



HAL
open science

On markets and the conditions of a profitable use of economic instruments for environmental policy in countries in transition to market

Olivier Godard

► **To cite this version:**

Olivier Godard. On markets and the conditions of a profitable use of economic instruments for environmental policy in countries in transition to market. J. Becvar and M. Kokine. Role of Economic Instruments in Integrating Environmental Policy with Sectoral Policies, New-York and Geneva, Economic commission for Europe, United Nations, pp.11-21, 1998. halshs-00624095

HAL Id: halshs-00624095

<https://shs.hal.science/halshs-00624095>

Submitted on 15 Sep 2011

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Published in J. Becvar and M. Kokine (eds.), *Role of Economic Instruments in Integrating Environmental Policy with Sectoral Policies*. New-York and Geneva, Economic commission for Europe, United Nations, ECE/CEP/60, 1998, pp. 11-21.

On markets and the conditions of a profitable use of economic instruments for environmental policy in countries in transition to market¹

Olivier Godard²

1. Introduction

Economic instruments are generally advocated by economists for their ability to get cost-efficient outcomes when allocating scarce resources to environmental protection. Here, cost-efficiency means that achieving a given environmental target can be obtained at least total cost for society. How much is the gain, compared to other approaches, is an empirical issue which can be answered only by empirical studies: the margin of potential gain depends on typical features of each situation in which the use of economic instruments is considered.

Such features are related first to some 'structural' conditions such as information availability, the diversity of technologies in use and the scope for new technological opportunities, the heterogeneity of costs functions, the shape of environmental damage curves, and so on. They are also critically linked to characteristics of the prevailing economic organisation: definition of property rights (against free access) and liability rules, enforcement of the rule of the law, existence of markets on which firms do compete or which are open to easy entry of competitors ('contestable markets'), economic decentralisation of the choice of means for achieving some environmental quality targets (against administrative technological forcing), and so on.

¹ The paper has been presented as the introductory report to the *UN-ECE/OECD Workshop on the Role of Economic Instruments in Integrating Environmental Policy with Sectoral Policies*, held in Průhonice, Czech Republic, 8-10 October 1997.

² International Centre for Research on Environment and Development (CIRED), Paris, France.

In some recent actual cases, it is reported that well-functioning economic instruments can cut abatement costs by a factor of 3³. In other cases, the gain may be limited to only 30%, which may nevertheless leads to important amounts being saved when we deal with such economically important sectors as water treatment and distribution, or waste management. The more environmental policies develop and potentially constrain business practices, the more the gains derived from the use of economic instruments could be important. So, far from being a limited concern reserved for economists as a profession, economic efficiency of environmental policies ought to be considered a real concern for environmentalists who understand that environmental action will only be acceptable by populations in the long run if its cost is justified and non-inflationary, for industrial circles sensitive to competition on the marketplace or for local authorities sensitive to budgetary and tax constraints.

Meanwhile, analysts are generally aware, even on the basis of OECD experience, that a significant gap may exist between theoretical analyses of economic instruments' achievements and their actual performance in specific empirical cases: the practical design of instruments may be far enough from the theory in which it is said that inspiration has been taken; a lot of additional regulatory constraints may impede a correct running of the instrument; the contextual conditions in which the instrument is implemented may be at odd with the ones fitting well a cost-effective working of the instrument.

For instance, this would be non sense to expect an incentive tax to achieve significant environmental improvement and cost-minimisation in a situation where markets are hardly existing and essential resources are allocated through non-market procedures. A tax or a charge can be incentive if agents having to pay do have alternative ways to behave - it means they can make choices - and are sensitive to price stimuli.

On the other hand it would be a rather depressing conclusion that economic instruments could only be used when a full and perfect market economy is set up. In that case, there would be no room for using economic instruments for environmental policies at all, either for present OECD countries

³ This is the case of a recent assessment of the benefits of a flexible interutility SO₂ allowances trading in the USA in the framework of the Acid Rain Program, as compared to a traditional command-and-control approach (a uniform emission abatement rate for all facilities). See Burtraw (1996).

or countries in transition! In fact, there is a broad scope for an intelligent use of economic instruments without waiting the full development of a market economy. In intermediate, 'mixed', models of economic organisation, the issue of incentive compatibility of regulatory rules and institutional regimes has a critical importance for the cost-effectiveness of policies. In most cases incentive compatibility can be significantly improved by introducing economic thinking and instruments in such regimes.

The purpose of the paper is to provide an introductory discussion on the conditions permitting to benefit by economic instruments in a context of transition. Rather simple views on appropriate use of these instruments will be proposed. They will stress the advantages of a global economic restructuring towards a market economy for exploiting the efficiency potential of these instruments. At the same time, examples from OECD experience will show which benefits can be obtained from economic instruments even if markets do not function as hoped in textbooks, and in which directions some institutional settings could profitably evolve.

Section 2 considers theoretical efficiency conditions for economic instruments and derives two basic recommendations. Section 3 briefly looks back to past experience. Section 4 underlines why economic instruments may be profitable even when a market economy is not fully developed, and introduces two examples. Section 5 suggests a simple model of choices of policy instruments constrained by institutional trajectories. Section 6 considers some issues which may shape the choice of policy instruments in economies in transition. Section 7 provides a summary and conclusions.

2. From theoretical conditions of efficiency of economic instruments to basic recommendations

Economic instruments have, in many circumstances, a greater potential of economic efficiency than traditional Command And Control (CAC) approaches. This general conclusion is linked to stylised facts and assumptions characterising the contexts in which these instruments do their best. They correspond to the operation of a 'nearly perfect' market economy, i.e. a market economy which is 'perfect', excepted for environmental external effects. We know such 'perfect economy' does exist nowhere in the world, but it provides a

useful benchmark to clarify some critical conditions for the good functioning of a developed market economy and to identify what improvements should be targeted in the economies in transition so as to make a profitable use of economic instruments for their environmental policies.

