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Introduction to the work and revised structure of the indicator metadata

STATISTICS

16th Session of the Joint Task Force on Environmental Statistics and Indicators, Geneva, 28-29 October 2019

Rationale

Why a review of the indicators and online guidelines?

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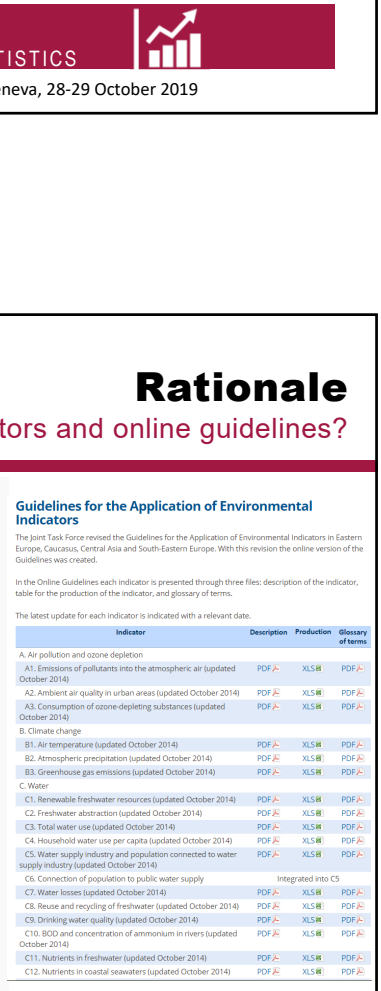
The JTF requested the Secretariat to review the ECE set of environmental indicators and the associated Guidelines to

- **inform better the recent global policies** (such as 2030 Agenda, Paris Agreement and Sendai Framework for Disaster-risk Reduction)
- **link them with statistical frameworks**, such as the United Nations Framework for the Development of Environment Statistics and the System of Environmental-Economic Accounting
- **increase user-friendliness** of the metadata



Guidelines for the Application of Environmental Indicators

The Joint Task Force revised the Guidelines for the Application of Environmental Indicators in Eastern Europe, Caucasus, Central Asia and South-Eastern Europe. With this revision the online version of the Guidelines was created.

In the Online Guidelines each indicator is presented through three files: description of the indicator, table for the production of the indicator, and glossary of terms.

The latest update for each indicator is indicated with a relevant date.

Indicator	Description	Production	Glossary of terms
A. Air pollution and ozone depletion			
A1. Emissions of pollutants into the atmospheric air (updated October 2014)	PDF	XLS	PDF
A2. Ambient air quality in urban areas (updated October 2014)	PDF	XLS	PDF
A3. Consumption of ozone-depleting substances (updated October 2014)	PDF	XLS	PDF
B. Climate change			
B1. Air temperature (updated October 2014)	PDF	XLS	PDF
B2. Atmospheric precipitation (updated October 2014)	PDF	XLS	PDF
B3. Greenhouse gas emissions (updated October 2014)	PDF	XLS	PDF
C. Water			
C1. Renewable freshwater resources (updated October 2014)	PDF	XLS	PDF
C2. Freshwater abstraction (updated October 2014)	PDF	XLS	PDF
C3. Total water use (updated October 2014)	PDF	XLS	PDF
C4. Household water use per capita (updated October 2014)	PDF	XLS	PDF
C5. Water supply industry and population connected to water supply industry (updated October 2014)	PDF	XLS	PDF
C6. Connection of population to public water supply	Integrated into C5		
C7. Water losses (updated October 2014)	PDF	XLS	PDF
C8. Reuse and recycling of freshwater (updated October 2014)	PDF	XLS	PDF
C9. Drinking water quality (updated October 2014)	PDF	XLS	PDF
C10. BOD and concentration of ammonium in rivers (updated October 2014)	PDF	XLS	PDF
C11. Nutrients in freshwater (updated October 2014)	PDF	XLS	PDF
C12. Nutrients in coastal seawaters (updated October 2014)	PDF	XLS	PDF

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Expected results of the review

