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Maria J. Welfens\*

# System Transformation and Environmental Policy

## Problems and Options in Central and Eastern Europe

*The economies of Central and Eastern Europe have inherited serious burdens of environmental pollution, while their economic scope for dealing with these is limited. The transition to the market economy offers chances for improvement, but it also brings new environmental problems. How will the transforming countries be able to cope?*

At the beginning of the 1990s, all Central and Eastern European states decided in favour of pluralist democracy and a market economy as the base from which to set about dealing with the problems of economic and political crisis. That entails transforming the economic system in double-quick time by trying to repeat the long evolutionary process Western Europe's economies now have behind them within just a few years.<sup>1</sup>

However, in their attempts to develop a modern economic system as the basis for prosperity and stability, the reforming countries cannot institute new rules of the game for the allocation of resources while ignoring the problems of the past; on the contrary, they have inherited all manner of economic and ecological burdens which delay the process of structural change and the renewal or modernization of the economy. Not least of these problems is that socialist member states of the Council for Mutual Economic Assistance had been accumulating ecological problems over several decades, the negative consequences of which persist today, including damage to health and hence higher healthcare costs, and constraints on the development of more sophisticated production processes. Oversized production plants in heavy industry, which were strongly concentrated in specific regions, are not only representative of the former inefficient use of resources, but also of local pockets of intense opposition to factory closures and the relocation of production. Yet

these countries will not manage to draw close to Western European living standards in the long term unless they undergo ecological and economic modernization and efficiency-oriented structural change.<sup>2</sup> In contrast to Western European economies which have relatively high standards of living and are able to resort to sophisticated technology in order to reduce emissions and clean up the environment, the economic scope for funding environmental protection measures is limited in Central and Eastern Europe and imports of emission-reducing technologies and equipment from other countries can normally only be paid for by increasing the level of exports.

The transformation of former planned economies towards a market system is extremely difficult from an economic, political and social point of view. Among the specific measures required are:

- Privatization of state enterprises which must then be run according to the principles of the market economy, in

<sup>1</sup> On the transformation of economic systems, see H.-J. W ag e n e r (ed.): *On the Theory of Policy of Systemic Change*, Heidelberg 1992; K. H. Hartwig and H. J. Thieme (eds.): *Transformationsprozesse in sozialistischen Systemen*, Heidelberg 1991; P. Marer (ed.): *The Transition to a Market Economy*, Paris (OECD) 1991; OECD: *Reforming the Economies of Central and Eastern Europe*, Paris 1992; P. J. J. Welfens: *Market-oriented Systemic Transformations in Eastern Europe*, Heidelberg 1992.

<sup>2</sup> On environmental problems in the system transformation process, see M. J. Welfens: *Umweltprobleme und Umweltpolitik in Mittel- und Osteuropa. Ökonomie, Ökologie und Systemwandel*, Heidelberg 1993. On the situation in Poland in particular, see M. J. Welfens: *Umweltprobleme und Umweltpolitik im Prozess der Systemtransformation in Polen*, in: S. Nissen (ed.): *Modernisierung nach dem Sozialismus*, Marburg 1992, pp. 83-100.

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particular profit maximization and the use of the capital markets to obtain finance. Private ownership of the means of production, and thus a large number of owners who bear individual responsibility, is the key to a practicable market economy in which the system of ownership must be established in a legal framework which protects rights of use. The legal framework also provides the basis for legally binding contracts and legal business transactions, without which it would be impossible to exchange goods and services on markets or to enforce any rights (e.g. the problem of liability). Firms in a market economy, under competitive conditions at least, are subject to systematic pressure to push costs down; consequently, the available productive resources are efficiently used, and a range of products is developed which suits consumer preferences. Once relative world market prices prevail, firms can no longer afford to produce in the energy-intensive and raw material-intensive way they did before. Competition of course also assures product innovations and, as a result, the development of new building and other materials which may harbour new risks to health and to the environment.

□ The creation of a functioning labour market which, as the mobility of labour increases in the longer term, will mean that regions whose environments are no longer intact are likely to lose skilled employees as they migrate to new and growing economic centres; privatization will expose hidden unemployment in many industries, confronting many regions with high unemployment levels. As long as these continue to be high in all regions, however, the potential migration of skilled workers out of environmentally troubled regions will not initially exert very much pressure on environmental policy-makers, either regional or central, to take action.