*Economic instruments in
a nearly perfect market economy*

Regarding the ideal development of a market economy, the following assumptions are particularly significant:

- property rights on scarce goods are well-defined and legally enforced by the rule of the law; in the basic model, private property is the dominant form of property for all private goods, although some public and common property coexist for collective goods; each agent is given the opportunity to fully exploit its own property rights and, at the same time, strictly respects the property rights of others;
- access to private goods and services is provided on a competitive market, for which individual agents are 'price-takers'; market prices ensure an equilibrium between demand and supply; this equilibrium is Pareto-optimal, but contingent to the initial distribution of income and property rights;
- economic agents behave as to maximise an objective-function - utility in the case of consumers, profit in the case of producers -; because of this supposed ability to optimise their choices in using scarce resources and goods, and willingness to catch advantageous opportunities, agents are sensitive to changing economic conditions; so, they are responsive to price movements;
- decentralised agents possess the best information on the range of technologies available, the nature and quality of economic goods and services, and the costs and benefits that may be the outcome of their actions; business firms, but also public utilities, are supposed to be familiar with their own production function and their own marginal abatement cost curves for the pollution they emit; compulsory accounting procedures are facilitating this consciousness in providing separate analytical accounts for each category of goods produced or consumed;

- the income or budgetary constraint applies rigorously, which is a key departure from the planned socialist organisation in which a 'soft budgetary constraint' was dominating the behaviour of publicly-owned production units (Kornai, 1984);
- though their choices are limited by the income or budgetary constraint, some intertemporal flexibility is allowed by an undiscriminated access to credit; the rate of interest on this credit market provides the appropriate equilibrium between supply and demand, savings and investment;
- general state expenditures for guaranteeing basic conditions of public order for citizens within a modern state (justice, police, defence, education,...) are covered by non-distortionary taxes⁴; the provision of specific public goods (a bridge crossing a river...) is supposed to be covered by user charges corresponding to the marginal willingness to pay of each category of users, inasmuch information on willingness to pay is not strategically biased and there are no possibility of secondary black market; various publicly produced, privately consumed services (water or power distribution, for instance) are rated according to the rule of marginal long run production cost, with a constraint of budgetary equilibrium;
- internalising external effects into the market prices is the most straightforward way to take into account environmental external damage of production and consumption activities.

In such a stylised context, economic instruments (incentive charges, tradable emission permits or tradable production quotas, deposit refunds) are appropriate policy tools, since they involve the action of a price mechanism and are able to capture its efficiency properties. To say it shortly, the frequent superiority of economic instruments is to be found on the grounds of incentives and information, when

⁴ A tax is distortive when it changes the relative incentives to which agents are exposed through price mechanisms, then unintendedly affecting choices regarding investment, the choices of techniques or consumption bundles; it introduces a gap between their actual choices and the 'first best' ones they prefer when they face with undistorted price signals. For instance, if product taxes only respond to raising funds purposes, they are distortive in proportion of the price-elasticity of demand of these products. Welfare loss resulting from distortionary price signals is often referred to as 'dead-weight loss cost' of taxes.

decentralised agents do behave as market operators. So, two central dimensions of economic instruments are of concern for the following discussion:

- they provide economic incentives so as to reconcile private and public interest and escape frequent tendencies for individuals to try to escape rules that impose on them costs or constraints not directly responding to self-interest;
- they allow the full use of private information owned by decentralised agents without requiring the transfer of this information to central authorities; being exposed to the appropriate price signals, decentralised agents calculate optimal responses which incorporate all technological and economic information they possess, for the best benefit to society.

Independently on the level of market extension, some features of the real world introduce various sources of additional complexity in the model and may change the content of recommendations for the use of economic instruments. One of these features is uncertainty regarding social abatement costs curves or damage costs curves, or both. One another is related to technological progress. Main features are synthesised thereafter in the Figure 1 which details the influence of several variables on the best policy instrument.

Two derived basic recommendations

The mentioned theoretical economic construct is useful for understanding the general conditions of an efficient action of price mechanisms. Two main recommendations can be derived:

- (1) *achieving a definition of property rights as complete as possible*: In every case, property rights are essential because, by making access regulated and conditional to a counterpart, they lay the ground for a rational, intertemporal management of resources. Defining property rights does not necessarily mean private property. International experience demonstrates the great variety of forms of property rights and conditions for cost-effective management of natural resources. Along with private property, there exists quite traditional public property and also common property (Ostrom, 1990). The so-called 'tragedy of the commons' is only a 'tragedy of free access'.

Figure 1 : Variables affecting the choice between regulation and economic instruments

(from Godard and Beaumais, 1994, p. 155)

| INFLUENCE | IN FAVOUR OF ADMINISTRATIVE REGULATION | IN FAVOUR OF ECONOMIC INSTRUMENTS |
|---|---|--|
| CIRCUMSTANCES | ↑ | ↑ |
| Nature of the problem | → | → |
| | Definition of a common convention or goal | Allocation of a scarce resource |
| Number of agents concerned by an allocation problem | Small | Large |
| Access to information | Common, or public knowledge | Asymmetric and strategic |
| Shape of marginal damage cost curve compared to marginal abatement cost curve, under uncertainty | Deeper slope, or critical thresholds | Flat slope |
| Diversity of costs and opportunities across decentralised agents | Low | High |
| Potential to be expected from technological innovation | Low | High |
| Potential to be expected from technological standardization | High | Low |

How to read the figure is illustrated by the two arrows. Examples: (1) where the circumstance "nature of the problem" is in the position "definition of a common convention or goal", this favours the choice of administrative regulation; (2) where the circumstance "potential to be expected from technological innovation" is in the position "low", to some extent this also favours the choice of administrative regulation. An example is actions of conservation of natural spaces based on zoning and various restrictions upon usage and productive activities; limited to specific parts of the territory, such measures will not have major negative impacts on innovation. The situation is very different with control policies targeting industrial pollution.