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1. Metadata of each indicator:
   - Missing information (e.g. link to SDGs) added
   - References (e.g. methodological information) updated
   - Information and structure harmonized across indicators
   - Electronic version (database) for easy editing, search of information, library with reference documents, reduced duplications, export functions etc.
   - No significant change of the structure and content of the current metadata
   - Defined review process
2. Content (list of indicators)
   - Additional indicators if necessary (e.g. to better align with 2030 Agenda, Paris Agreement and Sendai Framework)
   - Filling of important gaps in the list of indicators (e.g. “Environmental Expenditures” is still a placeholder)

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Considerations for reviewing structure of metadata

Database developed in MSAccess

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JTF requested:

- Avoidance of duplications (e.g. reference documents)
- Links to SDG indicators
- Links to SEEA and FDES
- Simple editing of indicators and underlying data and statistics
- Search functions
- No drastic change of structure of existing metadata sheets

Distinction is important between

a) **Indicators (e.g. SO2 emissions per unit of GDP)**

b) **Data and statistics (e.g. SO2 emissions in 1000 t/year)**

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Considerations for reviewing structure of metadata

What is environmental data, what is statistics, what are indicators?

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Reference: UN Framework for the Development of Environment Statistics (FDES 2013)

Environmental data are large amounts of unprocessed observations and measurements about the environment and related processes…

Environment statistics are environmental data that have been structured, synthesized and aggregated according to statistical methods, standards and procedures. The role of environment statistics is to process environmental and other data into meaningful statistics that describe the state of and trends in the environment and the main processes affecting them...

Environmental indicators are environment statistics that have been selected for their ability to depict important phenomena or dynamics. Environmental indicators are used to synthesize and present complex environment and other statistics in a simple, direct, clear and relevant way. Environmental indicators are generated because environment statistics are usually too numerous and detailed to meet the needs of policymakers and the general public, and often require further processing and interpretation to be meaningful. Environmental indicators may take various forms such as rates, ratios or proportions, and be constructed at different levels of aggregation. The purpose of these indicators is to assess present and future directions with respect to goals and targets, evaluate and determine the impact of specific programmes, monitor progress, measure changes in a specific condition or situation over time, and convey messages…

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Distinction between "indicators" and "data and statistics" helps to avoid redundancies in metadata

Data and statistics are multi-purpose

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G. Energy

G1. Final energy consumption	PDF	XLS	PDF
G2. Total primary energy supply	PDF	XLS	PDF
G3. Energy intensity	PDF	XLS	PDF
G4. Renewable energy supply	PDF	XLS	PDF

Data items to calculate G2 (all in ktoe):

- Coal
- Crude oil
- Oil products
- Natural gas
- Nuclear energy
- Hydropower
- Geothermal and solar energy, etc.
- Biofuels and waste
- Electricity
- Heat

Data items to calculate G4 (all in ktoe):

- Hydropower
- Biomass
- Biofuels
- Wind power
- Solar power
- Geothermal energy
- Other renewables

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Indicator metadata database

Currently developed in MS Access

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- A clear distinction is made between “indicators” and “data and statistics”
- Indicators and/or underlying data can be linked with
  - Policy references and methodological references
  - SDG indicators
  - SEEA accounts
  - FDES themes
- 1 data item can serve production of multiple indicators, therefore “indicators” and “data and statistics” are maintained in separate tables
- Forms for searching and editing of indicators, data, statistics, reference documents etc.
- Export functions (e.g. metadata sheets, lists of underlying data and statistics, reference documents)

