

# OECD WORK ON ENVIRONMENTAL INDICATORS

by Myriam Linster<sup>1</sup>

## 1. Background

Over the past 30 years, environmental policies and related reporting activities adopted by OECD countries have steadily evolved. This evolution has been largely driven by increased public awareness of environmental issues, their international aspects and their linkages with economic and social issues. Initially the demand for environmental information was closely related to the definition and implementation of environmental policies and their effects on the state of the environment. Over the years, policy priorities evolved, as did demands for reliable, harmonised and easily understandable information, not only from the environmental community but also from other public authorities, businesses, the general public, environmental NGOs and other stakeholders. At the same time, international activities and co-operation on the environment continued to grow.

This has stimulated a number of countries to produce environmental information that is more responsive to policy needs and public information requirements. The aim is to further strengthen countries' *capacity to monitor and assess* environmental conditions and trends so as to increase their *accountability* and to evaluate how well they are satisfying their domestic *objectives* and international *commitments*. In this context, environmental indicators are cost-effective and valuable tools.

## 2. Purpose and scope

Indicators can be used at international and national levels in state of the environment reporting, measurement of environmental performance and reporting on progress towards sustainable development. They can further be used at national level in planning, clarifying policy objectives and setting priorities. The OECD work on environmental indicators is designed to:

- Contribute to the *harmonisation* of individual initiatives of OECD Member countries in the field of environmental indicators by developing a common approach and conceptual framework; assist in *further development* and use of environmental indicators in OECD Member countries; and promote the *exchange of related experience* with non members and other international organisations;
- Support the OECD's *policy analysis and evaluation* work by developing core sets of reliable, measurable and policy-relevant environmental indicators to:

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<sup>1</sup> Administrator, Environmental Performance and Information Division, Environmental Directorate, OECD.

- measure environmental progress and performance,
- monitor policy integration, and
- allow effective international comparisons;

The OECD work focuses mainly on indicators to be used in *national, international and global* decision making, yet the approach may also be used to develop indicators at *sub-national* or ecosystem level. The actual measurement of indicators at these levels is encouraged and lies within the responsibility of individual countries.

### **3. Approach and results**

The development of harmonised international environmental indicators is done in close co-operation with OECD member countries. It uses a *pragmatic* approach, recognising that there is *no universal set* of indicators; rather, several sets exist, serving *several purposes and audiences*. OECD work led in particular to:

- Agreement on a common conceptual *framework*, based on a common understanding of concepts and definitions and on the *pressure-state-response (PSR) model*;
- Identification of *criteria* to help in selecting indicators and validating their choice: all indicators are reviewed according to their policy relevance, analytical soundness and measurability;
- *Identification* and definition of indicators;
- Provision of *guidance for the use* of indicators in connection with the evaluation of environmental performance, stressing that indicators are only one tool and have to be interpreted in context to acquire their full meaning;
- Agreement to use the OECD approach at national level by adapting it to *national circumstances*.

#### ***Publication and use***

Those indicators for which internationally comparable data exist are *regularly published and used* in OECD work, particularly in *environmental performance reviews*. They are a way to monitor the integration of economic and environmental decision making, to analyse environmental policies and to gauge the results.

Beyond this application, they also contribute to the broader objective of reporting on sustainable development and to the elaboration of *sustainable development indicators*.

