

GLOBAL FORUM ON SUSTAINABLE DEVELOPMENT

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# CONFERENCE ON ECONOMIC ASPECTS OF ENVIRONMENTAL COMPLIANCE ASSURANCE

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## BACKGROUND PAPER

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*This Background Paper is intended to facilitate discussions during the OECD Conference on Economic Aspects of Environmental Compliance Assurance, which will be held on 2nd and 3rd December, Paris. It introduces the topic of the conference and provides background information on individual sessions. It also presents questions for discussion. The paper was prepared by Ms. Simone Schucht, a consultant to OECD under the guidance of the Secretariat.*

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## INTRODUCTION

1. Environmental enforcement, or compliance assurance, programmes involve a broad array of actions that governmental agencies take, alone or in co-operation with other stakeholders. These actions are taken to correct or halt behaviour of the regulated community that fails to comply with environmental requirements. Some countries include under this term, compliance promotion activities. Even though these programmes are very often comprehensive, the compliance rates are still unsatisfactory<sup>1</sup> as detecting and prosecuting non-compliance is complex, as well as time and resource consuming.
2. Low compliance rates often stem from inadequate incentives provided by governmental regulations. Reviewing and redesigning regulations in a way that takes account of incentive factors that do influence industries' behaviour and deploy public resources and compliance assurance instruments in the most cost-effective ways, will help to deter violations and promote compliance. On the other hand, underlying theoretical assumption is also that perfect (*i.e.* 100 per cent) enforcement is not always efficient. Therefore, promoting more effective and efficient approaches in governmental enforcement and compliance assurance programmes is essential for better environmental performance in enterprises, strengthening environmental governance, and achieving environmental and sustainable development objectives.
3. The underlying reason for flawed enforcement programmes is often a lack of in-depth analysis of the entire spectrum of economic reasons that influences the decision of the firm to comply, or not, with environmental requirements. This includes, for example, the relations between levels of penalties and compliance monitoring activities (inspections), the selection of an appropriate penalty for non-compliance, the need for a differentiated approach depending on the type of the regulated community, relations between compliance rates and tax breaks and special financing, the size and structure of firms, the structure and influences of its ownership, etc.
4. In recent years there has been a rapid growth in theoretical discussions about the economic framework for environmental compliance and enforcement. Some empirical studies have also been carried out. In both cases the literature, which has been reviewed and is presented as references, talks about the experiences of the most industrialised countries. In-depth analysis of government enforcement policies from the economic angle has recently been carried out in some OECD countries.
5. In transition and developing countries such analyses are sporadic or often non-existent. Also, approaches to the rule of law and the infrastructure for law enforcement frequently differ between OECD Member countries and non-OECD countries. A history of undemocratic rules, lack of market economy principles, corruption, poverty, and military conflicts are important causes of weak enforcement and widespread non-compliance. Very rarely do government agencies in transition and developing countries consider the economic aspects of enforcement and non-compliance.

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<sup>1</sup> See Part 1 of this paper for details.

6. Inadequate attention is paid to answering the following fundamental questions:

- Why do firms comply (or not) with environmental laws?
- What are optimal enforcement strategies and tools that can maximise environmental benefits and minimise costs to the regulators and regulated community? and finally,
- What are the opportunities and limits in the choice, and calibration, of regulatory instruments to deter non-compliance, and the ways to supplement them with information-based and other instruments to promote compliance?

### **Background and objectives of the Conference**

7. Discussions about strengthening enforcement systems in the context of designing policies that stimulate economic growth have become a subject of particular interest in the national and international context. Most recently, this issue has been discussed within the framework of the International Network on Environmental Compliance and Enforcement (INECE) and also in the context of the OECD programme of environmental co-operation with non-member countries.

8. For example, the INECE has identified the topic of economics of environmental compliance assurance as one of the priorities in its work programme (<http://www.inece.org/>). Furthermore, the recently concluded conference of Environment Ministers from Eastern Europe, Caucasus and Central Asia and their Partners (Tbilisi, Georgia 21-22 October 2004) pointed out that "...better enforcement of environmental regulations is needed to provide the incentives for greater expenditures by the private sector...". The development of economically efficient, environmentally effective, and financially viable compliance programmes is one of the priorities in the OECD/EAP Task Force work in the region of Eastern Europe, Caucasus, and Central Asia (<http://www.oecd.org/env/policy>). Other partners, including the World Bank and others, have been carrying out analysis of this subject.

9. These discussions have shown the need to develop and promote a more systematic assessment of the incentive structures facing firms and the need to provide governments with approaches that can generate, and optimise the use of, public and private expenditure on compliance and its assurance.

10. The 2004 OECD Global Forum on Sustainable Development (GFSD) will take these discussions further by facilitating a dialogue and exchange of experience and good practices between OECD countries and non-members from transition and developing economies. The conference intends also to provide a springboard for developing a comprehensive programme that can provide assistance to governments and their partners to design and apply more effective and efficient compliance incentive structures. Ultimately the programme will contribute to the promotion of better environmental management in enterprises, environmental improvement, and sustainable development under different economic, social, and cultural contexts.

### **Participants and structure of the discussion**

11. The GFSD Conference (see also Box 1) will bring together senior government officials, academics, researchers, and NGOs, as well as business people, from OECD Member and non-member countries. Participants will attend in their personal capacities. Therefore, the conference will have an analytical rather than a political character. There will be no attempt to negotiate an agreed text. The main issues emerging from the discussion will be summarised in a report prepared by the Secretariat. The report will reflect its view of the discussion and will not necessarily reflect the views of participants, or the OECD Member countries.

### Box 1. OECD Global Forum on Sustainable Development

The OECD Global Forum on Sustainable Development involves policy dialogue on best practices for integrating economic, social, and environmental policies. Two meetings have been held under the Global Forum on Sustainable Development on issues related to financing. Other meetings have addressed climate change and development, and economic aspects of biodiversity. The outcomes of these meetings have contributed to the UN Commission for Sustainable Development (UN CSD) and other high level world events.

12. The Conference does not aim to address all the aspects of enforcement and compliance in a comprehensive way; rather the agenda has been structured around four main issues:

- Determine the factors that drive environmental performance and non-compliance behaviour of firms *vis-à-vis* environmental regulation, in order to identify key elements in the **incentive framework for firms to comply with regulations** (Session 1);
- Classify **government approaches to ensuring environmental compliance** according to behavioural patterns of enforcers suggested by economic and political economy-based literature. The relevance of practice will be asserted in order to make suggestions with respect to types of regulations that induce compliance and can encourage innovation (Session 2);
- Assess empirical evidence on how inspectors allocate their limited enforcement budgets. The aim is to make suggestions to optimise current instruments in compliance assurance programmes, focusing primarily on compliance monitoring and enforcement (or non-compliance responses), and their impacts on administrative implementation and firms' compliance costs (Session 3);
- Identify approaches susceptible to reducing the administrative costs of monitoring and enforcement with a view to **promoting innovative approaches which save administrative and compliance costs** (Session 4).

13. The Conference is organised with the financial support of the OECD and the World Bank. It is organised in cooperation with the INECE and its partners. The conclusions of the OECD conference will be presented at the forthcoming 7<sup>th</sup> global meeting of the INECE that will be held on 11-15 April 2005 in Marrakech, Morocco.

### Objectives and structure of the paper

14. This paper aims to serve as a starting point for discussion at the conference. It is not intended to provide a comprehensive analysis of the theories of economic aspects of environmental compliance assurance. Neither is its aim to describe extensively practices from different countries and regions. The examples presented serve illustrative purposes only; they do not attempt to be representative of all countries.

15. The proceedings from the conference will include this Background Paper, a summary of the discussion, and a number of country-specific examples which will be presented at the conference. The proceedings are expected to assist in developing broader guidance on how best to apply the theory and good practices in different political, socio-economic, and environmental contexts.

