

VI. GUIDANCE DOCUMENT ON ECONOMIC INSTRUMENTS TO REDUCE NITROGEN OXIDES, SULPHUR, VOLATILE ORGANIC COMPOUNDS AND AMMONIA

355. Economic instruments enable a reduction in the overall cost of implementation and can, in principle, bring about a full internalization of the environmental costs, thus leading to the optimal level of pollution control. Giving a financial incentive to polluters to reduce emissions, economic instruments provide an alternative to other measures. In practice, however, a mix of instruments may prove to be most effective. Some economic instruments are designed to serve purposes other than environmental ones. A common feature of economic instruments is that they leave some freedom of choice to the producers and consumers concerned. This enables them to exploit cheap abatement options that are available to them and provides a lasting incentive to develop technological innovations and more cost-effective emission control measures. In many cases, economic instruments create revenues. In some cases these have been used to further other policy objectives ("double dividend"), in others they have been earmarked for purposes closely related to the environmental objective: e.g. to compensate those that suffer damage from pollution; to subsidize emission control measures; or to compensate for a loss in competitiveness for the industry concerned.

356. To reap the benefits of economic instruments it is important to consider carefully the conditions under which particular economic instruments are likely to perform relatively well and take account of the situations in which their use is less advisable, for instance, when an appropriate tax base cannot be found. Furthermore, every economic instrument can be designed and implemented in a variety of ways. Careful design and implementation may help to make them more effective and to reduce the chances of undesirable side effects, for instance, due to misdirected incentives. In many cases, this will mean that economic instruments are part of a policy mix in which direct regulation, voluntary approaches and exchange of information play a role as well.

The experience gained in the use of economic instruments to reduce emissions of nitrogen oxides (NO_x), sulphur, volatile organic compounds (VOCs) and ammonia has been reviewed in a background document based on national expertise and scientific literature. Using this review, the tables below summarize the most important findings of relevance to Parties implementing the obligations of the Protocol. The first of the three tables shows the main features and aspects of the four categories of economic instruments that are likely to be the most relevant in the present context (tradable permits and quotas; emission and process taxes/charges; product charges and tax differentiation; subsidies and fiscal facilities).^{1/} Their performance is assessed against a number of criteria and some important issues in the design of the instruments are mentioned. The second table illustrates the applicability and actual application (in the years until 2010) of the four instrument categories to various source categories and the third table presents a (non-exhaustive) list of provisions needed for the actual implementation of economic instruments. Table 2 has been updated for 2010 based mainly on the OECD/EEA database on instruments used for environmental policy and natural resources management (Updated to 2010 for most countries) www.oecd.org/env/policies/database/; and Lindhjem, H; J. M. Skjelvik, A.Eriksson, T. Fitch and L-L. Pade Hansen 2009: The Use of Economic Instruments in Nordic Environmental Policy 2006–2009. TemaNord report 2009:578. Nordic Council of Ministers, Copenhagen.

Since the last update of this guidance document, a major difference is the implementation of the European Union Greenhouse Gas Emission Trading System (EU ETS) in 2005 and national ETSs for CO₂ (e.g. in Denmark and Norway); and the co-benefits these reductions in greenhouse gas emissions will have in terms of reducing emissions of pollutants covered by the convention. Other major changes include the implementation of emission charges for NO_x and SO₂ in more countries, the introduction of subsidies for renewable energy in many countries, and the emergence of voluntary agreements between the industry and the government.

