

Chapter 8

Economic Aspects

8. Economic Aspects

8.1 Economic Instruments and Financing

8.1.1 Economic Instruments for Hazardous Waste in Romania

1) Existing Environmental Instruments

The “polluter pays” principle is generally accepted in Romania, but practice diverges substantially. This is illustrated by the listing of economic instruments now existing in Romania, as shown in Volume 2, Chapter 6. In the present context, conspicuous by their absence are explicit taxes or other instruments relating to hazardous waste.

Regarding industrial waste management in general, economic instruments (basically non-compliance penalties) are set too low to have an impact on the generation of wastes and thus are not at present a significant tool for the management of air or water quality, or for the disposal of other industrial wastes. Effectiveness of economic instruments or other control measures is also constrained by the inadequacy of monitoring and measurement equipment for air and water quality.¹

Efficiency in resource use, clean production technology, and waste generation are all adversely affected by systematically low energy and water prices, which result in excessive consumption.

An extensive study by EPIQ, completed in late 1999², made a number of recommendations for policy change. These included measures to reduce the use of leaded gasoline and SO₂ pollution, both of which are major threats to public health in Romania, and the problem of disposing of used tires. Specifically relating to hazardous waste, the study addressed the problems of disposing of batteries and waste oil.

In the case of leaded gasoline, the study recommended an increase in the existing price differential between leaded and unleaded gasoline, by means of an extra charge on lead at the refinery stage, combined with an increased excise tax on leaded gasoline.

The SO₂ recommendations were to impose an environmental tax on the sulfur content of diesel fuel at the refinery gate and on all imported diesel fuels; an environmental charge tax on the sulfur content of coal and of fuel oil.

In the case of tires, the study proposed a deposit-refund scheme to encourage recovery of scrap tires, to be paid by producers of new tires and importers of new and used tires. Revenues would be paid into a Recycling Fund out of which subsidies would be paid to collectors of scrap tires.

Action has yet to be taken on these three items, although in the case of leaded gasoline, the existing small price differential plus, more importantly, administrative regulation will achieve the objective in the next few years. However, action has been taken on two other recommendations made by EPIQ, both of which relate to hazardous wastes, namely batteries and waste oil disposal (see below).

¹ Source: JICA Baseline Survey for Industrial waste management in Romania, ERM, September 2001.

² Promoting Economic Instruments for Environment Protection in Romania, USAID/EPIQ, November 1999.

2) Economic Instruments for Hazardous Waste Management

The use of economic instruments specifically designed for hazardous waste management should primarily be either in the form of sanctions or penalties to assist in the implementation of regulations or standards, or to provide funding and incentives to facilitate the treatment and disposal of hazardous wastes in accordance with legislative or regulatory requirements. In Romania, non-compliance penalties, user fees, and deposit-refund systems already exist, and strengthening of these systems is a high priority. The role of these and other measures are summarized below.

Non-compliance penalties. Provision for such penalties exists in Romanian law for all types of violation of pollution control standards. However in practice deficiencies in the system include inadequate distinction between different types of violation and of waste in determining penalties; penalties are in general too low and probably in the case of hazardous waste well below damage costs; and inadequate monitoring and inspection. Improvement of the existing system is of high priority.

User Fees. User fees are required for the use of landfill or fees paid to specialized hazardous waste recycling or disposal companies (or to companies that have excess capacity in their own incineration or other disposal means) will be reviewed. Such instruments must be accompanied by command and control regulations requiring generators of waste to dispose of hazardous waste in an approved fashion, either by waste generators themselves or by an approved waste treatment operator. Environmentally effective, relatively high administrative costs; monitoring and inspection requirements pose problems for the use of these instruments, but such problems are also encountered for a command and control system. In principle, charges for waste disposal and treatment services should equal the long run marginal cost involved.

Deposit-Refund Systems. The EPIQ study proposed the use of deposit-refund systems as part of a range of actions required to address the environmental problems caused by the disposal of used oil and batteries.

