



CHAPTER ELEVEN

INDICATORS FOR MEASURING COMPLIANCE

INTRODUCTION

This chapter introduces a selection of the best literature on environmental compliance and enforcement indicators. During the past decade, there has been a growing interest in measuring the results of environmental compliance and enforcement activities, both to help reduce illegal activities and to improve the ultimate state of the environment.¹ At the same time, policy makers and the general public increasingly are holding compliance program managers accountable for the efficient use of their resources. All of these players benefit from indicators.

Efforts to build better compliance systems must be based on a solid empirical foundation. Indicators are a method of displaying information about complex phenomena in a logical and concise manner that can be readily understood and communicated to decision-makers and other intended audiences. In the environmental context, indicators have been used to measure the status of air and water quality, waste management, and land use.² Indicators are an important part of a pragmatic, empirically-grounded approach to environmental management based on the collection of hard data on actual consequences of decisions that then can inform subsequent rounds of decision-making “in a continuous information feedback loop that enables dynamic readjustment of policy and practice.”³

¹ Durwood Zaelke & Thomas Higdon, *Strengthening Environmental Enforcement and Compliance: The International Network for Environmental Compliance and Enforcement*, 6th INECE Conference Proceedings Vol. 1 (2002), available at <http://www.inece.org>. See also MALCOLM K. SPARROW, *IMPOSING DUTIES: GOVERNMENT’S CHANGING APPROACH TO COMPLIANCE*, xv-xvi, 145-50 (1994).

² See OECD, *OECD Environmental Indicators: Development, Measurement, and Use* (2003), available at <http://www.oecd.org/dataoecd/7/47/24993546.pdf>. This paper describes OECD’s approach and framework for developing, measuring, and using environmental indicators.

³ Bradley C. Karkkainen, *Toward a Smarter NEPA: Monitoring and Managing Government’s Environmental Performance*, 102 COLUM. L. REV. 903, 907-08 (2002) (citing JOHN DEWEY, *LOGIC*:

continued



Despite repeated calls from the international community for their development,⁴ there is no comprehensive set of indicators of law and policy responses to environmental problems, and in particular those related to compliance and enforcement.

In response to this demand, INECE launched a project at the 2002 World Summit on Sustainable Development to create a framework for developing indicators to measure the effects of compliance and enforcement activities on the quality of the environment.⁵ These indicators will help agencies, as well as parliaments and the public, understand which activities or combination of activities are most effective.

Through the INECE Environmental Compliance and Enforcement (ECE) Indicators Project, an expert team of practitioners from around the world is collaborating to develop a scalable framework to guide the development of ECE indicator programs at the country level.⁶ Initial steps for the Project have included assessing how countries are using “input,” “output,” and “intermediate outcome” indicators to manage environmental enforcement programs.⁷ The Expert Working Group plans to expand the scope of the Project to include additional indicators for compliance assistance activities as well.

THE THEORY OF INQUIRY 39-40 (1938) and John Dewey, *Logical Method and Law*, 10 CORNELL L.Q., 17 (1924). See also Daniel C. Esty, *Environmental Protection in the Information Age*, 79 N.Y.U. L. REV., 115 (2004).

⁴ See Agenda 21 Chapter 8 and 40. For example, Chapter 8.6 states that “[c]ountries could develop systems for monitoring and evaluation of progress towards achieving sustainable development by adopting indicators that measure changes across economic, social and environmental dimensions.”

⁵ *Measuring Enforcement to Promote Sustainable Development*, 6TH INECE NEWSLETTER (2002), available at <http://www.inece.org/Newsletter6.pdf>.

⁶ *Performance Measurement Guidance for Compliance and Enforcement Practitioners*, 7TH INECE Conference Proceedings (forthcoming 2005).

⁷ “Input indicators” (e.g., number of inspectors) show the amount of resources used to carry out activities; “output indicators” (e.g., the number of inspections) show the extent of activities carried out; and “intermediate outcome indicators” (e.g., pounds of pollutant reduced) measure progress towards achieving final outcomes. “Final outcome indicators” (e.g., improvements in water quality), which measure the real impacts of compliance promotion and enforcement actions on the state of the environment, are difficult to implement because of the number of factors affecting environmental quality. See Kenneth J. Markowitz et al., *Improving Environmental Compliance and Enforcement Through Performance Measurement: The INECE Indicators Project*, 4(1) SUSTAINABLE DEV. LAW & POL’Y 17(2004).



Based on this framework, INECE is collaborating with several countries to develop indicator programs to monitor and report on their enforcement and compliance promotion activities.⁸ Most of these programs are starting with output indicators, which measure government activities, work products, or actions, such as the number of enforcement cases settled per year.⁹ In Costa Rica, for example, the Ministry of the Environment, in conjunction with INECE, has begun designing a pilot project to measure enforcement of laws protecting Costa Rica's forests. The indicators will aid the Ministry in determining the appropriate mix of information resources, personnel, and enforcement and compliance strategies to combat illegal logging in that country.