357. In addition to the issues presented in the tables, the following general considerations and recommendations should be taken into account:

1. Economic instruments will have their optimal effect in cases where the market mechanism functions well. Therefore, it is necessary to check whether the actors who will be directly or indirectly affected by the instruments operate on (at least) reasonably competitive markets and have access to the information needed for their decision-making. It may be necessary to accompany (or precede) the introduction of an economic instrument with policies that improve the functioning of markets and the availability of information on emission reduction options and environmental benefits;
2. Although pollution taxes or tradable permits are often presented as alternatives to direct regulation, they will in practice almost always be embedded in a mix of instruments, in which also standards, voluntary agreements and/or other instruments may be involved. When introducing an economic instrument it should be checked that the various instruments will be mutually reinforcing rather than counteracting;
3. Taxes and charges can have an incentive function and/or a revenue-raising function. The incentive function can be realized directly by making abatement efforts profitable or indirectly through reaction in the market (due to the cost increase being passed on to consumers);
4. Preferably, economic instruments (especially taxes and charges), like other instruments, should be announced well in advance of their starting date and should involve consultations with stakeholders. This will enable producers and consumers to take account of the instrument in their investment decisions and to react optimally to the changed market conditions, thus improving overall efficiency. However, for some product taxes, the announcement may also lead to stockpiling.

Table 1. Experiences, features, issues and considerations

	Tradable permits and quotas	Emission and process taxes/charges	Product taxes and tax differentiation	Subsidies and fiscal inducements
Main features	Allow the reallocation of emission or production rights among firms (or their spatial or temporal reallocation by a single firm)	Polluter pays a fixed or variable tax (charge) per unit of emission or per unit of a polluting activity	Polluter pays a fixed or variable tax per unit of polluting product; tax on "cleaner" product may be reduced	Improve the competitiveness of products or processes that cause lower emissions than "standard" technology
Exemplary cases (see also table 2)	Emission trading programmes (United States); manure quotas (Netherlands)	NO _x charge (Sweden; Norway, Denmark); emission taxes in several central and east European countries	VOC incentive tax (Switzerland); sulphur tax (some countries); tax reduction for "cleaner" fuels and cars (several countries)	Environmental funds (mainly in central and eastern Europe); accelerated depreciation schemes (several countries); price guarantees for renewable energy (Germany)
Applicability (see also table 2)	(Large) point sources (permits); polluting products (quotas)	(Large) point sources	"Intrinsically" polluting products	Low-emission technology (especially if performance exceeds standards)
Effectiveness	Allow flexibility while securing cap on total emissions	Can be very effective if rate is set at an appropriate level; precise effects of the tax may be difficult to estimate	Can be very effective if rate/difference compensates for higher cost of substitute	Can play an important role in creating a market for new technology; accelerated depreciation (and other corporate tax deductions) are only effective in case of profit-making firms
Efficiency	Potentially high, especially when abatement costs vary widely; accumulated capital savings in the United States estimated at > US\$ 10 billion	Potentially high, especially when abatement costs or costs of substitutes vary widely	abatement costs or costs of substitutes vary	Eligible equipment may not be optimal in all cases; risk of subsidizing investments that would have been made anyway
Monitoring and enforcement effort involved; administrative costs	Dependent on procedures and conditions; may be relatively high due to trade approval procedures	Dependent on number of sources affected and on measuring method; admin. costs in case of Swedish NO _x charge estimated at 0.7% of revenues	Relatively low, in particular if existing administrative infrastructure can be used and if number of producers/importers is limited; admin. costs in case of Swedish sulphur tax estimated at 0.1% of revenues	Dependent on scope and details of the subsidy scheme
Distributional aspects and economic impact	- Dependent on assignment of permits/quotas (e.g. "grandfathering" or auctioning); - If markets are imperfect, dominant firms may increase their market power	Dependent on market situation, tax/charge rate, costs of emission reduction, and revenue destination; impact can be minimized by recycling revenues	Dependent on market situation, tax/charge rate, costs of substitutes, and revenue destination; distributional impact may be regressive if basic goods (e.g. energy) are taxed and if income tax is simultaneously	May come into conflict with the "polluter pays principle"; may lead to "windfall profits" if subsidized investment would have been made anyway