For instance, if there are some concern about the use of groundwater and there is no regulation and property rights to define the conditions of access to this water, there is no base for an introduction of an economic mechanism, be they charges or tradable water rights; setting rules, rights and meters are a prerequisite of the play of any economic mechanism.

It is important that the definition of property rights is done as completely as possible in order to avoid leakage side-effects that will disrupt efficiency features of economic instruments. Partial settings may do no good. For instance, what about taxing commercial energy sources for their external effects (acid pollution, CO₂, ...), if agents may also have access to unregulated non-commercial sources whose extraction or use is depleting the environment? In such a case, the more the commercial source is taxed, the more the environment is disrupted through the leakage and bias in incentives.

(2) *defining incentives that are appropriate to target groups* (Nichols,1984): using incentive economic instruments may be a powerful instrument when target agents are sensitive and responsive to price signals. If, for whatever motives, the demand for goods or the use of natural resources is price-inelastic, economic instruments come to function only as taxes for raising revenues. For instance, if access to water services is priced and people who have to pay have got no alternative choices for changing their consumption patterns, due to the poor content of control variables they have in their hands (do they physically control their own consumption? have they access to alternative technologies?), this payment may be essential for financial motives but plays no economic role. Using economic instruments has to be seen as part of an integrated approach that, in parallel, aims at opening the scope of real alternatives to which agents have access. This diversity in means is supposed to be broadly brought by the development of a market economy. However it also depends, for public goods, on appropriate investments in, and organisation of public services.

When the price sensitivity and responsiveness is not developed, it may preferable to renounce, not to a strategic thinking in terms of incentives, but specifically to instruments directly

exploiting price mechanisms. Where decision-makers are sensitive to public opinion attitudes, devoting resources to a public information on environmental and cost performances of various entities (firms, local authorities, agencies) may be an interesting way to incite everybody to achieve a better environmental management. In other contexts, changing criteria for career advancement or adding some new personal bonus for good environmental management, may awake attention of managers often absorbed by other problems or taken within inappropriate routines. Another example is the specific role of committees and commissions in which members come from various horizons and represent different stakeholders: bringing regular flows of information, and possibly putting into question the reputation of such and such group or firm, may be an adequate incentive to vigilance⁵. Such a thinking may be very useful for defining a strategy of implementation of environmental policy targeting public sector activities, if they are still less responsive to price signals.

3. A brief comparative outlook on past experience

Much has been said on the reasons why planned, socialist economies have hurt so badly the environment in the past and demonstrated such a poor performance in environmental management⁶. Some are linked to structural choices (primacy for heavy industry and intensive use of dirty energy sources; under-development of so-called non productive activities). But others are related to incentives failures of the socialist economic organisation and institutions: disregard of the demand side, a focus on physical quantitative indicators of output, a lack of incentives for technological progress, a bureaucratic allocation of resources and funds, no pricing for the use of natural resources and functions, a low level of cross-sectoral integration, 'soft budgetary constraints', poor and distorted statistical information, a low implementation of the rule of the law, turned into an arbitrary and discretionary tool in the hands of a political bureaucracy (Goldman, 1985, Godard, 1991).

⁵ In the French case, the often quoted case of Water Basin Commissions, said to be sort of 'Water Parliament', is reported to achieve some efficiency by this exposure of each group to the look of others: no one likes to be denounced as a bad 'water citizen' due to its pollution! In that case, other aspects do matter too, with a complex mix: emissions and technological standards, subsidies received for investment programmes in pollution control and treatment, and, paradoxically not the most important aspect, the charges paid by polluters.

⁶ See a review in Godard (1991, 1994).

To some extent, the more recent history of some countries in transition such as Poland or Czechoslovakia also demonstrated a paradox: since the mid-seventies, they have committed themselves to an early introduction of some price instruments (charges for water resources, fines and penalties for non compliance, liability regimes for environmental damage) in an economic system which was not yet mainly driven by market price mechanisms; this early use has not proved to be successful, both on environmental and economic grounds (Godard, 1991; Zylicz, 1994).

Interesting paradoxical points can also be derived from the experience of OECD countries. In spite of early advocacy by economists and organisations as OECD, environmental policies have been mainly founded on administrative approaches (permit systems) and regulatory instruments based on various types of standards and corresponding concepts (BATNEEC⁷, for instance), which are currently characterised as CAC. In many cases, this CAC approach has been supplemented by financial tools (earmarked charges) so as to raise resources for financing investment programs for sewage treatment or pollution prevention. The recent growth in the use of economic instruments (Barde 1997) and 'third generation' instruments (dialogue, consultation, persuasion, covenants, voluntary agreements) (Dente, 1995) has not replaced that foundation, but supplemented it.

These facts can be interpreted as saying:

1. administrative, regulatory and law tools, by themselves, generally are not sufficient to achieve the enforcement of environmental targets recognised by the law; this may be seen as a social weakness of the rule of the law for environmental matters;
2. to be enforced, they need the support of appropriate financial and economic mechanisms, reducing the incentive gap for decentralised agents and bringing the means to invest in pollution control;
3. on the top of these tools, some specific scenes for exchange of information, deliberation, shaping common visions of issues and identifying common interests among main stakeholders, are often required to set the

⁷ BATNEEC stands for Best Available Technologies Not Entailing Excessive Costs.

policy directions and build the broad social acceptance of environmental policies.

So, a new frontier for policy instruments lies less in a further expansion of 'pure' economic instruments than in an improvement of 'mixed approaches'. How the three types of instruments do interact and can be put on a learning trajectory leading to an improved economic efficiency is the key question. For instance, can we avoid that consultation and dialogue lead to erode incentives and economic efficiency? Through which procedures of concerted actions could actors who take part to the definition of a regulatory regime be interested in choosing economic instruments for solving the problems they perceive?

