Approach to Assessment of Policy Effectiveness

Coordinating Lead Authors: Klaus Jacob (Freie Universität Berlin), Peter King (Institute for Global Environmental Strategies), Diana Mangalagiu (University of Oxford and Neoma Business School)

Contributing Author: Beatriz Rodríguez-Labajos (Universitat Autònoma de Barcelona)

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10.1 The Context

Policies are crucial in determining and improving the state of our environment. A simple way to think about policy and policy instruments is that a policy is a statement of intent to change behaviour in a positive way, while an instrument is the means or a specific measure to translate that intent into action (Mees *et al.* 2014). Therefore, discussion of effectiveness of environmental policies means addressing both aspects. Goal setting (including targets, indicators and time frames) is an important step towards legitimization of environmental policies. Execution of the policy instruments is through effective governance. Governance is "the process whereby societies or organizations make important decisions, determine whom they involve and how they render account" (United Nations Economic and Social Council 2006). The recently adopted Sustainable Development Goals (SDGs) give a new impetus to 'governing through goals' (Yoshida and Zusman 2015).

Strong environmental policies form an integral component of UN Environment's theory of change, which posits alternative pathways to global sustainable development. UN Environment defines a theory of change as when "an intervention depicts the causal pathways from outputs through outcomes via intermediate states towards impact" (United Nations Environment Programme [UNEP] 2017). The theory of change further defines the external factors that influence change along the major pathways – that is factors that affect whether one result can lead to the next. These contributing factors are called drivers and assumptions.

The theory of change for the fifth Global Environment Outlook (GEO-5) showed an expectation that GEO should be policy relevant and draw from a good understanding of global and regional policy issues (UNEP 2012). In GEO-6, however, policy effectiveness is seen to be more central in the theory of change, as shown in Annex 1-3. Reflecting on the mandate of UN Environment's High Level Intergovernmental and Stakeholder Advisory Group, it is no longer sufficient to be merely policy relevant. Member governments want to know which policies are most effective in dealing with seemingly intransigent and insurmountable environmental problems. Using the Drivers, Pressures, State, Impact, Response (DPSIR) framework (see Figure 1.2, Chapter 1), current responses to environmental problems are discussed in the thematic chapters in Part A of this report, while Part B addresses the question of when these policies are effective, and Part C incorporates the most promising policy approaches into the pathways of transformation. While GEO-6 is not policy prescriptive, it offers guidance to governments and policymakers who would like to know which policies have worked best in which circumstances, under what governance arrangements and whether that experience is transferable to other contexts.

10.2 Environmental policy and governance

Environmental policies are pursued through a multitude of modes of governance and are designed to promote desirable behaviours by a defined set of actors and to overcome a range of challenges that impede effective environmental management. Policy objectives are to be achieved via policy measures or instruments – structured activities targeted at changing other activities in society towards achieving environmental goals. Not all effective policy instruments are for environmental policy alone, other instruments (e.g. in energy and transport policy) may include environmental policy goals, often as secondary goals to the prime non-environmental goal (e.g. reducing congestion). This is the usual case now in most integrated policies (as discussed in Chapter 11). Accordingly, environmental governance extends well beyond environmental ministries.

Governments are often thought of as the primary domain for development and implementation of policies. While governments are often the most important actors in formulating, implementing and enforcing policy instruments, they do not act alone, and various governance arrangements are needed. Effective policies usually involve a wide range of stakeholder inputs throughout the policy cycle. Governments at all levels are active in policy formulation and implementation, as are private sector and civil society actors. Roles and responsibilities are spread not only between governmental and non-governmental institutions, but also across all levels vof governance.

Politicians, policy think tanks, education and research institutions, non-governmental organizations (NGOs), civil society organizations (CSOs), lobbyists, communities and companies all have roles to play in influencing policy outcomes in different contexts. At the regional and global levels, policy instruments are created and implemented by global, regional or national institutions in multilayered governance arrangements. There is also a growing number of 'public-private partnerships' and 'corporate sustainability initiatives', including the emergence of 'business-NGO interactions' aimed at stimulating responsible and sustainable behaviour in specific sectors (Forsyth 2005; van Tulder *et al.* 2016). Such partnerships (e.g. UN Environment's Clean Seas Initiative) emerged in the design and production of goods, risk assessments, due diligence, training, monitoring, reporting and mediation, transparency in supply chains and more. In many countries, citizens and communities are also contributing to the realization of collective environmental goals. These are often framed as 'citizen co-production' and/or 'community-based initiatives' (Mees, Crabbé and Driessen 2017).