16. This paper consists of four main parts:

- Part I identifies key characteristics of an incentive framework for firms to comply with regulations. It also looks both at theoretical suggestions and empirical evidence on what drives firms' compliance decisions.
- Part II analyses regulators' actions from the perspective of economic and political economy-based literature and discusses the types of regulatory approaches. It also discusses issues of rent-seeking behaviour, personnel management, and capacity-building to encourage inspectors to carry out their job effectively. Finally, this part presents some characteristics of efficient regulation that can further compliance and innovation.
- Part III examines the application of the two traditional instruments of environmental inspectorates, which are: i) Compliance monitoring (inspections), and ii) Enforcement actions (or non-compliance response). On the basis of empirical evidence, this part discusses several inter-related issues: How inspectors allocate their limited enforcement budgets between compliance monitoring (inspections) and enforcement (sanctions); what kind of enforcement measures they apply and according to which rules; on which criteria they base penalties; and the extent to which "deregulatory strategies" are pursued (*e.g.* regulatory relief in return for the application of environmental management systems (EMS) and publication of environmental performance information).
- Part IV of the report focuses on various alternative approaches suggested by economic theory that may help to reduce the administrative costs of monitoring and enforcement. It also aims to assess the limits to administrative cost savings with respect to their effects on firms' compliance costs.
- Finally, selected reference documents are listed and additional information supporting the discussion in previous parts is presented in an Annex.

17. After each part of the paper some selected questions are listed that will be raised at the conference. However, participants will be encouraged to raise additional issues and questions that require discussion.

**PART 1:**  
**INCENTIVE FRAMEWORK FOR FIRMS TO COMPLY WITH REGULATIONS**

18. Compliance with environmental regulations is rarely complete. For OECD countries, Russel [47] reports that 65 per cent of regulated sources in the US may be in violation of air emission limits, and the compliance of Canadian pulp and paper mills with federal biological oxygen demand (BOD) standards in 1987 on an annual average was 69 per cent [24]. The European Commission, in 1996, published data indicating that even though member states had notified implementing measures for 91 per cent of the European Union's environmental directives in 1995, 265 suspected breaches of the Union's environmental law were detected in that year [7]. Heyes [29] points out that actual compliance rates may even be lower than reported compliance rates, as the latter only indicate that the inspection agency has not been able to prove non-compliance. Still there is very little information on compliance rates, even in the most developed OECD economies.

19. Knowledge of the factors that drive environmental performance and non-compliance behaviour of firms *vis-à-vis* environmental regulation is crucial to designing and applying regulations to stimulate firms' behaviour. It is also important to identify central political action variables that can influence the firms' constructive response to regulations. With the aim of identifying key characteristics of an incentive framework for firms to comply with regulations, both theoretical suggestions and empirical evidence on what drives firms' compliance decisions are looked at in this part of the discussion.

**The “normative” environmental economics view**

20. The normative environmental economics approach towards compliance with, or violations of, environmental regulations assumes that regulated agents are rational when making compliance decisions: They decide whether to comply or not on the basis of a cost-benefit analysis. This involves comparing expected compliance costs (*i.e.* expenses for technological and management improvement that will allow environmental requirements to be met) with non-compliance costs (*i.e.* costs of non-compliance fees, penalties and other associated costs) and eventually choosing the least-cost option.

21. Usually, compliance costs are easy to calculate but non-compliance costs are more complex as, in reality, compliance monitoring is not complete, either due to scarce administrative resources or efficiency reasons. Therefore, non-compliance will only be sanctioned within the terms of a certain probability. The cost of non-compliance is hence the statistical expectation of the sanction  $x = pF$ , where “p” is the probability of monitoring (detection) and “F” the severity of the punishment (financial or non-financial sanctions).

22. Normative economics literature which deals with the implementation of environmental policies models the monitoring probability and the penalty as constituting the variables of available political actions from which the regulator can start in order to increase deterrence.<sup>2</sup> The regulator can, therefore, either raise

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<sup>2</sup> This view is based on Gary Becker's [1] seminal article 'Crime and Punishment: An Economic Approach', not specifically dealing with the environment but developing a more general economic model of crime. Following this article, economic theory has taken monitoring and enforcement costs into account.

the probability of detection and conviction (for example by increasing the monitoring probability via an increase in the monitoring frequency and/or by applying advanced monitoring technologies, or by changing legal rules to increase the probability of conviction [e.g. requiring less evidence]), and/or the severity of the monetary or non-monetary sanction (e.g. increasing level of penalties).

23. In economic terms, it is suggested that in order to save monitoring costs, an arbitrary increase in “F” in the form of a monetary fine<sup>3</sup> could be compensated by an equal percentage reduction in “p”, leaving the expected penalty  $pF$  unchanged (“p” and “F” as perfect substitutes for deterrence). Whether this is the case, however, depends on the regulated agent’s attitude towards risk, *i.e.* on the elasticity of the response of violations to changes in “p” and “F” [1].<sup>4</sup> Next to risk aversion, there may be further limits to high fines, such as exogenously imposed limits due to legislation, social norms, or just for reasons of perceived fairness (e.g. [23; 45]). It can also depend on wealth constraints (risk of insolvency of a firm), where the monetary penalty exceeds the polluter’s wealth and simply makes it impossible for him to pay the potential fine. In an extreme case, where the polluter can declare bankruptcy because of a penalty, the sanction may lose its deterrent effect [6; 29; 49].

### “Positive” approaches to explaining compliance behaviour

24. Literature takes also a more “positive” stance by seeking to explain the empirically established behaviour of regulated agents. There are a few suggestions on why compliance may sometimes be higher than expected with the current levels of monitoring and enforcement by regulatory agencies (so called “Harrington paradox”<sup>5</sup>):

- Firstly, firms often subjectively overestimate the expected penalty [6]. Therefore **perceived levels of inspections and sanctions** as compared to actual levels may determine firms’ compliance behaviour and explain compliance despite low sanctions;
- Secondly, compliance may also be the effect of dynamic regulator-regulated relationships with **government-operated enforcement schemes**, *i.e.* the expectation of becoming subject to stricter monitoring and sanctions if previously found non-compliant [22; 23] (see also session 4).

25. The literature, furthermore, acknowledges a larger variety in regulatory behaviour than suggested above. On the one hand, “**regulatory dealing**” (or “issue linkage”) may explain cases where firms comply without a credible threat of sanctions [29]. The idea is that enforcement agencies may interact with a firm in more than one context, for example they meet in several regulatory settings or because a firm has several

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<sup>3</sup> Because these are less costly to society than, for example, imprisonment.

<sup>4</sup> In fact, “p” and “F” being perfect substitutes is strictly correct only in the case of risk neutral agents, but would no longer hold if actors had a preference for risk or were risk averse. While an increase in “p” compensated by a reduction in “F” would still not change the expected income from non-compliance, it could change the expected utility. In the case of risk aversion a regulatee would get a higher utility out of secure than out of insecure situations and payments. This means that their utility is higher if they are monitored more frequently and pay a lower fine if found non-compliant than if they are seldom monitored but have to pay a high penalty if found non-compliant [6; 45]. In the case of a risk preference, an increase in “p” would reduce the expected utility and with that non-compliance more than the equal percentage increase in “F”. In the case of risk aversion, “F” would have the greater effect.

<sup>5</sup> According to Becker’s [1] theory of rational crime, a profit-maximizing firm will comply with an environmental regulation only as long as the expected penalty of violating exceeds the compliance cost. On this background, economists faced evidence seeming to indicate that firms comply with a much higher degree than predicted by this theory. Harrington (1988) summarized this phenomenon in the following three statements:

- (i) For most sources the frequency of surveillance is quite low;
- (ii) Even when violations are discovered, fines or other penalties are rarely assessed in most states;
- (iii) Sources are, nonetheless, thought to be in compliance a large part of the time.

plants. As a result, agencies may tolerate non-compliance in one setting if they judge it to be ameliorated by the firm's over-compliance in another. On the other hand, regulators may also provide **positive incentives**, such as subsidies for compliance, for example in the form of tax breaks, which may add to firms' compliance by affecting their cost-benefit calculus [6].

