2012    | <a href="http://www.moepg.gov.mk/?page_id=797&amp;lang=en">http://www.moepg.gov.mk/?page_id=797&amp;lang=en</a>  |
| Ukraine                                   | Fully met                                   | Fully met     | 2011-2013    | <a href="http://www.ukrstat.gov.ua">www.ukrstat.gov.ua</a><br><a href="http://www.scia.gov.ua">www.scia.gov.ua</a><br><a href="http://minregion.gov.ua/zhkh/Blahoustri-terytoriy/stan-sferi-povodzhennja-z-pobutovimi-vidhodami-v-ukraini-za-2012-rik/">http://minregion.gov.ua/zhkh/Blahoustri-terytoriy/stan-sferi-povodzhennja-z-pobutovimi-vidhodami-v-ukraini-za-2012-rik/</a>                      |

### Structure

Armenia, Azerbaijan, Bosnia and Herzegovina,

This analysis considers only one parameter of the indicator I1, in accordance with the requirements of the project on establishing a joint system of environmental indicators, in order to set up a regular process of reporting on those indicators.

### Format

The parameter is to be provided in thousands of metric tons of generated wastes; population is measured in millions of people.

Kazakhstan, Montenegro, Serbia, the former Yugoslav Republic of Macedonia, Kyrgyzstan and

Ukraine provide data which fully meet the requirements of the Indicator Guidelines, by including information on one or more of the following categories: municipal solid waste, municipal waste, household waste, or waste produced by households, - as a total and per capita.

The Republic of Moldova publishes data on waste generation, not distinguishing the generation of municipal waste, and has not calculated the value per capita.

Belarus and the Russian Federation have shown only waste removal from households and other users, with the special purpose vehicles, to waste disposal places as municipal waste generation.

Kyrgyzstan shows data on the generation of municipal waste by households, but when calculating waste generation per capita used data on solid waste removed by vehicles. The data on waste generation and the removal of solid wastes do not match each other.

Georgia has not provided links for this indicator.

#### *Format*

All countries providing data on waste generation, except for the Russian Federation, measure their quantity in accordance with the required data format (1000 tons/year).

Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Kazakhstan, Kyrgyzstan, Montenegro, Serbia, the former Yugoslav Republic of Macedonia and Ukraine show the data per capita in kg/capita.

The Russian Federation measures municipal waste removal to disposal places in 1000 m<sup>3</sup>, which does not meet the requirements of the Indicator Guidelines. At the same time the Russian Federation reported that work is currently underway to convert the data on waste from 1000 m<sup>3</sup> to 1000 tons/year.

The Republic of Moldova has not calculated the amount of generated wastes per capita in kg/capita.

## **3.2 Sharing**

The scope of an environmental indicator goes beyond the mere production of data. An indicator based on sufficient time series data can show key trends, help to describe causes and effects of environmental conditions, allow comparison between countries, and make it possible to assess the efficiency of environmental policies.

To make these important tools directly and easily accessible to a broad range of users, including policy makers as well as the local and international public, it is essential that the responsible national authorities create and maintain websites to share their environmental indicators.

### **3.2.1 Optimal levels of online sharing**

For this review of sharing of the core indicators the online availability, content, and the languages

of the websites to which links were submitted are analysed. The analysis is made against what is

considered an optimal level of on-line presentation and sharing of the indicators, with reference, where relevant, to the principles set for the Shared Environmental Information System (SEIS).

Links that were provided by the countries referring to (real-time) databases have not been considered in this analysis. All links that were taken into account for this review are provided in chapter 3.1.

### ***Online availability***

In an optimal case, each of the eight core indicators should be available on the website of an agency, which is given the responsibility to produce the indicator and to manage the data. This corresponds to the first SEIS principle stating that data should be managed as close as possible to a source of its production. Therefore, when countries have reporting obligations due to international treaties, the information should not only be published by the respective secretariats or conventions, but also on the websites of the national agencies responsible for reporting. Moreover, the webpage with an indicator or set of indicators should be easily accessible from the main agency's website, through a menu bar or a dedicated icon.

