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Challenges in Program Management

ENVIRONMENTAL INDICATORS AND OUTCOME METRICS: COUNTRY EXAMPLES

INTRODUCTION

The occasional series of international fact sheets on this web page provides summary information on selected topics relevant to the functions and activities of the EPA programs that manage waste, clean up contaminated sites, promote the productive use of land, and address emergencies. An important purpose of the papers is to promote a fuller understanding of actions around the world to protect the environment in relation to these subject areas. The international fact sheets do not establish policy or represent the views of EPA. Each fact sheet provides information and electronic links to other sources of information that can provide the reader with a fuller understanding of the material. For organizational purposes, the fact sheets have been placed in four broad categories:

- Treaties, Directives, and Policies
- New Directions in Program Management
- Innovative Approaches to Environmental Protection
- Emerging Issues





TOPIC SUMMARY

The fact sheet identifies a number of forward-looking approaches to **waste-related environmental indicators (EIs) and outcome-oriented measures used by selected countries**, including the United Kingdom, Germany, the Netherlands, Canada, Australia, and New Zealand. A recurring theme in use of metrics by countries is the emphasis placed on measuring interrelationships between environmental, social, economic, and cultural themes in support of sustainability goals. The fact sheet identifies some alternative approaches and frameworks used, along with strategies in particular for communicating this information to various audiences. This fact sheet is not comprehensive; rather it focuses on examples of environmental metrics and provides a starting point for readers interested in investigating the topic.

COUNTRY EXAMPLES

United Kingdom (UK). The UK uses a suite of 68 indicators to measure annual progress towards achieving environmental and sustainability goals and targets. See: <http://www.sustainable-development.gov.uk/progress/index.htm>. These indicators are divided into four categories: sustainable consumption and production; climate change and energy; protecting our natural resources and enhancing the environment; and creating sustainable communities and a fairer world. Although these indicators mainly apply to progress within the UK, the government is establishing indicators that allow the UK to compare sustainability trends among countries in the EU. The UK's indicators align with government priorities outlined in **the UK Government's Sustainable Development Strategy "Securing the Future"** (see

development.gov.uk/publications/uk-strategy/index.htm). The UK has developed a method of communicating indicator results to the public using a system of “traffic lights” for each goal/target to indicate degree of success/progress (see graphic):

	= clear improvement
	= little or no change
	= clear deterioration
	= insufficient or no comparable data

Determinations concerning indicator progress are made by comparing data from the current year with two baselines periods (since 1990 and since 1999). The yellow light, indicating little or no change, is determined if the indicator value has changed less than 3%.

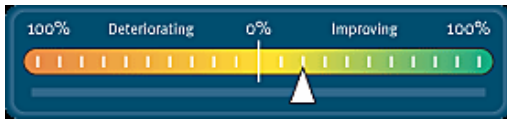
Germany. In 1999 Germany’s Federal Environment Agency developed the **German Environmental Index**, also known as “DUX” (see <http://www.umweltbundesamt.de/dux-e/index.htm>) to communicate information to the public on the effectiveness of Germany’s environmental policies, using an integrated, multi-media approach to describing the state of environmental affairs. Six media-derived indicators forming the **Environment Barometer of Germany** (see <http://www.umweltbundesamt.de/dux-e/umweltbarometer.htm>) are used to track progress in meeting environmental targets in equally-weighted thematic areas: climate, air, soil, water, energy, and raw materials. These six indicator areas align with political targets in order to measure progress. The DUX is not a scientific model; rather it serves as a means to illustrate complex issues. Instead of describing the overall quality of the environment in Germany, the DUX measures the degree to which environmental policy is reaching its stated goals.

Netherlands. The Dutch government’s Ministry of Housing, Spatial Planning and Environment (VROM) uses EIs to inform parliament and the public on the performance of environmental policy laid out in the strategic **National Environmental Policy Plan (NEPP)** (see <http://www.sharedspaces.nl/pagina.html?id=7377>). In addressing questions related to sustainable development, the NEPP looks at the interrelationships between pollution sources and ecological, social, and economic systems. Using a target-based approach to understanding and dealing with environmental problems, the NEPP defines environmental quality objectives (represented by themes) and establishes a long-term plan of action and targets to meet those objectives. The Dutch process allows the government to analyze environmental problems from “source to impact.” It is noteworthy that VROM places an emphasis on developments in environmental pressures rather than just conveying metrics relating to environmental quality or effects.

Three types of indicators are used to help assess implementation of the NEPP:

- **Theme Area indicators** address the main environmental quality problems (e.g., dispersion of toxic substances and disposal of solid waste);
- **Target Group Approach indicators** consider the societal players contributing to environmental problems (e.g., consumers and agriculture); and
- **Spatial-oriented Policy indicators** focus on regional differences in environmental pressures and desired states of environmental quality.

Canada. Environment Canada developed environmental indicators and national “indicator meters” that illustrate trends for a variety of themes and communicate environmental information to decision makers and the public (see http://www.ec.gc.ca/soer-ree/English/Indicator_series/default.cfm). For example, these metrics include an indicator meter for generation of municipal solid waste.



