

USING INDICATORS TO LEAD ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT PROGRAMS

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SUMMARY

Many environmental compliance and enforcement (ECE) programs around the world are making good progress in identifying and implementing performance indicators. But at present, very few countries have moved into the next stage of actually using performance indicators to: 1) monitor and manage operations; 2) improve program effectiveness; and 3) enhance accountability to political overseers and the public. This article explains why ECE programs need to develop and use performance indicators, describes patterns emerging from the progress being made by many countries toward identifying and implementing ECE indicators, discusses how indicators can be used to manage and improve ECE programs, and suggests ways to ensure continued progress for ECE indicators and programs.

1 WHY DO ECE PROGRAMS NEED PERFORMANCE INDICATORS

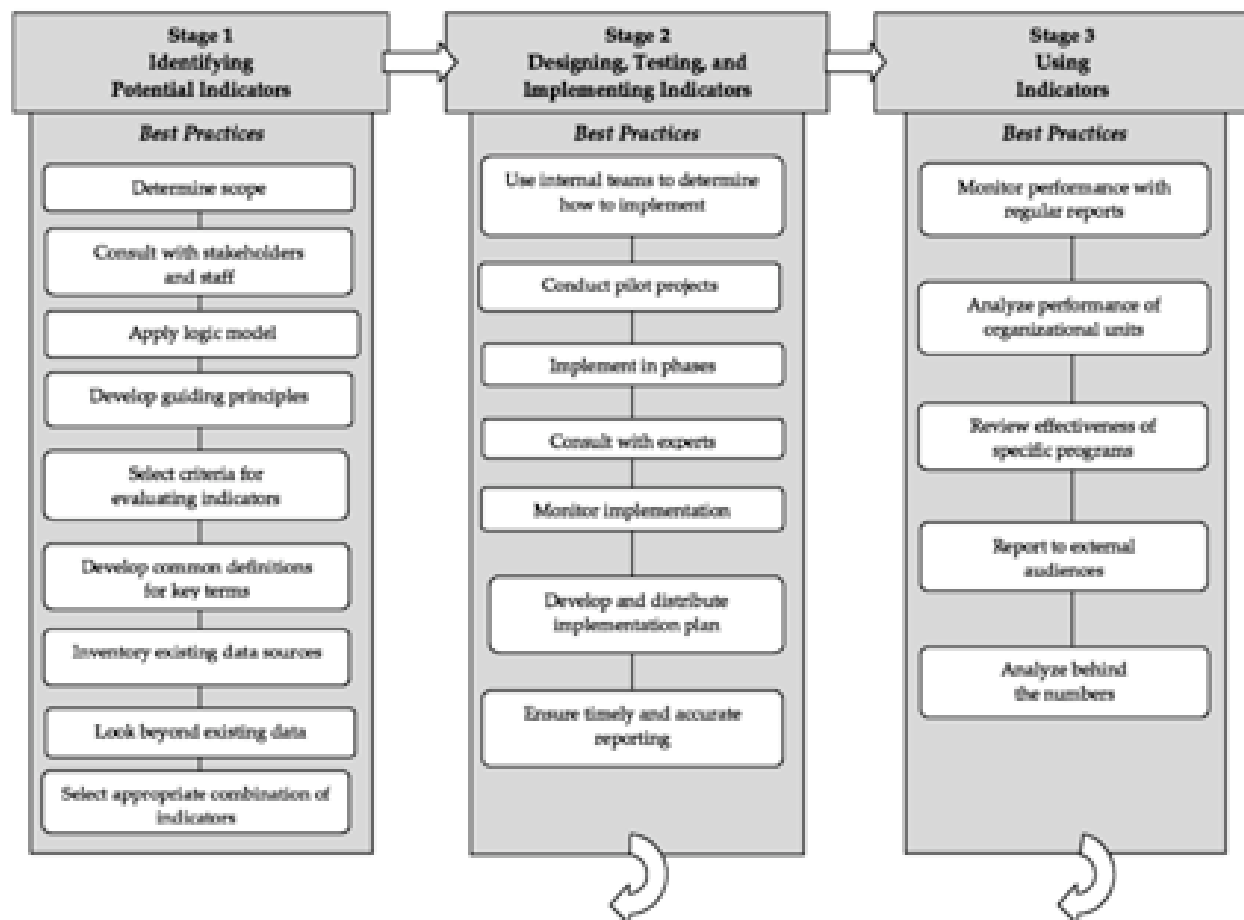
For many years, international organizations, environmental protection agencies of national and provincial governments, and various non-governmental organizations (NGOs) interested in environmental matters have used indicators to characterize environmental conditions. These indicators provide a sense of the current condition of the air, land, and water and help identify whether their quality is improving or deteriorating.¹

