

# EAP Task Force

## *Annual Meeting of the EECCA Regulatory Environmental Programme Implementation Network*

17-19 June 2008 (Tashkent, Uzbekistan)

REPIN(2008)5/ENG

# Guidance on Measuring Results of Environmental Regulation and Compliance Assurance in Eastern Europe, Caucasus, and Central Asia

Draft, 31 May 2008

Environmental regulation and compliance assurance (ERCA) indicators are measurable pieces of information that characterise the efforts of government authorities to reduce the impact of economic activities on the environment and human health and changes in behaviour and environmental performance directly associated with these efforts. The current document provides policy guidance in order to improve ERCA indicators in the region of Eastern Europe, Caucasus, and Central Asia (EECCA).

**Please note that a chapter outlining the reform of ERCA indicators will be added to this document.**

**ACTION REQUIRED:** The participants of the REPIN meeting are asked to endorse the final draft. Written comments should be sent to Ms. Angela Bularga ([angela.bularga@oecd.org](mailto:angela.bularga@oecd.org)) not later than **20 July 2008**.

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## FOREWORD

In democratic societies, governments are exposed to increasing pressures to demonstrate and improve the results of their activities. In response to these pressures, various sets of indicators have been used to measure performance, optimise policy and strategy decisions, help to meet targets at the lowest cost for the society, and ensure that authorities are transparent and accountable. Accurate, complete, impartial and easy-to-understand information is needed not only by the public administration, but also by business circles, NGOs, and other stakeholders.

Indicators describing environmental regulation and compliance assurance have recently been gaining attention in the international context as important measures of public authorities' efforts to provide effective regulation and guarantee compliance with environmental laws and regulations. For example, the "Guiding Principles for Reform of Environmental Enforcement Authorities in Eastern Europe, Caucasus, and Central Asia (EECCA)" called for application of indicators that would allow the assessment and continuous improvement of compliance assurance programmes. Globally, the International Network for Environmental Compliance and Enforcement (INECE), in the partnership with the OECD and other partners, has developed the "Performance Measurement Guidance for Compliance and Enforcement Practitioners".

The current document provides policy recommendations, based on good international practice that could help to improve performance measurement frameworks used by environmental authorities in the region of EECCA. It builds upon the INECE guidance and the results of two country studies in Armenia and Russia, a regional inventory of indicators used by environmental enforcement authorities, and discussions within the Regulatory Environmental Programme Implementation Network (REPIN) of EECCA.

The development of this document is one of the activities undertaken within the OECD programme of work with non-member countries in the context of the Task Force for the Implementation of Environmental Action Programme for Central and Eastern Europe (EAP Task Force), for which the OECD Environment Directorate serves as a secretariat.

## INTRODUCTION

### Purpose and target audience

1. The environmental authorities of EECCA need improved performance measurement systems that would increase the soundness of strategic and operational decisions that translate policy and regulatory intentions into action. To facilitate this task, the current document proposes an overall framework that would support an effective design and use of Environmental Regulation and Compliance Assurance (ERCA) indicators, including the necessary institutional basis, scope of performance measurement, information analysis approaches, and reporting requirements.
2. This guidance document is mainly intended for environmental authorities:
  - **Senior policymakers** in environmental ministries can use the Guidance to lead their implementing branches toward performance-based management;
  - **Staff of environmental authorities**, in particular managers, are the primary audience for the Guidance as they are responsible to monitor operations, adjust strategies, allocate or redirect appropriate resources (both human and financial) to specific programme elements, and enhance accountability to stakeholders and the public. They can use this document to initiate, design, and implement reforms of ERCA indicators.
3. Other stakeholder groups can also benefit from the current document:
  - **Legislators and Ministries of Finance** can become aware of ways to get a full account of the functioning and impact of environmental compliance assurance systems and will make better informed decisions about re-designing regulatory framework and allocating budgetary resources;
  - **Citizens' environmental organisations** can monitor operations or environmental enforcement authorities and ensure that they carrying out their mission in a publicly accountable manner.
  - **International organisations** can use an additional performance measurement tool when designing, monitoring, and evaluating environmental projects and programmes they support.

### Basic notions

4. Performance measurement is the process of
  - (i) Developing indicators whose values can be systematically tracked to assess progress made in achieving predetermined goals and
  - (ii) Using such indicators, and other tools, to actually assess progress.
5. Performance measurement is just one element of strategic management that involves an iterative cycle of planning, budgeting, implementation and evaluation. By generating and analysing indicators, performance measurement supports the decision making process.

