

NEXT GENERATION ENVIRONMENTAL COMPLIANCE AND ENFORCEMENT: BACK TO THE FUTURE

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SUMMARY

This paper considers a range of present day and forward looking activities associated with 'next generation' environmental compliance and enforcement. It does so, in part, by reflecting and looking 'back to the future' to see what lessons have already been learned and what information and holdings already exist that might assist environmental compliance and enforcement professionals into the future.

The paper understandably and perhaps unsurprisingly considers aspects that fall under broad groupings of: tools and technology; behavioural and social sciences; and systems and approaches. However, central to the paper is the important but sometimes underused role of environmental enforcement networks and the fact that often the human element of compliance and enforcement practitioners themselves can be overlooked or not fully appreciated.

The authors, between them, have in excess of 77 years of experience in undertaking, leading and supporting environmental compliance and enforcement efforts. Their activities, while based in three continents (Europe, North America, and Australasia), have informed global and regional environmental enforcement networks in most parts of the world.

The paper does not attempt to frame the discourse on next generation approaches as being 'better or worse' or 'old versus new'. Instead it frames the discussion on *where we were* as an environmental compliance and enforcement community: in previous generations, *where we are now* as an environmental compliance and enforcement community: in the current generation; and *where we are headed*: in the next generation. Simply put we look at changes and approaching changes and what we can learn and take from our past.

1 INTRODUCTION

An exchange, dating back to 1985, officially commencing in 1989, between the Netherlands Ministry of the Environment and the United States Environmental Protection Agency in international collaboration led to the establishment of the International Network for Environmental Compliance and Enforcement (INECE).

INECE, and the compliance and enforcement community it reflects, now represent several decades of experience and expertise with the challenges and conundrums of obtaining compliance with national and international environmental laws, standards and norms. It is not surprising and is a promising development that the dialog of the

community and the community itself have turned in part to the 'next generation' of problem solving in environmental enforcement and compliance.

During the past 25 years, the history of INECE has been documented many times, in many contexts. The authors do not intend to repeat this history here. However, a general overview of the history of INECE, in conjunction with consideration of two specific and recent publications, is considered useful in the context of this paper on next generation compliance and enforcement.

As indicated above, in 1985 the seeds of INECE were planted through two key activities. The first was an Organisation for Economic Cooperation and Development (OECD) research project on compliance monitoring and enforcement. The second, extended and formalized the first, took the form of a bilateral agreement between the U.S. EPA and Netherlands Ministry of Environment in the form of Memorandum of Understanding.

As a result, in 1989 the network was formally launched, with the naming of the network as INECE coming later. Thereafter INECE quickly became an early leader in understanding and placing a value on trans-governmental networks in responding to global challenges by facilitating collaboration and information exchange among officials (Slaughter, 2004). Moreover, INECE was established at a time when countries were significantly increasing a range of new legal requirements to protect human health and the environment and to comply with obligations under multilateral environmental agreements (Kaniaru, 2002). Given this confluence of developments, there was a clear need for flexible mechanisms to quickly disseminate information, harmonise regulations and respond to common problems from a shared perspective shaped by practical experience (Zaelke *et al*, 2005a; 2005b). INECE therefore has a long experience in supporting responses to what were the 'next-generation compliance' issues of the times.

It appears to us that the primary impetus for the recent emphasis on finding some more effective tools and concepts is a recognition that non-compliance rates continue to be disturbingly high in the face of the now decades long history of investment in various approaches (themselves based on a number of different and intersecting regulatory theories and models)¹ to achieve compliance. The key themes seem to center around:

- What behavioral, technical, and legal aspects of the system are affecting the level of compliance?
- How do we alter them to enhance the likelihood of compliance?
- What new technologies or analytical capabilities enable us to make better use of the approaches available to us, including use with "traditional" concepts like targeting, inspection and monitoring?

These few phrases represent a broad and far-ranging construct for the discussion of 'next generation' ideas. And they are not exactly full of all new concepts; though there are some pretty neat technologies that are quite new.

A key point of this paper is to help knit together the experience of the past to facilitate the generational dialog. As such, to not blur those lines, it is important to explain what in the opinion of the authors *is not* 'next generation' thinking. Next Generation thinking does not:

- **Reject** the value of the deterrence theory.
- **Diminish** the role of governmental enforcers.
- **Alter** the critical need for adequate and adequately trained enforcement resources.
- **Negate** the importance of a level playing field.
- **Contradict** the sound principles of enforcement and compliance that have provided the core approach for the national governments involved in environmental protection.
- **Underestimate** the role of technology and technical developments.

Instead, ‘next generation’ thinking, at its best and in its most useful framing: builds on, complements, and enhances these core principles and their related functions and activities.

This important observation is consistent with the viewpoint of Larry Starfield, Principal Deputy Assistant Administrator for Enforcement and Compliance Assurance, U.S. Environment Protection Agency, who states that ‘Next-Generation Compliance is not instead of traditional enforcement – it supplements it’.²

1.1 ‘Next Generation’: the journey thus far

While a key aspect of this paper is to illustrate the extent to which various current ‘next generation’ ideas have been active in the INECE dialog through the years, this paper is in no way intended to diminish the value of so much of the work reflected in INECE archives which is grounded in core concepts like deterrence (Gray and Shimshack, 2011; Shimshack and Ward, 2005; Stigler, 1990, Leviner, 2008) and effective governmental response (Mascini and Van Wijk, 2009), though they are not discussed extensively here.