26. Finally, this literature also suggests a broader view on compliance motivations. It acknowledges that not only publicly enforced sanctions for environmentally unfriendly behaviour/non-compliance may determine compliance. These may include **market forces** which may also penalise firms and influence compliance behaviour as potentially adverse reactions of customers, investors, stock-market valuations, or employees may be stimulated by information about a firm's negative environmental impact. Such information could also influence the general public's image of the firm concerned, or lead to the surrounding local communities exerting pressure [29].

27. Next to extrinsic (external) motivation, through regulatory deterrence suggested by normative economics, **intrinsic (internal) motivation**, such as honesty or social norms, might also lead to environmentally friendly behaviour and voluntary compliance, and explain compliance independently of costs [3; 16]. The "Harrington paradox" may be magnified in cooperative cultures with very widely shared communal values where many more people comply for non-economic reasons. These may include the desire to avoid personal feelings of guilt, or family/employee/public shame from being known to violate strong communal values. These values also include cleanliness and avoiding risking/hurting nature or one's fellow humans. This line of argumentation is also found in sociological and public policy analyses of regulatory compliance issues [6], which show acceptance of the regulation and the values of the regulated agent response. As well as financial incentives, enforcement agencies might thus also rely on utilising shared communal values and co-operation as tools to further compliance.

### **Evidence from empirical studies and surveys**

28. Many of the factors for non-compliance outlined so far are taken into account in enforcement strategies in OECD countries, as for example in the Dutch compliance strategy (see box A-1 in the annex) and are supported by empirical findings. There is evidence that the tools of monitoring and enforcement, when applied, are generally effective [see for example 19; 20; 27; 33; 37].

29. Interestingly enough, recent empirical research established that fines have a deterrent effect not only on the sanctioned firms but also on other firms in the same regulatory region. In this regard the regulator's credibility is enhanced on a wider scale than just with the firm targeted for compliance [50; 51]. Empirical evidence exists also for the impact on compliance of **compliance costs** (frequently proxied by the size/capacity and age of plants) and the feasibility for firms to comply without going bankrupt (reflected in the influence of a firm's liquidity and probability of closure [19; 20; 26; 27]). Comparing compliance across various plants belonging to the same firm may give indications about the firm's general **attitudes towards compliance** [19].

30. There is indeed evidence that **information disclosure** strategies may improve the environmental performance of firms and sometimes even yield strong effects on compliance [15; 55]. Frequently, however, studies that assess stock market fluctuations (as a reaction to the publication of positive or negative firm-related environmental information) do not go as far as estimating whether these market reactions eventually lead to environmental improvements [*e.g.* 10]. Evidence on the ability of **community or market pressure** to increase plant compliance remains mitigated [for example 9; 25)].<sup>6</sup>

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<sup>6</sup> Furthermore, the major part of the literature empirically investigating whether market forces and community pressure may constitute an alternative to formal public enforcement estimate their impact on environmental performance but not on compliance.

31. In this context, an OECD survey on firms in seven countries<sup>7</sup> investigated *inter alia* the influence of different stakeholders on environmental practices of facilities belonging to the manufacturing sector. The study identified public authorities as most influential, while only a limited influence was reported for consumers, industry/trade associations, and environmental NGOs. Shareholders were found to play a relatively important role only in some countries [13].

32. Some investigations found differences in compliance patterns across different **firm types**. This does not only hold for firm size. For example higher percentages of compliance amongst Mexican manufacturing factories were found for larger, multi-plant, multinational, and publicly traded firms as compared to small, single plant, domestic, and individually owned firms [9] (cf. Figure A-1 in the annex).

33. Certain firm types may also be more strongly affected by further obstacles to compliance than others. Smaller firms, for example, reported more frequently a lack of available resources. This resulted in a lack of access to environmental consultants and scarcity of resources for training than larger firms [8]. Smaller firms, with lower public profiles, may also be less exposed to pressure groups, while in particular public enterprises are vulnerable to share price and investor perceptions [21]. Firms also frequently point out a lack of **information regarding policy requirements** and their applicability [8; 14].

34. Finally a **firm's internal organisation and management aspects** may have an impact on compliance. A strong relationship between the implementation of an environmental management system (EMS) and compliance or pro-environmental firm behaviour was found in various OECD countries [13; 14]. The same holds for the presence of an environmental department and a budget for environmental R&D within the firm. Finally, the **stringency of environmental policy** is identified as having a strong impact on environmental investment [17].

#### Issues for discussion during Session 1:

1. Which factors have the greatest impact on regulatory compliance and non-compliance?
2. Are there clear differences between firm types (public-private, small-large, local-national-multinational) or firm location (developed-developing economies, economies in transition) both with respect to factors driving their compliance behaviour and their responses to regulations?

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<sup>7</sup> Countries included in the survey are: Canada, France, Germany, Hungary, Japan, Norway, and the United States.

## **PART 2: GOVERNMENT APPROACHES IN ENSURING ENVIRONMENTAL COMPLIANCE**

35. It has been firmly established that there are clear benefits to sound environmental performance of industry. This relates both to society overall in the form of reduced health and economic impacts of emissions and damage, and also to business in the form of cost savings through improved resource efficiency, reduced risk, improved reputation, and employee motivation [56]. However, in order to realise these benefits fully enforcement systems are needed. These must nevertheless operate in an effective way in order to make sure that the limited enforcement resources can be used in the most efficient and effective way. In addition, modern approaches to regulation should be pursued that aim, first and foremost, at an optimisation of the regulatory strategy overall.

36. This part of the discussion analyses regulators' actions from the perspective of economic and political economy-based literature and discusses the types of regulatory approaches. It also discusses issues of rent-seeking behaviour, of personnel management, and capacity building to encourage inspectors to carry out their job effectively. Finally, this part presents some characteristics of efficient regulation that can further compliance and innovation.

### **Theories of enforcement behaviour**

37. From an economic perspective, regulators aim to "maximise welfare" (*i.e.* they try to minimise the costs to society) when enforcing a regulation and therefore aim to balance administrative and compliance costs with the environmental benefits from reduced pollution. In practice, however, enforcers are often subject to political pressures, or they may just follow different strategies, such as trying to maximise compliance with environmental legislation.

38. Looking at the compliance issue from the regulator's aspect one can identify two distinctive reasons for why firms may not comply with a regulation:

- The enforcement authority may be **unable** to prevent non-compliance because of lack of power and limited resources; or
- The authority **may not want to** force all firms into compliance, for efficiency, political, or other reasons.

39. Under both settings the regulators will allocate their enforcement budgets to perform a limited number of enforcement activities. How they do this will be crucial to environmental and compliance outcomes and to the efficiency of the enforcement overall.

40. Much of the normative economics literature on monitoring and enforcement assumes that the regulator can be described as a "**benevolent welfare maximiser**" in the sense that his objective is to minimise the overall costs for society. However, the established political economy and public choice literature considers that this assumption may need to be adjusted to understand empirically found enforcement behaviour and actual political outcomes. This assumption considers political and administrative actors as individuals making rational, self-interested decisions, and that the influence of

interest groups is allowed. Therefore, possible regulator behaviour is classified below according to alternative objective functions<sup>8</sup> and their relevance in practice. Furthermore, in light of these discussions and those in Session 1, the present session aims at determining the necessary characteristics for (efficient) regulation that is required to further compliance and innovation.

41. The enforcer characterised as a “**benevolent maximiser of welfare**” can serve as the benchmark case for evaluating the economic efficiency of enforcement patterns. This type of “enforcer” will balance the costs of compliance against the benefits of compliance so as to reach the **maximum environmental benefit at minimum overall cost**. In practice, this could result in a pattern where enforcement resources are allocated to those plants that have low marginal abatement costs or that cause high environmental damage. Provided the enforcer is not subject to any constraints (*e.g.* availability of information on pollution), the resulting compliance outcome would be economically efficient. This does not necessarily imply that all firms comply. Rather, compliance would occur at the level where overall compliance costs and benefits are equalised.