□ Removal of price controls and reduction of subsidies (including those on energy sources). Important signals are given to suppliers, competitors and consumers by prices determined freely on the market. Under competitive conditions market prices will tend towards the level of marginal cost, although the State and private monopolies still in existence in many markets will initially uphold higher monopoly prices. The withdrawal of subsidies (especially on energy prices), and possibly the promotion of renewable sources of energy, will act as incentives to reduce the level of energy consumption and promote the development of new and more energy-efficient products for households and industry.

□ Liberalization of foreign trade which results, on the one hand, in greater pressure exerted by competing imports (and hence curtailment of existing monopolies in the economy); on the other hand, the hope is that it will pave the way for inflows of foreign capital, and special efforts are

being made to promote joint ventures with Western partners. After the dissolution of the CMEA and the collapse of Eastern European intraregional trade, the former member states are now conducting more trade with the West, and some countries are aiming for EC membership in the long term.

□ Decentralization of the entire economic management system and freedom to establish new companies (free choice of occupation or trade) which is important for structural change. New companies will especially tend to be established in the fields which were neglected by the socialist planned economy.

□ The introduction of functioning capital and lending markets on which a positive real rate of interest creates an incentive to make efficient use of capital as a factor of production, which in turn will lead to less capital-intensive production or exert pressure in favour of a more efficient investment policy.

### Conflicting Objectives

Reshaping the economy to conform to market principles is intended to procure greater economic efficiency which may also lead indirectly to an improvement in the chances of protecting the environment. Firms under pressure to minimize costs will be forced to reduce their raw material and energy inputs and will also be given incentives to innovate. However, the relative price shocks and the tough competitive pressure which arise when an economy is opened up to the world market have the effect of devaluing a part of the capital stock, with the result that production, national income and employment will all fall. In this situation, environmental protection measures which will force up costs will, if positive long-term effects are disregarded in a short-term outlook, be perceived as additional risks to the safeguarding or creation of jobs. It is in this initial phase of transformation in particular that the priorities of economic growth and job protection could lead to an ecologically dubious course being set for future development. At the same time, products which are ecologically sound and have a positive image in environmental terms could have good sales prospects, in the longer term, on the markets of Western Europe, or even on those of Central and Eastern European countries. In reality though, adjustment measures which are equally prudent from the ecological and economic viewpoints in the long term are very difficult to implement when faced with a shrinking economy. This is especially true when both economic and political actors have a very short-term orientation, i.e. the main aim is to survive the current recession, or the next election.

A prime area in which there is a fundamental

contradiction between the ecological potential for modernization and what is realistically possible is the energy sector. Just part of this picture is that companies could improve their energy efficiency, with electricity generating companies improving their thermal efficiency and reducing their emission levels. If more natural gas which is low in emissions were to be used instead of coal, this would represent an initial ecological modernization move on the input side of power and process heat generation. Hungary is so far the only country to have made early moves to set the scene for improvements in the energy structure and in energy-intensity, which the government expects to fall by 14% over the period 1989-2000, and by a further 27% in the following decade.<sup>3</sup> However, a policy such as this will lead to greater unemployment in the coal industry, and thus to massive opposition from coal miners in the former CMEA.

Considerable ecological advances can also be expected to be made by private households, particularly by modernisation in the housing sector. In contrast to Western Europe, energy prices were kept lower for private households than for industry; on the other hand, private households tend to have few savings or other means of financing home improvements, and state housing corporations, faced with a lack of funds (e.g. due to unpaid rents, major increases in construction costs combined with low rates of rent increase), are unlikely to be in a position to pay for modernization projects to improve energy efficiency. Previously, domestic energy prices were considerably below those on the world market, which means that as prices gradually come up to international levels there is a great need for adjustment.