### Box 1. Functions and definitions of environmental indicators

The OECD *terminology* points to two major *functions* of indicators:

- they reduce the number of measurements and parameters that normally would be required to give an exact presentation of a situation.  
*As a consequence, the size of an indicator set and the level of detail contained in the set need to be limited. A set with a large number of indicators will tend to clutter the overview it is meant to provide.*
- they simplify the communication process by which the results of measurement are provided to the user.  
*Due to this simplification and adaptation to user needs, indicators may not always meet strict scientific demands to demonstrate causal chains. Indicators should therefore be regarded as an expression of "the best knowledge available".*

#### Definitions

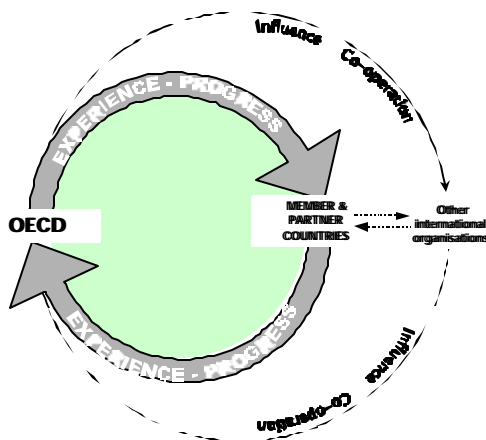
- *Indicator*: a parameter, or a value derived from parameters, which points to, provides information about, describes the state of a phenomenon/environment/area, with a significance extending beyond that directly associated with a parameter value.
- *Index*: a set of aggregated or weighted parameters or indicators.
- *Parameter*: a property that is measured or observed.

### A dynamic process

None of the OECD indicator sets is necessarily final or exhaustive in character; they are regularly refined and may change as scientific knowledge, policy concerns and data availability progress.

## 4. Links with national and other international initiatives

The indicator development has built on OECD experience in environmental information and reporting since the 1970s and on leadership of several OECD countries. It has benefited from strong support from all member countries and their representatives in the OECD Working Group on Environmental Information and Outlooks.



Results of OECD work, and in particular its conceptual framework, have in turn influenced similar activities by a number of countries and international organisations. Continued *co-operation* is taking place in particular with: the United Nations Statistics Division (UNSD), the UN Commission for Sustainable Development (UNCSD) and UN regional offices; the United Nations Environment programme (UNEP); the World Bank, the European Union (Commission of the European Communities, Eurostat, the European Environment Agency-EEA) and with a number of international institutes. Such co-operation is essential to achieve synergies, to help identifying commonalities and to clarify the specific purposes of the various initiatives.

Co-operation and *exchange of experience* is also taking place with non OECD countries, and in particular with Russia and China.

<b>Box 2. Criteria for selecting environmental indicators</b>	
As indicators are used for various purposes, it is necessary to define general criteria for selecting indicators and validating their choice. Three basic criteria are used in OECD work: policy relevance and utility for users, analytical soundness, and measurability.*	
<b>POLICY RELEVANCE AND UTILITY FOR USERS</b>	An environmental indicator should: <ul style="list-style-type: none"> <li>◆ Provide a representative picture of environmental conditions, pressures on the environment or society's responses;</li> <li>◆ be simple, easy to interpret and able to show trends over time;</li> <li>◆ be responsive to changes in the environment and related human activities;</li> <li>◆ provide a basis for international comparisons;</li> <li>◆ be either national in scope or applicable to regional environmental issues of national significance;</li> <li>◆ have a threshold or reference value against which to compare it, so that users can assess the significance of the values associated with it.</li> </ul>
<b>ANALYTICAL SOUNDNESS</b>	An environmental indicator should: <ul style="list-style-type: none"> <li>◆ be theoretically well founded in technical and scientific terms;</li> <li>◆ be based on international standards and international consensus about its validity;</li> <li>◆ lend itself to being linked to economic models, forecasting and information systems.</li> </ul>
<b>MEASURABILITY</b>	The data required to support the indicator should be: <ul style="list-style-type: none"> <li>◆ readily available or made available at a reasonable cost/benefit ratio;</li> <li>◆ adequately documented and of known quality;</li> <li>◆ updated at regular intervals in accordance with reliable procedures.</li> </ul>
<p><i>Extract from "Environmental indicators for environmental performance reviews", OECD, 1993.</i>            *These criteria describe the "ideal" indicator; not all of them will be met in practice.</p>	