42. Taking the positive theory of regulation (initiated by Stigler [53] and Peltzman [44]) as a reference model it was suggested that enforcers might be seeking to maximise certain (personal) political objectives or (net) political support, instead of welfare. Such a “**politically biased enforcer**” will target **polluters that are less likely to reward him with political benefits or more likely to harm him politically** in the absence of the enforcement action. On the other hand, the enforcer might also try to gain support from an environmentally aware community, which may result in “visible” monitoring and enforcement actions [12]. While the compliance outcome here can generally be expected to be inefficient in an allocative sense of balancing costs and benefits of environmental regulation<sup>9</sup>, it may nevertheless be compatible with some normative macro level political objectives (*e.g.* securing employment).

43. In practice, corruption (*i.e.* an enforcer accepting a bribe in exchange for over-looking a violation [2]), can also be considered as the way for an enforcer to follow personal objectives when making enforcement decisions. Bribery is socially undesirable because it dilutes deterrence of non-compliance as it results in a lower payment by the violator than the sanction for a violation. For firms using bribes, pollution will often be at its highest because they have not been forced to pay the penalty.

44. While bribery leads to reduced enforcement activity, the **enforcer that follows “budget maximising”** behaviour may spend excessive amounts of resources on monitoring compliance. The reference model of “bureaucratic behaviour theory” was presented by Niskanen’s [39]. It is based on the assumption that government personnel derive benefits (*e.g.* in the form of secured employment and career enhancements) that increase with their budgets. Assuming further a “principal-agent” relationship and asymmetric information between the bureaucratic agency and a higher government level, it is suggested that the agency may follow behavioural patterns that lead to an increase in its budget.

45. In some cases, observed in the communist or other totalitarian regimes, enforcement could also be considered as a pure law enforcement function designed to achieve (at least in theory) the **maximum possible rate of compliance** [6]. Taking the law as the truth, this enforcer type would concentrate his enforcement efforts on those plants that are less likely to comply, for example because of their particularly high compliance costs, or on easy enforcement targets, irrespective of the environmental benefits achievable. Such a strategy ignores costs altogether, hence implicitly presumes that compliance is equally desirable regardless of the impact of the plant’s emissions to the environment, and regardless of the firm’s

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<sup>8</sup> As well as these more general behavioural assumptions presented here, there exist further approaches based on more detailed interactions between the Congress, or oversight committees, and the regulatory agency adapted to the US context.

<sup>9</sup> Except if local preferences reflect efficiency considerations.

compliance costs. The level of compliance resulting from this strategy will be effectively limited by budget constraints, not by efficiency considerations.

46. Yet an alternative enforcement pattern is the **maximisation of environmental benefits**. Here, the regulator would rather focus on plants with the highest environmental pay-off per monetary unit invested in enforcement effort. If the enforcer's budget is limited, he might shift his enforcement resources away from high-cost firms (from which it is more difficult and more costly to obtain compliance) and the result might come closer to the socially optimal strategy of a maximisation of net environmental benefits [6].

### **Some empirical evidence on enforcement patterns**

47. It is not always easy to distinguish unambiguously to which enforcement theory enforcement patterns found in practice apply.<sup>10</sup> While the results should not be generalised, various econometric studies – primarily carried out in the North-American context - suggest that enforcement decisions, tend in practice to follow a mix of different objectives. Some of them may be more sensitive to the damage of violations, others to the community's willingness to pay, as well as to other political variables. In addition, compliance history, *i.e.* past violations or past enforcement actions towards a plant, frequently shows significant impacts on enforcement behaviour [12; 19; 26; 27; 32; 35; 42; 43].

48. Helland [27], who studied the US federal context about who actually determines compliance outcomes (the local or the national regulator), finds that local discretion can be limited by the central regulator. He confirms that local regulators are able to respond to local interests only to some extent as the national regulator has ability to alter regulatory policy.

49. An interesting question in this context is how much discretion should be left to local regulators in determining their enforcement patterns. On the one hand discretion by local authorities may actually increase the efficiency of the initial policy when assuming that national regulations (*e.g.* standards) are unlikely to be optimal as they do not take account of the heterogeneity of the local context. The reason for this is that the local enforcement officials are supposedly better informed about the local situation than their central level counterparts [*e.g.* 12]. On the other hand, local discretion opens possibilities for corruption or the non-transparent granting of exemptions resulting in lowering compliance. This is an issue which has been rampant in the region of Eastern Europe, Caucasus, and Central Asia [5]. At the same time, however, these transition economies have been subject to complicated legal frameworks with excessively strict standards, poor economic situation, and severe human and resource constraints in the enforcement agencies.

### **Rent-seeking behaviour and corruption**

50. In principle, possibilities for **rent-seeking behaviour** by regulated firms exist wherever policy measures set no fixed rules but give discretion to enforcers. For example in cases where there is a lighter regulatory touch, in exchange for firms applying environmental management, firms may try to obtain regulatory relief, then postpone sound environmental management and spend efforts on convincing the regulator why they need more time. Rent-seeking may also occur in cases where the enforcer is given discretion to award firms with additional time for complying with regulatory requirements without

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<sup>10</sup> To give just two examples, empirical evidence of enforcers targeting plants according to their compliance history (prior non-compliance) is compatible with compliance maximisation, but also with political support maximisation where the public demands it. It may even be compatible with welfare considerations where enforcers apply state-dependent enforcement schemes, further discussed in session 4 [cf. also 6]. Indications that enforcement measures are in line with environmental preferences is sometimes interpreted as enforcers taking account of perceived benefits of pollution reduction (welfare), and sometimes as enforcers being sensitive to political support or opposition by their constituencies.

imposing sanctions. Furthermore, approaches that adjust sanctions to the polluter's ability to pay may induce firms to give inaccurate information regarding compliance costs and their ability to afford compliance costs or penalties.

51. **Corruption of enforcers** or higher government levels is considered a pervasive constraint to enforcement of environmental regulations but also with respect to management of natural resources (*e.g.* illegal logging) in many countries [4]. According to a recent report of the World Resources Institute [36] a combination of economic, social, and administrative factors, such as poverty, weak mechanisms of accountability, and oversight, low salaries for civil servants responsible for the enforcement of regulations, and the social acceptance of corrupt behaviour, creates favourable conditions for corruption,

52. This finding points to the need of establishing systems for **personnel management and capacity building** to encourage inspectors to carry out their job effectively. Indeed, sufficient scientific, economic, and legal qualification of staff; human, financial and material resources; and motivation are considered a prerequisite for enforcement agencies to effectively and correctly carry out their work [see 41]. In addition to an appropriate material basis, this requires adequate staff selection procedures, continuous personal development and training, adequate salaries, appraisal and promotion criteria, and remuneration for good performance. Clear and transparent guidelines should be provided to ensure that the regulated community is treated in a consistent and proportionate manner. Furthermore, full accountability of inspectorate staff can increase their integrity, in particular as an inspector's work will frequently involve some level of personal judgement and, hence, require discretionary decisions. While it is generally considered that enforcement related decisions are best carried out at the lowest administrative level possible, support from national agencies may be necessary where local level agencies are subject to pressure from powerful pressure groups or large facilities.

### **Characteristics of an efficient regulation furthering compliance and innovation**

53. Enforcement strategies are only one element that can influence and modify enterprise behaviour. In general, they operate within, and have to be consistent with, the framework of existing regulations. Therefore, some analysis of the key characteristics of an efficient regulation is required to ensure that both the regulations and their enforcement can further compliance and promote innovation.