With regard to oil, a mix of command and control and economic incentives was proposed, with a deposit-refund system being complemented by strict regulations and penalties in case of illegal dumping and other actions. It included the obligation of lube oil retailers to have collection points, as well as a tax-subsidy program, with a 15-20% tax on new oil sales, and revenues being used where required to subsidize non-economic oil disposal. The general principles have been incorporated into the Used Oils Management Decision no 662/12 July 2001.

The EPIQ study considered various mechanisms for implementing a deposit-refund system of car batteries, proposing one in which battery retailers would be required to accept scrap batteries. A deposit-refund system would be essential for this to work. However the Batteries Decision no 1057/18 October 2001 requires producers or importers of small and portable batteries to have system of collection, free of charge.

EPIQ have also informally proposed the introduction of controls (deposit refund or other) over disposal of rechargeable batteries and used computers.

The current study supports these initiatives, the deposit-refund system meeting most of the criteria indicated at the beginning of this chapter.

Product Charges. Product charges, based upon environmentally damage costs, can in principle be applied to a variety of industrial inputs or consumption goods, including oil and batteries. Such devices may be environmentally effective and administratively feasible, and can be used in combination with other measures, such as a deposit-refund system.

Emission Fees and Tradable Permits. As noted earlier, international experience suggests a limited role for emission or discharge fees for managing hazardous waste, due in large part to the uncertain environmental impact that is implicit in reliance upon economic incentives, the extremely demanding administrative requirements for monitoring and inspection, as well as the need for outright bans on many activities. . The last two of these obstacles also apply to the use of tradable permits.

Subsidies are a frequently used economic instrument in other countries, but are clearly in contradiction to the polluter pays principle and are particularly difficult to justify in the Romanian context in which the public fiscal deficit remains a major constraint to economic development. Nevertheless there may be good reason to use subsidies, perhaps making use of concessional foreign aid, as an interim measure. It will be noted that the rationale for an EF essentially depends upon the need for some form of subsidization.

Complementary actions – air and water pollution. Ideally, emissions taxes should be used, but due to the administrative costs of monitoring, in practice product charges relating to air and water pollution are likely to be more feasible. Tightening of controls or levying charges for hazardous waste disposal must be accompanied by equally stringent controls (economic or regulatory methods) on alternative forms of waste disposal, i.e. those that result in air or water pollution. Efforts should be made to introduce pollution taxes along the lines of the SO₂ tax proposed in the EPIQ study, in order to influence environmental behavior.

Legal liability for damages. EU legislation recognizes the important role that can be played by explicit recognition of environmental damage as a subject for litigation. For this to be effective and efficient, methods will be required to assess the economic costs of environmental damage. While deficiency in such information is obviously a constraint, it is required anyway in evaluating environmental investments and tax/charge levels (see following Section 8).

Waste Exchange. Applicable in principle to all forms of waste, government has a role in facilitating the establishment of a market for waste material, or for waste exchange. Measures such as industrial zoning and provision of information may encourage cost-effective disposal and treatment measures.

Voluntary agreements as in Japan and EU. These are part of the Extended Producer Responsibility concept, advocated by EPIQ and others. Currently a case by case approach has to be followed, in part due to the inability to monitor emissions from large numbers of enterprises. Voluntary agreements can help to address this issue, by concentrating on major polluters. It is proposed that industrial enterprises should be selected for such negotiations based upon severity of hazardous waste or other pollutants discharged and/or upon their willingness to demonstrate best practice methods. The agreements would specify economic penalties as well as other sanctions in the event of non-compliance. Initial targets should be oil, automobile, pharmaceutical industries. As in Japan demonstration voluntary agreements may stimulate similar innovations elsewhere. Paralleling this, the introduction of professional pollution control managers in major firms, with legal responsibility for environmental violations, as in Japan, should be considered.