6. A performance measurement system consists of indicators, a formalised data collection process, and a diagnostic tool that describes performance implications of the data, e.g. compares actual performance with a benchmark or a target. Indicators are defined as measurable pieces of information (parameters, or value derived from parameters) that describe a phenomenon/ environment/ area and possess a synthetic meaning.

7. Environmental regulation and compliance assurance (ERCA) indicators characterise the efforts of government authorities to reduce the impact of economic activities on the environment and human health and changes in compliance and environmental results directly associated with these efforts. Compliance is a response to regulation and compliance assurance manifested through the state of technical and behavioural conformity with regulatory requirements. Within the general framework for monitoring and assessment, ERCA indicators help authorities to maximise the results of environmental regulation at a minimum cost for society. They are indicators of societal response to environmental challenges.

### **Purpose of performance measurement**

8. Environmental authorities should ensure that the design and use of ERCA indicators satisfy the following needs:

- Demonstrate the degree to which environmental enforcement authorities are achieving their goals and desired results, and motivate further improvement. If analysed in combination with indicators of environmental conditions, ERCA indicators can help to assess the quality of policies, laws, and regulations;
- Monitor programme operations and help to ensure that resources are estimated, budgeted and used appropriately to accomplish strategic and annual activity plans;
- Support activity planning and optimise compliance assurance instruments and their mixes;
- Identify work approaches that are highly effective and efficient, and replicate success stories;
- Facilitate the use of human, material and financial resources in a cost effective way;
- Guarantee coherence and coordination across national and sub-national agencies, specific compliance assurance programmes, and jurisdictions;
- Enhance transparency and accountability towards external stakeholders, including legislative bodies, central budget authorities, non-governmental stakeholders and the general public.

9. In modern compliance assurance systems, the major aim of ERCA indicators is to help policy makers and programme managers determine whether the pursued goals and the strategies to achieve compliance within the regulated community are working. Commonly, results of such evaluations are used as a basis for identifying problem areas and making changes in the design of strategies to improve environmental effectiveness and cost efficiency. Therefore performance measurement should be fully integrated into strategic management thus placing strategy and vision, goals and objectives in the focus of policymakers and managers. This should stimulate enforcement agencies to set realistic and measurable targets, and select the most effective and efficient mechanisms for assuring regulatory compliance.

## Challenges of performance measurement in EECCA

10. In EECCA countries, over thirty core ERCA indicators are routinely collected within relatively structured frameworks. Examples of key indicators are the number of issues permits, number of inspections, number of violations, number of fines and amounts collected, and number of criminal cases. The scope of collected data is quite comprehensive: Commonly, the ERCA indicators cover the entire corpus of environmental legislation and are broken down by media-specific programme areas, by industry sector, and geographic area. In some countries non-compliance patterns are analysed by specific articles of the Administrative and Criminal Codes. Regular reporting to internal and external audiences ensures a certain level of transparency and accountability.

11. At the same time, indicators are designed around activity counts and much less attention is paid to their use to make strategic and operational decisions. Enforcement authorities measure the intensity of inspection and the extent of application of enforcement tools without showing the connection between these activities and expected behaviour (compliance) and environmental changes. Reports miss data analysis and are not tailored to stakeholder needs. Other major problems include:

- A widespread use of output indicators as “targets” and association of high performance with high numbers of inspections, investigated violations, or monetary sanctions applied regardless their behavioural and environmental effect;
- Lack of indicators that would demonstrate causal links between activities and environmental results;
- Absence of measures of cost-effectiveness;
- Poor standardisation of terminology and processes used for performance measurement that opens up opportunities for misinterpretation or manipulation of data;
- Absence of ERCA indicators that would cover the application of innovative instruments of compliance assurance.

12. Demand for ERCA indicators is growing as recognition is growing that continuous feedback from practice is needed to correct environmental legislation and policies. Currently, such feedback is limited and when a law or a policy proves to be ineffective government officials often yield to the temptation to issue a corrective document without understanding the roots of failure. Such a scenario, which perpetuates “symbolic” regulation and policy-making, becomes a serious threat to governments’ credibility.

## INSTITUTIONAL FRAMEWORK FOR PERFORMANCE MEASUREMENT

### Major requirements

13. Performance measurement should be part of core functions of authorities in charge with environmental policy implementation, mandated either in the primary or secondary legislation. The organisation structure of these authorities should include a unit responsible for design and use of ERCA indicators. Procedures need to be developed to routinely collect, analyse and report ERCA indicators.