In this paper, we attempt to look at certain key issues in the ‘next generation’ compliance dialog through the lens of the history of INECE’s record of promoting national, transnational and international networking for all those with a stake in environmental protection and the critical role of compliance in achieving meaningful progress. For supporting materials, we rely primarily on:

- The published proceedings of the nine INECE International Conferences held to date, beginning with the first conference in Utrecht in 1990 and the most recent conference in Whistler in 2011.
- The INECE compilation ‘Making Law Work: Environmental Compliance and Sustainable Development, Volume 1 (Zaelke, Kaniaru, & Kružíková, 2005a) and Volume 2 (Zaelke, Kaniaru, & Kružíková, 2005b).
- Other related materials and sources contained within the INECE online library,³ which supplement this paper notably (INECE 2009, 2013, 2015), and
- The papers and presentations at the three INECE-affiliated Next Generation conferences held in Washington DC, USA (INECE, n.d. (a)), Rotterdam, The Netherlands (INECE, n.d. (b)), and Bangkok, Thailand (INECE, n.d. (c)) in March, April and September 2015 respectively.⁴

1.2 Back to the Future: subjects and sections considered

We attempt to go ‘back to the future’ as we consider five subjects, in five sections, which are of importance in the ‘next generation’ dialog. These subjects include both

key concepts at the forefront of 'next generation' thinking and critical approaches to advance 'next generation' thinking nationally and internationally. By way of overview:

- In the first two sections we deal with certain prominent 'next generation' focus areas including the design of law/regulations to promote and incentivize complying behavior and the role of transparency, public accountability and civil society involvement in enhancing compliance.
- Then the following two sections emphasize the power of networks and the experiences of national and international capacity building. Note we have not included a separate section on the exciting new technologies which may become game-changers affecting not only how we design requirements and involve the public but aspects of compliance that we cannot now fully imagine. However, in the third and fourth sections, we do emphasize the vital potential for networks in technology dissemination and adoption and the essential need for capacity building in connection with emerging technologies.⁵
- The final section broadly addresses both the potential presented by the "big data" opportunities made possible by technological and other advances as well as the critical role of measures of success and accountability for compliance programs generally.

More specifically, in terms of the outline of the paper:

Firstly and as a framework for the remainder of the discussion, we examine the importance of the design of environmental requirements (laws, regulations, treaties, permits, etc.) and the key intersection between how requirements are designed and compliance behavior.

Secondly we focus on transparency, information availability, public accountability, and citizen/community involvement in enforcement and compliance behavior.

Thirdly, we turn to the discussion of 'networks' and 'networking' as being a (if not the) vital instrument for implementation of next generation ideas. This part has a particular emphasis on the role of networks (at the international, regional, national, and sub-national levels) in technology acceptance and transfer.

The fourth section focuses on capacity building and training, with an emphasis on their actual and potential role in implementation of next generation approaches.

The fifth section concludes with another crosscutting topic: measurement, data and results. In this section, we touch briefly on "big data" and data analysis as a 'next generation' approach, as well as more generally on the importance of key performance indicators, measurement and a results orientation as critical aspects of all compliance and enforcement efforts.

At this juncture it should be noted that sections three, four and five are purposively designed to showcase the potential and central role that INECE (and related and similar regional networks) have to play in this area. Moreover, they highlight the critical importance of networking and capacity building in terms of successfully advancing approaches to environmental compliance and enforcement. The reason for this is that no matter how powerful the potential of 'next generation' ideas, they will only become sustainable with the support of active networking and capacity

building at the national, multi-national and international level and adequately trained personnel.

It is our intention that, after consideration of these issues, readers will have a greater understanding of the strong foundations that already are available to support sound 'next generation' concepts. And, more importantly, they will be more attuned to the opportunities that exist for them to leverage off of that existing groundwork productively into new and/or enhanced areas. Our aim is that this will assist the environmental compliance community (without regard to which generation they are operating in)⁶ to see common threads through the decades and find more common vocabulary and vision as we go forward.

2 DESIGN OF REQUIREMENTS AND COMPLIANCE BEHAVIOUR

2.1 INECE Contributions to Enhancing Regulatory Design

It would not be an exaggeration to say that INECE was born out of an increasing awareness of the critical role that compliance plays in the development of environmental policy and the successful solution to environmental problems. This history was presented at the original Utrecht Conference in 1990 by Hans Schaap, Deputy Inspector, VROM, The Netherlands, who explained the Dutch experience:

'...In the mid-1980's far more emphasis began to be placed on enforcement. Pieter Winsemius, then Minister for the Environment, presented his view of the environment policy in the form for the life-cycle of environmental problems he had developed, indicating how, in the first stage, a period of differing opinions on the nature and seriousness of the problem slowly gives way to an acceptance of the problem after which the development of policy is set in motion, culminating in the third stage: the solution provided by legislation. This is followed by the fourth stage, the administrative phase, in which prime importance is placed on inspection and enforcement...' (Schaap, 1990, p. 88).