3) Environmental Fund

In assessing the potential role of an EF in Romania, fiscal issues are of paramount importance. The Emergency Ordinance June 7 2002 sets out guidelines as to the sources of revenue that should be sought for the Environmental Fund. Precise norms and modalities for collection are to be studied by the USAID-EPIQ program, which has already proposed a number of product charges (SO₂, tires, as noted above). However, these were rejected by the Ministry of Finance if the revenues were to be paid into the Environmental Fund. The objection of the Ministry of Finance is presumably due to the need to generate public revenues for general purposes, in the interest of fiscal flexibility.

Hence recommendations made by environmental experts tend to ignore possibilities for raising funds via product charges or other taxes, since these would have to go into the general revenue fund for allocation on a country priority basis by the Ministry of Finance, rather than being specifically available for environmental improvements. Thus deposit refund schemes – which are not taxable systems - are the preferred type of economic instrument.

User charges apparently do not encounter opposition from the Ministry of Finance as they are not strictly speaking taxes. It has been proposed that some portion of the fees paid to recyclers should be paid into the environmental fund.

Subsidies are inherent in the concept of an environmental fund. However, the overall operation, if it involves collection of fees and charges from polluters, can be seen as a revenue-neutral action and thus acceptable in a fiscal sense. If however, it is funded from other sources, it implies that polluters overall are subsidized; this is clearly contrary to the polluter pays principle, and, unless carefully targeted to priority needs, inappropriate in the Romanian context of extreme fiscal austerity.

Establishment of funds that can make a useful contribution will typically require considerable capacity-building effort on the part of external donors or national governments. There is then the danger that the funds become so competent and powerful, building up a protective constituency, that they become difficult to terminate. And any success the funds might achieve in generating revenue may make them more attractive to the Finance Ministry as a source of general revenue.

While EF's may play an important role in emergency situations, they should therefore typically be seen as temporary measures, and certainly not as a substitute for fundamental reforms. Otherwise, their existence may in practice postpone solution of environmental problems rather than hasten their solution.

4) Enabling Factors: The Adjustment Process

Hazardous waste policy reforms, or indeed environmental policy reforms in general, may be ineffective if other enabling factors are not present. In the present context, relevant issues include pricing policies for complementary activities, the status of market liberalization in the economy as a whole, financial and technical capacity of the public sector, and education and awareness of key stakeholders. Clearly, this issue is of primary importance in a transition economy such as Romania, where in the absence of some key enabling factors, a gradual approach may be required, involving the setting of short term and longer term goals, many of which are related to economic development in general. Some key examples are indicated below.

To be feasible, such recommendations have to be tailored to economic and political realities. A key element of the strategy of a transition economy such as that of Romania is the replacement of SOE's by private enterprise. The soft budget constraints and lack of economic incentives for such enterprises means that there is likely to be little response to any market based instruments such as pollution taxes, as indeed the record of failure to pay utility bills suggests. The rate of progress in dismantling the SOE's and the government's ability to manage the social consequences of such changes will be a major determinant of the prospects for effective use of economic instruments in the field of environmental management.

The general objectives of clean production technology and sound environmental management will ultimately depend heavily upon the existence of economic incentives that ensure that energy and water as well as other inputs are used efficiently and avoid waste. Pricing policies for energy and water are a major problem in Romania, with prices not only below financial costs but even more so in terms of long run marginal costs, particularly if these are defined to include externalities.

There are of course many reasons why energy and water price reforms are required, which transcend by far the specific issue of hazardous waste. This is particularly so in Romania with its acute fiscal situation. Subsidized electricity and water supply (and natural gas prices at the well head being one fifth of international prices and thus well below the economic opportunity cost) involve explicit or implicit subsidies which have a negative impact on overall economy, with fiscal deficits and high borrowing costs being a major obstacle to economic growth. The hazardous waste aspect is but one more reason why reform in these areas is required. However it is so important for the hazardous waste issue that it should certainly be emphasized, providing one more reason why policy reform in this area is required.

The relevance of efforts to "fine tune" prices of environmentally-related resources in the presence of massive distortions in prices in general also needs to be assessed (e.g. proposing a product charge for electric power generators where inputs are priced at a small fraction of their value, would be a purely academic exercise).