4. On an efficient use of economic instruments in imperfectly developed, but improving, market economy

From section 2 it could be concluded that economic instruments should be reserved to fully developed economy. In fact, it is not necessary that the practical running of an economic instrument exactly corresponds to the pure theoretical market scheme to be a source of economic gains. Those instruments may be productive well before reaching a full development of a market economy. Several features are of interest:

- (1) Economic instruments tend to reveal information about abatement costs, obstacles and rigidities. This information is gained by observing the reactions of agents to the incentives supplied, since such instruments are not forcing behaviours and technological choices. This learning dimension is very important in practical contexts, where assessments of abatement costs and potentials are often very uncertain. It allows further adaptation of policies, adjustments of expectations about possibilities and priorities of action, and finally stimulate better-thought projects and regulatory action.
- (2) They preserve the flexibility and decentralisation of responses. So, they can avoid important mistakes and misallocations that could derive from an administrative forcing of technologies, for instance through imported stringent emissions standards, when the latter are based on wrong expectations about domestic costs and potentials. Bad information and wrong expectations are

more frequent than generally recognised: the history of regulation is full of surprises! Moreover, the flexibility of economic instruments allows the environmental policy to benefit by the general progress of the economy towards more flexibility and efficiency, while a CAC approach would not catch these opportunities. So economic instruments may be profitable, even when they are not so much efficient by themselves, but by avoiding other types of instruments that could induce unnecessarily high economic costs due to information deficiencies or limitations.

- (3) They can be profitable through their side-effects, or institutional opportunities they offer for building new settings responding to environmental and non-environmental objectives of society. Some of them are sometimes called « double dividend ».

Two exemplary cases deserve special attention since they demonstrate the potentials of these efficiency gains and other benefits that environmental economic instruments may bring to economies in transition. The first one shows the gains resulting from the coupling of two mentioned aspects: avoiding the costs of a bad-informed CAC; allowing to benefit by the economic changes towards more market flexibility. It is provided by the first phase of implementation of the Acid Rain SO₂ allowances trading programme in the United States. The second case is related to the use of charges and taxes, or auctioned tradable permits for achieving more comprehensive tax reforms. The current plea for an extension of ecotaxes (OECD, 1996, 1997) is based on a strategic thinking trying to link several types of improvements, for instance both environmental improvements and economic ones could be aimed at through the incorporation of ecotaxes and the reduction of fiscal distortions.

The US SO₂ allowances trading programme

Since the mid-seventies, the U.S. have experimented various solutions to give some flexibility to a rigid CAC environmental policy: 'bubbles', 'netting', 'offset', 'banking'. All these instruments have been linked to the concept of 'tradable' or 'marketable' permits, although most achievements did not involve any market or transaction with other economic agents, only arrangements between the administration and a

firm having one or several regulated facilities (Hahn and Hester, 1989).

A new turn has been taken with the 1990 reform of the Clean Air Act. Title IV includes the rules for developing a country-wide SO₂ allowances market for abating total emissions of power utilities by 50% of their 1980 level. Phase 1 of the programme formally⁸ began on January 1995, but allowances transactions happened before, the first publicised one being a 10.000 units trade made in May 1992 between the Tennessee Valley Authority and the Wisconsin Power & Light for a unit price said to be in the range of \$250-300.

What have we learned about abatement costs? Whereas prices of SO₂ allowances have been expected to go beyond \$1000⁹ and all the public debate during the 80s was animated by the view of very high costs, transactions achieved during the first years have been made at a much lower price than expected (\$130 in average and as low as \$70 in 1996) (Conrad and Kohn, 1996). At the same time, transactions volume has been rather low until 1995¹⁰, only 9% of utilities having taken the opportunity to trade (Rico, 1995). Is it a success or a failure for a market-based instrument? Not yet a success, according to what we imagine to be a fully developed market of allowances, but certainly a success if we consider economies in cost that this programme has already allowed: the implementation cost will be between one third or one half that it would have been with CAC, says Burtraw (1996). Key features are the following:

- CAC would have imposed scrubbers on every big power facility; market of scrubbers would have been a captive one and the cost would have remained rather high. Since utilities were not constrained by the Acid Rain Programme to adopt scrubbers, but allowed to consider alternatives, as fuel switching and blending with low sulfur coal, scrubbers producers have been driven by competition to innovate and find ways to cut the cost of the equipment they sell per ton of SO₂ saved (improvement in design, decrease of

⁸ It means that a binding cap on SO₂ was implemented from this date.

⁹ Before 1989, industry was saying that the marginal cost would be around \$1500/tonne of SO₂ and was opposing the programme on this basis.

¹⁰ In fact a take-off of the volume of transactions happened since 1995. Whereas transactions were limited under 2 million allowances during the April 1994-March 1995 period, they reached more than 5 million the next year and nearly 6 million in the April 1996-March 1997 period.

maintenance cost and increase of utilisation rate). In five years the overall cost of scrubbers has been halved. So, even with a low volume of transactions, tradable permits can be a powerful instrument for stimulating more cost-efficient solutions.

- In the same period, deregulation of railways has been achieved, provoking a drop in railway rates and allowing access to a much cheaper low-sulphur coal from the West. Such an increase of economic flexibility and competition outside the sector under consideration for the policy instrument (SO₂ emissions of power generation) has had a tremendous effect in cutting abatement costs. A CAC technological forcing would not have been able to catch this economic opportunity and would have maintained high abatement costs on utilities.

Environmental taxes and green tax reforms

For a specialist of fiscal matters, a perfect tax system is one which raises stable and predictable resources for the state with no distortions of economic behaviours. For an environmental economist, a perfect tax system is one which achieves perfect internalisation of external environmental costs by adding to the price system a whole set of incentives taxes. Until now, neither of them have been successful in achieving their ideals: actual tax systems are full of devices generating inefficiencies and distortions and incentives taxes for internalising external effects are scarce. Although both experts have difficulties to reconcile their views, the latter could be joined with profit so as to incorporate environmental or 'green' taxes in the general tax system (OECD, 1997). 'Double dividend' may have an empirical content inasmuch the actual tax system and environmental policies show sources of inefficiency and distortions. This is a matter of controversy among experts, since an assessment of potential benefits depend on judgements on the extent of present imperfections in economic organisation, whereas most economic models assume, for methodological reasons, either perfect competition on every market (top-down models) or needs-and-technology-driven behaviours (bottom-up models). Such models do not easily integrate existing price distortions, dynamic effects on technical progress, secondary environmental benefits and are not so reliable in testing various revenue recycling strategies (see Ekins, 1995).