Mr. Schaap went on to say that, The Minister had:

'... also indicated the place of enforcement in the chain of regulation, referring to the serious danger of its always becoming the weakest link. In this context he stressed the importance of constant movement in this chain, where regulation is found to be deficient, experience gained from enforcement must stimulate the adjustment of legislation and the rules governing the issuance of licenses' (p. 88).

Behind these quotes, and the sharing of the Dutch experience, is a fundamental recognition of the critical role that achieving compliance plays in environmental policy and the extreme policy vulnerability in that arena. They make it clear that there is also the critical need to integrate compliance expertise with law design: statutes, regulations or permits.

In the first presentation, and associated paper, from the first conference in Utrecht, Cheryl Wasserman on behalf of the United States presented a broad perspective on compliance and enforcement "Philosophy, Strategies, and Management Tools".⁷ Speaking to the connection between compliance and overall environmental protection, this paper starts with the succinct observation that '[c]ompliance is critical to realizing the benefits envisioned by environmental policy.... Compliance is the regulatory bottom-line" (Wasserman, 1990, p. 9).⁸

This concept, of integration and achieving policy delivery/outcomes, is at the heart of 'next generation' thinking. Specifically, the legal and technical requirements should be designed in ways that maximize the likelihood of compliance. Doing so requires certain conclusions about the behavior of regulated entities (and their regulators).⁹ The development of useful data to reach these conclusions, from the behavioral sciences, is an important step. Experience with the challenges of inspecting, monitoring, and responding to violations helps throw light on what kinds of provisions facilitate both self-policing and regulator/enforcer responses. Even more fundamentally, experience with the challenges of compliance can help identify concepts or technologies that require less human decision making and are more self-executing or that require affirmative steps to violate such that the default inaction leads to compliance.

Indeed, the INECE archive reveals not only an awareness of the key role of compliance in environmental protection policy, but also a determination to further understanding of the behavioural and other drivers of compliance behaviour. It is precisely this commitment to an understanding of the underlying "science" of compliance that provided a key impetus for the *Making Law Work* compendium published by INECE and partners in 2005 (Zaelke, Kaniaru, & Kružíková, 2005a and 2005b) which features leading academic publications on compliance behavior theory. These materials provide a good compilation of the available literature and offer a grounding in the key aspects of the theoretical underpinning for both traditional enforcement concepts like deterrence and for many of the next generation ideas, especially those related to the design of regulatory requirements for environmental protection.¹⁰ We will not try to summarize what Professor Malloy calls the "rational actor" and the "normative" models other than to note that both can inform and enhance next generation thinking about the design of requirements.

Much of the historic INECE-facilitated attention to regulatory design as a means to promote compliance has focused on classic elements of environmental law systems and schemes, with special attention to the importance of workable legal authorities to support government enforcement programs. These kinds of provisions start with the importance of adequate authority to investigate, inspect, collect information and bring formal actions in civil, criminal or administrative forums.¹¹

But even from early days, discussions relating to the attention to the design of requirements went beyond these basics. For example during the second conference held in Budapest in 1992, Scott Fulton and Elliott Gilberg of the United States Environmental Protection Agency presented a paper on '*Developing Enforceable Regulations and Permits*' (Fulton and Gilberg, 1992, pp. 253-263). While the emphasis was on assuring that the enforcement authorities can more readily enforce regulations and permit conditions, most of the particulars align almost completely with the 'next generation' emphasis on designing requirements to minimize confusion, reduce ambiguity and unnecessary complexity as well as requirements that permit ease of monitoring and detection of compliance status. At the time this paper provoked a lively discussion, captured in the summary report (DeLong, 1996), which included a general awareness that reducing complexity can be very challenging in the environmental protection context. In the same, early conference, the numerous and daunting challenges facing the European Union in obtaining both nation-state and regulated entity compliance sharply illustrate the next generation design issues of clarity, implementability, incentive, transparency, and accountability.

Moving forward some 16 years, by the 8th Conference, in Cape Town, in 2008 the discussion of regulatory design and the compelling need for compliance considerations had developed to such a degree that Dutch Public Prosecutor Gustaaf Biezeveld offered “32 golden rules” for legislative design alone.¹² Although many of these feature elements of design critical to the investigation and prosecution functions of government, a significant number are right out of the ‘next generation’ playbook. For example, he urges environmental legislators to consider:

‘Golden rule 12

Always take care that there can be no doubt about:

- a. *what* the norm is that has to be complied with;
- b. to *whom* the rules refer, so by whom they have to be fulfilled or complied with and by whom the inspection on compliance is to be carried out and against whom, if necessary, enforcement action has to be directed;
- c. *how* inspection can be done and how it can be determined whether or not there is compliance with the norm

Golden rule 13

Limit the number of exceptions to the norm as much as possible.

Golden rule 14

If an exception is absolutely necessary: describe it in a separate paragraph or article because of clear liability to punishment’ (Biezeveld, 2008, p 126 [original emphasis added]).¹³

The powerful nexus between law design and implementation has been graphically illustrated in many of the papers and presentations of INECE networkers. One compelling cautionary tale is ‘*Legislative Changes for improved compliance and enforcement; the case of Bulgaria*’ by Liliana Maslarova, a presentation, and subsequent paper, at the Oaxaca conference (Maslarova, 1994, pp. 97-102) She illustrates the extreme challenges to compliance where the newly developing legislation lacks key fundamental underpinnings. Of particular relevance to our discussion here is her emphasis on the absence of requirements for self-monitoring and self-investigation by industries and the combinations of extremely stringent overall standards and the lack of individualized permitting of specific and clear requirements which resulted, as she put it, in everyone’s inability to comply. These challenges with law drafting faced by nations like Bulgaria emerging from the long Soviet era and with underdeveloped industrial bases, illustrate not only the broad applicability of next generation principles but also the value of networking across national, regional, and continental borders.