Both the design of tariffs for energy and water as well as the levels of any economic instrument for environmental management must recognize that price distortions prevail throughout the remainder of the economy. The general strategy should be to propose that any increases in tariffs or other economic instruments should be tailored to parallel general trends in market liberalization in the Romanian economy, or the adjustment process.

Other key enabling factors include awareness on the part of governments at various levels, workers and consumers about health hazards resulting from the manufacture or use of certain products. An example is the sale of waste oil as low grade fuel oils, with consequent severe health risks. Such awareness and ability to articulate stakeholders' concerns in an informed manner is required if local conditions are to be adequately reflected in environmental policies and if economic instruments are to function effectively.

8.1.2 Feasibility of Economic Instruments

Using the criteria listed at the beginning of this chapter, the following factors are especially relevant for Romania in determining the feasibility of economic instruments: revenue raising is an important objective; administrative feasibility may pose a major constraint; and the search for cost-effective methods is critically important. In practice,

general market imperfections pose a serious obstacle to the relevance of economic instruments for environmental management, and political acceptability and social aspects may pose a major constraint due in part to need to take measures that may result in unemployment or other social adjustment

The foregoing implies that while some policy reforms in the field of hazardous waste management can be introduced relatively quickly, others will be dependent upon the overall pace of economic policy reform in the country.

A gradual approach is thus required, with the need to tailor a hazardous waste action plan over an extended period. In the early years, almost total reliance should be placed on strengthened command and control measures, supported by (a) a more systematic and rigorous use of non-compliance fees which more accurately reflect the damage caused by actual violations and (b) user charges for treatment and disposal based upon true economic costs. Some use can be made of deposit refund systems and product charges, which entail minimal administrative costs. Carefully targeted subsidies, perhaps originating from external funding (see next Section), and routed through an Environmental Fund, may be appropriate at this stage, but only as a transition measure. Voluntary agreements with key industrial concerns should be entered into on a case by case basis, and involving economic sanctions as penalties for non-compliance.

At this time capacity building measures, laying the foundation for subsequently greater reliance upon economic instruments should take place, including both monitoring and measurement as well as analytical capacity in establishing priorities and basis for tightening environmental regulations or raising charges. Subjects should include epidemiology and economic valuation techniques.

It is reasonable to expect the economic reform process – in particular, completion of the privatization program and energy and prices that represent full economic costs - to be essentially completed within ten years. By that time, certain actions should be introduced, including at least as much reliance upon market based instruments as other EU countries; phasing out of environmental fund and subsidies.

Finally, as an even longer term goal, the principle of taxing environmental pollution should be extended to the use of green taxation as an instrument of fiscal policy.

In summary, defining the timing of Phases in indicative terms only, the increasing use of economic instruments and related reforms might be in terms of the following schedule:

Phase 1: Year 1-5

- Strengthen non-compliance fee system: this is described as a component of the Action Plan in Chapter 9 (Action D5)..
- User charges for waste treatment and disposal based on full economic costs. These will emerge naturally as a result of market forces as the regulatory system is fully enforced, and third-party contractors become involved.
- Deposit-refund systems. These have already instituted for small and portable batteries and waste oil, but the case should be examined for possible extension to other products.
- Carefully targeted subsidies. To be managed primarily via the newly established Environmental Fund. Potentially the most significant element of this program would be to take advantage of subsidized interest rates from external donors (Action J1).

- Voluntary Agreements. Model agreements would, by demonstration, indicate potential gains to industry from improved hazardous waste management, and thus facilitate the acceptance of regulatory or economic incentives (Action D3).
- Tighten general air and water pollution controls. These have already been declared as a government objective: use of economic incentives for air and water pollution should also, by reducing the total volume of pollutants, also make it easier to address specific problems of hazardous waste management.
- Capacity Building. Monitoring, valuation, determination of least cost solutions priorities, public awareness and information, legislative reforms, and training are all required as complements to strengthened use of economic instruments as well as regulatory approaches. These are components of almost all the specific Actions listed in Chapter 9.