A transition to world market prices for energy inputs – which although it is still being delayed in the CIS, has clearly been introduced by price reforms in the other CMEA countries – would produce incentives to save energy, so long as companies are already responding in market terms. However, some energy-intensive manufacturing operations would no longer be able to survive in international competition (where energy-saving measures have been under development since the oil price hikes in the 1970s). More energy-efficient products would have to be developed and the appropriate inputs obtained in domestic and foreign markets, since

<sup>3</sup> See OECD: Energy Policies. Hungary. 1991 Survey, Paris 1992, pp. 23-24. Hungary is also the leading user of natural gas in the former CMEA alongside Romania and the former Soviet Union, and intends to expand that use further: the share of primary energy input for electricity generation accounted for by natural gas is to increase from 31% in 1989 to 34% by the year 2000 and the share of coal to decline from 24% to 19%. For physical geographical reasons, hydroelectric energy is an insignificant factor, so the remaining proportions in the input spectrum are planned to be oil (32%), nuclear power (12%) and a residual 2% from electricity imports; cf. *ibid.*

companies can no longer take it for granted that they can sell almost anything they produce, as they could when demand always exceeded supply in the socialist “shortage economy”.

### Market-conforming Instruments

In addition, environmental policy – if not to say the whole of economic policy – now has to be operated according to different principles since the state, once enterprises are privatized, loses its direct control over corporate decisions relating to research, production, transport and sales. It is now mainly by establishing an appropriate general framework that governments can attempt to influence economic developments in directions which suit overall policy goals. It is necessary to create new economic institutions (bank and stock exchange supervision, unemployment insurance etc.) and also to define different levels of responsibility for central government, regions and municipalities. Apart from agreeing the objectives of economic policy, and establishing the agencies to implement it, there is also a need to develop new, preferably market-conforming instruments which should distort the competitive process as little as possible. These new instruments may, provided that they are selected to suit the problems, assure greater efficiency in environmental policy. This applies in the long term at least.

The democratization of political life finally brings with it new opportunities for various political groups to push through ecological aims. Political competition and a now increased number of parties assure that environmental aspects will gain increasing importance in the struggle for votes and power.

Before the aims of the transformation process can be achieved, a transitional phase is unavoidable which will be characterized by many conflicting aims, insufficient methods of control (the old ones no longer apply, new ones have not yet been passed or taken effect) and deep recession. In this transitional phase, it is normally too early for the greater part of the new incentives provided for in economic programmes to be effective. The political situation is also one of many contrasts during this phase: they exist between the ruling and the opposition parties, between former Communist Party members and the capitalistic parties now in charge, thus making it difficult to achieve any political consensus.

Taking a realistic view, one has to assume that only limited attention will be given to environmental problems during the first few years of system transformation. Only in the longer term can a rise in per capita incomes be expected, and only then will there be an easing of tension

between the conflicting aims of growth versus environmental protection.

### New Problems

Nevertheless, transition to a market economy will also mean new environmental problems. These problems will be seen in the packaging industry which threatens to give rise to an aggravated waste problem, in industry-oriented advertising and in growing numbers of automobiles and road transport services. These are the sectors in which the Eastern and Central European states must be careful to take over the positive and ecologically progressive innovations of the West rather than repeating its mistakes. The inherited socialist bureaucracy means that "de-bureaucratization" will be an ongoing task.

Reforming countries will increasingly suffer traffic problems, especially with the existing, largely outdated, infrastructure (and the public-sector budgetary problems). A reduction in the vertical integration of enterprises during the transition to the market economy, combined with the plans to open up economies to foreign trade, means rising levels of freight transport between suppliers and downstream manufacturing stages. An increase in NO<sub>x</sub> and CO emissions is to be expected as a result. The changeover to unleaded petrol and to cars equipped with catalytic converters as standard could keep traffic-generated emissions within limits. If car manufacturing is increasingly aimed at Western markets, or if car manufacturers in OECD countries start up production in Eastern Europe, the automobile industry can be expected to change over to modern ecological products and production methods in the medium term. Also conceivable are incentives towards ecological behaviour, in traffic especially, such as emission-based taxes on vehicles, a subject also being discussed by the EC.

It took Western countries many years of experience before they developed ecological solutions in a large number of sectors.<sup>4</sup> These solutions chiefly include recycling, returnable packaging, ecological waste utilization (collecting base materials for recycling, separation of types of waste), environment-friendly household and chemical products, and modern transport systems with reduced emissions, in particular smaller cars equipped with catalytic converters. In order to make such

<sup>4</sup> M. J. Welfens: Umweltpolitik und Innovationen im Systemvergleich: Bundesrepublik Deutschland-Polen, in: P. J. J. Welfens, L. Balcerowicz (eds.): Innovationsdynamik im Systemvergleich, Heidelberg 1988, pp. 106-125, esp. p. 118.