In sum, INECE and its network members have long understood the importance of compliance in law/regulatory development and the roles played by behavioural sciences in understanding how to build compliance thinking into regulatory requirement design. And while much of that history has focused on law design through the lens of the needs of the enforcement institutions, there is a rich trove of more fundamental considerations of environmental law design, relating to propelling the likelihood of compliance in ways that include but go well beyond maximizing the effectiveness of the enforcers.

2.2 Opportunities for INECE going forward

Through its involvement in and support of recent collaborative conferences (Washington; Rotterdam; Bangkok), and others such as the Australasian Environmental Law Enforcement and Regulators neTwork (AELERT) conference in Brisbane in October 2015, INECE continues to claim and maintain its place in the continuing dialog about environmental compliance and enforcement. This is becoming especially so around 'next generation' ideas. We applaud this continuing connection and offer the following suggestions for continued contributions from INECE specifically in the area of law and regulatory design. INECE could:

- Consider updating existing publications and support in these areas – for the ongoing work that builds upon the existing INECE expertise and archives.
- Support small national-level projects – to tackle design problems in real-world situations, like a particular regulation or permit or category of permits.
- Facilitate the exchange of experts and expertise – required to advance such activities and projects.

3 TRANSPARENCY, PUBLIC ACCOUNTABILITY AND CITIZEN/COMMUNITY INVOLVEMENT

3.1 INECE contributions to the participation of the public and civil society in environmental compliance

Many aspects of the 'next generation' thinking about compliance drivers have been centred around enhanced measurement and transparency of results, to government, to the regulated community and to civil society at large. The premise is that access to better and more timely information about compliance and environmental impacts will alter behaviour of all the actors involved. The engagement of citizens, through fence-line monitoring information, citizen-led monitoring tools, and social media all play in the 'next generation' version of this core element of successful environmental protection approaches.

The idea is that more information and more readily available information will empower citizens to have an impact of the behaviour of regulated entities. Further, more open and clearly understandable information about facilities can require those who operate them to be increasingly responsive to their employees, their families, and their social networks. Better information can also facilitate the role of consumers, customers, bankers, insurers and others who may affect and motivate the behaviour of regulated entities.

From the earliest days of what became the INECE footprint, the key concepts of public access to information and increasing role for civil society in motivating compliance, and citizen involvement in enforcement have been a dominant theme.

Participants and lead networkers throughout the history of INECE engagement have approached this tapestry of issues through multiple strands, including improved monitoring, recordkeeping, and reporting; public availability of information and the role of the press; citizen engagement and formal citizen roles in enforcement.

The second conference in Budapest in 1992 featured an entire theme on Public and Citizen Involvement in enforcement, which included a paper entitled '*From Public Disclosure to Public Accountability: What Impact will it have on Enforcement?*' (Irvin, 1992). That same conference, which occurred just as the former Soviet states were

emerging from the USSR, featured a fascinating presentation on ‘*NGO’S Role in Environmental Enforcement in Ownership Transformations in Poland 1990 - 1992, Opportunities and Problems*’ by Stodulski, from the Institute for Sustainable Development (Stodulski, 1992). This thorough discussion of the role of non-governmental organizations and citizens’ groups in the efforts to privatize (and regulate) the state-owned business that dominated the economy illustrate the power of networking for cross-fertilization and international bridge-building.

This report of the Polish experience understatedly concluded that “there are some restrictions for activities of non-governmental ecological organizations in the field of monitoring of restructuring, privatization and liquidation processes in Poland.” The enumerated restrictions included:

Lack of access to information on environmental status of enterprises; documentation on either economic or environmental issues is confidential in the course of negotiations and afterwards; lack of up-to-date information about current environmental status of enterprises on new sources of emissions or on old contaminations; difficulties in gathering information during rapid and complicated splitting real assets and changes in property rights take-overs; administration is not able to catch up with transfers of environmental liabilities from former state-owned enterprises to new owners; inflexibility of government in passing over information needed to make good and timely decisions; the work requires highly experienced specialists with deep professional knowledge in economy, legal system, business activities, legal and technology context of the environmental protection; requirement for long and very intensive engagement of people involved (Stodulski, 1992, pp. 91-98).

This presentation remains intriguing because, despite its esoteric context in time and place, the same barriers and challenges present our ‘next generation’ efforts to enhance citizen knowledge and involvement.