14. Indicators should be used at all levels of implementation (national, sub-national, and municipal). Differences may well exist between various sets of indicators used by authorities at different levels and still those sets be adequate to the mandate, goals and strategies of a given authority. At the same time, national-level sets of indicators should be universally applied and designed to ensure, among other things, comparison between results, as well as reveal any lack of cross-national coherence.

15. A combination of indicators – covering the profile of the regulated community and instruments of compliance assurance, measuring input, output and outcomes, generic or project-specific, aggregated and disaggregated, from a national and local perspective – should be used. The number of indicators should, however, be limited to those ones that are essential for producing data that aids programme evaluation and decision-making.

### Standardisation of terminology and data collection

16. National level agencies should standardize ERCA indicators, *i.e.* to ensure (i) the attribution of a same meaning to a single indicator or data category by all users and (ii) the use units that enable appropriate comparison and exchange of data among environmental authorities and other entities. National standardisation of data should not constrain what information an agency chooses to collect, nor automatically constitute a reporting requirement. Each data element (parameter, indicator, or index) should be represented by a name, definition, format (maximum length and data type), and where applicable, permitted values. In addition, explanatory notes can be provided relating to the definition and use of the data element.

17. A terminological (data) standard could be mandated by the legislature or the competent executive agency (e.g. the Ministry of Environment or the Department of Statistics). Environmental regulation and compliance assurance authorities can initiate the process of standardisation, secure political support and funding, draft the standard, and engage in a broad dialogue with sub-national units and other stakeholders while drafting the standard. Training for all involved actors should be provided after the data standard is adopted.

18. Data standards should be reviewed periodically to maintain their usefulness and applicability. It is desirable that standardisation be implemented prior to or at least in parallel with information systems development.

### Data management systems

19. Environmental authorities should build comprehensive, accurate, and user-friendly data management systems that would be capable of storing, integrating and analysing various kinds of data across programme and geographic areas. These systems can be organised in several big blocks, including specific

information about regulatees (permit conditions and self-monitoring reports), data on compliance promotion and compliance monitoring, and non-compliance response information. It is important that information systems ensure full traceability of individual cases, from inspection and non-compliance discovery until the full execution of decisions related to non-compliance response.

20. Establishing clear data management procedures should be a first step toward this situation. Uniform procedures of data production and transfer, and requirements for a timely update of information, can strengthen the usefulness, quality and accessibility of information. Automated data storage systems need to be developed to improve access to primary data and enable direct consultation of dossiers electronically through local area networks. Periodic auditing of procedures and information management systems for the purpose of verifying their practical application and ensuring their use by staff is recommended.

21. Although upgrading information systems can be costly and difficult to design, this has the benefit of providing avenues to retrieve and analyse information more effectively and timely. Improved information management can enable a better targeting of resources towards the most serious compliance and environmental problems, and there is no other option to track the growing number of the regulated entities and to deal with the data reported by these entities and environmental enforcement units at the sub-national level.

### **Measuring and comparing performance of sub-national units**

22. Besides measuring own performance, the national-level authorities should assess sub-national units. This should be done in view of improving performance and harmonising approaches and capacity across all geographic units, rather than punishing outsiders.

23. Normalisation of data, *i.e.* bringing them to a common denominator, is necessary to enable comparisons. For example, comparing the total numbers of inspections in two regions will be meaningless if one is characterised by a small number of large facilities and the other one has many Small and Medium-sized Enterprises (SMEs). To make comparison possible, the number of inspections needs to be related to the respective segment of the regulated community.

### **Assessment of organisational capacity**

24. Organisational capacity should be assessed, as it is an important factor that will influence the proper functioning of performance measurement systems. In this regard, the key aspects to be considered are as follows:

- **Information needs:** What are the current information needs for decision-making and outreach? Who are the stakeholders? What data is being collected and how is it used? Are new indicators needed as a result of change in strategies or enactment of new laws?
- **Data quality:** Do the scope, quality, and analysis of data meet the decision-making and outreach needs? How accurate should be the measurement? Are there guidelines to ensure national consistency and comparability of data?
- **Data collection and storage:** How frequently should data be collected? Who will collect the data? Who will ensure quality control and quality assurance of data? Where will the data be stored? Is there an existing data system that collects timely and accurate data? Can it be enhanced? Will the data be computerised? What resources are needed to obtain the necessary data?
- **Data analysis:** Who will analyse the data? How should the data be reported, and to whom?