54. As presented in previous sections, enterprises have a variety of motivations for compliance. At the same time, there are differences in capabilities to comply, as well as resource constraints from the aspect of enforcement agencies. These factors imply that regulatory approaches have to be tailored to specific contexts in order for both the regulator and the regulatees to reach environmental objectives effectively and in a cost-effective way.

55. Approaches to modern regulation (*e.g.* of the US EPA [59]; the UK [56]; or [21]) aim at a high level of environmental protection at least cost to society. They point at the need for a "smart regulation" that chooses regulatory and non-regulatory measures according to the specific context of the environmental issue and the regulated community. The key objective of these strategies is to increase the polluters' responsibility for the environment and, at the same time, to increase their flexibility in reaching compliance. They also target minimising the bureaucratic burden to firms and focussing on environmental outcomes, firm performance, and the prevention of pollution when creating an adequate policy mix (see Table A-1 in the annex for the suitability of specific instruments according to context factors).

56. Broad, integrated, preventive strategies consisting of an optimal mix of policy instruments could also be applied step-wise. Gunningham [21] suggests a hierarchy of control, especially for SMEs. It could start with the facilitation of voluntary action through information and support for cleaner production initiatives, then escalating through the use of positive and negative incentives, and culminating in enforcement of direct regulations for firms which might not be reactive to less interventionist strategies.

57. Regulatory agencies could furthermore try to initiate supply chain pressure (from upstream suppliers, customers), thus relying on the market to introduce EMSs, or increase the demand for “green” products and the application of sound environmental technologies through public “green” purchasing policies.

58. Voluntary business action can also be promoted through regulations or public/private partnerships, such as the European Union’s EMAS scheme or US EPA’s “National Environmental Performance Track Programme” (see Box 2). These initiatives can help facilities of all size and types to work on their environmental performance and reach continuous environmental improvements. The US EPA lists participants on the programme’s web-site.

**Box 2. US EPA’s “National Environmental Performance Track Programme”**

This programme strives at creating networks between participating facilities to share their information. It also aims to attract environmental leaders, to encourage other facilities to join, and educate the public.

Incentives to firms consist, for example, of lower priority for routine inspections, facilitation of reporting requirements, granting flexible permits or performance permits which contain less specific requirements, speeding up of permit processes, and a reduction in the burden of reporting.

59. Similarly in the Netherlands customised and framework licences are used for companies which operate environmental management systems properly. This can provide firms with greater flexibility about how to achieve prescribed environmental targets, to set their environmental priorities, and to modify production processes without notification [40].

60. In addition to public information disclosure programmes, there are also examples of corporate reporting requirements, such as the French law on “New Economic Regulations” that requires reporting on environmental and social performance from firms traded on the stock-market.

61. Both the US EPA and the UK Environment Agency suggest that “modern” (or “smart”) regulation should be coupled with an enforcement approach that concentrate resources where risks are the highest and performance the poorest. Emphasis is also given to a consistent and transparent behaviour of regulatory agencies when applying enforcement tools. Not only would this allow firms to know the rules and processes when making compliance decisions, but it also increases the regulated community’s trust in enforcement agencies and limits the agencies’ misuse of local discretion. Such an approach requires effective tools of compliance, performance, and risk assessment of polluters, which should be applied continuously in order to allow for an evaluation of policy outcomes and, hence, regulatory learning.

**Issues for discussion during Session 2:**

1. Which are the key elements of an incentive framework in governmental enforcement programmes that would best encourage firms to comply with, and go beyond, regulations?
2. How should the discretion of local regulators be structured so as to achieve efficient, effective, and equitable enforcement action in practice?

### **PART 3: OPTIMISING COMPLIANCE MONITORING AND ENFORCEMENT**

62. Economics suggest that in order to ensure marginal deterrence, expected penalties should be lower for minor than for major infractions. Marginal deterrence is socially desirable because it ensures that those who are not deterred from committing a violation have a reason to, at least, reduce the level of harm they cause [29; 46]. As pointed out in Session 1, expected penalties can generally be increased by increasing the possibility of detection (monitoring probability) as well as the level of the sanction.

63. The key objective of this part is to examine the application of the two traditional instruments of environmental inspectorates, which are: i) Compliance monitoring (inspections), and ii) Enforcement actions (or non-compliance response). On the basis of empirical evidence, this part discusses several inter-related issues: How inspectors allocate their limited enforcement budgets between compliance monitoring (inspections) and enforcement (sanctions); what kind of enforcement measures they apply, and according to which rules; on which criteria they base penalties; and the extent to which “deregulatory strategies” are pursued (*e.g.* regulatory relief in return for the application of environmental management systems and publication of environmental performance information).

#### **Risk and performance-based targeting priorities in the Netherlands and the UK**

64. Both in the Netherlands and the UK, **priorities for monitoring and enforcement** are based on compliance, or performance and risk criteria. In the Dutch context, priorities are identified for each environmental law and for each regulatee separately by evaluating, by experts, the present state of risks and compliance behaviour [61]. In the UK, where a more integrated approach is applied, the risk and performance assessment focuses on a more general assessment of operators. For both assessment criteria, scores are allocated to operators, which allow the Dutch and UK regulators to establish priorities and non-priorities for enforcement (for more details see Box 3 and Box A-1 in the annex).

#### **Box 3: The Dutch and UK approaches to setting targeting priorities**

##### **The Dutch approach**

In the Netherlands the regulations are firstly classified according to four compliance gap indicators: good, sufficient, medium, and bad compliance. Secondly, risk indicators are established which cover aspects of public health, safety, sustainability, and social factors in the absence of enforcement. On that basis the firms are categorised in four risk classes: Very high, high, mediate, and low, to which scores are allocated. The results are then transposed to a 2x2 matrix with risk and non-compliance on the axes. This approach allows establishing priorities and non-priorities for enforcement.

A specificity of the Dutch compliance strategy is that it includes an assessment of individual legal acts with respect to the possibility of compliance, enforcement, and sensitivity to fraud. A negative score implies that the inspectorate should not make efforts to enforce the legislation as this would be ineffective and inefficient. Instead, the legislation is addressed back to the legislator for improvement.

### **The UK approach**

Inspection targeting priorities for facilities regulated under IPC are established in the UK on the basis of the “Operator and Pollution Risk Appraisal” (OPRA) methodology. It assesses the inherent environmental risks of processes (“Pollution Hazard Appraisal” - PHA) and the operator’s ability to manage the environmental risks of processes (“Operator Performance Appraisal” – OPA; for the attributes comprised in PHA and OPA see Box A-2 in the annex).

Allocating scores from one (low hazard/performance) to five (high hazard/performance) to each attribute and separately adding up all PHA and OPA scores leads to a classification in five bands (A: Lowest pollution hazard/best operator performance; E: Highest pollution hazard/worst operator performance), which can then be allocated to a matrix on which priorities are based.

The Environment Agency’s decisions about the level and nature of compliance assessment are furthermore based on “Compliance Assessment Plans” (CAPs). It is used to ensure that all requirements of permits and other regulatory approaches are checked within a defined period. In addition “Compliance Classification Schemes” (CCS) are used, which classify non-compliance with permit conditions according to the potential impact on the environment.

Compliance assessment activities cover site visits (pre-arranged or unannounced), audits, and review of procedures; analysis of reports, monitoring data and progress of improvement programmes, check-monitoring; and responding to incidents and complaints. Resources are allocated to assess compliance at all sites and activities, but effort is targeted at the performance and level of environmental risk of facilities. Where non-compliance is detected, the Agency’s enforcement powers are used.

### **The choice of specific enforcement actions in the UK**

65. The UK Environment Agency’s enforcement powers fall into two categories:

- Measures aimed at the prevention or remediation of harm to the environment (injunctions, suspension, variation or revocation of licences, prohibition notices, enforcement notices, works notices, and the carrying out of works initiated by the agency and recovery of costs); and
- Measures providing a response to a criminal offence (warning, formal caution, prosecution).