	Tradable permits and quotas	Emission and process taxes/charges	Product taxes and tax differentiation	Subsidies and fiscal inducements
		to charge-/taxpayers	reduced	
International trade aspects	No discrimination against foreign-owned firms	"Border tax adjustments" can be applied, but should be compatible with WTO and, where applicable, EU rules	Tax/charge can be levied on imported goods and refunded for exported goods (but no customs duties allowed in intra-EU trade); discrimination against foreign producers should be avoided	Compatibility with WTO and, where applicable, EU rules should be checked in advance; appearance of favouring domestic producers should be avoided
Possible side effects	<ul style="list-style-type: none"> - Risk of "hot spots" if location of emission matters - Auctioned permits raise revenue for public spending 	Taxes will generate revenue		Subsidy may act as a catalyst in negotiations between environmental authorities and firms
Important issues in instrument design	<ul style="list-style-type: none"> - Criteria for trade approval should be transparent and not too restrictive, so as to avoid market thinness - Fiscal treatment of permits and quotas (as assets) should be clear 	Tax should be accompanied by a reliable emission reporting system	Scheme should provide for exemption/refund if product is used in ways that do not cause emissions	Budgetary impact should be carefully assessed, especially if scheme is "open-ended"

Table 2. Applicability and application by main source category */

	Tradable permits and quotas	Emission and process taxes/charges ^{a/}	Product taxes and tax differentiation	Subsidies and fiscal inducements
NO_x: (large) point sources	√√ Emissions trading: CA US GB CH ^{c/} "Internal bubbles": DK NL	√√ Incentive charge on emissions: SE, NO Financing charges/taxes on emissions: BG CA ^{c/} CZ EE ES ^{c/} FR HR IT LV LT ME PL RO RS RU SK		Emission related: NL ^{b/} Energy related: AT CA DK DE LT NL NO PL SE GB Industry related: CA CY FR DE GR NL PL PT
NO_x, SO₂ and VOCs: mobile sources	√√ Only used on the urban scale: Cracow (PL), Singapore	√ Environmentally motivated road pricing: AT, BE, DE	√√ Lower taxes on "cleaner" vehicles and/or fuels: AL AT BA BE BG CA HR CZ DK FI FR DE GR HU IS IE IT LV LI LT LU NL NO PL PT RO RU SK SI ES SE CH TR UA GB US	Investments: CA CY HU LT NO PL Car scrapping schemes: CA IE IT NO FR GR SE US
SO₂: large point sources	√√ Emissions trading: PL ^{d/} US GB CH ^{c/} "Internal bubbles": NL GB	√√ Financing charges/taxes on emissions: BG CZ DK EE ES ^{c/} FR HR IT LV LT ME PL RO RS SE SK	√√ Taxation of fuels differentiated according to S content: BE BG DE DK FI FR LI LU NO PT SE CH GB TR	Energy related: AT CA DK DE LT NL NO PL SE GB Industry related: CA ^{c/} CY FR DE GR NL PL PT
SO₂: small point sources		√√ Taxes on emissions: CZ		
VOCs: large point sources	√√ Emissions trading: CA US	√√ Incentive charge on emissions: CH Financing charges/taxes on emissions: CZ EE FR LI LV PL Financing charge on processes: PL	√√ VAT reduction for low-solvent paint: CZ SK Tax on solvents (as from 2000): CH	Energy related: AT CA DK DE LT NL NO PL SE GB Industry related: CA CY FR DE GR NL PL PT
VOCs: small point sources and products		√√ Taxes on emissions: CZ		
NH₃: large point sources		√√ Financing charges/taxes: BG CZ EE PL LT		Industry related: CA CY FR DE GR NL PL PT
NH₃: agriculture	√√ Emissions trading ("offsets"): NL ^{e/}	√ Charge on surplus manure: BE NL	√ Charge/tax on N-fertilizer: AT ^{b/} DK FI ^{b/} NO SE US ^{e/}	

Notes:

a/Excluding non-compliance fees.; b/ Abolished.; c/Sub-national level; d/Sub-national experiments.