In the analysis an indicator is rated as "easily accessible" if it is directly reachable via a clearly recognizable menu bar, a submenu, or an icon from the main page, and considered "not easily accessible" if the links to indicators on the main page are difficult to find, or access is only possible via a number of clicks. For reasons of clarity, the information should be preferably presented on one page per indicator or thematic area (e.g. water or air pollution) and in an

interactive file format that permits easy navigation between indicators or indicator content. The main agency's website should include a search function to facilitate the access to specific indicators requested by users.

### ***Content***

The website with an indicator/set of indicators should be presented in a clear and comprehensive way. It should provide clear and brief information on the content of the indicator presented (at least containing information on data structure and format, as well as on methodology) and a brief interpretation of the data.

To allow further access to more detailed background information, links on – at least – more detailed references to methodology, sources of data, and data validation procedures should be provided.

Moreover, the website should indicate when the content was changed.

### ***Languages***

The webpage(s) presenting the indicators should be available in local languages to be utilizable for the local public and policy makers and in a second language (English or Russian) so that it can be used by the international community and public of neighbouring countries.

Taken into account for the analysis of the available languages are the websites which contain information on the indicators, not the main pages of the relevant agencies.

## 3.2.2

## Analysis of online sharing of indicators in South-Eastern and Eastern Europe, Caucasus and Central Asia countries

Table 15: Analysis of online sharing of indicators

| Country                | Online Availability  |  |   |   |  |                           | Content  |   |                                     | Language          |         |         |
|------------------------|--|--|---|---|--|---------------------------|--|---|-------------------------------------|-------------------|---------|---------|
|                        | Number of indicators online on websites of national agencies | Accessibility from main page of national agencies    | One web page per indicator or thematic area | Indicators presented in interactive file format | Indicators presented as PDF or Excel files | Search function available | Information on content provided on website                             | Links with further reading provided           | Indication when content was changed | National language | Russian | English |
| Armenia                | 8  | Easily accessible: 8/8                               | Yes   | 8/8   | 0/8  | Yes                       | Full information provided: 7/8<br>Incomplete Information provided: 1/8 | Links provided: 8/8                           | Yes                                 | 8/8               | 0/8     | 8/8     |
| Azerbaijan             | 8  | Easily accessible: 8/8                               | Yes   | 0/8   | 8/8  | Yes                       | Full information provided: 7/8<br>Incomplete Information provided: 1/8 | Links provided: 8/8                           | Yes                                 | 8/8               | 0/8     | 8/8     |
| Belarus                | 8  | Easily accessible: 8/8                               | Yes   | 4/8   | 4/8  | Yes                       | Full information provided: 5/8<br>Incomplete Information provided: 3/8 | Links provided: 8/8                           | Yes                                 | 8/8               | 8/8     | 0/8     |
| Bosnia and Herzegovina | 7  | Easily accessible: 5/7<br>Not easily accessible: 2/7 | Yes   | 0/7   | 7/7  | Yes                       | Full information provided: 7/7   | Links provided: 3/7<br>No links provided: 4/7 | No                                  | 7/7               | 0/7     | 6/7     |
| Georgia                | 7  | Easily accessible: 7/7                               | Yes   | 0/7   | 7/7  | Yes                       | Full information provided: 6/7<br>Incomplete Information provided: 1/7 | No links provided: 7/7                        | No                                  | 0/7               | 0/7     | 7/7     |
| Kazakhstan             | 8  | Easily accessible: 8/8                               | Yes   | 0/8   | 8/8  | Yes                       | Full information provided: 8/8   | Links provided: 8/8                           | Yes                                 | 8/8               | 8/8     | 8/8     |
| Kyrgyzstan             | 8  | Easily accessible: 8/8                               | Yes   | 4/8   | 4/8  | Yes                       | Full information provided: 7/8<br>Incomplete information provided: 1/8 | Links provided: 6/8<br>No links provided: 2/8 | Yes                                 | 8/8               | 8/8     | 0/8     |
| Montenegro             | 8  | Easily accessible: 8/8                               | No  | 0/8   | 8/8  | Yes                       | Full information provided: 8/8   | No links provided: 8/8                        | No                                  | 8/8               | 0/7     | 7/8     |
| Republic of Moldova    | 8  | Easily accessible: 7/8<br>Not easily accessible: 1/8 | Yes   | 2/8   | 6/8  | Yes                       | Full information provided: 3/8<br>Incomplete information provided: 5/8 | Links provided: 3/8<br>No links provided: 5/8 | Yes                                 | 5/8               | 4/8     | 3/8     |
| Russian Federation     | 8  | Easily accessible: 4/8<br>Not easily accessible: 4/8 | No  | 5/8   | 3/8  | Yes                       | Full information provided: 3/8<br>Incomplete information provided: 5/8 | Links provided: 8/8                           | Yes                                 | 8/8               | 8/8     | 0/8     |

