

Executive Summary

Main objectives of the report

What are the impacts on environmental effectiveness and economic efficiency of using an “instrument mix”, rather than a single instrument, to address a given environmental problem? Which are the main arguments for using such instrument mixes, and are the instrument mixes currently in use actually well designed in response to these arguments? These are the main questions addressed in this report, which is based on a series of in-depth case studies analysing instrument mixes applied in OECD member countries used to address household waste, non-point sources of water pollution in agriculture, residential energy efficiency, regional air pollution and emissions to air of mercury. The main objectives of the project have been to derive further insights on – and, where appropriate, to elaborate policy recommendations concerning:

- How should member countries assess the environmental effectiveness and economic efficiency of a given instrument mix?
- What are the *additional* impacts (in terms of environmental effectiveness and economic efficiency) that appear because a given instrument is *used in combination* with one or more other instruments?; and
- Which types of instrument mixes are likely to provide high environmental effectiveness and economic efficiency?

Reasons for using a mix of instruments

There *are* a number of good arguments for using a mix of instruments to address a specific environmental problem: First and foremost, many environmental problems are of a “multiaspect” nature – in addition to the *total* amounts of releases of a certain pollutant, it can, for example, also matter *where* emissions take place, *when* they occur, *how* a polluting product is applied, etc. Secondly, certain instruments can *mutually underpin* each other – as when a labelling scheme enhances the responsiveness of firms and households to an environmentally related tax, while the existence of the tax help draw attention to the labelling scheme. Often, a mix of instruments is required in order to address non-environmental “failures” in the markets in which environmental policy instruments operate, such as lacking information, ill-defined property rights, market power, etc. Sometimes such mixes can also limit compliance-cost uncertainty, enhance enforcement possibilities and reduce administrative costs.

Reasons for restricting the number of instruments in a “mix”

When applying several policy instruments in a mix, there is a danger that one instrument will unnecessarily hamper the flexibility to find low-cost solutions to a problem that another instrument could have offered if it had been used on its own. In other cases, some of the instruments in a mix are simply redundant, contributing only to increase total administrative costs.

Detailed country case studies were analysed

This report is based on a number of in-depth case studies of instrument mixes applied in selected OECD countries to address a number of different environmental problems. Regarding *household waste*, the instrument mixes applied in the Netherlands and in the United Kingdom were analysed; in the latter case, focused on the instrument mixes applied in England and in Wales, alongside the nationwide instruments.

Instrument mixes dealing with *non-point sources of water pollution in agriculture* were analysed in four countries: Denmark, the Netherlands, the United Kingdom and the Chesapeake Bay area in the United States. For Denmark, separate studies were made on instrument mixes addressing nitrogen run-off, phosphorous run-off and pesticides use. Mixes addressing both pesticide use and nutrient run-off were also analysed regarding the United Kingdom, while the case studies of the Netherlands and the Chesapeake Bay area only focused on nutrients run-off. As regards the Chesapeake Bay, both Federal measure and State-level measures in Virginia and Maryland were analysed.

As for *residential energy efficiency*, the instrument mixes applied in the United Kingdom and in Canada were analysed – with attention given to both Federal and Provincial instruments in the latter case. The focus in both cases was on the thermal energy efficiency of buildings and on the energy efficiency of household appliances.

The case studies *regarding regional air pollution* focused on the instrument mixes used to limit SO₂ and NO_x emissions in Sweden and in Canada. The Canadian case study addressed instruments applied at the Federal level and in the Provinces of Ontario and Alberta.

Instrument mixes addressing *emissions to air of mercury* in Norway, Sweden and in the United States were also analysed. In the latter case, the focus was on instruments applied at the Federal level, and on instruments in use in the States of Massachusetts and Michigan.

Many of the cases analysed respond well to the arguments for using instruments in combination, *e.g.* by reflecting the *multi-aspect character* of many of the environmental issues addressed. Many instruments are also applied to reduce *information problems* and other “failures” in the markets in which environmental policy operate, and in several cases one instrument enhances the functioning of other instruments applied. However, in a number of situations, the use of *overlapping* instruments reduces the economic efficiency of the mix, while in other cases, the *lack of some instruments* can jeopardise environmental effectiveness and/or economic efficiency.