<sup>5</sup> On various economic and ecological aspects of transformation in the former GDR, see P. J. J. Welfens (ed.): Economic Aspects of German Unification, Heidelberg 1992; G. Sinn, H. W. Sinn: Volkswirtschaftliche Aspekte der deutschen Wiedervereinigung, Tübingen 1991.

solutions acceptable to society, it is necessary to implement campaigns to raise consciousness on a broad scale, improve education and training and extend the responsibilities and expertise of relevant authorities.

### Varying Prospects for Transformation

The process of transformation runs in very different ways among the countries of Central and Eastern Europe. Each of the former socialist planned economies started with its own particular conditions and international environment. The former USSR, Czechoslovakia and Yugoslavia have also had the added problems arising from their political break-up into smaller states.

On the whole, it can be assumed that after the reunification of Germany, market principles will most quickly determine the allocation of resources in former East Germany. A series of special arrangements and forms of state aid for branches of industry in crisis and general investment subsidies (financed by western German taxpayers) mean that there are still as yet many exceptions from the rule of market competition in eastern Germany – although conditions for development are favourable on a longer-term view; however, this region differs from the other former CMEA states in that it does not have the instrument of exchange rate adjustment available to it in order to ensure that products and locations are able to compete. The general framework of the west German social market economy is likely to prevail almost without exception in eastern Germany by the end of the 1990s; by the same time, eastern Germany could be more than two-thirds of the way towards catching up on the western area in economic terms, not least due to a huge transfer of finance and personnel.<sup>5</sup> As eastern Germany has not only acceded to the Federal Republic, but has automatically become a member of the EC, it will also (have to) catch up with the standard of environmental protection in Western Europe by means of large-scale clean-up efforts in many problem areas.

In Hungary, system transformation has also made rapid progress through the removal of price controls, the decentralization of economic planning and the liberalization of foreign trade. Hungary was able to build on the reforms carried out since 1968, as well as on the relatively well-established trading relations with the OECD countries; however, Hungary's freedom to implement reforms is restricted by its very high foreign debt. Although Czechoslovakia and Poland instituted privatization programmes, it cannot yet be said that their economies are operating largely on the basis of market principles; Poland's foreign debt is a particular problem, while the Czech Republic and Slovakia must each try to

achieve political stability and credibility after their separation in 1992. It is Slovakia with its problematic regions of heavy industry and its armaments factories which faces the greater economic problems. By mid-1992, only a very small part of industry had been privatized in Czechoslovakia or in Poland, but the process could gather momentum quickly in the Czech Republic. Privatization is an essential element in setting the process of economic modernization in motion, with unprofitable sectors of heavy industry – which are mainly responsible along with the energy sector for the environmental pollution – either closed down or having production levels cut back.

Competitive conditions are only being created gradually in Poland, Hungary, the Czech Republic and Slovakia. Given the dominance of large-scale enterprises compared to the situation in Western Europe, competition often cannot be created until the time-consuming, conflict-ridden process of deglomerating these enterprises has been mastered. The modernization of large-scale enterprises in heavy industry is likely to trigger considerable local opposition in so far as it is associated with unavoidable large-scale redundancies. Without competition and simultaneous price liberalization, prices are unable to function as indicators of scarcity nor are consumer desires effectively registered by producers (consumer sovereignty). Modernization and privatization of state-owned housing could be a constitutive element of comprehensive ecological modernization. Housing in CMEA countries has tended to be badly insulated, heating to be rarely equipped with thermostats, and heating charges to be little influenced by levels of consumption.

Most difficult of all is the situation in the former USSR, which failed to achieve either political or economic stability in the period 1990-1992. Hyperinflation in 1992, and ongoing conflicts regarding programmes for stabilization and privatization, as well as the high foreign indebtedness, are making it impossible to create a framework of sufficient credibility to attract private-sector initiative and investors. Sharp falls in national income and output combined with inflation, accompanied by a fall-off in the provision of goods and services, were the characteristic features of the CIS states in 1991/92. Nationalist conflicts are further

aggravating the situation created by difficult internal and external adjustments, and further problems are associated with the loss of the former Soviet Union's status as a world power.