66. The criminal process is used to institute prosecutions, which aim at punishing wrongdoing, avoiding recurrence and acting as a deterrent to others. The courts decide on the penalties to be applied<sup>11</sup>. For criteria determining the normal enforcement response in the UK (see Box 4).

#### **Box 4: Criteria determining specific enforcement actions in the UK**

Non-compliance at permitted sites in the UK is assessed with respect to the potential environmental effect according to the «Compliance Classification Scheme» (CCS) and rated according to four categories which decide on the normal enforcement response. The categories distinguish non-compliance with a potentially “major”, “significant”, “minor”, or “no potential” environmental effect. Normal enforcement responses are differentiated according to these categories. Compliance history, foreseeability of the event, the polluter’s attitude and his intent, the deterrent effect of a prosecution, and personal circumstances of the offender are also taken into consideration when deciding upon the adequate enforcement action.

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<sup>11</sup> In the UK, magistrates’ courts and the Crown Court may deal with environmental offences. The sufficient gravity of an offence or its effect may justify the referral of a case to the Crown Court. The courts are encouraged to consider the gravity of the offence and to decide on the penalty accordingly. Magistrates’ courts can issue penalties of up to six months imprisonment and/or a £20 000 fine; the Crown Court can issue penalties of up to five years imprisonment and/or an unlimited fine.

Prosecutions are generally issued for incidents or breaches with (potentially) significant consequences, lack of relevant operation licences, excessive or persistent breaches of regulatory requirements, non-compliance with remedial requirements, reckless disregard of management or quality standards, failure to supply information without reasonable excuse or knowingly false or misleading information, and obstruction or impersonating of Agency staff.

Where appropriate, prosecutions may be used in conjunction with other available enforcement tools, such as a prohibition notice requiring operations to be stopped until specified requirements are met. According to the Agency's policy, prosecutions are only commenced or continued where there is sufficient evidence for a violation and a realistic prospect for conviction.

### **Penalties based upon “harm” and “gain”**

67. One important question is whether penalties should be based on the “harm” caused by an environmental violation to the environment, which can be assessed in monetary terms, or on the basis of monetary “benefits” to the polluter (*e.g.* in the form of foregone abatement costs).

68. Cohen [6] notes that, in practice, governments base penalties either on gain or on some combination of harm and gain. In the following text box the examples of two countries, the UK and the United States, are presented. In both cases penalties are based both on the harm to society and the gain to the offender. In addition, further criteria such as the blameworthiness of the offender, his cooperativeness, or his ability to pay also have an impact on the level of penalty (see Box 5).

#### **Box 5: Harm and gain-based penalties in the UK and the US**

##### **The UK approach**

Sentences are required to reflect the damage - including environmental, economic, and social impacts - resulting from an environmental offence (polluter-pays principle). At the same time they are also required to reflect gains to the offender [34]. Further criteria are also taken into account when deciding on the sentence for an environmental crime. They include: Liability-related criteria (blameworthiness/culpability of the offender), the potential risk brought about by an offence, the offender's ability to pay (facility closure should be avoided where possible), the overall deterrence effect of the sentence (fines on companies should be large enough to make an impact also on shareholders), and the offender's cooperativeness. Finally, the level of the fine should also reflect prosecution costs. Costs for clean-up and restoration - if not carried out by the offender himself - should be recovered.

##### **The US EPA approach**

The “Penalties under the Clean Air Act Stationary Source Civil Penalty Policy” [60] covers an economic benefit component (reflecting benefits both from delayed or avoided cost), and a gravity component (reflecting the seriousness of the violation which includes actual or possible harm influenced by the amount of pollutant, the sensitivity of the environment, and the toxicity of the pollutant as well as its duration). The gravity component should furthermore increase with the size of the violator's business since a given fine does not have the same economic impact on small and large companies.<sup>12</sup>

Adjustments of the gravity and benefit components are possible under clearly specified conditions and for clear criteria (*e.g.* degree of wilfulness or negligence, degree of cooperation, non-compliance history). The risk of litigation and the offender's ability to pay are also to be taken into consideration when determining penalties, although the US EPA reserves the option of imposing a penalty that might contribute to the company closing down if necessary to ensure the deterrence effect. Formulas and penalty amounts for specific circumstances of a violation are defined in the policy document. Unlike the UK, the US have set a statutory upper limit to monetary sanctions imposable per day and violation.

<sup>12</sup>

Note however, that penalties increasing with firm size are not in line with the economic optimal penalty theory.

## Regulatory relief in the US

69. Next to negative (deterrence based) incentives for compliance, the US EPA also provides positive incentives in the form of penalty relief and lower reporting requirements under its Audit Policy “Incentives for Self-Policing: Discovery, disclosure, correction, and prevention of violations”. Conditions that render firms eligible for a reduction in the gravity-based penalties and to an omission of recommendations for criminal prosecution are given in Box 6.

### Box 6: Conditions for penalty relief in the US

The discovery of non-compliance is voluntary (and not through legally required monitoring); disclosure of the discovery to the US EPA is prompt; discovery and disclosure are independent (not through EPA investigations or third-party information); correction and remediation occur within a specified time; a recurrence of the violation is prevented; and the disclosing business cooperates.

Certain types of violation are ineligible for the scheme, such as repeated violations, violations resulting in serious actual harm or violations that may have presented a substantial endangerment. Moreover, gravity-based penalties can be eliminated if firms additionally meet the condition of systematic discovery, *i.e.* discover the violation through an environmental audit or a compliance management system. Finally, the EPA refrains from routine requests for audit reports from businesses disclosing information under the Audit Policy.

70. The US EPA also offers a further scheme for penalty relief under its Small Business Compliance Policy, which is specifically tailored to small and medium-sized enterprises. To the extent that such programmes are taken up by business, administrative costs for investigation and enforcement can be reduced.

71. Both the US EPA and the UK EA demand the violator’s ability to pay to be taken into consideration when determining a sanction. But both agencies also put the burden of proof on the firm. In the US, when a violator fails to provide sufficient information for demonstrating inability to pay, this factor should be disregarded in adjusting the penalty. Comparably, the UK enforcement approach foresees that a company not producing its accounts can be assumed by the court to be able to pay whatever fine the court imposes. To better determine a firm’s ability to pay, the US EPA uses additionally a number of economic enforcement models, which can evaluate not only a firm’s claim that it cannot afford compliance costs (clean-up costs or penalties), but also can calculate violators’ economic savings from delaying and/or avoiding pollution control expenditures, the present value of clean-up costs, or the real cost of a supplemental environmental project.

## Contradictory signals

72. It should be noted, however, that in many cases the introduction of regulation is often followed a few years later by subsidies where regulators, even in the presence of non-compliance, use “carrots” rather than “sticks” to improve the environmental outcomes. Where subsidies are provided solely to close the funding gap to industry, and do not trigger environmentally-friendly technological progress that can increase productivity, the coexistence of regulation and subsidies represent contradictory political signals. Such subsidies also prohibit the internalisation of the full environmental and social costs of economic activities because some of the damage caused by these activities is not paid for by those undertaking the activities.

### Issues for discussion under Session 3:

How can enforcement approaches be optimised with respect to environmental goal attainment, the effectiveness of administrative implementation, and firms’ compliance costs? What obstacles need to be overcome?

**PART 4:  
PROMOTING INNOVATIVE, COST-EFFECTIVE APPROACHES  
TO COMPLIANCE ASSURANCE**

73. In order to attain a higher level of environmental protection in light of the scarce resources of enforcement agencies, it is crucial to identify and apply approaches susceptible to reducing the administrative costs of monitoring and enforcement. Whereas high fines coupled with a low inspection probability appear, on first sight, to be an attractive option for ensuring deterrence and keeping administrative enforcement costs low, an arbitrary increase in fines is not always feasible (due to external, *e.g.* regulatory limits or affordability) or not desirable (when taking account of risk aversion). High fines may even be counterproductive, as they may induce the regulatees to spend resources on evading liability through, for example, falsification of monitoring reports, hiding of pollution incidences, challenging of enforcement decisions in court, or attempts to bribe officials [6].