Phase 2: Year 5-15

- Extend use and levels of economic instruments to reflect full damage costs
- Extend use of product charges
- Phase out environmental fund/reduce subsidies

Phase 3: Year 15-20

- Introduce green taxation as an instrument of fiscal policy

8.1.3 Financing: Possible Intermediary Loan

One of the key enabling factors referred to above is the existence of an efficient capital market in which industry can obtain funds both for productive purposes as well as for pollution control at reasonable interest rates. Financial market reforms have been slow to take effect in Romania, where economically justified investments, including often very low cost “win-win” opportunities cannot be realized.

Various inefficiencies in the financial sector, including ambiguous legal responsibilities, imply a high level of risk for potential investors, resulting in excessively high interest rates even for otherwise financially attractive investments. This is a major constraint to industrial and economic growth in Romania. Nevertheless external donors may, as long as specific safeguards and institutional development measures are built into the process, be willing to assume such risk and provide funds to Romania at significantly lower interest rates than currently available.

Based upon external support, a targeted subsidy program is proposed here as essentially an interim measure, and justified as compensation for capital market failure.

An appropriate mechanism would an intermediary loan of the kind that has frequently been used by external donors such as the World Bank and EBRD in support of financial intermediaries operating in a variety of sectors. These institutions are designed in effect to replicate the project support processes of the external agencies in project identification, appraisal and monitoring. EBRD has particularly relevant experience in supporting the commercial banking sector in Romania. JBIC also has considerable experience with intermediary loans, including agricultural credit as well as pollution control. Such a loan (which could be at an interest rate of 0.75%, repayable in Japanese yen over 40 years) could be made by JBIC to an institution which would on-lend at rates which would permit financial viability of the institution to be maintained, but still be far less than the exorbitant rates

currently being charged in Romania.

The advantage of such a process would be to facilitate investments in pollution control, or clean production technology, in order that industry can comply with pollution regulations and standards, and also to achieve this in a cost-effective way where industrial process changes, which may require substantial funding, are required. Moreover, when seen from the vantage point of the external donor, this process allows financial support to be given to large numbers of relatively small scale companies, which would not typically be reached by traditional development projects.

A project to achieve the above would consist of developing a financial intermediary capable of performing a banking function, able to invest funds and appraise sub-loans in terms both of their financial as well as technical soundness. The financial intermediary should not be expected to have an indefinite life: its usefulness would decline significantly when overall reform of the financial sector has been completed.

Necessary conditions would therefore include: a legislative and regulatory framework specifying the duties and obligations of the new institution; financial or other contributions to be made by the national government; on-lending conditions and appraisal procedures; and adequately trained staff, both in financial/banking and technical areas. In particular, staff should be able to judge on the cost-effectiveness of proposed sub-loans and the extent to which they are actually for pollution control or clean production.

It is expected, that in order to be attractive to both the external donor(s), such as JBIC and EBRD, as well as to the Romanian government, approval of sub-projects should depend upon their financial viability. Partly for this reason, it is also possible that the financial intermediary should not be restricted to financing hazardous waste projects, but also environmental projects more generally, including cleaner production technology and energy efficiency, such investments being not only ends in themselves, but also conducive to more efficient hazardous waste management. The precise modalities of the institution should be determined in a feasibility study (see Action J1). This would address such basic issues as to whether a totally new institution should be created, or whether it should be as an adjunct to an existing financial intermediary. It is expected that the existing commercial banking network would be relied upon to appraise sub-loans, subject to development of their necessary technical capacity in this area.

8.2 Valuation and Priorities

8.2.1. General Principles

In principle, alternative projects or other expenditure decisions should be determined in accordance with priorities established by comparison of costs and benefits. In practice this is rarely possible, primarily due to the difficulty of assigning monetary values to the impacts of such decisions. Value judgments are unavoidable, particularly in the case of projects or policies which impact upon public health.