The challenge is for all these actors, layers and levels to mesh together and provide a coherent mix of policies appropriate for the scale and period of application and consistent with the national social, cultural, historical and political context (European Environment Agency [EEA] 2001a; EEA 2001b; European Commission [EC] 2012; Niles and Lubell 2012; EEA 2017).

Polycentric governance is a source of innovation and by enabling the competition of ideas, collaboration and alignment, it creates momentum for environmental policies (Jordan and Huitema 2014). However, dispersion of responsibility may lead to fragmented policies, poorly defined roles and responsibilities, weak follow-up and monitoring mechanisms, lack of accountability for results or a stalemate in decision-making.

10.3 Policy instruments

Policy instruments come in multiple forms and can be implemented by multiple actors (not only governments) at multiple levels of governance (Mees *et al.* 2014; Keskitalo *et al.* 2016). Policy instruments can be aimed at various mechanisms:

i.   available alternatives can be amended;
ii. impacts of alternatives can be changed; and
iii. evaluation of outcomes can be influenced (Boersema and Reijnders eds. 2009).

These forms vary between traditional top-down steering by governments to self-regulation of business organizations. Some forms are more, and others less, successful in fulfilling their policy objectives. It is often stated that collaborative modes of governance, which rely on stakeholder participation, are needed to address the complex, multi-scalar and cross-sectoral dimensions of environmental problems (Challies *et al.* 2017; Kochskämper *et al.* eds. 2018). Moreover, increasing understanding of environmental challenges have changed policy approaches and instruments from targeted policies and single-use instruments to policy integration and raising of public awareness to policy coherence and systematic approaches (e.g. green economy) (EEA 2017).

One policy tool to address transboundary environmental problems and maintain 'the commons' is robust and legally binding international agreements. However, given the structure and legal basis of international law-making, such agreements often fall short in meeting the ambitions of the front-running or most affected countries (Sandler 2017). Therefore, coalitions or clubs of countries may step in and develop more ambitious environmental policies (Hovi *et al.* 2016).

An often-stated understanding of environmental policy instruments is that they can be 'carrots, sticks or sermons,' although this is only a partial characterization of the full range (Niles and Lubell 2012). Some common types of policy instrument include legislation and regulatory policies, financial incentives/disincentives, voluntary approaches, treaties and agreements, and international soft law (Hildén, Jordan and Rayner 2014). GEO-4 used the following traditional structure: regulations and standards, market-based instruments, voluntary agreements, research and development, and information instruments (UNEP 2007). In GEO-5, common threads were traced between and across different world regions, emphasizing particular policy approaches that had proven successful in a number of cases. Successful policy responses in several regions were assumed to be more likely to accelerate achievement of internationally agreed goals. Within the DPSIR framework, policies that address 'drivers' tend to be preferred, as they intend to address the roots of environmental problems rather than treating the symptoms (UNEP 2012). For GEO-6, the typology in Table 10.1 has been used to provide guidance on the selection of types of policies instruments and governance approaches and associated case studies. Note, however, that the typology is not intended to be an exhaustive coverage of all possible environmental policies or policy instruments.

Environmental policies ultimately aim to preserve a state of the environment that protects habitats, safeguards ecosystem services and minimizes risks for human health from pollution. Therefore, environmental policies have been typically developed to protect different environmental media (air, water, land), to influence the state of the environment outlined in Part A of this report, and usually under the control of an environment ministry. However, effective environmental policies not only address the state of the environment, but also the drivers and pressures originating from social and economic activities (outlined in Chapter 2). Accordingly, governments across the world have developed institutions and policies that address the most important polluting sectors, such as energy, mobility, industry and agriculture (Organisation for Economic Co-operation and Development [OECD] 2016).

In Part B of this report, a selection of the most commonly adopted policies, cutting-edge policies and policy clusters that show real promise in each thematic area and cross-cutting issues are analysed, recognizing that there are literally thousands of policies and policy instruments and it is not possible to cover them all. The selected policies represent a sample from different types of policy instruments and governance approaches (see **Table 10.1**) from different regions of the world.