| Country                                   | Online Availability  |   |   |   |  |                           | Content  |   |                                     | Language          |         |         |
|---|--|---|---|---|--|---------------------------|--|---|-------------------------------------|-------------------|---------|---------|
|   | Number of indicators online on websites of national agencies | Accessibility from main page of national agencies | One web page per indicator or thematic area | Indicators presented in interactive file format | Indicators presented as PDF or Excel files | Search function available | Information on content provided on website                             | Links with further reading provided           | Indication when content was changed | National language | Russian | English |
| Serbia                                    | 7  | Easily accessible: 7/7                            | Yes   | 5/7   | 2/7  | Yes                       | Full information provided: 5/7<br>Incomplete information provided: 2/7 | Links provided: 5/7<br>No links provided: 2/7 | No                                  | 7/7               | 0/7     | 3/7     |
| The former Yugoslav Republic of Macedonia | 8  | Easily accessible: 8/8                            | Yes   | 3/8   | 5/8  | Yes                       | Full information provided: 8/8   | No links provided: 8/8                        | Yes                                 | 3/3               | 3/3     | 3/3     |
| Ukraine                                   | 3  | Easily accessible : 3/3                           | Yes   | 0/3   | 3/3  | Yes                       | Full information provided: 2/3<br>Incomplete information provided: 1/3 | No links provided : 3/3                       | Yes                                 | 3/3               | 3/3     | 3/3     |

Note: As a given country's indicators might be published on diverse websites with different patterns of online availability, content and languages, for each category of the analysis it is stated how many of the indicators are published on national websites. For example, if a country publishes 6 indicators and 4 of them are available in English, the respective field states 4/6. For more information on the approach of the assessment and the rating please refer to section 3.1 (Optimal levels of online sharing). The links and the content on the respective pages were assessed in October/November 2014. It should be noted, that the websites might have been changed since the assessment.

### **Online availability**

#### *Number of online indicators on websites of national agencies*

According to the provided information, Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, the former Yugoslav Republic of Macedonia, Montenegro, the Republic of Moldova and the Russian Federation share the information on all eight core indicators on national websites. For the last analysis in May 2014, only three countries (Belarus, the former Yugoslav Republic of Macedonia, and the Russian Federation) submitted links to all eight core indicators. After submitting links to four core indicators in May 2014, the Republic of Moldova submitted links to four additional indicators for the update in November 2014, so that now also data on all eight core indicators are shared. The country has

launched a new government data portal, which categorizes datasets in groups (e.g. "Environment") and facilitates the navigation between related datasets.

Also for Georgia considerable progress in sharing indicators is found: after only submitting data in Excel sheets in May 2014, for the current analysis links to all seven core indicators that are produced for the country were provided.

The Russian Federation publishes datasets on eight core indicators on websites of different ministries and departments.

Armenia, Azerbaijan, Belarus, Georgia and Kazakhstan have launched websites called "Joint system of environmental indicators" on which relevant datasets are published.