## 5. Several types of indicators

OECD work on environmental indicators, initiated in 1989, includes several categories of indicators, each corresponding to a specific purpose and framework (see also Box 3):

### **TRACKING ENVIRONMENTAL PROGRESS AND PERFORMANCE:**

**CORE ENVIRONMENTAL INDICATORS (CEI)** are designed to help track environmental progress and the factors involved in it, and analyse environmental policies. The OECD Core Set is a set commonly agreed upon by OECD countries for OECD use. It is published regularly. The Core Set, of about 50 indicators, covers issues that reflect the main environmental concerns in OECD countries. It incorporates core indicators derived from sectoral sets and from environmental accounting. Indicators are classified following the PSR model: indicators of environmental pressures, both direct and indirect; indicators of environmental conditions; indicators of society's responses.

### **INFORMING THE PUBLIC:**

**KEY ENVIRONMENTAL INDICATORS (KEI)**, endorsed by OECD Environment Ministers, are a reduced set of core indicators, selected from the OECD Core Set, that serve wider communication purposes. they inform the general public and provide key signals to policy-makers.

### **PROMOTING INTEGRATION:**

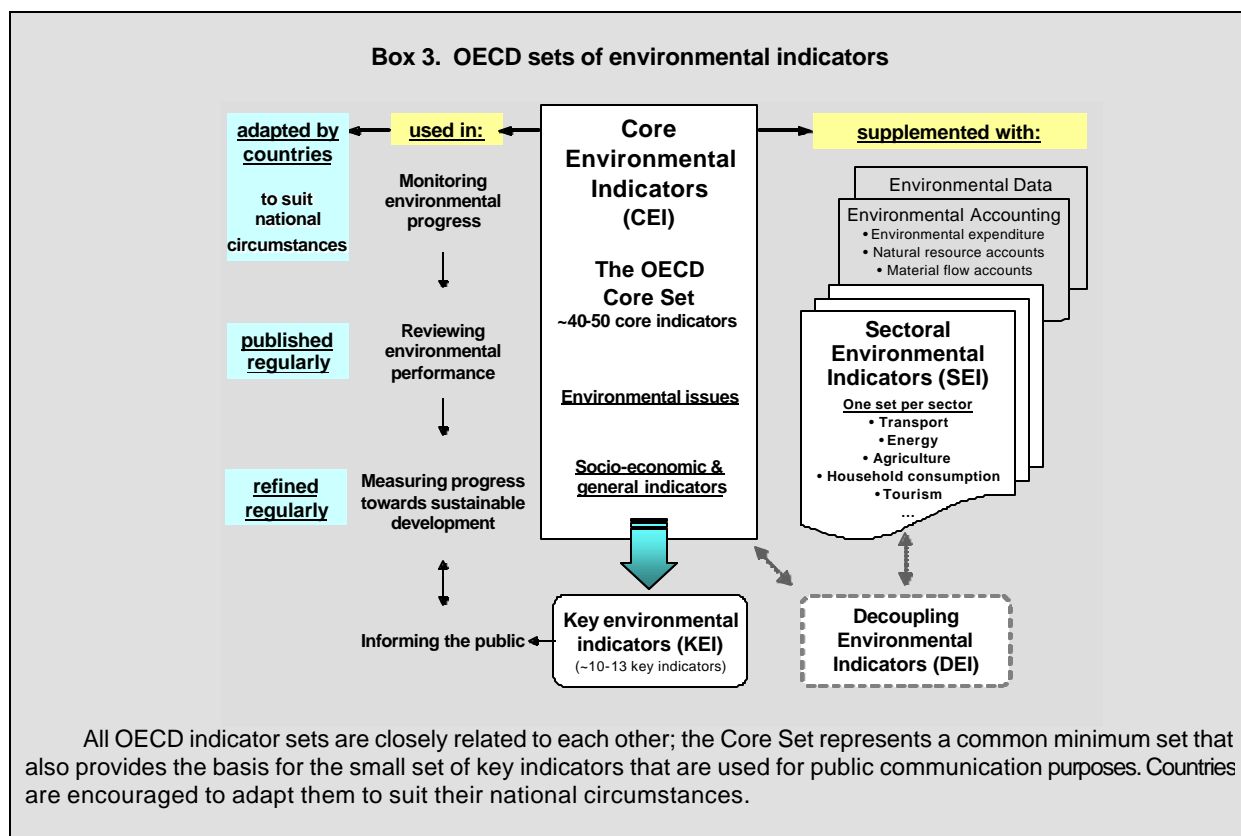
**SECTORAL ENVIRONMENTAL INDICATORS (SEI)** are designed to help integrate environmental concerns into sectoral policies. Each set focuses on a specific sector (transport, energy, household consumption, tourism,