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Structure of the metadata

Old metadata: description file + xls file + glossary of terms

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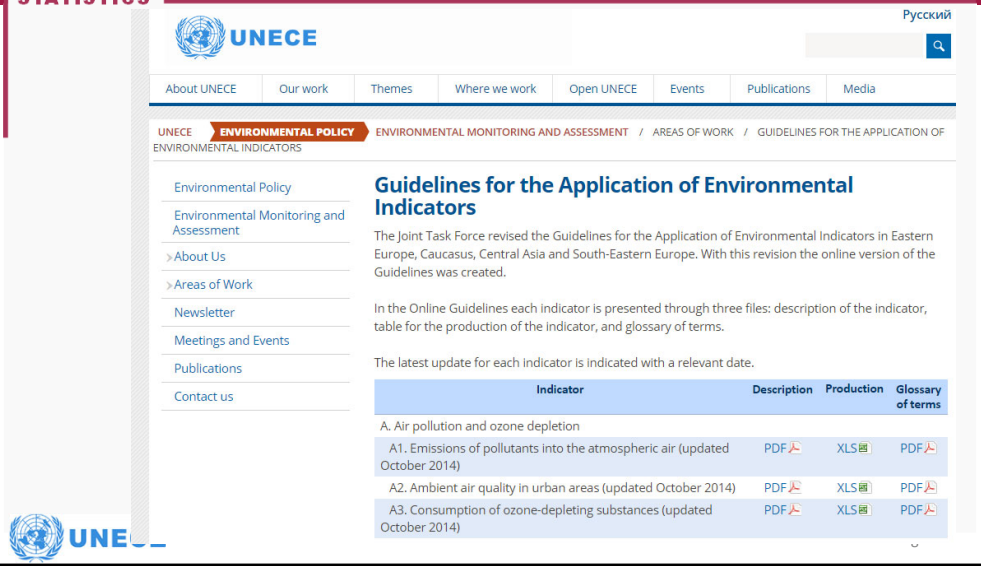

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Structure of the new metadata of INDICATORS

Aligned with "old metadata", but some improvements

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NEW

Header	Metadata
General description	Indicator ID
	Indicator name
	Indicator definition
	Unit of measure
	Coverage
	Reference period
	Update frequency
	Relation to other indicators of the UNECE guidelines
Relevance for environmental policy	Purpose
	Policy context
	Link with SDG indicators
	Policy references
Methodology and guidelines	Methodology for indicator calculation
	Methodology references
	Data and statistics
	Possible data validation
Other	Comments

OLD

Structure of the new metadata of DATA AND STATISTICS

Each data item is described separately and linked with FDES and SEEA

STATISTICS

ID	1
Name of data item	Ambient air quality - PM10: Daily average limit value
Unit of measure	mg/m3
Explanation	Particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at an aerodynamic diameter of 10 µm. According to international guidelines: 24-hour limit value: 50 µg/m3, not to be exceeded more than 35 times a calendar year; please indicate the limit value which is applied in your country.
Data source(s)	National Ambient Air Quality Standards
Methodological reference	WHO guidelines for PM, O3, NO2 and SO2
	Add reference document
FDES topic	1.3.1: Air quality
SEEA account	
Comments	
Date of data entry	4/29/2019 3:05:15 PM

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New list of indicators appears to be longer

Example "Indicator A1: Emissions of pollutants into the atmospheric air"

Data and statistics are multi-purpose: Only described once in the database

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Indicator A1 actually includes the following indicators:

Data and statistics needed:
- SO2 emissions
- NOx emissions
- …
- Population
- Area
- GDP

1. A-1.1 Emissions of sulphur dioxide per capita
2. A-1.2 Emissions of sulphur dioxide per km2
3. A-1.3 Emissions of sulphur dioxide per unit of GDP
4. A-1.4 Emissions of nitrogen oxides per capita
5. A-1.5 Emissions of nitrogen oxides per km2
6. A-1.6 Emissions of nitrogen oxides per unit of GDP
7. A-1.7 Emissions of non-methane volatile organic compounds (NMVOC) per capita
8. A-1.8 Emissions of non-methane volatile organic compounds (NMVOC) per km2
9. A-1.9 Emissions of non-methane volatile organic compounds (NMVOC) per unit of GDP
10. A-1.10 Share of sulphur dioxide emissions from stationary or mobile sources
11. A-1.11 Share of nitrogen oxides emissions from stationary or mobile sources
12. A-1.12 Share of NMVOCs emissions from stationary or mobile sources
13. A-1.13 Share of ammonia emissions from stationary or mobile sources
14. A-1.14 Share of carbon monoxide emissions from stationary or mobile sources
15. A-1.15 Share of hydrocarbons emissions from stationary or mobile sources
16. A-1.16 Share of total suspended particels (TSP) emissions from stationary or mobile sources
17. A-1.17 Share of PM10 emissions from stationary or mobile sources
18. A-1.18 Share of PM2.5 emissions from stationary or mobile sources