10.4 Policy mixes and coherence

Given the multiple actors and factors causing environmental deterioration and the various types of barriers to environmental innovation, a single policy instrument is rather unlikely to be sufficient for achieving the desired goals. Against this background and the multiple challenges to address when developing effective environmental policies, adopting policy mixes rather than a single policy is claimed to be more effective (Jänicke *et al.* 2000; Mees *et al.* 2014; Kivimaa and Kern 2016).

However, different policies may not always complement each other, but could impair each other (e.g. economic incentives may undercut intrinsic motivation). A policy package, portfolio, mix or cluster is a collection of policy instruments all designed to achieve a common goal or set of intentions (Lay *et al.* 2017). When developing policy mixes, their coherence has to be ensured in order to achieve optimal results (Howlett and Rayner 2007; Huttunen, Kivimaa and Virkamäki 2014).

Policy coherence is the systematic promotion of mutually reinforcing policies that can accumulate synergies in attempting to achieve agreed objectives (OECD 2016). Policy coherence can be sectoral, transnational, across governance regimes, multi-level (from global to local) and/or from policy objective through to instrument design and implementation practice (Hood 2011). Policy coherence occurs when the balance of policies is aligned with that common goal or set of intentions.

In addition to policy coherence, policy synergy is also necessary. In order to realize environmental objectives, environmental concerns need to be incorporated in other policy sectors. This is often referred to as policy synergy or environmental policy integration and contributes to policy coherence (Hood 2011; Lay *et al.* 2017). Policy synergy occurs when successive policy instruments have a cumulative or reinforcing impact in achieving the common goal or overarching policy aspiration (OECD *et al.* 2015).

Table 10.1: Policy typology

Policy instrument / governance approach	Point of intervention[a]	Assumed causal mechanism	Barriers to effectiveness	Potential costs	Typical policy instruments	Contextual requirements
Command and Control	Industrial processes and products Technologies End of pipe or smokestack pollution control	Prohibition of environmentally harmful technologies (products and processes) or demanding environmentally friendly technologies as part of permitting => reduced emissions/resource use => if emissions/resource use cannot be reduced enough by upstream controls, then improved waste management is needed. Can also address enabling issues such as property rights and access issues.	Lack of monitoring Corruption.	Costs for firms, harmful for competitiveness. No incentives to innovate.	Permitting processes/ fines. Discharge/emission standards. Total pollutant load caps Real-time monitoring systems. Legal reviews.	Administrative capacities. Self-reporting by industry.
Promotion of innovation	Green innovation	Incentivizing R&D in green technologies => introducing green technologies to markets (=> cost savings + exports)	Spill over.	Additional costs.	Subsidies, tax relief for R&D, green procurement.	Public and private budgets.
Market-based/ economic incentives	Pricing of products or processes	Change of relative prices between environmentally harmful and green technologies => increased markets for green services; => incentives to innovate and disincentives to cause environmental harm.	Lack of significance within the overall context of consumer budgets and/or industrial capital plans.	Distributional/ regressive impacts, harmful for competitiveness. Retrofitting costs for existing industries.	Cap and trade, public procurement, removal of subsidies.	Private investment in new products or processes Effective tax regimes.
Convincing consumers, employees and stockholders	Public information, education, knowledge, awareness, advocacy	Knowledgeable consumers and producers will voluntarily choose environmentally sound products and processes.	Cost disincentives Inadequate supply of alternative products and processes.	Power imbalances cause poor choices by consumers.	Campaigning. Labelling. Certifying. Nudging. Stockholder voting blocs.	Media and stock markets Education system.
Enabling actors	Environmental actors	Strengthening participation of governmental and non-governmental actors in decision-making on policies or projects leading to improved project design and implementation.	Environmentally disinclined actors may wield more power.	Access to all relevant information, skill levels.	Access to information, requirements on transparency, enabling participation, requesting evidence base (EIA, SEA, IA), legal review.	Environmental and social safeguards.
Supporting investments	Infrastructure and technologies	'Green' infrastructure (waste management, electricity grids for renewables, railways, etc.) => enabling market access for green technologies => demand for increased access.	Incremental costs.	Uncertainty in relation to future impacts such as climate change could cause maladaptation.	Climate-proofing infrastructure Green investment funds.	Public-private partnerships.

[a] Point of intervention refers to the issues considered as key for environmental degradation, especially its improvement (e.g. technologies, innovation, infrastructures, actors, behaviour).
EIA: Environmental Impact Assessment; IA: Impact Assessment; R&D: research and development; SEA: Strategic Environmental Assessment.