Better ex ante and ex post assessments are needed

On this background, the report offers a number a number of recommendations on how environmental instrument mixes should be assessed, and on how their design could be improved.

First and foremost, policy-makers should consider carefully whether the benefits of further environmental improvements and the costs to society of achieving these improvements balance reasonably well. This implies the need to assess the *targets* set for environmental policy. If the sum of *all* the benefits of additional improvements can be expected to exceed the related costs, the improvements ought to be pursued. If the costs clearly outweigh the sum of all relevant benefits – even if the most efficient policy instruments were to be applied in order to reach the targets – a reconsideration of present priorities would be appropriate.

Policy-makers should also make in-depth *ex ante* assessment of any new *instrument* being considered for implementation – to assess what each instrument would contribute as regards environmental effectiveness and economic efficiency. They should also regularly undertake careful *ex post* reviews of the instruments they apply to achieve a given target – and eliminate or modify redundant instruments, *i.a.* to reduce administrative costs.

Careful review of current or potential instrument use, as well as the design of improved instrument mixes, clearly requires that policy-makers have a good understanding of the environmental issue at hand, covering all the aspects of a “multi-aspect problem”, and of the interrelations between this environmental issue and other related environmental and non-environmental policy issues.

Instruments should address environmental problems as broadly as possible

Both from the perspectives of environmental effectiveness and economic efficiency, policy-makers should apply instruments that address a given environmental problem *as broadly as possible*. Further, one should (to the extent possible) provide *similar incentives at the margin* to all producers that contribute to the problem in question. Economic instruments can “automatically” provide equal marginal abatement incentives, but various regulatory instruments can (at least partially) also do the same job.

For “multi-aspect” environmental problems, policy-makers should supplement instruments that address *total amounts* of pollution with instruments that address *the way* a certain product is used, *when* it is used, *where* it is used, etc. In many cases, regulatory instruments, information instruments, training, etc., can be better suited to address these dimensions than *e.g.* a tax or a trading system.

Instrument mixes should provide flexibility

In order to exploit possibilities for various instruments to mutually underpin each other (so that the application of one instrument enhances the effectiveness and efficiency of another), instruments that *provide as much flexibility as possible* to the targeted groups should be used. Economic instruments will generally provide such flexibility – but *some types* of regulatory instruments can also do so.

Scope for mutually enhancing instruments should be exploited...

Various labelling schemes and other information-instruments can enhance the environmental effectiveness of taxes, fees and charges – especially if they convey information on *private benefits*. Hence – with the general caveat of making sure that benefits exceed costs – such instrument combinations could usefully be applied.

... but otherwise, overlapping instruments ought to be avoided

Except for situations where mutual reinforcement between instruments is likely, or when the instruments address different “aspects” of a given problem, policy-makers should generally *avoid introducing overlapping instruments* – as such overlaps will tend to reduce the desired flexibility and create unnecessary administrative costs.

Avoid “over-burdening” environmental policy instruments with non-environmental tasks

It is advisable to address social concerns primarily with non-environmental policy instruments (e.g. the social security system or the tax system), rather than to modify environmental policy instruments. This will *inter alia* make it easier to provide an incentive at the margin for low-income households to behave in environmentally benign ways.

To the extent policy-makers want to address any negative impacts on the competitiveness of certain sectors stemming from environmental policies, it is again important to provide an incentive at the margin to abate emissions. Such incentives can, for example, be provided through (both grandfathered and auctioned) emission trading systems and through environmentally related taxes – possibly with recycling of revenues back to the sectors of concern.

It can also often be preferable to primarily address *non-environmental market-failures* (market power, incomplete property rights, split incentives, etc.) with non-environmental instruments, such as competition policy instruments, improvements to patenting systems, deregulation of the housing markets, etc.