In spite of controversies about ‘double dividend’, Sweden introduced in 1991 a large, budget neutral, fiscal reform touching 6% of GNP. It had several aims: greening the tax system, transferring income tax, which had reached very high levels, to VAT and environmental taxes. New environmental taxes include a CO₂ tax, a SO₂ tax, a differential tax on leaded and unleaded gasoline, and a NO_x tax for power generation. The CO₂ tax was intended in 1992 to generate a little over \$2 billion a year in revenue. After various adjustments, a little less has been obtained in 1993-1994, representing 30% of the total amount of energy and carbon taxes (OECD, 1996).

Such an approach has been much debated¹¹, without practical results until now, in the context of the international action for controlling climatic risks of global warming: a rather high carbon tax, phased in during several years in a predictable way, could allow both to contain CO₂ emissions and bring the means to reduce or cut other taxes and charges having distortionary effects. Particular attention is given on the unwanted side-effects of having placed for decades the social security burden on labour: they have contributed to generate massive unemployment in the EU, through a distortion of technological choices and types of technological progress in production, oriented to be labour-saving. Economies in transition could take the opportunity of structural reforms for putting the burden of social security partially on ‘bads’ such as environmental pollution and carbon emissions, rather than ‘goods’ such as employment, which is contributing at a macro level to the social equilibrium and equity of society.

5. A simple model for understanding choices of instruments constrained by institutional trajectories

Economic instruments may bring economic efficiency in environmental policies not only when a market economy is fully developed, but also, in the context of transition, when sufficient conditions are met regarding the definition of property rights, implementation of the rule of the law, and a minimum diversity of supply of goods and services, providing a scope for choices to agents. So far, so good, but why economic instruments have not been more intensively used up

¹¹ In 1992, the European Commission unsuccessfully proposed to other OECD countries to adopt a combined energy and carbon tax. The European debate is documented by A. Liberatore (1995).

to now? The concept of 'institutional trajectories' may give some light to this regard (Godard, 1995). This concept is linking the margin for change in the choice of policy instruments to the previous, inherited features of the regulatory regime. Due to the pre-existing 'investment in forms'¹² in the regulatory regime, which generally have been costly to set up, it is not an easy endeavour to change a whole regime. To be introduced, change should be perceived as a strong necessity or as a way to capture very significant benefits. So institutional innovation will mainly be achieved steps by steps from existing rules and devices, making overall compatibility with the existing framework an important issue.

Several attempts to introduce economic instruments (incentive charges, tradable permits) have failed in the past due to the lack of fitness to the existing legal or institutional background: it has been the case of differentiated charges according to the ecological sensitivity to pollutant discharges (Poland), or of new bases for taking charges (France) to take examples. The same way, in some countries, the development of tradable permits could be blocked by a strict interpretation of a basic principle of Administrative Law, that administrative permits are 'non-transferable'.

A rather simple, but radical for economists, conclusion results: the main issue of actual policy changes are not generally about economic efficiency, but about problem-solving and law compatibility. In uncertain and controversial universes (Godard, 1997), the very definition of the problem to solve is an issue of arbitration/compromise-seeking between alternative visions of priorities in the policy process. In that process, problem-building is directly related to the concerns and purposes of social actors, not directly to some objective, extra-social definition of environmental issues, as illustrated by debates on such issues as drinking water standards or global climate change hedging strategies.

¹² The concept of 'investment in forms' embraces types of investments required to establish and maintain new forms of organisations and conventions, implying the constitution and stabilisation of networks of actors whose behaviour has to be coordinated. Examples are the development of new accounting procedures (green accounting, life-cycle analyses, ...), framework for collective negotiations (Water Basin Commissions) or international regimes (climate change and the Rio convention). In the context of economies in transition, a whole set of new institutions have to be further developed regarding property rights, liability rules, statistics and data on the state of the environment and environmental expenditures, financial circuits and so on.

For the choice of policy instruments, this means that economic efficiency as such does not matter for most actors as the first priority, even if some of them use this rhetoric to achieve their aims (for instance, budget reductions aimed at by the Ministry of finance). For an institutional trajectory to lead to the use of cost-effective instruments, it has generally to provide other properties appreciated by social actors in a problem-solving context. Economists interested in the development of such instruments have to demonstrate the ability of these instruments to solve main problems perceived by actors and fit the major components of the institutional context.

So a rather simple model of ‘institutional trajectories’ and instrument adoption for public policies can be derived to understand the conditions of policy changes:

1. The existing regulatory regime should prove incapable of tackling problems generated by its functioning, or coming from a change in the larger economic or political environment.
2. Key actors of the existing system should have the feeling of suffering, now or in the near future, from the unresolved problems.
3. They should develop a clear conviction that it will be impossible to solve these problems within the existing regulatory regime.
4. They should be gained to the conviction that a specific change or new instrument will be able to solve the problems, because of its specific properties.
5. A critical coalition of actors sharing the same conviction about the necessity of change and the virtues of a new instrument should emerge and become an active spokesman in favour of the instrument.
6. The coalition in favour of the envisaged change should succeed in avoiding the formation of an opposite coalition able to block the process.
7. The proposed change and the profile of the new instrument should be in approximate accordance with the general

ideological and institutional movement of the society, here towards a market economy, but also in accordance to more specific stakes.

So considering economies in transition, the potential of development of economic instruments is linked to the ease with which such instruments could contribute to solve problems linked to what are perceived as major stakes.

