For Official Use **ENV/EPOC/WPIEEP(2017)2**

Organisation for Economic Co-operation and Development

28 June 2017

English - Or. English

ENVIRONMENT DIRECTORATE
ENVIRONMENT POLICY COMMITTEE

Cancels & replaces the same document of 7 June 2017

Working Party on Integrating Environmental and Economic Policies

Flexibility Mechanisms in Environmental Regulations: A Scoping Note

5-7 July 2017
OECD Headquarters, Paris

At the WPIEEP meeting 14-15 November, a presentation was made suggesting possible lines of work in a project in the 2017-2018 PWB called "Towards smarter environmental regulation". Building on that presentation and on comments made during the WPIEEP meeting, this note scopes out in more detail work that could be done to assess advantages and disadvantages of building-in various forms of flexibility mechanisms in "command-and-control" (CAC) environmental regulations.

Nils Axel Braathen, Telephone: +33 (0) 1 45 24 76 97; email: Nils-Axel.Braathen@oecd.org.

JT03416822

Note from the Secretariat

At the WPIEEP meeting 14-15 November, a presentation was made suggesting possible lines of work in a project in the 2017-2018 PWB called "Towards smarter environmental regulation". Building on that presentation and on comments made during the WPIEEP meeting, this note scopes out in more detail work that could be done to assess advantages and disadvantages of building-in various forms of flexibility mechanisms in "command-and-control" (CAC) environmental regulations.

ACTION REQUIRED: For discussion.

Flexibility Mechanisms in Environmental Regulations: A Scoping Note

1. Introduction

1. At the WPIEEP meeting 14-15 November, a presentation was made suggesting possible lines of work in a project in the 2017-2018 PWB called "Towards smarter environmental regulation". Building on that presentation and on comments made during the WPIEEP meeting, this note scopes out in more detail work that could be done to assess advantages and disadvantages of building-in various forms of flexibility mechanisms in "command-and-control" (CAC) environmental regulations.

2. The OECD has conducted extensive work highlighting the advantages of using market-based instruments, with a focus on aligning incentives and getting the prices right, to efficiently and effectively achieve environmental objectives. Over the years, this has contributed to the greater use of taxes, charges, and tradable permits to manage environmental issues, both within and beyond the OECD's membership. Nevertheless, direct "command and control" (CAC) regulatory instruments, such as laws or regulations stipulating environmental quality standards or limits on emissions of various pollutants, still represent a major proportion of all instruments currently being used for environmental policy in OECD countries. The main advantage of introducing one or more flexibility mechanisms in such regulations is that this could possibly reduce the costs of complying with the regulations – which in principle could make it possible to increase the level of ambition underlying the environmental objectives behind the instruments.

3. However, some types of flexibility mechanisms might also entail environmental drawbacks, for example shifting local air pollution from areas with low population density to areas with higher population densities, thus increasing the social costs of a given amount of emissions.[1] For example, Chan et al. (2015[1]) found that such effects were important in relation to the US Acid Rain Program. Hence, a careful analysis of the costs and the benefits of the different policy instruments – and of potential modifications to them – is called for.

[1] The terms "emissions" and "pollution" are being used here in a broad sense; most of the discussion is relevant also for other types of environmental issues, such as resource management and biodiversity protection.

2. Categories of environmental issues

4. It can first be useful to highlight some potential drawbacks of CAC policy instruments, cf. (Gunningham, 2011[2]):

1. The overall strictness of the instruments could be "wrong" (as is the case for any other instrument category). This would imply that the overall social benefits of a well-designed modification of the instrument would be larger than the related costs.
2. The instruments do not equalise marginal abatement costs across sources contributing to the same problem (lack of static efficiency). This means that polluters for whom abatement is costly are abating more than optimal, whereas polluters for whom abatement is less costly are abating too little. The total costs to society of achieving a given level of environmental quality are higher than necessary.
3. The instruments do not provide "correct" incentives for further technology development and innovation (lack of dynamic efficiency). With many types of standards; once a polluter is in compliance, he has no economic incentive to develop technologies to abate even more.