By the time of the third conference in Oaxaca in 1994, one of the major themes was *The Role of Communication in an Enforcement Program*. In this context, one paper by Mr. Jan Veenman of the Netherlands entitled “the Role of Communication in Implementing Enforcement Policy” (Veenman 1992) addresses this issue in the overall context of achieving environmental policy objectives. These issues are just as relevant today, if not more so than when they were raised 21 years ago. And one paper, from Paul Keough, one of INECE’s early leading U.S. participants, is entitled “Changing Environmental Behavior in the United States Through the Use of Public Disclosure of Information” (Keough, 1994). The subheadings of his paper underscore the scope of this topic and its alignment with current “next generation” thinking, and were:

1. Public Access to Compliance Monitoring Data,
2. Public Disclosure of Environmental Releases,
3. Public Notice as an Enforcement Tool,
4. The Power of the Press,
5. Integrity of Data is Key,

6. Public Disclosure Has Led to Major Pollution Prevention Efforts (for example the Toxic Release Inventory, under U.S. chemicals law), and
7. Public Outreach (Keough, 1994, pp. 285-292).

The technologies have changed — for obtaining and disseminating information. Social media have entered the picture. Google Earth can be on anyone's computer. Hand held devices gain capabilities in waves and surges. The “press” is so much more than the print media and mainstream radio/television. The INECE archives mostly do not speak specifically of blogs and tweets. But the core aspects of the power of information and citizen engagement have been studied and shared throughout the history of this network.

From a major contribution to the fourth conference, held in Chang Mai, Thailand in 1996), participants heard a thorough analysis of “The Evolving Role of Citizens in Environmental Enforcement” which examined citizen enforcement through the reasons for and benefits from, the necessary groundwork (legal and informational, including clarity of regulatory design) and the special challenges for citizen monitoring, citizen “inspections”, public complaints and citizen enforcement actions (Casey-Lefkowitz, Futrell, Austin and Bass, 1996). This thorough, thoughtful and still mostly current work also touches on transboundary public participation and international cooperation and capacity building.

Further the 4th conference in Chiang Mai and 5th conference in Monterrey, California, featured workshops on both enforcement communication and citizen enforcement. While the 6th conference in Costa Rica refined that focus to "Encouraging Public Role in Compliance Monitoring and Impact of Public Access to Environmental Information", featuring a paper connecting the public involvement issue with regional networking. And the 8th Conference featured an entire “sub-track” of the Detecting Noncompliance Track to a topic called “citizen monitoring and reporting.”¹⁴

3.2 Opportunities for INECE going forward.

Networking that involves the public and civil society is one area where there have been major changes because of technology and social media. While these affect the tools and means of networking among governments and professional specialists, they also profoundly affect the engagement with the broader public.

We recommend that INECE examine how it can best contribute, working with national governments and other networks, to a new, social-media and technology centric approach to the engagement of civil society in environmental compliance and enforcement. INECE itself can and should lead in the adoption of information and communication tools vital to successful networking and to successful engagement of civil society.

4 NETWORKS AND NETWORKING WITH NEXT GENERATION CONCEPTS AND FOR TECHNOLOGY TRANSFER

4.1 History of INECE as a leader in successful networking for ‘next generation’ concepts

As mentioned in the introduction, two recent publications address aspects of INECE's history, which are relevant to its ability to generate, support, and disseminate information that advances ‘next-generation compliance’ efforts.

In the first publication, *Developing and sustaining environmental compliance and enforcement networks: lessons learned from the International Network on Environmental Compliance and Enforcement*, Gerardu, Koparova, Markowitz, Zaelke and Baldwin (2015) outline the necessary work at an *institutional* level in establishing, sustaining and maintaining environmental enforcement networks (EENs). In terms of advancing next-generation compliance efforts – key aspects of this chapter include looking back to learn from the past¹⁵ and looking ahead to provide guidance on future directions for the network.¹⁶

The fact that EENs are the primary vehicle through which the majority of environmental regulatory agencies receive support and guidance as they build response capabilities is well established (Faure, de Smedt and Stas, 2015; Geysels and Johnson, 2013).

In the second publication, *International Compliance and Enforcement Networks: The Critical Role of Collaboration in Environmental Protection*, Baldwin, Gerardu, Koparova, and Ruessink (2015) outline the critical role that *collaboration* plays in ensuring that EENs are effective. In advancing next-generation compliance efforts – key aspects of this chapter include a recognition that ‘collaboration helps deliver the required concerted and coordinated efforts that are needed to tackle the international environmental implementation challenges’ (p. 22). However at the same time there is a recognition that ‘advancing next-generation compliance undoubtedly will require the use of different forms of collaboration and networking’ (p. 31).

The fact that EENs are already actively engaging in knowledge exchange and knowledge transfer has them well placed to undertake different forms of collaboration and networking. This flexibility in working together is critical to ensure that networks deliver value to members, to the maximum extent (Gemmell and Circelli, 2015; Pink and Bartel, 2015).

Specific examples for INECE in terms of technology transfer are found in areas of water quality (Krahn and Sekela, 2009) and hazardous and radioactive material (Kopsick and Bearden, 2009). Remote sensing and other technological developments were the subject of a dedicated workshop during the 8th conference that produced a particularly telling list of recommendations, suggesting that INECE should:

1. Explore ways to facilitate the sharing of information on technology used to collect enforcement evidence.
2. Continue to build networks between individuals and organizations, particularly in terms of identifying needs and assisting in the development of needs assessments.
3. Develop a reference library targeted to appropriate programmatic areas.
4. Look for ways to facilitate the equipment exchange.
5. Provide a forum to pose questions/get answers on technology issues.
6. Share strategies to show how technologies will allow inspectors to do more with less. This can act to justify spending the money up front on technology (INECE, 2008, p. 52-53).