### **Mechanisms for feedback and partnerships**

25. National level enforcement authorities should establish effective feedback mechanisms on ERCA indicators and a forum for sharing best practices. The sub-national authorities should be able to comment on existing indicators, their interpretation and collection approaches, as well as to propose new approaches for performance measurement. They also should have the opportunity to share experience from adopting innovative instruments and ERCA indicators. This will benefit the development of environmental regulation and compliance assurance at all levels.

## SCOPE OF INDICATORS

### Major clusters of indicators and the need for sub-categories

26. ERCA indicators should reflect the entire regulatory cycle:

- **The quality and scope of regulation:** In order to understand the magnitude of the regulatory challenge, indicators are needed for the number and quality of legal acts and permits. The quality of lawmaking and facility-specific regulation is another important factor of effective regulation and require measurement as well, *e.g.* by counting the number and frequency of amendments or number of appeals driven by poor quality of legal acts.
- **The profile of the regulated community:** Authorities should have a good understanding of the key characteristics of the regulated community. First of all, this concerns the number of facilities belonging to different segments, such as largest polluters and small and medium sized enterprises. Besides, authorities will monitor parameters judged useful to decrypt facility-specific environmental and non-compliance risks. Categories of regulatees should be clearly identified;
- **Instruments of compliance assurance:** Indicators are needed to characterise (i) compliance promotion (*e.g.* number of training hours provided to the regulated community, inquiries per specific topic or piece of legislation, web site hits, etc.); compliance monitoring (*e.g.* number of self-monitoring reports from industry, on-site visits, in-depths assessments, complaints from citizens, etc.), and enforcement (number of administrative and criminal cases, specific sanctions applied, imposed and collected monetary penalties, etc.);
- **Institutional capacity and governance:** Institutional capacity can be assessed based on the quality and quantity of resources, *e.g.* number and training level of personnel; the capacity to commission sampling and analysis of regulated pollutants, etc. Adherence to good environmental governance can be measured, *e.g.*, using the rate of confirmed appeal cases, the rate of satisfied information enquiries from citizens or the regulated community or time for responding to such enquiries. The transparency of procedures and involvement of the general public is another aspect of regulation that has to be monitored;
- **Achievement of results:** This category can include, for instance, compliance rates, amount of recovered economic gains that facilities obtained through unlawful activities, integrated indices of environmental performance, or simpler parameters, such as frequency and gravity of accidents within the sector, number and seriousness of violations, amount of emissions and their reduction due to enforcement actions, use of environmental management systems, etc.

27. Within major clusters, authorities need to use categories and sub-categories of indicators. For instance, the category of “compliance monitoring actions” (belonging to the “instruments” cluster) can include such sub-categories as information requests, on-site visits, in-depth investigations, and offsite review of company’s reports. Regulated facilities can be grouped according to their (i) risk for the environment and (ii) compliance profile. Non-compliance episodes can be classified according to their seriousness. And so on. Within each category of indicators, the share of its different elements could be determined, *e.g.* the share of planned inspection versus complain-driven or other kind of reactive inspections. This can help authorities to detect patterns of problems and facilitate targeting.

## Minimum criteria for assessing and selecting indicators

28. The ERCA indicators should have the following characteristics:

- **Relevant:** reflecting the compliance assurance goals and the needs of external stakeholders;
- **Transparent:** promoting the understanding about organisation's operation and performance and ensuring accountability;
- **Comprehensive:** addressing the important programmatic and operational aspects;
- **Reliable, credible and feasible:** being based on data that are complete and accurate, as well as incorporating advanced information technology;
- **Functional and feasible:** encouraging constructive behaviour among staff members and balancing the cost of measurement, data collection and analysis with the value of this information.

## Aggregation levels

29. Dealing with cases collectively can often be more cost-effective, particularly if this highlights an industry-wide problem that the industry itself may not see, or when it points to patterns of problems in different sectors or regions. In order to identify high incidence phenomena (e.g. most common violations in a sector or geographic area), authorities should pursue the practice of aggregating and analysing ERCA indicator data according to:

- Segments of the regulated community (e.g. industrial sectors, municipal utilities),
- Environmental media (or: environmental concerns, major legal acts), and
- Geographic areas (or: jurisdictions, environmental enforcement authorities).