The meters reflect trends over time (usually the past decade), showing the degree to which a given indicator is deteriorating, stable, or improving. The indicator meters are not intended to

rank the importance of environmental issues; they collectively serve to provide the public with “signposts” of progress towards environmental sustainability. Environment Canada hosts a very thorough, easy to understand, and user-friendly website, **InfoBase**, that presents information on trends (charts, graphs, and underlying data is available) and what the Canadian government is doing to address environmental concerns (see <http://www.ec.gc.ca/soer-ree/English/default.cfm>). Specific Canadian regions, such as the Pacific and Yukon, also have websites highlighting regional information and trends (see http://www.ecoinfo.ec.gc.ca/index_e.cfm).

Working in close collaboration with Statistics Canada and Environment Canada, the **National Round Table** has developed six proposed new formal economic measures or indicators. These indicators will augment familiar economic data such as gross domestic product (GDP) and the consumer price index (CPI). Five of the recommended indicators measure Canada’s natural capital – measuring trends in forest cover, freshwater quality, air quality, greenhouse gas emissions, and the extent of wetlands. The sixth indicator measures educational attainment. (see http://www.nrtee-trnee.ca/Publications/HTML/Report_Indicators_E.htm).

Australia. In Australia, indicators are used to develop the **State of the Environment (SoE)** report (see <http://www.deh.gov.au/soe/>), using theme commentaries. SoE reporting occurs at both the national and state/territory levels. The SoE reports progress toward meeting ecologically-oriented sustainable development goals. It follows a modified version of the OECD’s pressure-state-response model. “**Headline**” indicators are used to help answer the question, “Has life in our country gotten better, especially during the past decade?” To answer this question, Australia Bureau of Statistics (ABS) looks at a combination of indicators to assess progress during the past decade. ABS takes into account the interaction among the various dimensions of capital (human, social, and financial) to achieve a more complete understanding of the country’s growth and progress.

New Zealand. In New Zealand two government agencies work on indicators. The Ministry for the Environment (MFE) focuses on Environmental Performance Indicators, while Statistics New Zealand (SNZ) addresses “**linked**” indicators that tie socio-economic indicators with MFE’s EIs to monitor indirect pressures responsible for environmental change. Both groups coordinate and leverage data, when possible. Although MFE has not confirmed the latest set of indicators, in 2000 the Agency released indicators including measures for solid waste, hazardous waste, and contaminated sites (see <http://www.mfe.govt.nz/publications/ser/waste-indicators-sep00.html>). SNZ’s approach emphasizes the need to coordinate government data collection functions and defines linked indicator sets to include economic, social, environmental, and cultural indicators. SNZ is investigating sustainable development indicators that will address the interrelationships among these various indicator sets (see <http://www.stats.govt.nz/analytical-reports/linked-indicators/default.htm>).

SOME U.S. ACTIVITIES AND ADDITIONAL RESOURCES

EPA and other government agencies in the United States at the federal, state, and local levels have undertaken a number of efforts to develop environmental indicators and measure government performance. Below are selected brief descriptions and links for this work.

- **EPA Report on the Environment.** <http://www.epa.gov/indicators/>. As the first step in EPA's multi-year Environmental Indicators Initiative, the Agency in 2003 published its draft Report on the Environment (ROE) and supporting materials. EPA is developing a 2007 ROE.
- **Government Performance and Responsibility Act (GPRA)** <http://www.epa.gov/ocfo/planning/gpra.htm>. GPRA requires U.S., federal agencies to: develop five-year strategic plans, including a mission statement, that set out long-term goals and objectives; annual performance plans, which provide annual performance commitments toward achieving the goals and objectives presented in the strategic plan; and annual performance reports, which evaluate an agency's progress toward achieving performance commitments
- **EPA – 2003-2008 Strategic Plan.** <http://intranet.epa.gov/ocfo/plan/plan.htm>. EPA's 2003 Strategic Plan is the Agency's road map and guide in establishing annual goals. It helps EPA measure progress in achieving strategic goals
- **Program Assessment Rating Tool (PART).** <http://www.epa.gov/evaluate/part.htm>. The PART was developed by the U.S. Office of Management and Budget (OMB) to assess the performance of federal programs
- **EPA – Superfund Environmental Indicators.** <http://www.epa.gov/superfund/accomp/ei/ei.htm>. Superfund Environmental Indicators are measures of program performance used to communicate tangible progress made in protecting human health and the environment through site clean up activities
- **EPA – Corrective Action Environmental Indicators.** <http://www.epa.gov/bioindicators/>. EPA uses Environmental Indicators (EIs) for human exposure and groundwater to measure progress in the RCRA Corrective Action Program
- **AIRNOW.** <http://airnow.gov/>. The Air Quality Index, a joint undertaking coordinated among a number of agencies, reports daily air quality. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide
- **EPA – Biological Indicators of Watershed Health.** <http://www.epa.gov/bioindicators/>. Biological indicators are numerical values derived from actual measurements, have known statistical properties
- **EPA – America's Children and the Environment (ACE): Summary List of Measures.** <http://www.epa.gov/envirohealth/children/measures/index.htm>. ACE brings together, in one place, quantitative information from a variety of sources to show trends in levels of environmental contaminants in air, water, food, and soil; concentrations of contaminants measured in the bodies of children and women; and childhood illnesses that may be influenced by exposure to environmental contaminants
- **Global Reporting Initiative (GRI).** <http://www.globalreporting.org/Home>. Through multi-stakeholder involvement, GRI promotes the use of a sustainability reporting framework worldwide. Over 1000 organizations in over 60 countries use the GRI framework.