INECE has a long history of success in terms of ‘knowledge generation’, ‘knowledge exchange’ and ‘knowledge transfer’ across a vast array of environmental compliance and enforcement issues, going well beyond specific technologies. Therefore, in terms of raising awareness, building capacity and strengthening networks –

numerous individual and collective examples are contained in the nine volumes of INECE conference proceedings¹⁷ which at present contain over 580 papers. These combined with other documentation generated by INECE projects and initiatives are contained in its repository of electronic resources.¹⁸ Several products, in addition to those already mentioned, are worthy of special mention.

- *Making Law Work: Environmental Compliance & Sustainable Development Volume 1 and II* (Zaelke, D, Kaniaru, D, & Kružíková, E. (eds.) (2005a; 2005b) – this publication looks at leading and cross-cutting topics related to compliance with and enforcement of laws to protect the environment and promote sustainable development.
- *Principles of Environmental Compliance and Enforcement Handbook* (INECE, 2009) – this publication draws on the collective knowledge and experience of peers to provide actionable guidance in the areas of: designing effective requirements, setting priorities, monitoring compliance, conducting enforcement response, and measuring program performance’.
- *Compliance Strategies to Deliver Climate Benefits* (INECE, 2013) – this publication, in the form of a Special Report, considers the early indicators of more severe threats to society associated with climate change governance and management.
- *Next Generation Compliance* (INECE, 2015) – this publication, in the form of a Special Report, aims to inspire and stimulate innovative problem solving and use of advanced tools and a range of effective approaches to strengthen environmental performance.

The first two publications tend to take more of a functional approach to matters, whereas the last two take more of a commodity approach.

It is important to note here that INECE has created and worked across the three types of networks identified by Slaughter (2004): *information networks*, *enforcement networks* and *harmonisation networks*. These networks are now considered briefly in turn:

- *Information networks* - ‘The glue of any transgovernmental network is the exchange of information and ideas. Put a group of environmental regulators, central bankers, or utilities commissioners in a room and they will begin talking about different techniques of regulation, commiserating about common problems, and brainstorming new approaches’ (p.52).
 - The conferences and workshops coordinated and facilitated by INECE are examples of this in action. INECE conferences have always been working conferences; workshops, lunch with buffet of ideas and only a few general presentations
- *Enforcement networks* - ‘[This] type of network focuses primarily on enhancing cooperation among national regulators to enforce existing national laws and rules. As the subjects they regulate – from criminals to corporations – move across borders, they must expand their regulatory reach by initiating contact with their foreign counterparts’ (p. 55).
 - The INECE Seaport Environmental Security Network (Seaport Network or SESN) is an example of this in action.¹⁹

- *Harmonisation networks* - ‘... regulators may work together to harmonise regulatory standards, such as product-safety standards, with the overt aim of achieving efficiency’ (p. 59).
 - The *Principles of Environmental Compliance and Enforcement Handbook* (INECE, 2009) mentioned previously is an example of this in action.

Using these different types of networks, either individually or in combination collectively, is important given that:

‘The compliance issue has turned out to be one of the major concerns for global environmental governance (GEG) in both international environmental law (IEL) and international environmental politics (IEP) in recent decades’ (Savasan, 2015, p. 68).

4.2 Opportunities for INECE

In many ways the opportunities for INECE today are not that different to what they were 25 years ago when it was established. That is, INECE, and now with the assistance of its global network of regional environmental enforcement networks, is well placed to develop work plans, projects and initiatives in the areas including, but not limited to: capacity building, raising awareness, training, support for other networks (whether geographically-based, discipline-based, or commodity-based).²⁰

What is clear is that to maintain currency and influence the value of what INECE delivers needs to be recognised by a larger number of actors, with this group including: politicians, senior government officials, international governmental organisations, non-governmental organisations, academia, and civil society.

Also, and perhaps more so than previously, the work of INECE and other environmental enforcement networks must connect to and form part of the overall economic, social, and environmental narrative. In order to achieve this, the importance of international collaboration on compliance and enforcement and importance of mutual reinforcement of ideas and the possibility and need of influencing the international environmental agenda cannot be underestimated.

A regional example of this approach can be seen in the work of the Network of Heads of European Environmental Protection Agencies (NHEEPA) which was established with 31 members in 2003. In April 2008 it produced *Improving the Effectiveness of EU Environmental Regulation – A Future Vision* (NHEEPA, 2008). This statement, in part, recognised that ‘a clean and healthy environment supports a competitive economy and is key to sustainable development’ (p. 3), and therefore asked the EU Commission for:

- An approach to regulation based on environmental outcomes;
- A simple, transparent and consolidated legal framework, with a common approach to regulation;
- Effective policy-making process (p. 2).

Given the experience of INECE, based upon the ‘needs’ of its membership, the authors consider that many of the opportunities for progress will be in the areas of capacity building and training.

5 CAPACITY BUILDING AND TRAINING FOR NEXT GENERATION APPROACHES

5.1 History of INECE involvement (in training and training network generally)

INECE has had a long history of successes in the area of capacity building and training for environmental compliance and enforcement. Anecdotal information and previous research (Pink, 2008; Van Der Schraaf, 2008; Davis and Honorato, 2015) indicate that access to training and other forms of capacity building material is one of, if not the, major factors that attract members to environmental enforcement networks.