74. In practice, schemes where only a few violators are monitored and detected but punished severely are rarely found [see for example 45]. Given these findings, this part of the report focuses on various alternative approaches suggested by economic theory that may help to reduce the administrative costs of monitoring and enforcement. It also aims to assess the limits to administrative cost savings and with respect to their effects on firms' compliance costs.

**Links between government compliance monitoring and self-monitoring by enterprises**

75. Targeting non-compliant firms is one option for reducing enforcement costs suggested by economic theory. It follows the idea that the intensity of monitoring of a polluter may be based on the firm's prior compliance history [6]. By introducing **compliance dependent compliance monitoring and enforcement**, firms previously complying might be monitored less frequently [22, 23]. They can also be fined less if found non-compliant than firms previously violating legislation. The threat of being placed in the "more frequently monitored" and "more severely punished" group serves as an incentive to comply. Empirical examples of targeting firms with a greater risk of non-compliance and using higher penalties for repeat-offenders were found in the US EPA's enforcement approach. Unlike the empirical examples, Harrington's [23] approach suggested not monitoring firms with the highest compliance costs because this would need over-proportionally high enforcement resources. This strategy, however, does not take account of damage costs.

76. The introduction of **self-monitoring and self-reporting schemes** as a complement to state monitoring has been considered as a possible means of substituting government compliance monitoring efforts by passing some of the monitoring responsibility and cost on to the firm without decreasing deterrence [6]. It is obvious that this may help save administrative enforcement costs to the extent that the firm's self-monitoring and reports replace monitoring activity and detection by the government. This

approach also assumes that related cost reductions would not be over-compensated by costs for processing the reports and by the potentially increased frequency of imposition of fines.<sup>13</sup>

77. As an additional incentive for firms to report correctly, it has been suggested that a combination of self-reporting schemes with differential penalties be implemented. The idea is to impose lower penalties on correctly reported violations or pollution than on violations that have gone unreported and that have been detected by the authority [6; 28; 31; 54]. In reality, environmental legislation (for example in the EU) frequently requires the regulated agents to install monitoring equipment, to report emissions, and to report violations of the regulations (e.g. in cases of malfunction of abatement equipment). Furthermore, the US EPA Audit Policy (see above) is an example where positive incentives are granted for self-monitoring and correctly self-reported non-compliance. The quality of monitoring data delivered by operators and regulated processes may also be furthered by monitoring certification schemes as used in the UK. In non-OECD countries, enterprises frequently lack the necessary monitoring equipment and self-monitoring is hence much less developed.

### **Personal liability for non-compliance**

78. The previously suggested approaches treated the regulated firm uniformly, not distinguishing the various actors in a firm. However, it is known that pollution releases may often depend on the individual behaviour of employees (principal-agent relationship between the firm management and employees). Therefore, the question arises as to how sanctions could be best allocated between the firm and the employee. Economists argue that the actors who are in a position to magnify the risk of pollution should have sufficient incentives to reduce this risk. When the hierarchical control of the employees is limited, or when specific allocations allow them to evade the burden (for example because the penalty is too high to be recovered from wage reductions), corporate fines are not perfect substitutes. In these cases the allocation of penalties matters, *i.e.* the employee should be penalised rather than the firm and/or imprisonment rather than financial sanctions may be considered [6; 18; 30; 48; 52]. As shown in Box 7, there are practical examples of countries that take criminal proceedings against company employees.

#### **Box 7: Personal liability in the UK**

The UK Environment Agency's enforcement policy foresees that criminal proceedings could be taken against those people responsible for an offence [58]. While usual practice is to prosecute the company where there has been an offence, any part played in the offence by officers of the company (*e.g.* directors, managers) is also considered and action may be taken against these. Where it can be shown that the offence was committed with the company's consent or due to their neglect, both individual officers and the company may be prosecuted. Where appropriate, the Agency may seek disqualification of directors.

### **The role of the public, the courts and market forces in compliance**

79. There are generally two principal enforcement channels: The administrative enforcement channel, and a legally-based channel (private litigation). The former has been mostly applied in government policies, especially in Europe. The latter is common in the US and has also been attempted in the countries of Eastern Europe.

80. Legally-based enforcement is an important instrument as it can allow citizens to bring polluters before a court for damage caused by their non-compliance with regulation. A recent text discusses the desirability of this way of so-called "private" enforcement. The advantages of private involvement in enforcement are, amongst other things, the direct impact that has been made on private agents, which may allow them to be better judges of polluting behaviour (due to, for example, proximity of their communities)

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<sup>13</sup> As a second advantage, self-reporting may reduce the risk for firms, as pay-offs become more certain, *i.e.* firms reporting their behaviour bear certain rather than uncertain sanctions [31].

than enforcement agencies. Private enforcement might also improve enforcement towards certain firm/industry types, such as government-owned polluters, where public enforcers might lack the will to enforce. “Private” enforcement can also provide the possibility to save government monitoring costs, and allows the limited public enforcement means to be better targeted [6; 38].

81. A disadvantage, however, may be associated with the possibility that “private” enforcement may lead to over-enforcement and thus to over-deterrence.<sup>14</sup> This may be the outcome when citizen suits are added to the government enforcement but not taken into account when setting the government enforcement action. It is particularly likely if a reward for private enforcement is available [46].

82. Some international agreements aim at developing access to information, complaint procedures, and access to litigation to facilitate the public’s possibilities for private enforcement (see the Århus “Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters” of 25 June 1998 (<http://www.unece.org/env/pp/welcome.html>) and the European Directives aligning Community legislation with the Convention’s provisions (<http://europa.eu.int/comm/environment/aarhus>).

83. For the US, Cohen [6] reports findings that link an increased number of citizen suits in the early 1980s to facilitated access to information on polluters. It should nevertheless be mentioned that there are limits to complaint-driven enforcement. An empirical study of environmental complaints in China found that citizen complaints seem to focus on highly visible pollutants, and therefore not necessarily on the most harmful [11].

84. Information provision may play a further role in triggering market reactions and community pressure to pollution incidents or non-compliance that will be discussed in Session 1. Various countries use instruments of information disclosure as a complement to public enforcement action. One well-known example is the Toxic Release Inventory (TRI) programme under the US Community Right-To-Know Act which makes publicly available information on toxic chemical releases reported annually by certain industry groups and federal facilities that manufacture, process, or use significant amounts of such chemicals. There is evidence that firms have decreased their emissions following disclosure [6]. While TRI is about legal pollution releases, the Environment Ministry of British Columbia in Canada regularly publishes two separate lists of firms that either do not comply with existing regulation or whose environmental performance causes concern. The “out of compliance” list appears to have had an especially positive impact on the subsequent compliance behaviour of firms [15]. The OECD in its work on Pollutant Release and Transfer Registers (PRTRs) has been promoting wider use of such instruments (see Box 5).

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<sup>14</sup> Over-deterrence characterises, for example, a situation where the regulated agent spends more resources on abating pollution than is socially optimal.

#### **Box 8: OECD Programme on Pollutant Release and Transfer Registers**

A key tool governments are using to provide data to the public about potentially toxic releases to the environment is a Pollutant Release and Transfer Register (PRTR). A PRTR is a database, or register of the quantities of potentially harmful chemicals, reported by facilities, which are released to air, water, and soil and/or transferred.

In 1996, the OECD Council adopted a Recommendation on implementing PRTRs. Since its adoption, the OECD has worked with governments, industry, and NGOs to develop practical tools that help reduce efforts by OECD Member countries, provide outreach to non-member countries, and co-ordinate international activities. One key document prepared by the OECD is the PRTR Guidance Manual.