Many forces contribute to the state of environmental conditions. In the “pressure/state/response” model used by the Organization for Economic Cooperation and Development (OECD), various human activities (often involving energy, transport, industry, agriculture, and others) put direct and indirect pressure on the air, water, land, and other living resources, and these pressures are mitigated by various societal responses, including economic forces and actions by government agencies and programs.²

Among the responses of government are programs designed specifically to protect the environment by setting standards and regulating behavior and industrial practices that have an adverse impact on the environment. A fundamental element of environmental protection programs at the local, provincial, national, and international level is to ensure compliance with environmental laws and regulations.

1.1 The Special Mission and Obligation of ECE Programs

A premise of this article is that programs to ensure compliance with environmental laws deserve and need their own distinct effort to develop and use performance indicators. There are three arguments in support of this premise. The first argument is that environmental protection systems cannot be effective in improving environmental conditions if the laws and regulations designed to protect the environment are not known, respected, and obeyed. ECE programs play a crucial role in ensuring compliance with environmental laws, it

FIGURE 1. Three-Stage Model for Developing and Using Indicators

is their primary mission to bring about such compliance. Second, the absence of a credible environmental compliance program will mean that a major incentive for voluntary efforts to go beyond compliance will also be absent if no one is even bothering to comply, why even consider going beyond compliance? Thus, programs designed to ensure compliance are not just a building block in an environmental protection system, they provide the foundation on which the system is built. The third and less recognized argument is that ECE programs often use tools (e.g., enforcement actions) that impose penalties and/or obligations. These programs are, in turn, obligated to use these authorities fairly and wisely. Performance indicators, especially when shared with the public, can help determine whether authorities and resources are

being used appropriately.

For all of the above reasons, it is crucial for environmental ministers, staff and managers of ECE programs, regulated industries and facilities, legislative overseers, and the public to know if environmental compliance efforts are succeeding, and if they are not, how they can be improved. ECE indicators can help provide this knowledge.

A well-designed set or system of performance indicators can be a powerful tool to direct ECE programs toward the most important results. Indicators can be used to:

1. Monitor and manage day-to-day operations of ECE programs;
2. Identify and correct performance issues and problems in ECE programs;

3. Adjust strategies and resource allocation to improve the effectiveness of ECE programs;
4. Provide an account of program performance to political overseers and the public.

Each of these uses will be described further in this article under Section 3, "Using Indicators to Manage and Improve ECE Programs."

2 PROGRESS TOWARDS IDENTIFYING AND IMPLEMENTING ECE INDICATORS

Under the auspices of organizations such as the International Network for Environmental Compliance and Enforcement (INECE), the World Bank Institute, and the OECD, good progress is being made by many countries in developing performance indicators for their ECE programs. While one uniform set of indicators is not emerging from these efforts, some of these countries are being guided by a three-stage framework which suggests: 1) identifying indicators; 2) designing and implementing indicators; and 3) using indicators as three steps on a path to follow for developing ECE indicators.³ For each of these three stages a set of best practices has begun to emerge to help countries manage their ECE indicators projects. Figure 1 lists the best practices for each of the three stages of the indicators framework.⁴

2.1 Emerging Patterns

As more countries make progress along the path of developing ECE indicators, there are some patterns that can now be identified:

1. Most Participating Countries in Identification and Implementation Stages. In addition to providing a path for countries to follow, the framework also serves as a set of basic milestones for assessing the progress of countries currently developing ECE indicators. Many countries are now on this path and have progressed to the first milestone (i.e., they are identify-

ing indicators) or even to the second (i.e., they are designing and implementing indicators). Projects in Brazil, Mexico, Argentina, and Costa Rica, among others, are currently involved in identifying and implementing indicators. Only a few countries have taken the path all the way to the point of using indicators to manage their programs, and these countries are only in the early stages of using indicators as a management tool. Projects in the United States and Canada are beginning to use indicators to manage all or part of their ECE programs.⁵

2. Indicators Tailored to Unique Circumstances. Most countries in the identification and implementation stage are developing indicators that are tailored for their unique circumstances. While many ECE programs are learning from examples used by other countries, indicators are being selected for implementation based on institutional needs and conditions of individual agencies or programs. This means that there is not one universal set of ECE indicators being adopted, but varying sets with some common indicators or characteristics.
3. Four Types of Indicators Projects. The ECE indicators projects going on around the world fit into one of four categories, depending on whether they are comprehensive or focused with respect to the laws and requirements they include, and whether they are national or sub-national in terms of the jurisdiction they cover. The four categories are:
 - a) Comprehensive national indicators – These are used to assess effectiveness of national ECE programs' efforts to ensure compliance with all national statutes and regulations. Developing a set of comprehensive national indicators is very complex, since it involves many persons, multiple agencies, collection of data from many sources, and may necessitate development of a national data system.
 - b) Comprehensive sub-national indica-

tors – These are used to assess effectiveness of an ECE program of a regional or district office of a national agency, a state/provincial environmental agency, or a local or municipal agency. This type of effort has the advantage of being a more manageable size than a comprehensive national effort, and can often provide a means of testing a system of indicators that can later be applied to the national program.

- c) Focused national indicators – These are used when a national environmental agency wants to assess the effectiveness of a focused national initiative to address a specific non-compliance pattern or environmental risk. For example, focused national indicators might be developed for an inspection and enforcement initiative to improve compliance among the petroleum refining industry, a targeted enforcement initiative to improve compliance with all air pollution requirements, or a strategy that integrates incentives and enforcement to reduce emissions of a specific pollutant into water bodies.
 - d) Focused sub-national indicators – These are used when a regional, provincial/state, or local/municipal agency wants to assess the effectiveness of a focused initiative to address a specific non-compliance pattern or environmental risk. For example, this type of indicator system might be developed for a regional or state effort to use inspections and enforcement to control deforestation, or a municipal initiative to combine assistance followed by enforcement actions to limit illegal dumping of waste on the land.
4. Common Set of Barriers. Another pattern that can be identified from the indicators projects going on around the world is a set of barriers that many ECE programs confront as they try to develop indicators. Those barriers are:

- a) Compliance culture in formative stages – In some countries, the obligation to comply with environmental (and other) laws is not yet ingrained deeply and the rule of law is not yet embraced fully by citizens, businesses and institutions of government.
- b) Environmental laws not fully implemented – Environmental laws may be relatively new, they may have been changed significantly, and there may be impediments to implementation of specific sections of a law.
- c) Environmental agencies not mature – The operation of environmental agencies may not be very sophisticated, they may possess limited capabilities, or they may have resource shortages.
- d) Systematic data collection lacking – Some countries may lack data systems or may be only beginning to develop them.
- e) Duration of implementation – Identifying and implementing a useful set of performance indicators takes a significant amount of time and commitment of personnel, and the effort required may sometimes seem disproportionate to the value to be gained from developing and using performance indicators.
- f) Lack of analytical skills – Agencies often lack the ability to interpret the meaning of indicators, i.e., to determine what's behind the numbers, as this requires a sophisticated understanding of program operations and a skill for diagnosing problems.
- g) Misuse by external audiences – The prospect of performance indicators being inadvertently or knowingly misused by advocacy groups or legislative overseers sometimes discourages program managers from developing and using indicators.