For this reason, cost-effectiveness, rather than cost-benefit comparison, is a more practical approach for health-related decision making.

The above is especially relevant for hazardous waste, the control of which is primarily required, directly or indirectly, for public health purposes.

While cost-effectiveness in achieving health objectives such as declines in mortality or morbidity is required to prioritize hazardous waste actions, efficient allocation of public resources should involve conscious comparison with the impact of alternative expenditures in the health sector as a whole.

Thus if the cost of achieving a given health impact by the most efficient hazardous waste project or policy is greater than that of the best alternative action in the conventional health sector, funds should be allocated to the latter rather than the former.

In practice however, such decisions are difficult to make. In Romania in particular, such an approach is constrained by lack of epidemiological data that define the relationships between hazardous waste generation and the scale, severity, and certainty of adverse health impacts.

Informed judgment based on international experience however suggests that given the severity of the issue in Romania, the worst hazardous waste problems must be addressed, and that there are economically appropriate measures to do so. While in the longer term investment decisions in the hazardous waste field should be systematically compared with alternative expenditures in the health sector, it is thus appropriate at this stage to identify means of identifying priorities within the hazardous waste sector alone.

Given that protection of public health is the ultimate goal, the central part of the above approach is the technical analysis required to rank various sites or incidents of hazardous waste generation in light of their actual or potential seriousness for human health.

8.2.2 Proposed Approach

The potential seriousness of the hazardous waste site/activity for human health is the most important factor. Essentially this aspect is same as "risk assessment" practice normally done for remediation projects of contaminated sites.

Selection of priority hazardous waste investments in principle should involve the following steps:

1. Estimate the quantity and content of hazardous waste at disposal site or as on-going emissions at the source.
2. Trace exposure pathway to affected population. The exposure pathway is how a chemical travels from the source to a person. To be precise, exposure pathways are not only through drinking water but also through air and dust. However the major impacts from hazardous waste sites are normally through water. To avoid excess complexity of the exercise, we limit our consideration of the exposure pathway to water. In this case, exposure will depend on: surface and subsurface conditions; type and mobility of the contaminant; types of soils and ability to retard the contaminant; depth to groundwater and the speed of flow; and distance to the receptor.
3. Estimate the contaminant nature and volume of the substance as received by affected population (e.g. in drinking water supply). The contaminant nature can be evaluated by its toxicity and concentration level. In toxicity terms, chemical-specific health effects are classified into 1) Carcinogenic 2) Chronic/Systemic and 3) Acute toxicity. Scientifically, quantitative toxicity values can be obtained by Dose-Response

Assessment and Cancer Slope factor. Again, to avoid excess complexity of the exercise, simple value such as drinking water standard (maximum allowable concentration) for each contaminant can be used to indicate the relative toxicity of the hazardous substances.

4. Estimate the receptor, or population affected. Obviously, even if unit risks are constant, a toxic emission affecting 1,000,000 persons will have a much more serious impact than one affecting 1,000 persons. Therefore the maximum number of population exposed to the risk must be estimated. If we limit the exposure pathway to water only, drinking water source as surface water or groundwater which might be polluted by the hazardous waste project will be the key consideration factor. Practically speaking, evaluation will be done by identification of drinking water sources potentially affected by the hazardous waste and estimating the population supplied by the said drinking water source.
5. Assess persistence of the contamination, e.g. continual or restricted number of incidents.
6. Assess epidemiological impact, i.e. the probability of occurrence of different kinds of health problems arising from contact with different types of contaminants.
7. Translate this into a standard measure of ill-health (e.g. DALYs – disability-adjusted life years).³
8. Identify alternative hazardous waste control measures which might be 3Rs investments, improved management practices, reduction in use of certain inputs, waste exchange, etc. Estimate associated capital and operating costs.
9. Estimate impact of candidate control measures in reducing various diseases, measured in terms of DALYs.
10. Conduct cost-effectiveness comparisons of alternative investments or procedures, based on the data required in the following Table.