With PRTR programmes in place, government authorities can set priorities for reducing or even eliminating the most potentially damaging releases and track progress toward meeting environmental objectives. A PRTR also provides an incentive for industry to reduce its releases and transfers.

To help Member countries implement efficient and effective PRTR systems, the OECD produces documents dealing with: The experiences of countries who have developed PRTRs; current and emerging uses of PRTR data; how PRTRs differ; and the identification, selection, and adaptation of release estimation techniques that industry uses to calculate PRTR releases and transfers.

85. However, PRTR schemes are usually sophisticated and are thus resource-consuming. To lower costs associated with establishing such schemes simplified systems have been applied in developing countries. An example is Indonesia's PROPER PROKASIH programme. The programme gathers information about releases of selected, key pollutants, as well as environmental management in selected enterprises. On that basis, regulators rank the performance of individual facilities according to specific criteria. The ranking is then communicated to the media and the public using a simple colour label pattern (gold, green, yellow, red, and black). The programme is reported to have been successful in improving the environmental performance of participating companies, leading to community pressure, negative media attention, and increased likelihood of ISO 14000 certification [21]. It has since been successfully applied in other parts of the world, such as India, China, and other countries.

86. One general lesson can be drawn from the above discussion. The government enforcement policies can be supplemented by a number of information and liability-based instruments. They can increase the probability of detecting non-compliance, create deterrence effects, and lower administrative costs of enforcement. The issue for further discussion is of creation of a coherent and cost-effective mix of appropriate regulatory and other instruments that target priority pollutants and are adapted to the specific economic, social, and environmental circumstances.

#### **Issues for discussion during Session 4:**

1. Can "non-classical" approaches result in lower administrative costs overall? What are their impacts on firms' compliance costs? And what are their limits?
2. Do penalty schemes allowing for personal liability improve regulatory compliance?

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## ANNEX. BACKGROUND INFORMATION

### Box A-1: Reasons for compliance or non-compliance identified in the Dutch compliance strategy

#### Dimensions for spontaneous compliance

Knowledge of legislation  
 Cost/benefit  
 Acceptation of the rules  
 Values of regulatee  
 Informal control (within the regulate branch)

#### Control dimensions

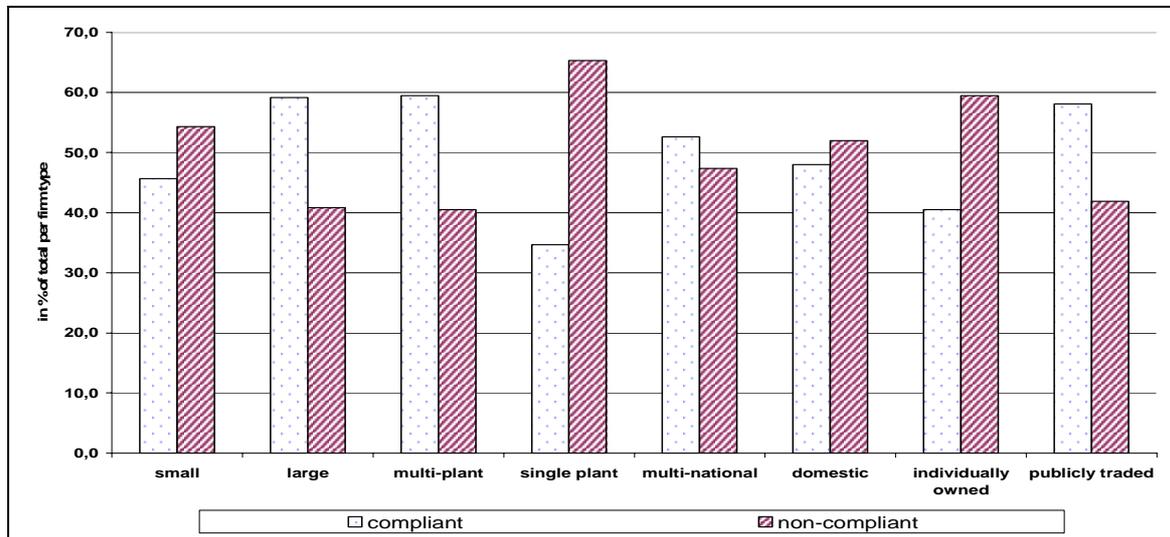
Informal chance of being snitched  
 Perception of the control chance  
 Perception of the chance of detection (when controlled)  
 Selectivity of the inspector

#### Sanction dimensions

Chance of being sanctioned  
 Height of the sanction

Source: Van der Schraaf and van der Plas, 2003

**Figure A-1: Impact of plant size, firm type and ownership status on firm compliance in Mexico's manufacturing industry**



Note: The sample comprises 92 small and 71 large firms, 121 multi plant and 98 single plant firms, and 19 multi national, 200 domestic, 121 individually owned and 74 publicly traded firms.

Source: Dasgupta *et al.*, 2000, adapted.

**Table A-1: Policy instruments and appropriate contexts for their application**

Instrument	Appropriateness	Advantage
Direct regulation	Pollution from relatively small numbers of large point sources; Particularly suited to localised pollution issues; Also useful to underpin other instruments such as economic or voluntary approaches	Can ensure a minimum level of performance;  Can improve performance of environmental laggards, not sensitive to more flexible instruments
Permits setting conditions at a high level, thus avoiding detailed prescriptions	See "direct regulation"; Performance and conformance with permit conditions must be measurable	Leaves the operators flexibility in the ways to reach objectives by avoiding detailed prescriptions; Can increase cost-effectiveness
Voluntary or negotiated agreements	Small number of relatively major companies	Can increase commitment of business; Usable to negotiate enhancement above a legislative minimum
Educational programmes, technical assistance projects (training and information dissemination on regulatory obligations, financially attractive opportunities for environmental improvement), codes of practice	Small and medium-sized enterprises (SMEs) and individuals where compliance is hindered by informational problems  Parallel to issuing new (regulatory) initiatives	Can reach groups that are not subject to direct regulation and that have little resources and capacity for environmental protection  Make new measures quickly known
Economic instruments a) Taxes  b) Tradable permits	Where alternative less polluting practices and products are available; Modest price signals have an effect on behaviour; Simple, broadly applicable rules can be used  Where a range of options to environmental improvements exist, and where pollutants have a long-range spatial impact	Operators can choose the least cost option for their situation, are flexible in the means to reduce pollution, and in the timing of pollution investment
Environmental management systems (EMS)  Simplified versions ( <i>e.g.</i> self-inspection, self-audit)  Subsidised environmental management training	Certified EMSs rather applicable to large business  For smaller companies without the adequate resources to apply certified EMSs  Countries characterised by weak regulation	Further responsibility of business for environmental impacts; Help to improve the management of environmental risks; May deliver cost savings from more efficient resource use  Might provide a useful complement to (uncertain) conventional enforcement
Disclosure of compliance, performance, and enforcement information	Large, reputation-sensitive enterprises	Sets incentives for improved performance by making use of potential market reactions
Rewards in the form of regulatory relief ( <i>e.g.</i> lower priority for checks by enforcers)	Proofs of a continuing high level of environmental management and compliance, <i>e.g.</i> through self-auditing and reporting	Limits costs to both the firm and the enforcement agency

Source: US EPA; UK EA; EPA/CMA, 1999; Gunningham, 2002

**Box A-2. Attributes contained in the UK's Pollution Hazard and Operator Performance Appraisal**

**Pollution Hazard Appraisal (PHA)**

Presence of hazardous substances  
Scale of hazardous substances  
Frequency and nature of hazardous operations  
Technologies for hazard prevention and minimisation  
Technologies for hazard abatement  
Location of process  
Offensive characteristics of emissions

**Operator Performance Appraisal (OPA)**

Recording and use of information  
Knowledge and implementation of authorisation requirements  
Plant maintenance  
Management and training  
Process operation  
Incidents, complaints, and non-compliance events  
Recognised environmental management systems

*Source: UK EA (1997)*