5. Haščič, Johnstone and Kalamova (2009[3]) discussed the innovation impacts of different policy instruments and found i.a. that

> "the juxtaposition between market-based instruments and direct forms of regulation is somewhat misleading. For instance, while a tax on CO_2 is flexible, a differentiated tax for environmentally friendly products is unlikely to be as flexible.[2] In the first case any possible means to reduce CO_2 is potentially attractive, while in the latter case the technological possibilities are constrained by the precise means of tax differentiation. Indeed, to the extent that the criteria for differentiation are based on technological criteria, it could be argued that such a measure would have more similarity with technology-based standards than with a CO_2 tax. Similarly, a performance standard may have more similarities in terms of flexibility with an emissions tax than with a technology-based standard. For instance, if the point of incidence of the performance standard is identical to the base upon which an environmental tax is applied, then they will be equally flexible.[3]"

6. It is also useful to keep in mind that the environmental problems which the CAC instruments are meant to address can be of a local, regional or global geographical scale, and they can be related to environmental stocks, e.g. of pollution (e.g. GHG concentrations in the atmosphere), or environmental flows (e.g. noise or short-term peaks in concentrations of ground-level ozone).

2 For instance, the application of the "bonus-malus" system on the sales price of motor vehicles in France. (*Note in the original*.)

3 Note, however, that the "depth" of the standard will be shallower since there will be no incentives to innovate beyond the level of the standard. (*Note in the original*.)

7. Further, one can distinguish various categories of flexibility that could be added to a CAC regulation:[4]

- Flexibility regarding *how* to reduce emissions, for example when a standard requiring the use of a particular abatement technology is replaced by a standard that sets limits on pollutant concentrations from a firm's smokestack.
- Flexibility regarding *where* emissions are being reduced, e.g. through emission trading systems that allow emissions to be shifted from one geographical area to another.
- Flexibility regarding *who* should reduce emissions. An emission trading system can also provide such flexibility – and so could e.g. various offset mechanisms covering point- and non-point sources of water pollution.
- Flexibility regarding *which* pollutant to address, for example if a given enterprise emits several pollutants that contribute to the same environmental problem, like nitrogen and phosphorous which both contribute to eutrophication of water.
- Flexibility regarding *when* emissions are being abated, for example through banking and borrowing provisions.

3. Impacts of various flexibility mechanisms

8. The different categories of flexibility will have different economic and environmental consequences in relation to the different types of environmental issues outlined in paragraph 5. Table 1 provides some preliminary examples, focusing on whether the environmental issue is of a stock or a flow character. Similar tables could be prepared to highlight differences between local, regional or global environmental issues.

4. The aim of the project

9. The main aim of the project would be to provide policy makers a better understanding of what would be the economic and environmental impacts of adding more flexibility to existing or new "command-and-control" regulations. Any such modification ought to be based on careful assessments of the related social costs and benefits, with the intention to maximise social welfare.[5]

10. With this aim in mind, the project should seek to clarify:

- What are the positive or negative *economic* (in a narrow sense) impacts of adding some sort of flexibility mechanisms in given categories of CAC regulations?

4 Toman, Morgenstern and Anderson (1999[4]) provides an early discussion of various types of flexibility mechanisms, in relation to the Kyoto Protocol.

5 The intention is *not* to indicate that such modifications ought to be subject to stricter scrutiny than what is common in other policy contexts. *Ideally*, all policy instruments ought to periodically be re-assessed, with the view to consider if any modifications to them could entail net social benefits. However, in practice, there are of course limits to the capacity of administrations to conduct ex post policy analyses.

Table 1. Impacts of flexibility mechanisms in regulations addressing stock and flow issues

	Stock issue	Flow issue
Examples of "command-and-control" instruments	*An energy-efficiency standard for electrical appliances aiming to limit the concentration of greenhouse gases in the atmosphere* *An energy-efficiency standard for coal-fired power plants also aiming to limit the concentration of greenhouse gases in the atmosphere*	*A standard prescribing the use of a given technology to limit the noise level of motorcycles* *A standard prescribing the use of scrubbers at coal-fired power-plants in order to limit SO_2 emissions*
How-flexibility	An energy-efficiency standard for electrical appliances or for power plants would normally not specify how a given performance is to be achieved, but if it did include some restrictions, increased how-flexibility would not affect the environmental outcome.	Flexibility on how to reach a given noise level could reduce economic costs and need not have negative environmental impacts – if this would not affect the enforceability of the standard. Replacement of the technology standard for power plants with a performance standard; allowing each plant to decide on how to reach a given performance level could reduce costs and should not have significant environmental impacts
Where-flexibility	Where-flexibility seems to be of little relevance for electrical appliances A possibility for electricity producers to average energy-efficiency performance across several coal-fired plants could reduce abatement costs and would not have an impact on the GHG concentrations. A chance in the location of power generation could, however, have impacts on the consequences of other emissions caused by these plants concerned.	Where-flexibility seems to be of little relevance for a noise standard for motorcycles. A possibility for electricity producers to average SO_2 emissions per kWh produced across several coal-fired plants could reduce abatement costs but would also change the location of where the emissions with negative health impacts takes place. Depending on the prevailing wind patterns and on the population concentrations in the affected areas, this could increase or decrease the social costs caused by the emissions.
Who-flexibility	The impacts are largely similar to those of where-flexibility. Perhaps a standard for coal-fired power plants could include a possibility to offset emissions linked to the plant with reduced emissions linked to the mining of the coal, which potentially could reduce overall abatement costs.	The impacts are largely similar to those of where-flexibility.
Which-flexibility	Not relevant for the electrical appliance standard. If an offset mechanism was included in the power plant standard, this could allow reductions in methane emissions to replace reductions in CO_2 emissions.	Not relevant for these two standards.
When-flexibility	In both cases, it would be possible to look at average energy-efficiency over a certain timeframe. While this might reduce compliance costs somewhat, the environmental impacts would be very modest, as they are determined by the accumulated concentration of GHGs in the atmosphere.	When-flexibility is of no relevance for a noise standard for motorcycles. A possibility for electricity producers to average SO_2 emissions per kWh produced over a certain time period could reduce compliance costs somewhat. If the averaging is done within each of the plants, the impacts on the environment and on human health should be relatively modest.