6. Key stakes for the choice of policy instruments in Central and Eastern European countries in transition to market

Main policy instruments have both advantages and drawbacks in a context of transition to market. The full development of market-based instruments is too early, due to the general level of development of market mechanisms and organisation in these economies. At the same time, sticking to traditional CAC and ignoring economic instruments would be a factor of paralysis and delay in the process of modernisation of public policies and could induce unnecessarily high costs. Such a landscape attributes no absolute evident superiority to any given solution. In order to identify the chances for a reasonable incorporation or further development of some economic instruments, it is necessary to take into account key stakes structuring the present move of economies in transition. Letting aside critical, but general issues as income growth, employment and social security, or payment of wages of civil servants and pensions of elder, it seems that the following points deserve specific attention (Godard, 1995).

Territorial decentralisation

Transition to a market economy has been associated with a strong demand for keeping more resources and political power at regional and local levels, against central states largely associated with the failure of previous socialist regimes. The ability for these territorial authorities to decide about raising taxes and managing funds appear to be a critical issue of the period. Environmental taxes and charges may gain political attraction to this regard. However, if such instruments were intended to support mainly central mechanisms (financing general budget of the country, or specific national funds), they would provoke reactions of dissent. At the same time, an extension of the tax power of regions and local authorities, or emergence of a quasi-tax power for non-elected bodies

(agencies), or a territorial differentiation of tax rates could raise significant problems of law compatibility.

Privatisation

Privatisation of economic activities is a central piece of the transition to market. It has been achieved to various extents in countries in transition. This step can be taken as an opportunity to clarify or enrich entitlements¹³ regarding access to resources (ground or surface water, for instance) and liability rules regarding technological risks, accumulated contaminants, or emission of pollutants. This stage could be seen as an opportunity to develop new market approaches such as insurance mechanisms or tradable permits. Generally speaking, since private firms are more sensitive to financial incentives than public bodies, extension of the private sector could profitably be supplemented by an increasing role given to price instruments for environmental policies.

In order to achieve a deeper integration of environmental policies in different sectors (industry, agriculture, transportation, energy usage, local services) a whole set of environmental taxes could be considered: air emission charges, energy taxes, mineral oil tax, waste deposit charges, packaging charges, basic chemicals charges, various water charges, and even land-use charges. A good management of all these taxes would require a solid fiscal administration with accepted and well-developed means for measuring actual flows or outright estimations based on technological classifications, tracking payments and checking accounts.

Meanwhile, privatisation generates new groups of interests and new lobbies wanting to exploit any opportunity to take advantage of an actual market economy by internalising benefits and externalising social costs (Kapp, 1950). An extension of ecotaxes will presumably be ferociously resisted by private business in these countries as in most OECD countries. Strategically, a key issue is to think about green tax reforms which may gain the neutrality or the support of significant part of business circles (for example those labour-intensive activities benefiting by a cut in labour charges).

¹³ "An entitlement is a socially recognized and sanctioned set of expectations on the part of everyone in a society with regard to *de jure* or *de facto* legal relations that define the choice sets of individuals with respect to the choice sets of others" (Bromley, 1989, p. 42).

Several countries in transition have a rather long experience of charges as an instrument of environmental policies. Privatisation give them the opportunity to increase the environmental and economic efficiency of such devices. Their past inefficiency should be no reason to dismantle them at the very moment they could begin to be economically appropriate to their implementation context.

Charges in use were generally intended primarily to raise funds and secondarily to deliver some incentives in favour of implementation of environmental regulations. Western experience shows that charges regimes can be initially introduced on the basis of earmarking to facilitate their acceptability by polluters and local authorities in providing them opportunities to get back financial support for their own environmental programmes. Then, with time, when the regime is incorporated in collective routines, earmarked charges could evolve towards more incentive tools with higher rates¹⁴ and a part of collected funds being directed to general budget at the regional or national level¹⁵, according to the concept of 'green tax reform' previously evoked. Meanwhile, since nearly nowhere in OECD countries are such taxes at work¹⁶, aiming at pure incentives taxes cannot be a realistic target for economies in transition. It would impose a very high level of takings on firms, except if recycling of taxation is organised so as to give back revenues to the community of polluters paying the tax, in

¹⁴ For instance, Germany introduced water charges in 1981 at a rate of DM12 per pollutant unit and increased the rate to DM70 in 1997. Resources raised go the budget of Länder, where they cannot be used freely but only for water-related expenditures. Polluters having adopted the Best Available Technology can have reductions; the costs of investment in pollution-control equipment can also be offset by charges reductions (Smith, 1995, pp. 25-31).

¹⁵ T. Zylicz (1994) rightly points that at the present stage of development of countries in transition (he considers the case of Poland), there is no case for wanting to implement pure incentive taxes, for instance on water pollution, which would go to the general budget: (1) to be incentive, the required rate would be much too high, by several orders of magnitude, and unbearable by firms; (2) there is a need to secure specific financial resources for environmental programs against the threat of a capture by the dramatic needs of the general budget.

¹⁶ One of the nearest examples to a Pigouvian tax may be the Swedish charge on NO_x emitted by power generation facilities: the charge basis is actual emissions, and the rate is very high (4700 Ecus/tonne of NO₂); resources raised are redistributed to facilities according to their energy production (OECD, 1994, 1996). However, this is not a pure Pigouvian tax since the rate has not been calculated as the marginal damage cost of emissions at the optimum but as a means to achieve a given abatement in view of accelerated enforcement of more stringent emission standards.

order to neutralise revenue transfers. The latter could be politically possible only when there is a neutral and objective criterion of recycling which can be judged fair by all firms.

An alternative approach, said by some observers (Zylicz, 1994) to be more adapted to economies in transition, would be to trust tradable permits for achieving a cost-effective allocation. At the same time, the needs of precise administrative monitoring of emissions for a good running of tradable permits should not be underestimated. It is often said by US observers that trading schemes can only be envisaged where there is a solid administrative experience in monitoring industrial pollution.