Policy conflict, on the other hand, sees the impact of one set of policies, often in unrelated sectors or from an external actor, undermining the intended outcomes of the desired environmental policies. For example, providing a subsidy to first car buyers may conflict with policies to reduce air pollution from transportation. Accordingly, any analysis of environmental policy effectiveness also needs to address the influence of economic and social policies in other domains (Perrels 2001; Interwies, Görrlach and Newcombe 2007; Lambin *et al.* 2014).

10.5 Methodology adopted to assess policy effectiveness

The assessment of policy effectiveness in the remaining chapters of Part B serves three main purposes:

1. To showcase policies and governance approaches at all levels that have demonstrated an impact and that can potentially be applied elsewhere.
2. To identify needs for further action by improving the effectiveness of policies. The analysis builds as much as possible on quantification of policy effectiveness (i.e. indication of how much/how often policies do have an effect, not only how and why).
3. To establish methods and best available knowledge for assessing policy effectiveness that can be used beyond GEO-6 for improving the evidence base of policymaking and thereby strengthen environmental policies.

The gold standard to evaluate and quantify the effectiveness of policies is the comparison of empirical observations with a control group in an experimental design or with a counterfactual scenario. However, constructing such

experiments or scenarios is in many cases costly if not impossible as the objects of policy interventions are complex social systems. For example, it is not possible to predict the reactions of markets with or without policy interventions. Furthermore, in many cases control groups cannot be identified and it may be unethical to deliberately withhold the benefits of a policy.

Evaluating policy effectiveness is still possible based on theoretical assumptions and empirical observations of policy impact. Theory-based evaluation uses an explicit theory of change throughout the causal chain from policy outputs to outcomes and final impacts (Blamey and Mackenzie 2007; Rogers and Weiss 2007).

Attributing causality to policies in often extensive and complex causal chains from policy, through its implementation, to behavioural changes and processes that are triggered, to impacts, indirect and induced impacts, is a particular challenge for policy evaluation (Forss, Marra and Schwartz eds. 2011). A conceptual approach was adopted in Part B of this report which aims to minimize the problem of attribution by combining a top-down and a bottom-up perspective (Sabatier 1986). The top-down perspective shown in **Figure 10.1** starts with the policy and traces the causal chains that are expected from the implementation of the policy. The bottom-up perspective starts from the observed outcomes and uses policy-relevant indicators to trace the causalities back to the policy interventions. This helps analysts to evaluate the effects of policy mixes. Both perspectives have their shortcomings – the top-down perspective tends to overemphasize the impacts of policies compared to other factors, the bottom-up perspective tends to overemphasize the impacts of contextual factors.

Figure 10.1: Methodological approach for assessing policy effectiveness: top-down and bottom-up approach
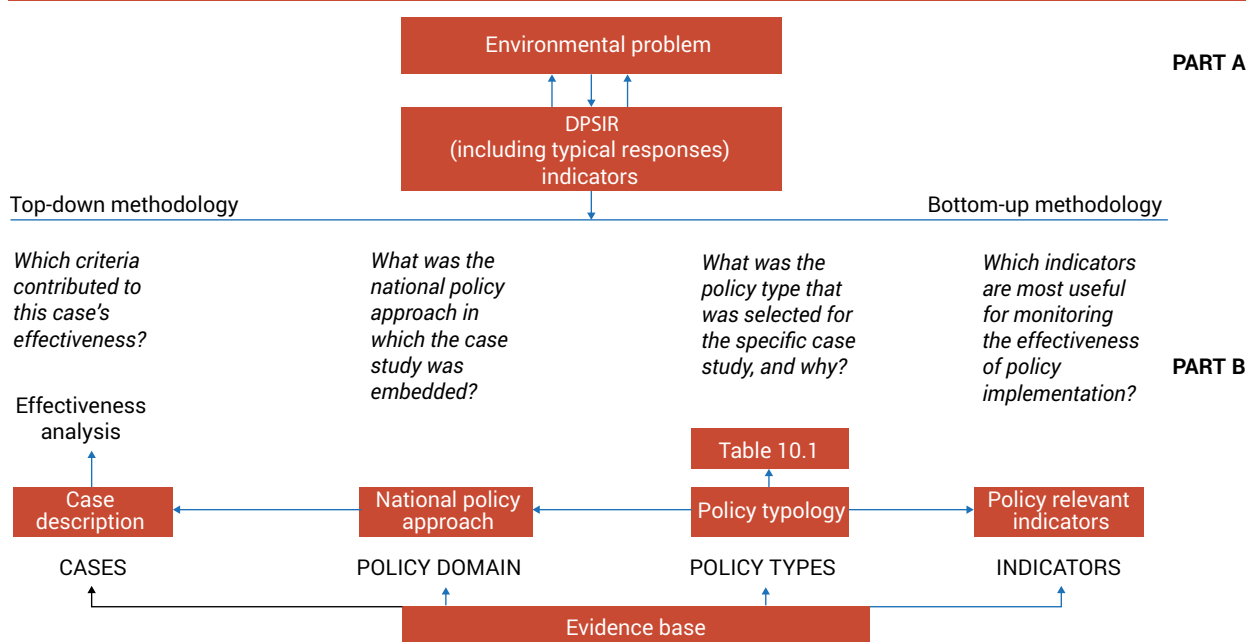
DPSIR: Drivers, Pressures, State, Impact, Response.