**Costs of Ecological Rehabilitation**

The road to the market economy begins with the serious burdens of environmental pollution inherited from centrally controlled economies, and it is foreseeable that it will be difficult to catch up with everything which needs to be done in this area.<sup>6</sup> The belief that the most severely polluted areas could be thoroughly rehabilitated or brought up to Western standards within a short time is wholly unrealistic. Reforming countries are unable to fund projects on this scale, given their tight budgetary situations. The scale of expenditure required to clean up the environment is seen clearly if we take former East Germany as an example.<sup>7</sup> It is estimated that financial expenditure of around DM 380-470 billion would be required merely to bring the areas of energy supply, transport, waste and waste water up to former West German standards within 10 years. If that amount is distributed annually over a decade, this would require around 20% of eastern German real net output, which was

**Table 1**  
**Costs of Cleaning Up the Environment in Selected ex-CMEA Countries**  
(Basis is 50% of East German Cleaning-up Costs)

	Unit	Poland	"Czecho-slovakia"	Hungary	CIS <sup>1</sup>
Population (1990)	mill.	38.1	15.7	10.4	206.6
Area	1000 sq.km.	312.7	127.9	93.0	5572
<b>Cleaning-up costs p.a.</b>					
(A) on a per capita basis <sup>2</sup>	DM bn.	43.6	18.0	11.9	236.5
(B) on a per sq.km. basis <sup>3</sup>	DM bn.	54.9	22.4	16.3	977.5
GDP <sup>4,5</sup>	DM bn.	95.4	66.8	49.4	–
High estimate					
C1 = (A)/GDP:	%	45.7	26.9	24.1	–
C2 = (B)/GDP:	%	57.5	33.5	33.0	–
Lower estimate					
C1* (50% of C1):	%	22.9	13.5	12.1	–

<sup>1</sup> European region only.

<sup>2</sup> Taking only 50% of expected cleaning-up costs in the former GDR: the annual cleaning-up costs in the GDR would be DM 1144.6 per capita (DM 19 bn./16.6 mill. inhabitants in 1990).

<sup>3</sup> in the GDR annual cleaning-up costs per sq.km. amount to DM 175,438.6.

<sup>4</sup> GDP at purchaser values, according to World Bank (1990): World Development Report.

<sup>5</sup> Exchange rate assumed is \$1 = DM 1.5.

Sources: Główny Urząd Statystyczny (Head statistical office): Rocznik statystyczny 1990 (Statistical Yearbook 1990), Warsaw, Tab. 6 (804), 521; U. Petschow, J. Meyerhoff, C. Thomasberger (eds.): Umweltreport DDR, Frankfurt am Main 1990, p. 110; World Bank: World Development Report 1992. Development and the Environment, New York (Oxford University Press), Tab. 1, Tab. 3; adapted from M. J. Welfens: Umweltprobleme und Umweltpolitik in Mittel- und Osteuropa, Heidelberg: Physica, p. 210.

<sup>6</sup> On environmental pollution in the former planned economies, see: G. Enyedi et al. (eds.): Environmental Policies in East and West, London 1987; H. Förster: Umweltprobleme und Umweltpolitik in Osteuropa, Aus Politik und Zeitgeschichte, Supplement to the weekly Das Parlament, B10/91, pp. 13-25; OECD: Reforming the Economies of Central and Eastern Europe, op. cit., pp. 97-101; M. J. Welfens: Umweltprobleme und Umweltpolitik in Mittel- und Osteuropa, op. cit., pp. 25-95.