Deficiencies of the rule of the law and corruption

Whatever the choice of policy instruments, their implementation depends on a general respect of the rule of the law and property rights. This may be a critical condition for environmental policies in economies in transition due to the law and political instability of the period and the many weaknesses of state administration regarding skills, information and material means. Experience of some OECD countries has demonstrated that implementation gaps could be more important in the field of environmental law than in other, more traditional fields of public responsibility: for instance, agriculture often benefits by special environmental rules and until very recently was not submitted to the polluter-pays principle; in some cases, industry efficiently puts forward competitiveness and employment arguments for justifying non-compliance; local public authorities may also not comply, but stress their dependence on local opinion and constraints of social acceptance of tax and new treatment facilities for explaining why they do not take all appropriate means for improving compliance... There is no reason why it should go differently in economies in transition.

To the extent there is some objective room for corruption of civil servants (very low wages, lack of hierarchical supervision, uncertain implementation of the rule of the law...), a preference should be given to instruments, the implementation of which depends less on discretionary decisions of administrative services and more on instruments having an automatic action. Tradable permits are an example of this sort, once an appropriate rule has been defined for the

initial allocation of permits¹⁷. Another point would be to avoid the concentration of all public functions (data collection, definition of technological standards, collecting taxes and charges, deciding on the allocation of subsidies, monitoring and supervision) in one unique public body, a multivalent agency for example. Another general idea is to organise relationships so as to introduce third parties in bilateral relations and to stimulate public release of information.

Relationships with the European Union and foreign investment

Since the turn to market economy, countries in transition have placed important hopes in flows of foreign investment and international support. Two dimensions can be underscored:

- (1) In order to attract foreign investment, countries in transition may be tempted to offer special conditions regarding environmental issues, e.g. dispensations of regulatory measures or of payment of charges for the use of natural resources. If it were the case, environmental quality would be the prior victim of foreign investment, and distortion in competition would be introduced, unduly inducing a misallocation of economic resources. Submitting foreign and domestic business to the same common law is a requirement of fairness and economic efficiency at the same time.
- (2) Countries in transition are also led to consider with more attention some topics for which there is an international concern (global warming, threats on biodiversity, North Sea and Baltic, ...) even if they differ from the national agenda of priorities. They are also led to consider the use of policy instruments similar to those adopted in leading OECD countries or the EU-type of approach for environmental regulation. Such conventional transfers of issues and instruments may not be the most economically appropriate one to national or regional contexts. Resistance to pure imitation should certainly be recommended, which would leave important room for an appropriate use of economic mechanisms. At the same time, needs for international coordination as well about regional and global issues as for domestic policy ones¹⁸ should not be disregarded: constraints

¹⁷ This distribution may be an occasion of much lobbying and discretionary devolution if this stage is not organised in reference to tough rules. But who wants tough rules?

¹⁸ Several countries in transition ambition to be members of the EU in the medium term. Adopting environmental regulation fitting the EU framework

may be overcompensated by advantages. For instance, if some international carbon permit trading scheme is eventually decided on at the Kyoto Conference of December 1997 in the framework of the Climate Convention, this may provide interesting opportunities for pushing further demand-side management and other energy efficiency policies in Eastern economies in transition.

Cleaning up inherited pollution, an issue in liability

The ecological heritage of socialism is heavy. This poses both an economic problem and a law one: the first is about the cost of cleaning-up and the second about who should bear it, since property has been radically transformed, often without legal continuity. Whoever is elected to be liable for, defining liability rules is a most urgent achievement since we know¹⁹ the worst situation is one with clear liability rule: it leads to a paralysis without way out for solving the problems. Specifically, such a definition is necessary for obtaining that insurance companies accept to cover the risks, otherwise not computable.

7. Summary and conclusions

Economic instruments for environmental policies could reach their full potential of efficiency in economies in which all commodities are exchanged on competitive markets and agents are maximising operators, ready for catching any market opportunity and sensitive to price signals. This ideal cannot be held as a realistic picture neither of OECD countries nor economies in transition to market, even if market mechanisms have gained, to a different degree, a considerable influence on their economic life. As far as environmental issues are concerned, contexts of action are of mixed-economies type, with an important role given to public regulation and public or collective financial circuits for environmental programmes. Happily, well designed economic instruments can do quite well

becomes a necessary condition for the success of this ambition. Paradoxically, this may be an impediment to the development of the use of economic instruments, insofar the EU approach has been structured by a CAC approach and various types of standards, for several reasons including the fact that most EU member states do not want to see the EU gaining competencies in tax matters. Alternatively, the constraints on the way to design a SO₂ allowances trading scheme in Europe are discussed, with some possible solutions, in Cros and Godard (1997).

¹⁹ This has been systematised as part of the argument surrounding the Coase theorem: an efficient allocation achieved by the means of exchange needs a non ambiguous initial distribution of property rights and liability.

for improving the cost-effectiveness of such policy contexts without waiting a full development of a market economy. This gains may be derived directly (positive incentives to minimise abatement costs), or by opportunity (alleviating technological and administrative rigidities). They can also result from reforms and new institutional settings they make possible ('green tax reform', or setting up water communities) on top of their direct incentive dimension.

These results can be obtained provided that:

- (1) property rights are defined and secured so as agents are price-sensitive, without significant leakage by free access to substitutes, and can rationally behave and invest according to secured rights,
- (2) supply of goods and services (technology) is sufficiently diverse for agents to be able to have real options of choices,
- (3) the general evolution of the economy is towards more market influence, including privatisation of productive activities having no reason to be maintained as public monopolies, some deregulation of economic activities, an extension of insurance business;
- (4) there exist strong, well-informed and reliable administrative bodies and agencies for providing services and functions which cannot be tackled by the market, and appropriate financial circuits to support environmental programmes that go beyond stimulation and regulation of decentralised initiatives.

In such a secured but moving context, economic instruments will allow to catch new opportunities of cost-effective responses to environmental challenges, whereas a CAC approach base on uniform standards of emissions, technological forcing or discretionary permitting systems will generally be too rigid and badly informed to catch these opportunities, and will impose unnecessarily high implementation costs.