The conceptual approach taken in relation to policy effectiveness in this section follows this dual perspective, combining a theory-based top-down evaluation and a bottom-up, observed outcomes-based evaluation. Despite the recognized shortcomings, this dual approach is the best available option for assessing policy effectiveness.

The top-down approach is particularly suitable for identifying policies that may serve as examples of good practice that can be applied elsewhere (the primary goal of such evaluations). Chapters 12-17 provide a narrative description of the most commonly implemented or most important policy instruments in the five thematic areas, as well as the cross-cutting policies that have positive or negative impacts on the themes. In addition, they have identified policy instruments at the cutting edge that appear to have considerable potential but have not been widely adopted to date, through a series of case studies, evaluated against the criteria listed in Section 10.6. However, a quantification of aggregate effects of this mix of policies will not be possible due to a lack of representative sampling and the limited number of policies reviewed.

The bottom-up evaluation, based on policy-relevant indicators, complements the analysis and contributes in particular to the quantification and the identification of needs for further action (goal 2 of the evaluation). The methods for each approach are further elaborated in the following sections. Figure 10.1 graphically summarizes how to assess policy effectiveness through these top-down and bottom-up evaluations.

10.6 Top-down evaluation methodology

The top-down evaluation of policy effectiveness in GEO-6 starts with the selection of policies and governance arrangements and associated cases. For each thematic area, up to five promising policy types or governance arrangements are selected by considering the coverage of the variety of policy types and governance arrangements, geographical diversity and the availability of data.

These policy types and governance arrangements are then evaluated using the available knowledge based on peer-reviewed publications, official reports and statistics.

Next, for each policy type or governance arrangement selected and evaluated, a case exemplifying the implementation of the policy is chosen and assessed in terms of policy effectiveness according to a common research protocol covering the achievement of stated objectives or improvement of relevant indicators, the quality criteria of policy formulation and implementation (e.g. level of participation), *ex ante* or *ex post* assessments and the contextual requirements for the effectiveness.

Note that 'policy effectiveness' is not merely a matter of achieving the policy goals at any cost. For example, an island nation may decide on a policy of carbon neutrality and attempt to achieve it by banning import of gasoline and fuel oil. If the local fishers are unable, however, to power their boats then there could be widespread malnutrition as fish

disappears from the diet. Crime might also increase in order to meet the unsatisfied demand for fuel.

The criteria for assessing the cases are derived from the literature on policy design and effectiveness. They are not prescriptive in terms of methods, data, policy instruments or causal chains, but on each aspect the relevant knowledge from the literature is presented. As all case studies are based on secondary data analysis, the research protocol necessarily leaves discretion to be adapted. For example, evaluation studies may be based on measuring effectiveness against the stated goal of policymakers, against an indicator, against a control group or against a counterfactual scenario. The research protocol does not prescribe one or the other method for assessment, but provides transparency on the underlying methods, theories and data sources of the individual case study.