Year	Project Costs (Investment, O&M)	Direct Economic Benefits		Net Social Cost (2)- (3)-(4)	Health Impact (e.g. DALYs)***
		To Industry*	Other**		
(1)	(2)	(3)	(4)	(5)	(6)

* e.g. the value of recycled products, or cost-savings

** e.g. savings to water supply operators (treatment costs, closure of sources etc), or demonstration effects

*** reduction in DALYs resulting from the hazardous waste control measure

³ Where standard toxicity-health relationships are assumed – the simplest assumption – alternative hazardous waste incidents may be ranked in order of their quantitative seriousness as the product of Risk (toxicity and exposure) and the Affected Population. While this permits ranking in terms of cost-effectiveness of alternative control measures (subject to the simplifying assumptions), it does not provide any basis for comparison with alternative non-hazardous waste expenditures.

The net social cost of the hazardous waste control measure (col 5) is the cost of measure minus any direct (non-health) economic benefits that result. For “win-win” actions, net social costs will be negative.

Divide the discounted value of col (6) (the improvement in health due to the control measure) by the discounted value of col (5) to give the discounted unit cost per DALY. This provides a basis for cost-effective comparison of alternative measures with different time horizons of costs and benefits.

In practice, data problems preclude ability to conduct such analysis with precision. But in principle the above should be a rough guide to identifying priorities, as well as for justifying pilot projects. In the absence of precise data, the use of explicit and transparent weighting systems, involving professional judgement and the participation of relevant stakeholders, will be required, particularly when variations in types of disease and mode of waste transmission are involved.

However, after the most obvious and serious cases are dealt with, unit costs of health improvement via hazardous waste management will increase. Carefully selected monitoring and data collection, including analysis of epidemiological relationships will then be required to determine priorities more accurately. The capacity building component of the JICA study may identify critical variables where improved data and information should be given priority.

8.3 General Relevance of Economic Analysis

Two major areas, distinguishing between historical waste and newly generated waste, correspond approximately to two main thrusts of economic analysis. Strategy for the management of historical waste is essentially an issue of prioritization (in theory, ranking alternative projects in terms of relative costs and benefits). Where possible, responsibility for project implementation should lie with the industries concerned, but in most cases assignment of responsibility will not be feasible, in which case investment and other measures for hazardous waste management becomes a solely public responsibility. On the other hand, management of newly generated waste should conform to the “polluter pays principle” and thus effectively be the responsibility of the private sector, with incentives and regulations determined and implemented by government. The continued existence of a substantial SOE sector complicates the issue in practice, but in principle SOE’s should conform to the same requirements as private sector operatives.

The major issue is how to develop a reasonable strategy in light of severe data problems, in particular, information on sources of hazardous waste, and their impacts, primarily on human health. The former has been addressed to some extent by the Study Team’s factory survey, but epidemiological data do not exist and their collection and analysis are beyond the scope of this study.

8.3.1 Historical Waste

Strategy should in principle involve the following steps: (a) identify the most serious problems, and develop some form of weighting to allow comparisons to be made (b) assign responsibility for those problems, e.g. between public and private sector (c) determine cost-effective solutions (d) rank investments and other actions in order of priority, and (e) develop financing mechanisms and sources of funds.

If the recommendations of the Study Team are to be acceptable and politically feasible, they will have to be made in light of the priority actions to be defined in the forthcoming National Waste Management Strategy and National Environmental Action Plan. In the absence of sufficient objective quantitative data, the Team should make efforts to achieve a consensus among its Steering Group members as to priorities for cleaning up historical hazardous waste.

However the study team will also develop its own objective criteria by which assumptions about the severity and impacts of historical wastes may be made transparent, possibly with a weighting system that reflects volume and concentration of waste, toxicity, and numbers of people affected.⁴ Other multidimensional criteria can be explored. Aggregate weighting can be used to estimate cost-effectiveness of alternative remedial actions. This will permit an independent judgment to be made by the Study Team about the priorities identified by the Romanian government. Although precise quantification will not be possible, general ideas about priority actions should result, and therefore also areas where monitoring of key variables will be required in order to identify potential projects for pre-feasibility analysis.