Kyrgyzstan has created a website "national report on the state of the environment in the Kyrgyz

Republic", which is part of the website of the State Agency on Environment Protection and Forestry and contains all eight indicators. In addition, some of the indicators are published on the webpage of the hydro-meteorological service of the country.

Seven indicators are shared by Serbia. Even though the country also publishes data on "nutrients in freshwater" (C11), this indicator is not considered for the analysis of online sharing as it does not contain information on the required datasets on lakes.

Seven indicators in the required format are shared by Georgia (all except I1) and three by Ukraine (A1, B3 and I1).

After submitting links to four webpages presenting indicators for the analysis in May 2014, Bosnia and Herzegovina now shares seven core indicators online (all except A1).

Albania, Turkmenistan and Uzbekistan have not provided links to indicators shared on national websites.

#### *Accessibility from main page of national agencies*

For Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Serbia, the former Yugoslav Republic of Macedonia, and Ukraine all shared indicators are easily accessible through the main webpages of the organizations responsible for the indicators' production, mainly through a menu bar entitled "Indicators" or "Environmental indicators".

Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan and the former Yugoslav Republic of Macedonia improved the accessibility of their indicators since May 2014, by listing all available indicators on a webpage, which is directly linked from the main page of the responsible ministry. Montenegro also inserted a

direct link to its indicator-based State of the Environment report to the main page of the responsible agency, which, however, could be positioned more prominently.

From the different webpages maintained by the Republic of Moldova, seven indicators are easily accessible, while the publication on indicator D1 is difficult to find. The access to this and other indicators could be improved by including the data into the section on "Geography and environment" on the website of the responsible National Bureau of Statistics.

In case of Bosnia and Herzegovina the indicator A2 is easily accessible from the main page of the Federal Hydrometeorological Institute, and the four core indicators published in the section on environmental indicators of the Agency of Statistics are directly linked from the main page of the agency. At the same time the information on indicators B3 and I1 is not easily accessible.

In the Russian Federation it is not difficult to find four out of eight indicators (A1, A3, B3, and D1). At the same time it is difficult to access the other four core indicators of the Russian Federation (A2, C10, C11, and I1).

#### *Presentation of indicators on individual webpages or by thematic area*

Azerbaijan, Kazakhstan, the Republic of Moldova, Serbia, the former Yugoslav Republic of Macedonia and Ukraine share their indicators on individual websites.

Armenia publishes all environmental indicators in a separate section of the website of the National Statistical Service of the Republic of Armenia and dedicates an individual webpage to each indicator. Azerbaijan has placed all eight indicators on individual webpages in the section "Baselines Shared Environmental Information System".

Belarus presents all its indicators on individual webpages named "Baseline indicators of the Joint Environmental Information System". Georgia publishes individual sheets on the core indicators on a website of the Ministry of Environment and Natural Resources, entitled "Environmental performance". And for Kazakhstan the datasets are made available on individual sheets on the website of the Committee on Statistics, entitled "Environmental indicators for monitoring and evaluation of the environment".

In the Russian Federation the data for indicators can be found in its annual national report on the state of the environment, which is published on the website of Ministry of Natural Resources and Environment. Further indicators are published on the individual websites of other organizations (Roshydromet, Rosstat).

The links submitted by Bosnia and Herzegovina for the indicators B3 and I1 lead to a bulletin on environmental statistics, while the information on the other indicators is presented in individual documents.

Kyrgyzstan and Montenegro presented most of their indicators in single documents –reports on the state of the environment, which are published on the national websites of these countries.

#### *Formats of indicator presentation*

Armenia presents all eight indicators in an interactive format.

Serbia produces seven indicators. Five of them are interactively accessible and include maps and graphs. Two more indicators (A1 and I1) are presented in a PDF report.

Belarus and Kyrgyzstan each use an interactive format for four out of eight indicators. The Republic of Moldova provides the two indicators

in an interactive mode (A1 and I1). For indicator A1 an animated map on emissions in different areas of the country was created.<sup>9</sup> The Russian Federation uses an interactive format for five out of eight indicators. The former Yugoslav Republic of Macedonia created a new website on which all core indicators will be shared. It contains interactive text boxes which can be clicked to show information on the definition of the indicator, units of measurement, etc. So far only three indicators (A3, C11 and I1) are published on this website.