3 USING INDICATORS TO MANAGE AND IMPROVE ECE PROGRAMS

Public management literature sug-

gests that performance indicators can be used for a wide range of purposes in public sector programs and organizations. In his article entitled, "Why Measure Performance? Different Purposes Require Different Measures," Robert Behn of Harvard University⁶ identifies eight specific managerial purposes that can be served by performance indicators. According to Behn, the eight purposes are to evaluate, control, budget, motivate, promote, celebrate, learn, and improve. Behn asserts that no single indicator is appropriate for all eight purposes, and that each purpose addresses a different management question and requires specific input, output, or outcome indicators. A very similar list of uses of performance indicators was previously offered by Harry Hatry of the Urban Institute.⁷

3.1 Four Uses of ECE Indicators

These purposes are relevant (in varying degrees) to any public program or organization, not just ECE programs. Building on these eight broad purposes, it would be useful to adapt them to describe the specific uses that ECE practitioners are making of performance indicators. For ECE practitioners, four distinct but related uses seem appropriate.

The first use of performance indicators for ECE practitioners is to monitor and manage program operations. Monthly or quarterly reports to program managers and staff about key outputs and outcomes can be a very useful management tool to ensure that resources are being used appropriately to produce specific activities or results. Such reports can be organized to break out data for a program as a whole (e.g., the national enforcement program), for specific program components (e.g., the enforcement of air pollution laws), and for particular organizational units (e.g., a regional or provincial office of a national program).

The second use of performance indicators for ECE practitioners is to identify and correct performance issues and problems. Data from input, output, and outcome indicators can be organized to com-

pare the current year to the previous year, illustrate a trend over a longer period of years, compare the performance of one program component or organizational unit to another during the same period, and to assess performance in achieving a particular goal or target. Indicators can highlight deficiencies and anomalies, allowing staff and managers to further analyze the cause of performance which deviates from past trends or current targets.

A third use of indicators by ECE practitioners is to evaluate and adjust program strategies and resource allocation to improve effectiveness. By analyzing patterns between inputs, outputs, and outcomes, ECE practitioners can learn more about what combination of activities produces the most important results. Such analysis can build a chain that improves the effectiveness of the ECE program. B resources are shifted to produce more of the right combination of activities, which increases the contribution of the ECE program to important outcomes that protect the environment.

A fourth use of indicators by ECE practitioners is to report to political overseers and the public about program performance. ECE programs can be well-served by providing to external audiences an annual (or more frequent) account of activities performed and results achieved. Reports that emphasize results and outcomes achieved through activities and outputs of the program can enhance support for the compliance and enforcement mission. By describing accomplishments in terms that emphasize results – pounds of pollution reduced through enforcement actions, improved environmental management practices at facilities from compliance assistance, improved rates of compliance in an industry sector – an account of performance is provided that is meaningful to multiple audiences.

3.2 Lessons that Inform Use of ECE Indicators

As ECE practitioners use performance indicators for these purposes, they

should be informed by two lessons from the experience of countries that have begun using indicators to manage their ECE programs. The first lesson is that the limitations of indicators need to be understood. Indicators that show the amount of an output or outcome produced do not tell program personnel all they need to know about that output or outcome. For example, an indicator can tell ECE program managers that the number of inspections conducted in 2004 is fifteen percent lower than the number conducted in 2003, but it cannot explain why the number is lower. To learn that, more analysis is needed of program operations, sometimes using qualitative information to understand the reasons for the reduction in inspections. Thus, indicators provide a kind of warning light that signals a need for deeper analysis or further investigation of the forces and influences that shape program performance.

A second lesson learned from the use of ECE indicators is that intermediate outcomes provide very valuable management information. Efforts to develop indicators often attempt to leap from measuring basic outputs (e.g., the number of enforcement actions taken) to measuring complex end outcomes (e.g., improvements in ambient air quality), ignoring many valuable results that are produced between activities and ultimate outcomes. Hatry defines intermediate outcomes as events, occurrences, or changes in conditions, behavior, or attitudes “expected to lead to the ends desired but are not the ends themselves.”⁸ Thus, in the context of ECE programs, examples of intermediate outcomes might be investment in pollution control equipment or implementation of improved environmental management practices resulting from enforcement actions taken at facilities. These outcomes will contribute to the end outcome (e.g., an improvement in ambient air quality) but they are not the end themselves.