In more advanced ECE indicator programs, such as those of the United States, Canada, and the Netherlands, practitioners may also use an intermediate outcome indicator—for example, the actual pounds of pollutant reduced as a result of compliance and enforcement activities—to measure their progress towards achieving a change in behavior or knowledge. It is anticipated that most of these programs eventually will also develop the final outcome indicators that measure the results or impacts of compliance promotion and enforcement actions on the state of the environment; that is, they will measure improvement to water quality, or air quality, and so on.¹⁰

ECE indicators also can be used to demonstrate how environmental compliance brings countries closer to achieving the Millennium Development Goals and other sustainable development objectives.¹¹ To this end, INECE is collaborating with the United Nations Environment Programme (UNEP) and the Organisation for Economic Co-operation

⁸ These countries include Argentina, Belarus, Brazil, Chile, Costa Rica, Czech Republic, Mexico, Russia, and Thailand. For case studies on the countries currently developing environmental enforcement indicators programs, see INECE and OECD, *Measuring What Matters: Proceedings from the INECE-OECD Workshop on Environmental Compliance and Enforcement Indicators* (2003), available at <http://www.inece.org/indicators/workshop.html>.

⁹ INECE Expert Working Group on Environmental Compliance and Enforcement Indicators, *INECE-OECD Workshop on Environmental Compliance and Enforcement Indicators: Measuring What Matters*, October 22, 2003, available at <http://www.inece.org/IndBackPaper.pdf>.

¹⁰ Frank Barrett & Dave Pascoe, *Environmental Compliance and Enforcement Indicators: Environment Canada Pilot Projects – Addressing Challenges*, INECE-OECD Workshop on Environmental Compliance and Enforcement Indicators: Measuring What Matters, November 3-4, 2003, available at [http://www.inece.org/indicators/2-WhatMatters\(Barrett\).pdf](http://www.inece.org/indicators/2-WhatMatters(Barrett).pdf).



and Development (OECD) to develop ECE indicators for the international context. INECE and UNEP are working together in select countries to use indicators to measure successful compliance strategies for multilateral environmental agreements (MEAs). They also will work with stakeholders within each country to coordinate successful implementation strategies for thematically-similar MEAs. INECE is working with OECD to develop a strategy to integrate ECE indicators into OECD's country performance reviews.

The articles in this chapter discuss the various uses of ECE indicators, provide sectoral and country-specific examples of their use, and describe INECE's framework for identifying, designing, and using indicators.

In the first article, Kenneth Markowitz, Krzysztof Michalak, and Meredith Reeves describe efforts to develop good practices and implementation tools for the INECE ECE indicators projects worldwide.¹² The article also provides a general introduction to the types and applications of ECE indicators, as well as an overview of several of the pilot projects being initiated around the world.

In the next article, Michael Stahl, the leading expert on ECE indicators, discusses the importance of using indicators to measure the results of environmental compliance and enforcement programs, including their specific benefits to environmental enforcement practitioners.¹³ Stahl's article presents a three-stage model for developing ECE indicators programs: identification, design and implementation, and use. This model is further described in the (*Performance Measurement Guidance for Compliance and Enforcement Practitioners*).¹⁴

¹¹ The final conference statement from the 6th International Conference on Environmental Compliance and Enforcement called upon INECE to develop uniform minimum criteria and to pilot test INECE Environmental ECE Indicators, in cooperation with regional networks, with a view to improving performance, public policy decisions, and environmental governance globally, ultimately contributing to the improvement of the quality of the environment. Final Conference Statement, 6th International Conference on Environmental Compliance and Enforcement at 19f, available at <http://www.inece.org/conf/proceedings2/2-ConfStatement.pdf>.

¹² Kenneth J. Markowitz, Krzysztof Michalak, & Meredith Reeves, *Improving Environmental Compliance and Enforcement Through Performance Measurement: The INECE Indicators Project*, Updated from 4(1) SUSTAINABLE DEV.L. & POL'Y 17(2004).

¹³ Michael Stahl, *Using Indicators to Lead Environmental Compliance and Enforcement Programs*, 7th INECE Conference Proceedings (forthcoming 2005).

¹⁴ The guidance document is available through the INECE Indicators Web Forum at <http://www.inece.org/forumsindicators.html>.



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In the final article, Nalin Kishor and Kenneth Rosenbaum present a World Bank case study on using indicators to monitor the effectiveness of law enforcement in the forestry sector.¹⁵ The article describes characteristics of reliable indicators and concludes by describing the applicability of indicators to forest law enforcement and governance initiatives.

¹⁵ Nalin Kishor & Kenneth Rosenbaum, *Indicators to Monitor Progress of Forest Law Enforcement and Governance Initiatives to Control Illegal Practices in the Forest Sector*, 5(3) INT'L FORESTRY REV., 211 (2003).