At the same time, the other countries publish all indicators in PDF or Excel format.

#### *Search function*

All websites of the relevant agencies contain a search function.

#### **Content**

##### *Information on content and links provided on websites*

Montenegro and the former Yugoslav Republic of Macedonia provided nearly complete background information on all indicators on the respective webpages, including information about the data structure and format, as well as the methodology and a brief interpretation of data. In their Indicator-based State of the Environment Report Montenegro publishes the links to indicators of the European Environment Agency (EEA) and the links to detailed indicators description on the website of the national Environmental Protection Agency (EPA), which are not working yet. The former Yugoslav Republic of Macedonia provides links to additional information at its new website on indicators (so far for A3, C11 and I1).

Information on indicators of Armenia are

<sup>9</sup> <http://www.statistica.md/pageview.php?l=en&idc=462&id=4535>

published with information on methodologies applied and glossaries for each indicator which matches with the Indicator Guidelines.

Azerbaijan shares on the webpages with their indicators a summary of the applied methodology and environmental policy targets, sources of data, and, for a number of indicators, compare data with the data of neighboring states.

Bosnia and Herzegovina provided brief background information for indicators A2, B3, and I1, including information on international policy targets and links which mainly lead to international conventions and frameworks. Indicators A3, C10, C11 and D1 are also published with some background information and data are presented in graphs, but no links are provided.

Background information is also available on the webpages published by Belarus, which includes evaluation criteria, methods of calculation, and schematic maps of monitoring sites for all eight indicators.

The Russian Federation publishes information on sources of data, present data in graphs and charts, and post information on environmental targets set by the country for most indicators in its annual national report on the state of the environment. However in terms of the individual webpages that were provided, only for three of the eight core indicators complete background information is published.

For Georgia and Kazakhstan basic information on the indicators is published in the Excel tables. In the case of Kazakhstan, each figure is accompanied by information on methodology, a brief interpretation (which includes data presentation in charts and graphs, as well as a glossary) and also links to guidelines on sources

of information. Georgia does not publish any links on the webpages with information on indicators.

Serbia publishes the information, including maps and graphs for five indicators. Links to detailed descriptions of the indicators by EEA (only in English) are provided for all four indicators on its indicator platform and in the report on Indicator I1, while there are no links provided for the indicators A1 and D1.

Kyrgyzstan shares complete background information on all eight indicators. Kyrgyzstan's data are provided in tables, being part of the national report on the state of environment, published every three years.

Ukraine publishes only data series for three indicators on the website of the statistical agency without providing background information and links.

The Republic of Moldova publishes some background information and links within its report on GHG emissions (indicator B3), as well as for the indicators included in the database of the National Bureau of Statistics (A1 and I1).

#### *Specification of the time of the last update*

Following recommendation 13, a number of countries have included a note on the time of the last update of content to their webpages. Armenia, Azerbaijan, Belarus, Kazakhstan and Kyrgyzstan show on their website that the content of each of the eight indicators was changed in 2014. Ukraine had changed in 2014 the content of two indicators.

The former Yugoslav Republic of Macedonia shows the date of the last modification of its new website on indicators. The newly created Government "Open Data Portal" by the Republic of Moldova also shows the time of the last update: For each datasets in the Portal it is possible to access a menu bar entitled "Activity stream",



leading to information when a dataset was created and modified.

### *Languages*

Kazakhstan and Ukraine publish the information on indicators on websites in their national language, Russian and English. Armenia, Azerbaijan, and the former Yugoslav Republic of Macedonia publish all their indicators in national languages and in English. Serbia publishes all of its seven indicators in national language. While the main portal on indicators is not available in English or Russian yet, for three indicators (A1, D1, I1) data are shared in publications which are available in English.