Hatry points out two advantages of intermediate outcomes that are relevant and important for ECE practitioners and programs.⁹ Intermediate outcomes, by definition, occur before B and are expected to

help lead to B the end outcomes. As a result, intermediate outcomes usually provide more timely information than end outcomes. A second advantage is that programs almost always have more influence over intermediate outcomes than they do over end outcomes. Stated another way, there is often a direct causal link between a program activity (e.g., an enforcement action) and an intermediate outcome (e.g., an investment in pollution control equipment required as a condition of the enforcement settlement). This direct causal link allows ECE programs to make a clear and credible claim that they have produced outcomes that would not have occurred in the absence of the program.

3.3 Benefits of Using ECE Indicators

When used appropriately, indicators have been able to provide a variety of benefits to ECE practitioners.

1. Improved Control of Program Operations. Even a very basic set of outcome indicators will increase understanding about what is being accomplished, and when combined with data about inputs, judgments can be made about whether resources are being used efficiently. At a minimum, basic output indicators can help determine whether program staff are performing fundamental program activities.
2. Improved Goal-setting and Strategy Development. By using indicators as a management tool, goals can be set regarding the amount of activities or results that should be produced over a period of time. Indicators can also be used to identify needed adjustments in the mix of activities or results the program is producing.
3. Improved Resource Allocation Decisions. Output and outcome indicators can be analyzed to determine whether resources need to be increased, shifted, or altered in some way to meet goals and achieve desired results. Indicators provide an understanding of the relationship between outputs and outcomes,

thereby enhancing the ability of program managers to increase resource investments in preferred outcomes.

4. Improved Identification and Correction of Performance Problems. Indicators that can be organized by type of output or outcome, by organizational unit, and by program area increase program managers' ability to identify performance problems and investigate them further to design solutions.
5. Improved Ability to Motivate Employees. There is much truth to the oft-repeated statement, "What gets measured gets done." Performance indicators send a clear signal to program personnel about what needs to be accomplished. Setting a goal to achieve a certain amount of a specific output tends to organize and focus some portion of resources on achieving the goal.
6. Improved Ability to Communicate with the Public. Performance indicators help external audiences understand and support program activities. Output indicators can convey to the public that funds are producing some amount of inspections, enforcement actions, or other activities. Outcome indicators can convey that these activities are resulting in important outcomes such as reduced pollution, increased compliance, and improved environmental management at facilities.

Although the challenges and barriers associated with identifying and implementing ECE indicators are formidable, the benefits derived from using the indicators to manage and improve programs are significant. Countries that have made it to the third milestone on the path – i.e., using indicators – have recognized that the benefits of using indicators outweigh the costs of implementing.

4 ENSURING FURTHER PROGRESS FOR ECE INDICATORS AND PROGRAMS

ECE practitioners using indicators

as a management tool need to form a community of practice to learn from each others' experience and to show the way for other practitioners who are on the path of identifying, implementing, and using indicators. Such a community is necessary if ECE programs want to receive the maximum benefit from performance indicators.

4.1 The Need for a Community of Practice

While the creation of sets or systems of indicators is an important step toward making ECE programs more effective, systems of indicators by themselves cannot bring about improved performance in ECE programs. Setting up a system of indicators can be seen as acquiring a tool, but the tool needs to be used continuously by program managers and staff. Over time, program personnel gain more experience and skill in using the tool, they hone and sharpen the tool to make it more useful, and ultimately the program to which they apply the tool becomes more effective.

There is not much accumulated experience in using ECE indicators for program management and improvement, since most countries are still in the identification and implementation stages of their ECE indicators projects. But a community of practice for ECE indicators could make a significant contribution to creating a cadre of experienced, thoughtful program leaders who document their knowledge, report it to interested colleagues around the world, and advance the collective learning of ECE practitioners. This community of practice should encourage its members to report periodically to a central repository about the progress or challenges associated with their indicators projects. Members should also be encouraged to post "indicator bulletins" to provide examples of how indicators are being used to manage and improve ECE programs, and e-dialogues about specific topics can be used to promote more frequent communication among members about ideas and developments in performance measurement.¹⁰