30. At the same time, aggregated data should be complemented with facility-specific data. For example, authorities should be able to search for all seriously non-compliant facilities, or those out of compliance for the longest period of time. Presenting facility-specific data is much in line with interest of the general public: Generally, people are interested in what is happening in their neighbourhood, rather than in country-wide information as the citizens cannot associate it directly with their own welfare.

## Correlation with programme elements (inputs, outputs, and outcomes)

31. The environmental enforcement authorities should use the programme matrix (logic model) to correlate indicators with programme elements as shown in Figure 1 below. The **programme matrix** is a theoretical "road map" of the programme implementation, upon which the ongoing progress assessment and final evaluation of performance are based.

32. Within this framework, indicators characterise:

- **Inputs:** Inputs include time, staff, funding, materials, equipment and the like that are necessary to carry out an activity. Input indicators can be used to show government's commitment and are important components for determining programme efficiency and return on investment when considered together with outcomes. They are the basis for fiscal (budgetary) accountability;
- **Outputs:** Outputs are activities, events, services and products that reach a regulatee. These indicators demonstrate a level of effort toward an outcome, but they do not indicate the degree

to which the outcome is achieved. They monitor whether authorities put efforts to provide services to the general public;

- **Outcomes:** Outcome indicators measure the results of an agency’s outputs, and are generally divided into two categories: (i) **intermediate outcome indicators** that measure progress toward a final outcome, such as a change in behaviour or other results that contribute to the end outcome; and (ii) **final outcome indicators** that measure the ultimate impact of activities. Outcome indicators provide the basis for medium-term and long-term accountability of the government in a specific programme area.

33. If used correctly, a programme matrix clearly demonstrates causal links of a chain from inputs and activities to outcomes. Within this framework, the environmental enforcement authorities should use a mix of input, output, and intermediate indicators in order to identify what types of activities produce results most effectively and adjust strategies accordingly. Intermediate indicators are needed to be introduced to overcome the limitations of current indicators that fail to reflect environmental results, reveal very little about the state of compliance (*i.e.* what percentage of the regulated community is in compliance or what the level of compliance is in its key segments) and do not assess the success of strategies and tools.

Figure 1. Sample programme matrix

The hierarchy of programme elements:	Examples of indicators:
<p style="text-align: center;"><b>FINAL OUTCOMES</b> <b>(LONG-TERM ACCOUNTABILITY)</b> State of the environment and human health</p> <p style="text-align: center;">↑</p>	<ul style="list-style-type: none"> <li>• Improved water quality (e.g. sufficient oxygenation)</li> <li>• Reduced bioaccumulation of pollutants in food chains</li> </ul>
<p style="text-align: center;"><b>INTERMEDIATE OUTCOMES</b> <b>(MID-TERM ACCOUNTABILITY)</b> Behaviour change or reduced pressure on the environment</p> <p style="text-align: center;">↑</p>	<ul style="list-style-type: none"> <li>• Greater understanding of rules and of how to comply</li> <li>• Improved practices at the regulated facilities</li> <li>• Increased compliance rates</li> <li>• Reduced emissions of pollutants</li> </ul>
<p style="text-align: center;"><b>OUTPUTS</b> <b>(ACTIVITY MONITORING):</b> What services do authorities deliver?</p> <p style="text-align: center;">↑</p>	<ul style="list-style-type: none"> <li>• Compliance assistance provided</li> <li>• Number of inspections conducted</li> <li>• Enforcement actions taken</li> </ul>
<p style="text-align: center;"><b>INPUTS</b> <b>(FISCAL MONITORING):</b> How are budgets allocated?</p>	<ul style="list-style-type: none"> <li>• Personnel</li> <li>• Facilities</li> <li>• Funds for operational and capital expenses</li> </ul>

Source: Based on Performance Measurement Guidance for Compliance and Enforcement Practitioners, INECE (2005).

34. Outcome indicators should be monitored but they cannot be a reliable means of institutional performance because outcomes are influenced by many factors and there is a weak causally linked to the activities of a single actor. Also, measuring changes in final outcomes can be very expensive, these outcomes may take years to appear, and improvements in final outcomes (such as air or water quality) can be influenced by many factors beyond the scope of government activity.

## ANALYSIS OF DATA

35. In order to create value, performance indicators should be not only collected, but also analysed and used to make decisions. Improving data analysis should become a priority for EECCA environmental authorities, as this is likely to substantially increase the value of data that are currently collected and filed away without their users realising that potential value.