agriculture). Indicators are classified following an adjusted PSR model reflecting: sectoral trends of environmental significance; their interactions with the environment (including positive and negative effects); and related economic and policy considerations.

**INDICATORS DERIVED FROM ENVIRONMENTAL ACCOUNTING** are designed to help integrate environmental concerns into economic and resource management policies. Focus is on: environmental expenditure accounts; physical natural resource accounts, related to sustainable management of natural resources; and physical material flow accounts, related to the efficiency and productivity of material resource use.

**MONITORING  
PROGRESS  
TOWARDS  
SUSTAINABLE  
DEVELOPMENT:**

**DECOUPLING ENVIRONMENTAL INDICATORS (DEI)** measure the decoupling of environmental pressure from economic growth. In conjunction with other indicators used in OECD country reviews, they are valuable tools for determining whether countries are on track towards sustainable development. Most DEIs are derived from other indicator sets and further broken down to reflect underlying drivers and structural changes.



**6. Using environmental indicators**

Over the years, the OECD has accumulated practical experience not only in developing, but also in using environmental indicators in its policy work. The indicators are used as a specific tool for evaluating

environmental performance, and for monitoring the implementation of the OECD Environmental Strategy for the first decade of the 21<sup>st</sup> century.

### ***Guiding principles***

When using environmental indicators in analysis and evaluation, the OECD and its Member countries apply the following commonly agreed upon principles:

<b>ONLY ONE TOOL</b>	<p>Indicators are not designed to provide a full picture of environmental issues, but rather to help reveal trends and draw attention to phenomena or changes that require further analyses and possible action.</p> <p>Indicators are thus <i>only one tool</i> for evaluation; scientific and policy-oriented interpretation is required for them to acquire their full meaning. They need to be supplemented by other qualitative and scientific information, particularly in explaining driving forces behind indicator changes which form the basis for an assessment. One should also note that some topics do not lend themselves to evaluation by quantitative measures or indicators.</p>
<b>THE APPROPRIATE CONTEXT</b>	<p>Indicators' relevance varies by country and by context. They must be reported and <i>interpreted in the appropriate context</i>, taking into account countries' different ecological, geographical, social, economic and institutional features.</p>
<b>INTER-COUNTRY COMPARISON AND STANDARDISATION</b>	<p>Most OECD indicators focus on the national level and are designed to be used in an international context. This implies not only nationally aggregated indicators, but also an appropriate level of <i>comparability among countries</i>.</p> <p>There is no single method of <i>standardisation</i> for the comparison of environmental indicators across countries. The outcome of the assessment depends on the chosen denominator (e.g. GDP, population, land area) as well as on national definitions and measurement methods. It is therefore appropriate for different denominators to be used in parallel to balance the message conveyed. In some cases absolute values may be the appropriate measure, for example when international commitments are linked to absolute values.</p> <p>Moreover, the choice of the <i>initial level</i> of an environmental pressure and of the <i>time period</i> considered can affect the interpretation of the results, because countries do proceed according to different timetables.</p>
<b>LEVEL OF AGGREGATION</b>	<p>Within a country a greater level of detail or breakdown may be needed, particularly when indicators are to support sub-national or sectoral decision making. This is important, for example, when dealing with river basin or ecosystem management, when using indicators describing drivers which are relevant at the local level, or when national indicators hide major regional differences.</p> <p>The actual measurement of indicators at these levels is encouraged and lies within the responsibility of individual countries. At these levels, however, comparability problems may be further exacerbated.</p>
<b>MEASURABILITY AND DATA QUALITY</b>	<p>Measurability issues such as the quality of underlying data are important in the use of environmental indicators, and must be taken into account to avoid misinterpretation. Measurability and data quality vary greatly among individual indicators. Some indicators are immediately measurable, others need additional efforts before they can be published and used. For example, most indicators of societal responses have a shorter history than indicators of environmental pressures and many indicators of environmental conditions, and some are still in development both conceptually and in terms of data availability.</p>