<sup>7</sup> On the costs of environmental rehabilitation in former East Germany, see U. Petschow, J. Meyerhoff, J. Thomasberger (eds.): Umweltreport DDR, Frankfurt am Main 1990, pp. 110-119.

in the region of DM 180bn in 1991. If half of the DM 380bn figure estimated for the cost of rehabilitation in former East Germany is taken as the lower limit (i.e. DM 190bn over 10 years, or DM 19bn per annum), this provides some indication of the costs of cleaning up the environment in other former socialist countries (Table 1).<sup>8</sup> An estimate of those costs in Central and Eastern European countries may be made by taking account of the fact that their wages and prices are lower than in Germany, which explains the 50% deduction on the per capita and square-kilometre figures in Table 1. Depending on how the clean-up costs are calculated, they reach levels between 24% (Hungary) and 58% (Poland) of domestic product of the countries under review (calculated over a period of 10 years). If it is assumed that the marginal costs of cleaning up the environment rise rapidly, and that it is possible to attain  $\frac{2}{3}$  of the western German environmental standards with half of the costs required for 100% rehabilitation, the resulting "C1\*" values for a more modest programme are still very high at 12%-23% of domestic product. This makes it obvious that any clean-up of inherited pollution can only take place on a gradual basis. It would be possible in some countries, assuming a high degree of mobility of labour, to leave out some rehabilitation areas for the time being, and concentrate instead on a policy of encouraging new companies to locate in relatively uncontaminated areas. However this would require considerable investment in both infrastructure and housing.<sup>9</sup>

Finally, the problem of overall pollution must be divided, for analytical purposes, into pollution based on the existing capital stock on the one hand, and that generated by net investment or increased production on the other. The quicker ecological modernization is implemented in the case of new investment (partly including re-investment), the sooner it would be possible to also justify a phased clean-up of the areas polluted in the past.

Comparing hypothetical clean-up costs with gross domestic product in Central and Eastern European countries clearly shows that the ex-CMEA countries will face huge costs for ecological rehabilitation and modernization, which could only be funded by a comprehensive reduction of subsidies; in 1990 subsidies accounted for 7.5%, 14.0% and 8.9% of gross domestic product respectively in Poland, former Czechoslovakia and Hungary, compared with 2% in the OECD countries. There is likely to be considerable opposition to any reduction in subsidies. Added to this is the fact that reforming countries are faced with huge foreign debts, which extremely limits the capacity for government spending.<sup>10</sup>

Under these circumstances the first thing which is

needed is to gain more freedom of action and to undertake measures which do not create an undue burden on public-sector budgets. Particularly worth recommending would be programmes designed to save natural resources and reduce energy consumption; such programmes would simultaneously result in considerable improvements, both economically and ecologically. There is ample potential scope for action here, given that the former planned economies tended to be wasteful in their use of resources and energy. Saving resources domestically could mean a reduction in import requirements, and it could help to increase income from exports, if resources were exported.

### Imperfections of the Market System

The introduction of competition and private ownership as the cornerstones of a market economy will improve allocative efficiency in the reforming countries. Such are the economic and political problems prevailing that it would appear a difficult task to secure environmentally acceptable growth while at the same time dealing with the problem of contamination from the past, yet even when funds are so scarce and the problems so great it is possible to make progress on the ecological front if environmental policy is appropriately designed. It is necessary to define appropriate principles for environmental policy, to assign clear responsibilities, to introduce regular checks on the results of national and regional policy (with a standardized method of reporting) and to firmly establish a viable framework for environment-friendly economic activity by firms and households.

The market itself is incapable of efficiently allocating the public good of "a clean environment" as there are often differences between the private (microeconomic) marginal costs of production and the social (macroeconomic) marginal costs; if firm *a* from industry A impairs the productivity of firm *b* in industry B by its emissions, this means that firm *a* generates economic costs in addition to its perceived production costs which, if they were taken into account, would have the effect of reducing industry A's production or expanding industry B's production. This is the problem of externalities, the level of which is particularly difficult to assess and to express in

<sup>8</sup> Cf. M. J. Welfens, *ibid.*, p. 210.

<sup>9</sup> Thus environmental rehabilitation would be far more expensive by this measure than was estimated by Hughes; see G. Hughes: Are the Costs of Cleaning up Eastern Europe Exaggerated?, in: *Oxford Review of Economic Policy*, 1991, Vol. 7, No. 4, pp. 106-136. See also P. J. J. Welfens, M. J. Welfens, P. Palinkas: *Environmental Policies in the EC and Eastern Europe: Economics, Ecological Modernization and International Energy Cooperation*, forthcoming (Springer).