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Indicator metadata database

Main menu

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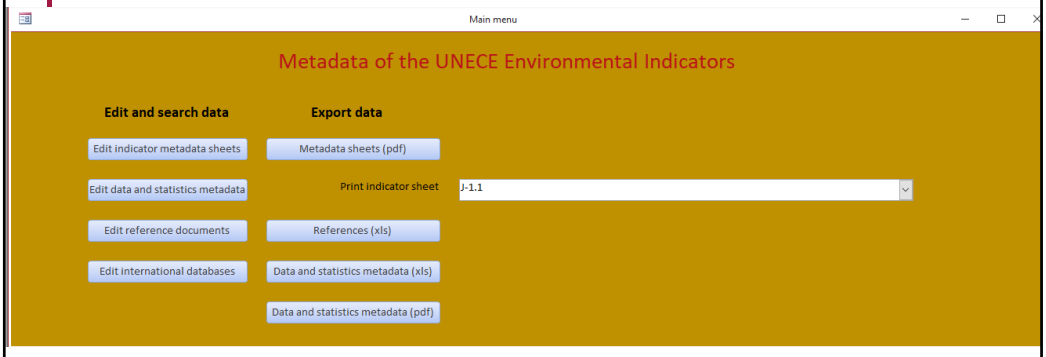

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Indicator metadata database

Editing indicator metadata

STATISTICS

Indicator metadata **A-2.1 PM10: Number of days with exceeded daily limit value**

Add new record | Close Form

Search indicator: [A-2.1] PM10: Number of days with exceeded daily limit value

Indicator ID and name: A-2.1 | PM10: Number of days with exceeded daily limit value | Status: Ready for JTF meeting

ID and name in current online guidelines: A2 | Ambient air quality in urban areas

First publication: | Latest update: 4/29/2019

Editor: Michael Nagy

Indicator definition and description: The number of days during a year when air pollution levels (for air pollutants such as at least: particulate matter 10 (PM10), sulphur dioxide (SO2), nitrogen dioxide (NO2) and ground-¬level ozone (O3)) exceed the established limit values (maximum allowable annual and daily concentrations (MACs)) in urban areas with regular observations of air quality

Unit of measure: Days per year

Coverage: Selected cities

Spatial aggregation: Individual monitoring stations

Reference period: Calendar year

Update frequency: Annually

Relation to other indicators of the UNECE guidelines

ID	Indicator (UNECE guidelines)	Comments
A1	Emissions of pollutants into the atmospheric air	

Record: 1 of 1 | No Filter | Search

Purpose of the indicator: The indicator provides a measure of the state of the environment in terms of air quality and the impact of air pollution on the population, the state of the environment and on vegetation/ecosystems.

Policy context and targets: ECE Convention on Long--range Transboundary Air Pollution (CLRTAP); WHO Europe guidelines on air quality limit values; Environmental Strategy of countries of South-Eastern and Eastern Europe, Caucasus and Central Asia: optimization of standards for ambient air pollution in urban areas; EU Directives 2008/50/EC (Air Quality Framework Directive) and 2004/107/EC lay down standards for air pollutants

Link to SDGs (select related indicators)

SDG indicators	Comments
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	

Record: 1 of 1 | No Filter | Search

Policy references | Add new reference document

Short name of reference	
ECE Convention on Long--range Transboundary Air Pollution (CLRTAP)	reducing and preventing air pollution by SO2, NOX, NH3,
WHO Europe guidelines on air quality limit values	WHO Europe recommends in its guidelines air quality lin
EU Directive 2008/50/EC on air quality	Laying down standards for air pollutants

Record: 1 of 3 | No Filter | Search

Methodology for indicator calculation: The indicators counts the number of days per year on which the nationally set daily limit value for a given pollutant was exceeded