### Identification and assessment of unwanted events

36. Increasing the ability to timely detect events that lead to environmental harm and increased risks is often the first step to improve performance. Based on the knowledge of a specific problem frequency, characteristics, and consequences, authorities can set priorities, allocate resources, and adjust their instruments. In operational terms, this means that environmental authorities need to count the number of accidents, facilities without permits, and in violation with permits. In addition to these, the **relative frequency** of these unwanted events will be systematically determined in specific segments of the regulated community (large, medium, and small companies working in a specific industrial sector).

37. The authorities will then work to understand the **characteristics** of unwanted events, including who caused the unwanted event, where, why, and when occurred the event, and how long the problem persisted. Such understanding can help address the revealed causes of unwanted events thus reducing the magnitude of problems. One of the simplest examples is scheduling inspection of wastewater treatment facilities or natural resources management for evening hours, when most of violations occur.

38. One particular application of this approach is to routinely monitor the percentage of facilities in non-compliance with environmental laws – the so-called “**non-compliance rates**”. Such rates will be most useful if correlated to the seriousness of non-compliance and the types of requirements (e.g. to hold a valid permit, to comply with Emission Limit Values, to have a self-monitoring system working as prescribed in the permit, and to implement timely activities foreseen in environmental improvements programmes).

39. When reporting non-compliance rates, authorities should indicate the percentage of facilities that were checked in comparison with the entire universe of regulated (controlled) facilities. Also authorities should take into consideration the fact that the reasons for which facilities are chosen for inspection can dramatically affect the calculated non-compliance rate. A high non-compliance rate would be naturally expected if authorities inspect facilities on the basis of complaints or other information suggesting the presence of a problem. Similarly, results can differ in the case of announced and unannounced site visits.

40. In order to enable **extrapolation**, authorities will need to periodically abandon the strategy of targeted on-site visits. Since in practice no government agency can afford to inspect all the facilities every year, which would be the method to calculate the real rate, random samples can be determined using sound approaches for selecting a statistically valid subset of facilities to inspect within different segments of the regulated universe.

41. Calculation of general non-compliance rates can pose serious **interpretation** problems, e.g. a low non-compliance rate can be misleading for programme design if the largest polluters remain out of compliance. Because of such difficulties in interpretation, it may not be reasonable to keep programme managers accountable for changes in non-compliance rates. Non-compliance rates, however, can give a clear signal for directing management attention (and resources) to specific areas. Overall, they are more constructive measures of performance than relying on input and output counts alone.

42. Finally, authorities should monitor **repeated occurrence of unwanted events** and identify measures to prevent recidivism, where possible. For example, repeat violators could be denied permits to expand their production or open production in new locations.

### **Timeliness of response**

43. The environmental authorities should be able to determine the timeliness of response – the time it takes to either respond to a violation, or achieve compliance. Ideally, many types of enforcement actions should be as swift as possible so that the offender can be returned to compliance as quickly as possible. Timeliness can be evaluated by monitoring trends and, sometimes, by comparing actual results against predetermined goals. Success is then measured by comparing the actual schedules with these timeliness goals. Goals can only be set for those types of enforcement actions that consistently take a predictable time to complete. These are usually the earlier and more routine (administrative) enforcement actions.

44. Enforcement actions involving later stages of legal procedures are generally too unpredictable to be evaluated in this way. Judging performance based on time for completing an action may not be possible or appropriate in some cases, such as criminal cases, that required detailed investigation before an enforcement action is filed. Care may be necessary to ensure that use of timeliness as a measure of programme success does not encourage enforcement personnel to take simple administrative action instead of a more time-consuming court enforcement action.

### **Understanding demand**

45. Services provided by environmental authorities to the regulated community (*e.g.* issuing permits) and the general public (*e.g.* responding to information requests or complaints) often can take a lot of staff time. Understanding the frequency and characteristics of demand can help authorities to better manage and sometimes reduce the resource-intensity of services that they deliver through such actions as process re-design (*e.g.* integrating permits and extending the standard time of their validity), outsourcing and better staff scheduling, using better off-pick periods, or applying information technology to respond to demands faster and, where possible, in bulk (*e.g.* identifying frequently asked questions and preparing standard responses).

### **Identifying and monitoring pre-cursor and predictor indicators**

46. Rare or high consequence events require careful analysis for identifying pre-cursor or predictor indicators that could help to anticipate and manage such events in the future. For example, an advanced age of infrastructure can be a pre-cursor for accidents and incidental releases. Similarly, complaints can be a useful way of detecting facilities that are in non-compliance with air protection requirements or illegal waste dumps. Identifying and using pre-cursor indicators can help decrease the magnitude of a problem through early intervention.