INECE has developed, delivered and facilitated numerous and varied trainings over the years. What is worth noting is that with its history and infrastructure INECE has produced several key courses and documents from which it can base further refinements and customisation for next generation issues. For example the core elements include that INECE has:

- A dedicated Capacity Building page on its website,²¹
- Established an Environmental Compliance Training Resource Library, which contains a collection of resources on designing training programs and guidance organized by theme across the environmental management cycle,²²
- Established the International Network for Environmental Compliance Training Professionals,²³ and
- Collected and collated numerous academic and practitioner articles on this topic in its nine volumes of conference proceedings.²⁴

The INECE proceedings are also replete with key training activities conducted or facilitated actively by INECE, and many aspects of each conference would be considered active training. However, for two examples, conducted 12 years apart, see the summaries of the special purpose workshops conducted at the 4th and 8th conferences, which focussed on: developing enforceable permits associated with water pollution and contamination of drinking water supplies (Crear and Erkelens, 1996) and identifying training needs at a strategic level (Brokerhof and Pink, 2008) respectively. These kinds of workshops and related activities at each conference provided extensive training opportunities for attendees and leave a legacy of materials for further learning opportunities.

5.2 Capacity Building and Training: specific next-generation opportunities.

Based upon the INECE conferences dedicated to next-generation compliance and enforcement held to date,²⁵ the authors consider that the opportunities for specific progress in the areas of capacity building and training will be in the areas of: technology, behavioural and support systems. For example:

- The Washington conference, in March 2015, shared perspectives on next generation compliance tools and technology.²⁶
- The Rotterdam conference, in April 2015 examined behavioural and social aspects and approaches from the social sciences.²⁷
- The Bangkok conference, in September 2015, considered how systems and approaches can improve the effectiveness of programs.²⁸

Further, the existing INECE training materials, training forum, and training network can all be harnessed to address next generation challenges and opportunities.

6 MEASUREMENT, DATA AND RESULTS

6.1 History of INECE leadership in data, indicators and measures of success

INECE has always recognized the vital importance to collecting and using data and related information about enforcement and compliance to inform all of us about the nature of compliance problems and the effectiveness of compliance and enforcement programs. INECE conferences and publications have probed the challenges of meaningful measures of success, the many challenges in gathering and analyzing data, and the role of data-driven accountability in the design and implementation of all aspects of the environmental policy cycle, with special emphasis on the compliance and enforcement aspects.

We have all collectively grappled with the necessity for and limitations of activity measures and helped move thinking about performance measures along the continuum from activity measures through environmental outcome measures (Stahl, 2008; 2005).

What our next generation challenges bring is the impact of the possibilities of "big data": huge quantities of already available data of all sorts, collected by public and private sources and dramatically enhanced by rapidly changing technological capabilities. In working with the enormous data sets available, some new approaches must build upon our previous lessons. We must, first and foremost, improve our data literacy and spread that literacy through networks and other means. We must learn to listen to and use existing data at a level and scale we have not previously contemplated. But we must also learn and relearn the data/measurement lessons of the past, including the importance of acting on sound data, communicating effectively about what the data do (and do not) show, and remaining appropriately sceptical and critical thinkers about data. Networks are well, even uniquely, suited to connect the communities of data users who are likely to benefit from improving each other's understanding of the available data and the many ways they can be analyzed and employed in pursuit of improved compliance and enforcement.

With information and data sources so vast it will be important to:

- Identify the precise (or most useful) data,
- Capture those data, and
- Have an ability to analyse the data and importantly develop it into products that are of use to decision makers, resource allocators and practitioners.²⁹

As we note in our introduction, a primary driver of "next generation" efforts is the sense that non-compliance rates are troublingly high and relatively intractable. We use terms like a "sense" that such is the case because statistically rigorous compliance rates are difficult to obtain for the vast majority of environmental regulations (Morita and Zaelke, 2005).

The decades-long struggle to improve compliance data helps to illustrate the challenges with assuring that "next generation" approaches are themselves both designed and measured with the best available information. Developing and using

data will require all the collective effort we can muster, and networking is critical to any effective collective effort.

While we have touched here on the prospects and promises of big data for compliance program design and measurement in the macro sense, it is important to remember that data-driven approaches to inspection targeting or case development can also be important elements of compliance program implementation. And of course, data and information are critical to the effectiveness of public and civil society contributions to environmental compliance (see Section 3 above). Further, the more data are clearly and readily available to the regulated entities, the more potential they have to police their own compliance programs and activities.

6.2 Opportunities for INECE

INECE is the natural and obvious starting point for the application of principles of sound data and measurement in connection with designing, implementing and evaluating next generation approaches, especially as they relate to the overall success of compliance programs and of environmental protection programs more generally. INECE also has great potential as a convener and manager of data systems, data collection efforts, and data analysis. Many potential collaborators, within government, academia, industry, and the vast array of data gatherers and users, can be cross-fertilized and made more efficient and effective through networks and network leadership.

As with all the topics we have covered, INECE brings the potential to build on very substantial past investment in this issue and to move quickly and with expertise and experience into aspects of data, measurement and accountability that are particularly suited to next generation efforts and concepts.