*/ Number of ticks reflects relative suitability of instrument/source category combination: √√ indicates the highest level of suitability. Codes are ISO-3166 codes referring to countries which have experience with the instrument/ source category combination:

AL	Albania	FR	France	MK	Macedonia
AT	Austria	DE	Germany	NL	Netherlands
BE	Belgium	GB	United Kingdom	NO	Norway
BA	Bosnia and Herzegovina	GR	Greece	PL	Poland
BG	Bulgaria	HU	Hungary	PT	Portugal
CA	Canada	IS	Iceland	RO	Romania
CH	Switzerland	IR	Ireland	RU	Russian Federation
HR	Croatia	IT	Italy	RS	Serbia
CY	Cyprus	LI	Liechtenstein	SK	Slovakia
CZ	Czech Republic	LT	Lithuania	SE	Sweden
DK	Denmark	LU	Luxembourg	SI	Slovenia
EE	Estonia	LV	Latvia	TR	Turkey
ES	Spain	MA	Malta	UA	Ukraine
FI	Finland	ME	Montenegro	US	United States

Table 3. Implementation provisions

This table presents a concise (non-exhaustive) checklist of the main actions, tasks and responsibilities likely to be involved in the application of the four types of economic instruments. Successful application of the instrument depends on the clear assignment of responsibilities for the implementation of each of these items

	Tradable permits and quotas	Emission and process taxes/charges	Product taxes and tax differentiation	Subsidies and fiscal inducements
Preparation	<ul style="list-style-type: none"> - Assessment of relevant factors and institutional settings (including division of responsibilities among different levels of Government) - Determination of appropriate instrument mix - Initial proposal for introduction of the economic instrument - Feasibility study and impact assessment (economic, environmental, administrative) - Revised proposal - Consultations with all parties involved (clarification of objectives, explanation of instrument chosen, overview of consequences, listing of comments, wishes and objections) - Final proposal and political decision procedure - Time schedule and preliminary/transitional provisions 			
Legislation	<ul style="list-style-type: none"> - Definition of tradable items - Eligible actors - Conditions and criteria - Relationship with existing regulations - Administrative procedure for trades - Sanctions 	<ul style="list-style-type: none"> - Taxable/chargeable events/products - Taxable/chargeable actors - Tax/charge rates, exemptions and refund criteria - Declaration/assessment procedure - Appeal procedure - Sanctions 		<ul style="list-style-type: none"> - Eligible investments/ products - Eligible actors - Conditions and criteria - Amount/rate - Application procedure - Appeal procedure - Sanctions
Information provision	<ul style="list-style-type: none"> - Information campaign at the introduction of the instrument (both general and targeted) - Continuous availability of information and assistance for affected/eligible actors 			
Execution, monitoring and enforcement	<ul style="list-style-type: none"> - Assignment of permits/quotas (auctions; redistribution of permits that have been "skimmed"; renewal of temporary permits/quotas) - Monitoring trade - Possible government interventions in the permit/quota market - Compliance checks - Judicial action 	<ul style="list-style-type: none"> - Monitoring of emissions (or sample checks) - Checking declarations - Imposing tax/charge assessments - Tax/charge collection and redistribution - Judicial action 	<ul style="list-style-type: none"> - Monitoring of sales volume of product (or sample checks) - Checking declarations - Imposing tax/charge assessments - Tax/charge collection and redistribution - Judicial action 	<ul style="list-style-type: none"> - Checking applications - Checking compliance with criteria - Issuing decision on application - Payment - Fraud investigation - Judicial action
Evaluation	<ul style="list-style-type: none"> - Establishing a time schedule and criteria for evaluation (before introduction) - Determining procedures for data collection and exchange (before introduction) - Laying down the initial situation and envisaged development/objectives (before introduction) - Confronting observed results with objectives - Analysing causes of deviation from objectives - Identifying implementation problems, administrative costs and unwanted side effects - Proposals for adjustments of the instrument, or for other measures to achieve the objectives resp. to avoid problems, costs or unwanted effects. 			

^{1/} Deposit-refund systems are not included, as their applicability in the present context is extremely limited. Voluntary agreements, which are sometimes considered as economic instruments, are omitted as they do not fall within the definition of economic instruments used here (i.e. they do not provide a financial incentive to reduce emissions).