The evaluation criteria and associated guiding questions for the case studies are the following:

1. Effectiveness/goal achievement – What effects did the policy have on the targeted problem?
2. Unintended effects – What were the unintended effects of this policy?
3. Baseline – Was the baseline defined at the policy design stage?
4. Coherence/convergence/synergy – How does the policy intersect with other related policies?
5. Co-benefits – Did the policy design provide for co-benefits?
6. Equity/winners and losers – What are the effects of this policy on different population groups?
7. Enabling/constraining factors – What external factors are likely to influence the intended policy effects?
8. Cost/cost-effectiveness – What were the financial/economic costs and benefits of this policy? Is it the most cost-effective or the least-cost approach?
9. Time frame – Was the policy implemented within the expected time frame?
10. Feasibility/implementability – Is the policy technically feasible in the institutional context?
11. Acceptability – Do the relevant policy stakeholders view the policy as generally acceptable?
12. Stakeholder involvement – To what extent were affected stakeholders actively involved in implementation?
13. Any other factors – such as transformative potential, intergenerational effects, transboundary impacts, sociocultural concerns, political interference, enforcement issues, compliance with legal standards (e.g. national/international human rights).

As a caveat, there is abundant evidence from the environmental policy and governance literature that policy effectiveness is highly context dependent (Jordan and Huitema 2014). Therefore, effective policies from one region or country cannot simply be transferred to another context. Social, cultural, historical and political differences do matter.

This top-down evaluation is complemented by a bottom-up evaluation described in the next section.

10.7 Bottom-up evaluation methodology

An indicator-based assessment of policy-sensitive/policy-relevant indicators for each thematic area and cross-cutting issue complements the top-down evaluation and provides evidence on the quantification of policy effectiveness (Hezri and Dovers 2006; Bauler 2012; Moldan, Janoušková and Hák 2012). Indicators are constructed to measure the state of complex systems which may not be observed directly or comprehensively. They measure certain aspects and based on theoretical considerations and/or evidence, conclusions can be drawn regarding the state of the overall system. For the purpose of measuring policy effectiveness, it is necessary to be explicit on the theory regarding how policies and the selected indicator interact.

Indicators that provide insights to the state of ecological or economic systems and their environmental performance are in many cases not directly influenced by policies. Instead, cultural, structural, political, geographical and other factors may intervene. Measuring the policy outputs (e.g. adoption of policy instruments) would not adequately capture the preferences of different countries for one or another instrument. For example, for mitigating greenhouse gas (GHG) emissions, one country may regulate emissions, another imposes taxes or emission trading schemes, a third implements information campaigns or subsidizes climate-friendly technologies. In each of these cases, the expected impact will be reducing emissions of GHGs. The indicator is influenced, however, by the industrial structure, natural conditions, level of income and other factors that are not, or not directly, impacted by (environmental) policies.

Therefore, an indicator-based assessment must have a transparent underlying theory on how policies would impact on the selected indicator and what other factors may also have an influence. **Figure 10.2** shows the underlying rationale for developing the theory on the relationship between policies and relevant indicators.

Figure 10.2: Approach of assessing policy effectiveness from the bottom-up

Alternative Indicators | System (e.g. State of the Environment in a country)
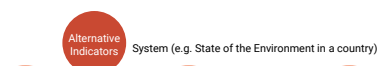
The analysis of data for the selected indicators has multiple objectives:

❖ To analyse progress on achieving internationally agreed goals since GEO-5 (including the SDGs);
❖ To identify countries or groups of countries that demonstrate – with their policy approaches and implementation experience – a high level of effectiveness; and
❖ To quantify policy impacts and thus identify where further action may be needed.

The selection of indicators is based on the following rationale:

❖ There is a causal relationship determining the variation of the indicator to policy instrument (preferably, different types of policy instruments) and their implementation can be demonstrated;
❖ The indicator has a relationship to a multilateral environmental agreement (MEA) and/or SDGs to guarantee the alignment of the analysis with the future global agenda;
❖ Data need to be available (at least at country level, and possibly at global scale, and also in a time series);
❖ The indicator should be relevant for the thematic area, i.e. it would provide insights into the state of the environment for the respective thematic area; the indicator should ideally consider the policy responses discussed in Part A of this report.

For each indicator, the following aspects are considered, based on peer-reviewed literature.

1. Scope and measurement: the indicator should provide insight into the state of the environment for the respective thematic area. The argument behind selecting each indicator in a thematic area is made transparent.

2. Policy relevance: the causal relationship between policy measures and instruments and the indicator is specified. Not all indicators are policy sensitive but the following questions can be asked of the indicators. Through which mechanisms would policies impact on the indicator? What triggers (e.g. prices, command and control, persuasion) are used by policy instruments that would impact on the respective indicator? Which actors change their behaviour as a result of these policies and how does this impact on the indicator? How does this indicator relate to the state