### ***Environmental indicators and performance analysis***

Environmental indicators support and illustrate the analysis made in the OECD Country Environmental Performance Reviews (conducted since 1992) and provide all reviews with a common denominator. This creates a synergy in which regular *feedback* is provided on the indicators' policy relevance and analytical soundness. To date, the environmental performances of all OECD countries and

some non members have been reviewed, and environmental information and indicators have been assembled for all OECD Member countries.

It is important to recognise, however, that indicators are *not a mechanical measure* of environmental performance. They need to be complemented with background information, data, analysis and interpretation. One should also note that some issues or topics do not lend themselves to evaluation by quantitative measures or indicators.

In the OECD environmental performance reviews, international indicators from the OECD sets (CEI, KEI, SEI) are used in combination with specific national indicators and data, and complemented as appropriate by additional information (e.g. lists of laws and regulations, economic instruments, and conventions; organigrammes; maps). Whenever possible, both state and trend data are presented for the indicators. Trends are shown over a decade for most indicators, and over two decades for selected topics to keep track of early policy measures and monitor changes over long periods.

Using environmental indicators in environmental performance reviews implies linking these indicators to the measurement and analysis of achievements, as well as to underlying driving forces and to the country's specific conditions. Three broad categories of indicators can be distinguished:

- **Performance indicators linked to quantitative objectives (targets, commitments)**

Examples of such indicators include e.g. air emission trends relating to *national or international targets*, urban air quality relating to national *standards*.

- **Performance indicators linked to qualitative objectives (aims, goals)**

These indicators generally address the concept of performance in two ways:

- With respect to the *eco-efficiency* of human activities, linked to the notions of *de-coupling*, *elasticities*: e.g. emissions per unit of GDP, relative trends of waste generation and GDP growth; and
- With respect to the *sustainability of natural resource use*: e.g. intensity of the use of forest resources, intensity of the use of water resources;

- **Descriptive indicators**

These indicators are not linked to explicit national objectives; they describe major conditions and trends and are close to the concept of “state of the environment” reporting: e.g. population connected to waste water treatment plants, river quality, share of threatened species.

### ***Indicator presentation***

The presentation of most key and core indicators is standardised over the reviews, though a certain amount of flexibility is allowed to adjust to the individual situation of the reviewed country and also to special topics. One can distinguish the following typology:

- *International core indicators* harmonised at OECD level and presented for the reviewed country together with a few selected OECD countries and OECD and/or OECD Europe averages to

reflect the national and international picture. These indicators tend to be relevant for most OECD Member countries; they focus on key issues and often present state data;

- *Country specific core indicators* that show trends or changes over longer periods, often associated with related targets or economic trends; or that provide a more detailed picture of the country's situation through further sectoral and/or spatial breakdown (e.g. sub-national data).
- *Supplementary country specific information and data* that complement the core indicators by pointing at particular issues of concern for the reviewed country and that help in interpreting the indicators in a broader national context.