Current uncertainty surrounding liability for environmental hazards created by inherited waste has apparently been an obstacle to privatization in some cases. Such uncertainty might be reduced by a one time payment at the time of purchase of an SOE in return for immunity from future claims for compensation...

Other issues of financing methods and sources of funds apply both to historic and new waste, and are discussed below.

8.3.2 On-Going and Future Hazardous Waste Generation

Unlike historical waste, which primarily involves pollution of soil and water, on-going activities also include generation of air pollutants. Economic instruments potentially can play a role either when explicitly directed at a particular hazardous waste, or when related to general air or water pollution, which may contain hazardous as well as non-hazardous wastes. Increasing controls for one form of waste may lead to creation of other means of disposal, so a holistic approach is required. Regulatory and economic instruments applicable to non-hazardous waste are thus highly relevant for hazardous waste management, as are the range of enabling factors referred to earlier.

Ideally both the level of economic instruments and the standards imposed on hazardous waste generators should be determined in accordance with marginal damage costs. At present these are virtually unknown, but are certainly not zero. The implication for any long term strategy is that in parallel with addressing the most obvious and immediate manifestations of the hazardous waste problem, there should be carefully targeted monitoring of prima facie high priority emissions and impacts. Prioritization of actions may use the formula referred to in the previous section. Strategy should involve developing institutional capacity to respond in a flexible way to future changes in environmental challenges, at the same time gradually increasing charges or raising standards as economic growth and policy permit.

⁴ See next section

8.3.3 Summary

In summary, economic analysis has relevance of hazardous waste planning at various stages, i.e.:

- Identification of the underlying macroeconomic and sector situation and potential obstacles to policy reform in the environmental sector overall (as outlined in Introductory Chapter),
- Potential use of economic instruments for environmental management in general and hazardous waste in particular (as outlined in 8.1 above),
- Evaluation of alternative hazardous waste investments policies (investments, management reforms, regulations etc) in terms of their costs and benefits (as outlined in 8.2 above), and
- Assessment of financial feasibility of proposed hazardous waste action plan in terms of value added/ability to pay of major polluting sectors, and in light of potential funding sources.
- Identification of appropriate sources of funding: in this case creation of a financial intermediary to administer and allocate funding from external sources is proposed.

In practice the current study recognizes the constraint that virtually all major investments in hazardous waste management in the foreseeable future will be carried out by the private sector. Government involvement, including financial support, can be expected to be minimal. The “polluter pays” principle will thus be followed.

However the government has an important role in creating the framework (enabling conditions) within which hazardous waste can be managed effectively by the private sector. This includes legislation and regulations requiring private operators to handle and dispose of their waste safely; penalties for non-compliance, and where appropriate, economic instruments to create incentives for cost-effective waste disposal measures to be taken.

The study identifies cost-effective technologies and investments, but these must typically be accompanied by policies that ensure they perform effectively. For example, it is necessary to develop politically, administratively and financially acceptable arrangements between waste generators and those carrying out treatment or disposal; waste oil used in cement kilns is a case in point. Such analysis will accompany the technical solutions identified on this study.

In addition to proposals relating to financing, including the role of an environmental fund and the creation of a financial intermediary to handle external funding, the study also proposes longer term capacity building measures, such as the need to improve understanding of epidemiological relationships between hazardous waste and public health.

More generally, the potential for immediate application of economic analysis is limited. However the study endorses the kind of recommendations made by EPIQ about the scope for deposit refund systems and gradual improvement in pricing methods for hazardous waste disposal services, and for pollution control in general. In the short term, moreover, strengthening the existing system of non-compliance penalties and developing an equitable and efficient pricing system for the treatment and disposal of hazardous waste should have priority. The technical and institutional recommendations contained in this report which focus heavily upon improved monitoring and information are the essential building blocks upon which economic analysis and the use of economic instruments as a management tool can become increasingly feasible.

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