Of the seven indicators published by Bosnia and Herzegovina, six are available in both national language and English, while indicator A2 is only available in the national language. The indicators published by Georgia are presented in English only. Montenegro publishes all eight indicators in

its national language, and all but one (C11) are also available in English. Of its eight indicators, the Republic of Moldova publishes only five in the national language, while data on three indicators are only available in Russian. Moreover, three indicators are available in English.

Belarus and the Russian Federation presented the data only in Russian, which is the national language. Indicators by Kazakhstan and Kyrgyzstan are available only in Russian, which is the official language, along with the national languages in these countries.

The menu of websites of some countries (Belarus, the former Yugoslav Republic of Macedonia, Kazakhstan, Kyrgyzstan, the Russian Federation) have links to switch from the national language to English. However this function does not seem to work fully yet, which makes environmental indicators difficult to access for international users.

## Part IV Future Outlook



Given the progress achieved in the production and sharing of the eight environmental indicators in the original core set, the target countries have agreed to expand it and work on additional indicators from the agreed Indicator Guidelines.

In determining the choice of additional indicators, it was proposed to the target countries to link them with the forthcoming Environment for Europe Ministerial Conference in 2016. The two priority themes chosen for the focus of the Ministerial Conference are green economy and air quality. Thus, two guiding criteria were considered for the identification of areas for further work in this proposal: 1) the suitability of indicators to support analysis in the fields of air quality and green economy and 2) the availability of data in the target countries.

Concerning the first criterion, since the topic of air quality was already covered by a number of indicators in the existing core set, the proposal aimed to include several indicators that could support evaluating progress in the transition to a green economy. The United Nations Environment Programme (UNEP) defines a green economy as an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. A current report on “Greening the economy in the pan-European region” by UNECE and UNEP, proposes three overarching green economy objectives for the region, supported by

specific goals. The first objective concerns conservation and sustainable use of ecosystems, ecosystem services and the natural resource base; the second focuses on sustained and sustainable economic development and sustainable production and consumption patterns enabling an increased share of green GDP in the economy; and the third prioritizes human development and well-being.

The additional 14 environmental indicators proposed were relevant to all three goals, and therefore found to be suitable to contribute to the assessment of progress in greening the economy in the pan-European region related to water, biodiversity, soil, agriculture, energy and transport.

Out of these 14 indicators, the target countries selected six as follow: Renewable freshwater resources (C1), Freshwater abstraction (C2), Total water use (C3), Threatened and protected species (D4), Fertilizer consumption (F2) and Passenger transport demand (H1). With them the extended core set contains 14 indicators to be considered for regional assessment work in the next two years, including the preparation of the Sixth Global Environmental Outlook publication of UNEP and the next Environment for Europe Ministerial Conference in Batumi, Georgia in 2016.

It seems evident that given the progress of the countries in production and sharing highlighted in this report, including setting up of dedicated

websites, there is optimism for similar goals to be achieved in the next two years and beyond until the entire set of environmental indicators are accessible in a complete national SEIS for the majority of target countries.

## **Progress in the production and sharing of core environmental indicators**

in countries of South-Eastern Europe, Caucasus and Central Asia

The United Nations Economic Commission for Europe (UNECE) Programme on Environmental Monitoring and Assessment assists UNECE member States in working with environmental data and information to enable their timely flows and adequate assessment. In this way, the Programme helps enable an informed decision-making process, both nationally and internationally, in the environmental sector.

Within the Programme, UNECE in collaboration with its partner the European Environment Agency (EEA) and thanks to donors such as the European Union, Norway, Switzerland and the Russian Federation has been working with 17 countries (Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Georgia, Kazakhstan, Kyrgyzstan, Montenegro, Republic of Moldova, Russian Federation, Serbia, Tajikistan, the former Yugoslav Republic of Macedonia, Turkmenistan, Ukraine and Uzbekistan) to produce and share environmental data in areas such as air, climate change, water, biodiversity and waste.

This publication analyses progress made by the target countries in the production and sharing of a core set of environmental indicators. The analysis is based on indicators, underpinning datasets and background information shared by the target countries through national websites.

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