### **Trends and links to interventions**

47. Stronger emphasis should be put on the use of trends over time or comparisons across sectors, regions, or agencies. Trend data is important so that changes in performance over time or compared to a reference point can be assessed. Also trends can be depicted relative to interventions whereby information about non-compliance should be linked to information about the enforcement action taken in response. A useful approach is monitoring the rate of change. Another useful addition to the current analysis of total and average values can be studying data at the upper and lower limit of a distribution.

### **Use of ratios and indexes**

48. The practice of calculating ratios and indexes should be introduced to allow comparison between indicators of the same or different kind and make relationships visible and interpretable. This can provide

information on the efficiency of an activity, on the intensity of an impact, or on the quality of a value or achievement. Furthermore, ratios and indexes can help determine linkages between environmental performance and compliance behaviour, on one hand, and the economic and social dimensions of development – on the other hand.

49. Also relative figures can be useful in comparing two authorities of different organisational scale. Normalised data, which relate an absolute figure (e.g. number of inspection) to a common denominator (e.g. number of large facilities), will enable programme managers to compare the relative performance of two units, regardless of differences in size, and determine factors that drive higher or lower performance. It is important that environmental enforcement authorities use only those that are important for their programmes, best capture the message that needs to be communicated, and support internal decision-making.

50. Several ratios and indexes can be calculated on ready-available data, for instance:

- Ratio of facilities holding a permit in relation to the total number of regulatees that is subject to permitting – this can describe the rate of spontaneous compliance, but also can indicate the gaps in outreach programmes or insufficient severity of non-compliance responses;
- Ratio of facilities inspected in relation to the total number of regulatees – it can describe the enforcement presence of authorities;
- Index of personnel available per 1,000 large facilities and 10,000 Small and Medium-sized Enterprises (baseline year = 100) – it can identify sharp changes in the institutional potential;
- Ratio of factual inspector salary to the minimum consumer basket – describes the incentive framework for personnel's integrity.

#### **Comparative assessments with strongest performers and in retrospective**

51. Environmental enforcement authorities should adopt benchmarking of their own performance and also the performance of regulatees. Within this approach, performance is improved based on studying the strongest performers and circumstances that underpin stronger performance. In practice, leaders can serve as *de facto* goal setters. Benchmarking is not a quick fix, done once for all time. Benchmarking efforts may extend over a number of months and it is vital to repeat them periodically so as not to fall behind in rapidly changing circumstances when good practices become outdated.

52. Sometimes, benchmarking does not necessarily identify best practices, because stronger performance may be explained by conditions or characteristics not related to the actions of government. Studying the strongest performers can, however, lead to the identification of the factors that do explain strong performance levels and motivate performance as fair comparisons with “peers” can be stimulating factor.

53. Also comparison should be made with previous years, analysing positive or negative changes in the performance of a given jurisdiction. Such retrospective comparison has the potential to boost performance due to the intrinsic desire to improve performance and achievements over time.

## Visual presentation of data and links to interventions

54. Visual presentation of data should be used to facilitate explanation of concepts, statistics or facts. By using visual representation of performance information (e.g. tables, charts, flowcharts, maps, etc.), agencies could help themselves set priorities and target action on the most pressing problems. In general, data presentation should be treated as an essential and core capacity of environmental authorities that need to build their capacity to translate data into visual means – graphs, maps, and photographs – and into stories that successfully capture the attention of key audiences. Progressively, mapping and Geographic Information Systems (GIS) could be used to identify geographic patterns of non-compliance, e.g. to view the compliance status of all facilities in a watershed in the context of integrated water management.

### Hints on visual presentation of data

Useful analysis need not be complicated. It does, however, need to catch the attention of decision makers and the regulated community. Possible ways to present data visually include:

**Graphs.** Graphs come in many forms, including:

Line charts, which can show trends over time, including in direction and slope. They enable, for example, comparison of annual changes or achievements of targets / predicted values;

Bar charts, which work well for showing the comparative incidence of problems for specific time periods. For example, non-compliance responses can be presented as an “enforcement pyramid”. Bar charts can also be used to show how component parts of annual trends change over time;

Pie charts, which are a useful way to convey variability within one category of indicators, e.g. the structure of the regulated community, violations, or non-compliance responses.