Methodology references | Add new reference document

Short name of reference	Comments
ECE Convention on Long--range Transboundary Air Pollution (CLRTAP)	
EU Directive 2008/50/EC on air quality	
WHO guidelines for PM, O3, NO2 and SO2	

Record: 1 of 3 | No Filter | Search

Data and statistics required for the compilation of the indicator | Add new data item

Data item	Comments
Ambient air quality - PM10: Daily average limit value	
Ambient air quality - PM10: Annual average limit value	
Ambient air quality - PM10: The highest daily concentration	

International databases containing this indicator | Add international database

ID_Internat_DB	Comments
WHO Ambient air Quality Database Application	Contains data on PM2.5 and PM10 concentrations around the world

Record: 1 of 1 | No Filter | Search

Comments: The type of calculation of exceedances can differ from country to country and between the different pollutants; Metadata on the used limit value and calculation of exceedences should be provided.

Indicator metadata database

Editing data and statistics metadata

Data and Statistics

Close Form

Search record

ID	1
Name of data item	PM10: Daily average limit value
Unit of measure	mg/m3
Explanation	Particulate matter which passes through a size-selective inlet with a 50% efficiency cut-off at an aerodynamic diameter of 10 µm.
Data source(s)	Data on ambient air pollution concentrations are routinely collected in national monitoring networks. General data on air quality in urban areas are published in annual environmental reports,
Methodological reference	WHO guidelines for PM, O3, NO2 and SO2
	Add reference document
FDES topic	1.3.1: Air quality
SEEA account	

Indicator metadata database

Export of metadata (e.g. as pdf)

STATISTICS

Indicator **A-2.1 Number of days with exceeded daily limit value**

ID and name in indicator guidelines A2 Ambient air quality in urban areas

First publication Latest update 4/29/2019

Indicator definition The number of days during a year when air pollution levels (for air pollutants such as at least: particulate matter 10 (PM10), sulphur dioxide (SO2), nitrogen dioxide (NO2) and ground-–-level ozone (O3)) exceed the established limit values (maximum allowable annual and daily concentrations (MACs)) in urban areas with regular observations of air quality

Unit of measure Days per year

Coverage Selected cities

Spatial aggregation Individual monitoring stations

Reference period Calendar year

Update frequency Annually

Relation to other indicators of the UNECE guidelines

ID	Name of indicator in online guidelines	Comments
A1	Emissions of pollutants into the atmospheric air	

Status of work

Continuous process with priorities

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Constraints

- Limited resources in countries and the secretariat
- International indicator sets and methodologies (e.g. SDG tier III indicators, Paris Agreement) still in development
- No harm to existing sets of environmental statistics and indicators

Agreed priorities of work

- Development of a working database - ***done***
- Priority 1 indicators:
  - Indicator A2 -Ambient air quality in urban areas – ***in database***
  - Theme D - Biodiversity (all indicators) – *in development*
  - Theme G – Energy (all indicators) – ***in database***
  - Theme H – Transport (all indicators) – *database to be populated*
- Priority 2 indicators:
  - Indicator A1 - Emissions of pollutants into the atmospheric air – ***in database***
  - Theme C - Water (all water resources and use indicators C1-C8) –***C1-C4 in database***
  - Theme I – Waste (all indicators) – ***in database***
  - Indicator J1 – Environment protection expenditure – ***in database***

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Procedure

Secretariat in collaboration with subject matter experts from countries and IOs

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- Small working groups for groups of indicators, involving next to JTF also subject matter experts from UNECE transport division and other IOs. Number of JTF members that have signed up so far:
  - A. Air pollution and ozone depletion: 9
  - B. Climate change: 7
  - C. Water: 9
  - D. Biodiversity: 3
  - E. Land and soil: 5
  - F. Agriculture: 5
  - G. Energy: 6
  - H. Transport: 5
  - I. Waste: 7
  - J. Environmental financing: 4
- Once draft metadata are ready, they will be shared with JTF for comments
- Further JTF meetings to discuss open issues

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Comments, suggestions?