4.2 Toward Performance-Based Management for ECE Programs

Ultimately, if ECE programs are to make their maximum contribution to environmental protection, they will need to join other government programs in moving toward performance-based management. This movement toward performance-based management is global, as described in various books and articles about global trends in public management reform.¹¹ In his article entitled "Performance-Based Management: Responding to the Challenges," Joseph Wholey defines performance-based management as "the purposeful use of resources and information to achieve and demonstrate measurable progress toward agency and program goals."¹² The United States Government Accountability Office (GAO) describes three key steps in performance-based management: (a) developing a reasonable level of agreement on mission, goals, and strategies for achieving the goals; (b) implementing performance measurement systems of sufficient quality to document performance and support decision making; and (c) using performance information as a basis for decision making at various organizational levels.¹³ Wholey suggests that in coming years there will be a premium on managers and staff with the knowledge, skills, and abilities to apply performance-based management to their programs. This will require training on how to use performance information: in agency and program management systems; to provide accountability to key stakeholders and the public; to demonstrate effective or improved performance; and to support resource allocation and other policy decision making.¹⁴

ECE practitioners, through their work on indicators, have established a steady pace of progress toward "implementing performance measurement systems of sufficient quality" and applying performance-based management to their programs. Managers and staff of ECE programs can determine whether they have succeeded in becoming performance-based programs by watching for specific

changes. (Perhaps these are best viewed as five indicators of program improvement.) ECE programs have reached the threshold for high performance when they are: addressing significant environmental, public health, and compliance problems; using data to make strategic decisions for better utilization of resources; using the most appropriate tool to achieve the best outcome; assessing the effectiveness of program activities to ensure desired program performance; and effectively communicating the environmental, public health and compliance outcomes to the public. When this threshold is reached, the hard work of identifying, implementing, and using performance indicators will have paid off and the effectiveness of ECE programs can be fully realized.

5 REFERENCES

- ¹ A relatively recent example of indicators pertaining to environmental conditions can be found in, EPA, "Draft Report on the Environment 2003," EPA-260-R-02-006, June 2003, also available at <http://www.epa.gov/indicators/>.
- ² Linster, Myriam, "OECD Work on Environmental Indicators," in *Measuring What Matters*, Proceedings from the INECE-OECD Workshop on Environmental Compliance and Enforcement Indicators, November 3 – 4, 2003, pg. 168.
- ³ Stahl, Michael, "Performance Indicators for Environmental Compliance and Enforcement Programs: The U.S. EPA Experience," in *Measuring What Matters*, Proceedings from the INECE-OECD Workshop on Environmental Compliance and Enforcement Indicators, November 3 – 4, 2003, pg. 150 - 157.
- ⁴ These best practices are described in an upcoming INECE publication entitled, "Performance Measurement Guidance for Compliance and Enforcement Practitioners," written by Michael Stahl in consultation with the INECE Indicators Expert Working Group.
- ⁵ Descriptions of many of these projects

can be found at the INECE web site, <http://www.inece.org/forumsindicators.html>.

- ⁶ Behn, Robert D., "Why Measure Performance? Different Purposes Require Different Measures," *Public Administration Review*, Vol. 63, No.5., September/October 2003, pg. 586 - 606.
- ⁷ Hatry, Harry, *Performance Measurement: Getting Results*, The Urban Institute Press, Washington, D.C., 1999, p.158
- ⁸ Hatry, Harry, IBID, p.16.
- ⁹ Hatry, Harry, IBID, p.19.
- ¹⁰ The INECE web site currently provides many useful features for practitioners interested in ECE indicators, and could easily be adapted to provide a visible forum for "indicators bulletins." INECE has also conducted e-dialogues on indicators topics on their web site.
- ¹¹ See, for example, Kettl, Donald F., *The Global Public Management Revolution*, Brookings Institution Press, Washington, D.C., 2000, pg. 2. Kettl describes "accountability for results," and a "focus on outputs and outcomes instead of processes and structures" "as a core characteristic of the global movement toward reform of public management.
- ¹² Wholey, Joseph S., "Performance-Based Management: Responding to the Challenges," *Public Productivity and Management Review*, Vol. 22, No. 3., pg. 288.
- ¹³ Wholey, Joseph S., IBID, pg. 289.
- ¹⁴ Wholey, Joseph S., IBID, pg. 303.