There are no rules for the form of graph to use. Authorities need to consider a particular situation and use their best judgment to convey a story using graphs. For example, authorities often want not only to track environmental problems but also link them to economic activity. Showing actual environmental pressures and normalized data, e.g. vis-à-vis GDP or industrial output, on the same graph is one way to show this relationship simply.

**Maps.** Maps can show possible relationships between causal factors (conditions) and indicator variations across space for a specific time period. Maps for different time periods convey both spatial and temporal variation.

**Photos.** Photos capture and communicate multiple aspects of change too complicated to convey concisely with numbers or even with graphs. Photos can be use, for example, to find and show illegal constructions.

New technologies make it feasible to connect maps and photos with graphs and underlying numbers. These technologies can to help staff and the public to see problems more clearly, understand their possible causes, and tailor solutions more precisely.

Whenever possible, authorities will need to use stories to give data a face, illustrating potential consequences of an environmental danger with a story about a person at risk or actually harmed. In addition to bringing attention to problems, data-supported stories can be used to promote promising practices. Also, stories can be used to share local successes and build confidence in agency competence.

Source: Based on Environmental Compliance Consortium (2007), A Memo on Measurement for Environmental Managers: Recommendations and Reference Manual.

## REPORTING

### Needs of different audiences and ways to reach them

55. Disclosing performance – making available or disseminating data and indicators – is crucial in order to show value and raise agency’s credibility, establish a positive public image and raise society’s support. Greater transparency of an environmental enforcement authority should be ensured within different audience since their needs are different. For instance:

- Internally, ERCA indicators are used to adjust strategies and tools, and develop budgets;
- The legislature and the government can use information to make policy and funding decisions;
- The regulated community can use ERCA information to estimate their compliance and environmental performance, and compare themselves to their competition;
- Environmental NGOs can use ERCA indicators to act as “watchdogs”; and
- The general public can use information to make consumer and community-based decisions.

56. Diverse mechanisms could be adopted to reach different audiences, such as:

- Publication of annual plans and annual reports (in hard copy and on the Internet);
- Development of data bases with ERCA indicators that are accessible via Internet;
- Personal communication with stakeholders;
- Issuance of press releases and articles in mass media, etc.

### Language and structure of communication products

57. The language and structure of any communication product should make the access to information easier. Meaningful headings and subheadings should be identified to help the reader grasp the important information as quickly as possible and easily navigate through the document. Reports should have concise (up to 4 pages) executive summaries to give programme managers and policy makers, and other stakeholders, an overview of the main findings and recommendations of the report that they can digest easily in a short amount of time. Writing style should be clear and simple, so as ideas are easily and quickly understood by the reader.

58. Publicly disclosed information should be simple but not simplistic. It should be provided in a context that allows meaningful interpretation, and visualized to facilitate understanding. Statistics about non-compliance or enforcement actions should be accompanied with brief narrative information. Aggressive information campaigns at the time of significant events will stimulate people's interest in ERCA issues. In order to reach the general public more effectively, it might be useful to identify up to 10 indicators that present a high interest for mass-media.

## Structure of annual reports

59. Annual reporting should be extended to fully fledged reports that contain narrative description, analysis of ERCA indicators, and policy recommendations. The annual reports could be structured around the following headings:

- Goals, organisation and resources of the enforcement authority;
- Overall performance, including analysis of instruments and cross-programme comparison;
- Issues (medium)-specific results and challenges;
- Progress in regions;
- Compliant tracking and public relations;
- Inter-agency co-ordination and feedback;
- Financial reporting.

60. Besides data about performance for the current year, the annual reports should also provide data about performance in the previously completed fiscal/calendar years to set a retrospective benchmark.

## Limitations in disclosing information

61. The environmental enforcement authorities should be informed about and take into account of certain limitations in disclosing information about environmental compliance assurance programmes and their results. These limitations will be mainly caused by:

- ***Danger of abuse of public information by the regulated community:*** Is it possible that putting data and agency strategies online will reveal too much information to regulated entities, allowing them to adapt their behaviour to avoid enforcement actions;
- ***Confidentiality and security limits of information disclosure:*** Very little information cannot be reported publicly because of its confidentiality. At the same time, there are indeed security concerns in publishing facility locations on the Internet, especially for plants with hazardous material.

62. Internal guidelines on dealing with media inquiries should be developed. In any communication with media about the regulated community procedural fairness and the presumption of innocence will be maintained.