- What are the positive or negative *environmental* impacts of doing so?
- What are the positive or negative *distributional* impacts of adding such flexibility?
- Do the impacts mentioned above vary with
  - The type of flexibility mechanism used (how, where, who, when, etc.)?

- The environmental domain that the regulation addresses (climate change, air pollution, water pollution, noise, etc.)?
- The geographical scope of the regulation (local, regional, global)?

5. Further steps in the project

11. It is suggested that the project

- elaborates the examples above further, discussing in more detail what could be the social costs and benefits of the impacts mentioned;
- incorporates additional examples, with a similar discussion of the consequences of the relevant impacts – incorporating i.a. examples suggested by delegates;
- discusses more in detail to what extent the flexibility mechanisms would address the drawbacks of CAC policy instruments mentioned in paragraph 4; and
- considers how the impacts of various flexibility mechanisms could vary depending on the geographical scale of the environmental issue of concern.

12. It is suggested that the project includes a broad review of the literature on economic, environmental and distributional impacts of various flexibility mechanisms in environmental CAC regulations. The findings of this review would be incorporated into the discussion outlined above.

13. It can also be useful to get a better picture of

- the extent to which member and partner countries apply such flexibility mechanisms in relevant policy instruments;
- the motivations behind their use; and
- the advantages and disadvantages experienced with their application.

14. The Secretariat will therefor prepare a draft questionnaire, which will be presented as a Room Document to the WPIEEP meeting on 5-7 July. The aim of this data collection would be to exchange experiences, in order to help countries consider whether it could be advantageous to introduce new flexibility mechanisms in their environmental regulations likely to provide net social benefits.

15. In order to limit the reporting burden for Delegates, it can be useful to limit the data collection to flexibility mechanisms applied in regulations focusing on a limited (e.g. 4-5) number of environmental issues (examples include climate change, ozone layer protection, local air pollution, water pollution, water scarcity, biodiversity protection, management of other natural resources, waste prevention, noise, and chemicals management [which probably would have to be limited to the management of a selection of chemicals]). Delegates are invited to suggest which issues it would be of greatest interest to them to look at – but it would be useful to cover a variety of categories of environmental issues.

16. In order to limit the reporting task further, it is suggested to limit the survey to national or federal policy instruments.

17. The findings of the survey would be built in to the draft project report, which will be presented to the WPIEEP meeting in February 2018.

References

Chan, H., et al. (2015), "The Impact of Trading on the Costs and Benefits of the Acid Rain Program", *RFF Discussion paper series*, No. 15-25-Rev, Resources For the Future, Washington, DC, http://www.rff.org/files/document/file/RFF-DP-15-25-REV.pdf [1]

Gunningham, N. (2011), *Improving the Economic Efficiency of Environmental Regulation: Scoping Paper*, OECD, Paris. [2]

Haščič, I., N. Johnstone and M. Kalamova (2009), "Environmental policy flexibility, search and innovation" *Czech Journal of Economics and Finance*, vol. 59/5, http://journal.fsv.cuni.cz/storage/1168_str_426_441.pdf, pp. 426-441. [3]

Toman, M., R. Morgenstern and J. Anderson (1999), "The Economics of When Flexibility in the Design of Greenhouse Gas Abatement Policies", *RFF Discussion paper series*, No. 99-38-REV, Resources for the Future, Washington, DC, http://www.rff.org/RFF/documents/RFF-DP-99-38-REV.pdf [4]