Although economic efficiency should be a common concern of all stakeholders, it is unevenly the case in real-life situations. It is a rather recent evolution to see such a concern enter the field of environmental decision-making, for instance

in Europe. So a strategy needs to be thought of in order to establish a link between envisaged economic instruments such as charges, product ecotaxes or tradable permits, with the main problems of concern for stakeholders taking part to the policy process related to environmental matters. To be adopted, economic instruments need to be seen as bringing practical solutions to problems that various interest groups want to solve or get rid of. Aside issues related to growth, income and employment, such stakes touch territorial decentralisation, privatisation, deficiencies of the rule of the law and corruption, relationships with the European Union and foreign investment, and the cleaning up of inherited pollution.

Increasing the cost-effectiveness of environmental policies is a key challenge as well for OECD countries as for economies in transition. If the idea of sustainable development is to be taken seriously, this concern for efficiency and integration of environmental issues in various economic sectors should receive a growing importance in the future, at least for keeping the long run acceptance of this orientation by all populations.

Bibliography

- BARDE, J.-P. (1997).- "Economic instruments for environmental protection: experience in OECD countries", *Workshop "Role of Economic Instruments in Integrating Environmental Policy with Sectoral Policies"*, UNECE and OECD, Pruhonice (Czech Republic), 8-10 October.
- BROMLEY, D.W. (1989).- *Economic Interests and Institutions. The Conceptual Foundations of Public Policy*. Oxford, Basic Blackwell.
- BURTRAW, D. (1996).- "The SO₂ emission trading program: cost savings without allowance trades", *Contemporary Economic Policy*, **14** (2), 79-94
- CONRAD, K. and KOHN, R.E. (1996).- "The US market for SO₂ permits. Policy implications of the low price and trading volume", *Energy Policy*, **24** (12), 1051-1059.
- CROS, C. and GODARD, O. (1997).- "The economic design of a potential tradable permit system for SO₂ emissions in the European Union", *European Economy*, European Commission, Directorate General for Economic and Financial Affairs, forthcoming October, (50 p.).

- DENTE, B.(ed.) (1995).- *Environmental Policy in Search of New Instruments*. Dordrecht, Kluwer Academic Publishers.
- EKINS, P. (1995).- "Rethinking the costs related to global warming: a survey of the issues", *Environmental & Resource Economics*, **6**, 231-277.
- GODARD, O. (1991).- "Scope for, limits of and conditions for the effective application of economic instruments for environmental policy in the countries in transition to market economy conditions", *Ad Hoc Meeting on Economic Instruments for Environmental Policies for Countries in Transition*, organised by the UN Economic Commission for Europe in cooperation with OECD, Geneva, 16-18 December.
- GODARD, O. (1994).- "Conditions et obstacles à la mise en œuvre d'instruments fiscaux pour la protection de l'environnement dans les économies européennes en transition", in Centre pour la Coopération avec les Economies en Transition.- *La fiscalité et l'environnement dans les économies européennes en transition*. Paris, OCDE, Doc. OCDE/GD(94)42, 17-40.
- GODARD, O. (1995).- "Trajectoires institutionnelles et choix d'instruments pour les politiques d'environnement dans les économies en transition", *Revue d'études comparatives Est-Ouest*, **26** (2), CNRS, 39-58.
- GODARD, O. (1997).- "Social decision-making under conditions of scientific controversy, expertise and the Precautionary Principle", in C. Joerges, K.-H. Ladeur and E. Vos (eds).- *Integrating Scientific Expertise into Regulatory Decision-Making. National Traditions and European Innovations*. Baden-Baden, Nomos Verlagsgesellschaft, 39-73.
- GODARD, O. et BEAUMAIS, O. (1994).- "Economie, croissance et environnement. De nouvelles stratégies pour de nouvelles relations", *Revue économique*, **44**, hors série, 'Perspectives et réflexions stratégiques à moyen terme', 143-176.
- GOLDMAN, M.I. (1985).- "Chapter 16. Economics of environment and renewable resources in socialist systems. Part 1: Russia", in A.V. Kneese and J.L. Sweeney (eds).- *Handbook of Natural Resources and Energy Economics*, Vol. II, Elsevier Science Pub., 722-745.
- HAHN, R.W. and HESTER, G. (1989).- "Where did all the markets go? An analysis of EPA's emissions trading program", *Yale Journal on Regulation*, **6**, 109-153.

- KAPP, K.W. (1950).- *The Social Costs of Private Enterprise*. Cambridge (Mass.), Harvard University Press.
- KORNAI, J. (1984).- *Socialisme et économie de la pénurie*. Paris, Economica.
- LIBERATORE, A. (1995).- "Arguments, assumptions and the choice of policy instruments. The case of the debate on the CO₂/energy tax in the European community", in B. DENTE (ed.), *op. cit.*
- NICHOLS, A. L. (1984).- *Targeting Economic Incentives for Environmental Protection*. Cambridge (Mass.), the MIT Press.
- OECD (1994).- *Managing the Environment: the Role of Economic Instruments*. Paris.
- OECD (1996).- *Implementation Strategies for Environmental Taxes*. Paris.
- OECD (1997).- *Environmental Taxes and Green Tax Reform*. Paris.
- OSTROM, E. (1990).- *Governing the Commons: the Evolution of Institutions for Collective Action*. Cambridge University Press.
- RICO, R. (1995).- "The U.S. Allowance Trading System for Sulfur Dioxide: An Update on Market Experience", *Environmental and Resource Economics*, **5**, 115-129.
- SMITH, S. (1995).- *'Green' Taxes and Charges: Policy and Practice in Britain and Germany*. London, The Institute for Fiscal Studies, November.
- ZYLICZ, T. (1994).- "Implementing environmental policies in Central and Eastern Europe", in A.-M. Jansson, M. Hammer, C. Folke and R. Costanza (eds).- *Investing in Natural Capital: the Ecological Economics Approach to Sustainability*. Covelo (California), Island Press.