<sup>10</sup> On subsidy ratios, see Bank of International Settlements: 62nd Annual Report, Basel 1992, pp. 70-71.

monetary terms during the phase of transformation. These external effects can only be estimated precisely when knowledge is available on the new cost and price structures which apply in the medium term. The introduction of emission-based taxes would then be one conceivable element which could help to cut back environmentally harmful production and to promote the product and process innovations which produce fewer emissions. However, that still initially leaves the problem of existing pollution unsolved. An important question in this context is whether it would be appropriate to encumber a privatized company with the environmental pollution of its state-owned predecessor, or with the clean-up costs.

Western market economies have developed a whole series of environmental policy tools aiming to eliminate or alleviate the imperfections of the market system and to motivate economic actors to behave in an ecologically sound manner; environment-friendly behaviour should be rewarded and encouraged, whilst environmental pollution should be reduced by using sanctions, such as taxation, payments of compensation or legal restrictions, e.g. by means of regulations which require that technology conforms to the "state of the art".

### Market-oriented Environmental Policy

"Environmental quality" is initially determined in market economies by setting out the basic environmental policy framework (including the basic specifications and requirements in environmental legislation), whereby all interested and/or politically committed citizens or groups have the opportunity to get involved in the constitutional or economic policy decisions on the issue. For the purpose of realizing these environmental aims in practice, suitable standards of measurement are required (e.g. environmental quality = remaining below the maximum value  $X$  over a 24-hour average, standard deviation up to  $x$ ); in addition instruments of policy have to be selected.

The core of a market-oriented environmental policy involves motivating people to behave in an environment-friendly manner without having to be compelled to do so by the state, through the use of financial and other incentives in accordance with policy objectives.<sup>11</sup> Instruments can promote environment-friendly behaviour in a variety of ways. Public information and education, as well as moral suasion, influence demand; the state as a consumer in its own right can also purchase environment-friendly products or sponsor them via model projects.

Environmental charges and licences appeal to the profit interest of firms and act as an incentive to reduce environmental pollution. Stricter liability for environmental pollution and associated insurance policies compel firms

to include the use of the environment in their cost calculations; any profit-maximizing company will endeavour to pay the lowest possible premiums; insurances companies will tend to penalize firms which have repeatedly been required by law to pay compensation by raising their premiums. This, in turn, increases production costs, so that competition will ultimately allow firms which are less of an environmental or legal risk to expand more rapidly through higher profits or lower costs than others which are notorious polluters. This is exactly the desired effect. The extent to which price incentives can influence behaviour and produce innovations in market economies was shown, more by accident than design, in the 1970s at the time of the oil crisis; higher oil prices resulted in considerable efforts to save energy and in energy-saving innovations.

There are a number of market-oriented environmental policy instruments intended to lead to voluntary environment-friendly behaviour. This group includes providing information about environmental risks and dangers, giving consumers better information, including environmental criteria in the testing of products and services, and distinguishing environment-friendly products by awarding an environmental quality symbol – the latter appeals to both the supply and demand sides; the development of environment-friendly products can help to enhance the reputation of certain product types or suppliers among ecologically aware consumers or purchasers, thus giving rise to an indirect positive ecological effect as companies compete for the favour of consumers.<sup>12</sup> If the demand for an intact environment increased along with higher real incomes, continuing growth in Central and Eastern Europe would make an indirect contribution to improving the environmental situation. As shown in the World Development Report 1992, it is by all means possible to decouple economic growth and increasing energy consumption, i.e. real incomes can rise while energy consumption remains constant due to increased use of energy-saving products.

### Systems of Regulations

In addition to the market-oriented instruments in the narrower sense of the expression, systems of regulations constitute an integral and established part of environmental policy in all market economies. Regulations and fiscal instruments continued to dominate

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<sup>11</sup> L. Wicke, J. de Wolff: Von der Sozialen zur Öko-Sozialen Marktwirtschaft in Deutschland, in: Bundeszentrale für Politische Bildung: Wirtschaftspolitik, Bonn 1990, pp. 367-381, esp. pp. 377 ff.