7 CONCLUSION

Environmental regulators and enforcers should reflect on how environmental enforcement networks have both provided a vehicle for progress and have been a 'tool' in their own right – there is nothing to suggest this should not continue to be the case on matters of next-generation compliance.

While advances have been made, are being made, and must continue to be made in the areas of: technology, behavioural and support systems – at the heart of any actionable response is a human. As such, capacity building and training will be needed to be directed towards individuals, teams and organisations. It is imperative that we all work to ensure that the weakest link in next-generation compliance and enforcement effort is not the current-generation of compliance and enforcement officer. Networks, and INECE in particular, offer us a means to empower all of those who will drive the success (or lack of success) for many generations to come.

8 REFERENCES

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9 ENDNOTES

¹ For example 'command and control' (Alm, 1992); 'responsive regulation' (Ayres and Braithwaite, 1992); 'really responsive regulation' (Baldwin and Black, 2008).

² Starfield, L. speech to Australasian Environmental Law Enforcement and Regulators neTWork (AELERT) Conference, 28 October 2015, Brisbane Australia. See Giles 2013, for further information on the U.S. EPA approach to Next-Generation Compliance, which specifically considers issues such as: rules with compliance built in, advanced pollution monitoring, electronic reporting, increased transparency and innovative enforcement strategies.

³ See <http://inece.org/resource/>

⁴ These events were co-organised with the George Washington University and US EPA, Erasmus University and IMPEL, and the Asian Environmental Compliance and Enforcement Network (AECEN) respectively, see the links contained in footnotes, 26, 27 and 28 for additional information relating to these events.

⁵ A number of these technologies are contained in the videos of presentation from the Washington Next Generation conference, available at <http://inece.org/2015/04/05/next-generation-compliance-conference-concludes-at-gw-law/>

⁶ This is an acknowledgment that for some agencies, depending on a range of factors including but not limited to budget, resources, technology, political support and other organizational constraints, that 'next generation' may not be achievable either in part or at all. The reality of the diversity of the compliance and enforcement community is that some agencies may have no choice but to work mostly with this generation or, worse, "last generation" technologies and approaches. We are hopeful that all readers and participants in our enforcement networks will find elements and concepts that mesh with their own limitations and constraints.

⁷ For the full paper see (Wasserman, 1990, pp. 7-45).

⁸ This paper, despite the passage of time, is a remarkably still contemporary overview of both theoretical constructs and practical approaches to development and management of compliance programs. It is as good a place to start as any on a journey "Back to the Future".

⁹ For a comprehensive analysis of the relationships and tactics used by both regulators and regulates, see de Bruin, ten Heuvelhof and Koopmans (2007).

¹⁰ See for example the following articles: Mitchell, 1996; March and Olsen, 1998; Malloy, 2003; and Vanderberg, 2006.

¹¹ While based on the work of Market and Competition Authorities, Ottow (2015) details five good agency principles with the acronym of LITER; legality, independence, transparency, effectiveness and responsibility.

¹² In total there are forty-eight design rules, see Biezeveld, 2008, pp.124 - 131.

¹³ Similarly, Golden rule 16 urges lawmakers to "Assure yourself that every punishable rule has been formulated in such a way that it provides a sound basis for a future indictment. The norm must be formulated in one provision, be as short and coherent as possible and preferably without reference to another article or part(s) of article(s), annexes or other regulations." Other drafting "golden rules" included: Golden rule 19 "When drafting a rule that includes a duty to provide for, look for a good balance between space for the addressee's own responsibility and the clarity on the reach of this."; Golden rule 21 "Assure that for each norm with a technical

character it is clear how it can be determined to what extent the norm is complied with.” and Golden rule 25 “Always remember that without obligations to report and register, adequate inspection and enforcement against non-compliance is not possible in the area of (chain) activities with substances, products and waste products.”

¹⁴ For the summary of this workshop, see INECE, 2008, pp. 47-54).

¹⁵ A valuable resource that captures and collates these lessons is the online *Manual on Creating and Sustaining Regional Enforcement Networks* (INECE, 2012)

¹⁶ Direction of purpose and effort can be seen in the *INECE Strategic Plan (2012-2017)*.

¹⁷ See <http://inece.org/resource/inece-conference-proceedings-directory/>

¹⁸ See <http://inece.org/resource/>

¹⁹ For more information on the INECE Seaport Environmental Security Network see Ruessink, Kopsick, Heiss, and Koparova (2015).

²⁰ For more information and examples of these types of networks see Pink and Bartel (2015).

²¹ See <http://inece.org/topics/capacity-building/>

²² See <http://inece.org/resources/>

²³ See <http://inece.org/topics/capacity-building/trainers-network/>

²⁴ See <http://inece.org/resource/inece-conference-proceedings-directory/>

²⁵ See <http://inece.org/topics/next-gen-compliance/>

²⁶ See <http://inece.org/2015/04/05/next-generation-compliance-conference-concludes-at-gw-law/>

²⁷ See <http://inece.org/2015/05/06/conference-examines-behavioral-and-social-aspects-of-nextgen-compliance/>

²⁸ See <http://inece.org/2015/09/18/aecen-next-gen/>

²⁹ For more information of the five stages of the basic intelligence cycle: direction, collation, analysis, dissemination, and feedback and review. See Ratcliffe (2004) and Quarmby and Young (2012) for general application, and for environmental application see Lehane (2014) and Weekers (2011).