<sup>12</sup> L. Wicke: Umweltökonomie und Umweltpolitik, Munich 1991, pp. 164 ff.



environmental policy in Western countries in the 1980s; market instruments which provide ecologically favourable behavioural incentives were still the exception at the beginning of the 1990s in Western Europe. The dominant approach throughout the western world is still one of regulatory intervention, supplemented by price measures (duties and eco-taxes) and, to a very limited extent, by quantity measures (environmental licences).<sup>13</sup>

All in all, western market economies can offer the Central and Eastern European countries tried-and-tested strategies and instruments of control in environmental policy, though these have not always been implemented consistently in the past. The problem of inherited pollution in Central and Eastern Europe also plays a special role. Depending on the sector and the overall prevailing conditions in the individual countries, the mix of instruments used will need to vary to suit the problems which are being experienced.

Although regulatory-based instruments are hardly able to promote economic efficiency in environmental policy, they do remain indispensable – during the transitional phase at least. Until the greater part of state enterprises has been privatized, the process of modernization is in full swing and both the economy and the state have been “de-bureaucratized”, transitional measures will be required to minimize acute environmental problems; this initially requires a step-by-step reduction of subsidies to industries with above-average emission levels or high negative external effects (subsidies are a spur to increase output and, therefore, to increase emission levels). Regulations offer some advantages in the transitional phase: the most important advantages of this type of instrument include its clarity and the fact that it does not require any great understanding of economics. Fixing technical parameters is less likely to induce conflict than finding complex rules to create an optimum economic effect; moreover, complex rules often harbour loopholes which allow the regulations to be by-passed. Regulations are easier to assert in many cases in political discussion than the economic instruments of environmental policy. Furthermore, they are practicable and quick to take effect (in contrast to the time required for the effects of environmental taxes to work through). Investors receive the certainty which they so urgently require for their planning and expectations directly, thus removing any additional obstacles to investment resulting from

uncertainty on environmental policy or any lack of transparency. High investment in modernization, also to ensure that production remains competitive internationally, is exactly what the ex-CMEA states need as quickly as possible.

During the transitional phase in particular, quick-acting regulations could be preferred initially to other alternatives in environmental crisis zones. No small part of the reason for this is the fact that as yet unprivatized enterprises suffering from sales and cash-flow problems do not even pay the statutory taxes in some ex-CMEA countries; instead they try (often successfully in Poland, for example) to persuade the government to reduce their tax burden or provide higher subsidies by pointing out that jobs are under threat. Obviously, duties or “penalty taxes” on emissions would have very little effect in a situation like this.

### Alternatives

Only after privatization has largely been completed and once positive economic growth allows scope for economic and political measures will market economy instruments be able to exercise any high degree of bite. Emission-based taxes are only likely to achieve any real success in terms of influencing behaviour in accordance with objectives when firms are faced with limited budgets and there is sufficient competition; this presupposes that such taxes are not of a superficial nature and that they have a graduated or progressive structure which is truly appropriate to the problem. Only after economic participants have learned how markets operate is it possible to make sensible use of price-controlled incentives to save resources and promote environmental protection. In practice, however, there is always a danger that any regulations once accepted will only be able to be substituted by market instruments at a later date with great difficulty or in the face of substantial opposition.

In general, it can be said that the transformation of the economic systems in Eastern and Central Europe also offers opportunities for efficient structures in the field of environmental policy. The instruments of the new environmental policy should, in the short term, be mainly regulatory-oriented, and then, once markets are largely in operation, should go on to include quantitative economic solutions (environmental certificates). Fiscal solutions should be implemented only to a limited extent since, given the large budget deficits of the ex-CMEA countries, there is a danger that these would be used primarily for revenue-generating purposes (the fiscal objective) instead of fundamentally providing incentives to reduce emissions (the ecological objective). The programme to implement the new environmental policy should take place

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<sup>13</sup> OECD: Economic Instruments for Environmental Protection, Paris 1989; H. Bonus: Umweltpolitik in der Sozialen Marktwirtschaft, in: *Aus Politik und Zeitgeschichte*, supplement to the weekly *Das Parlament*, BB 10/91, pp. 37-46; H. Müller-Witt: Öko-Steuern als neues Instrument in der Umweltpolitik. Eine kritische Analyse umweltpolitischer Anreizinstrumente in den USA und in der BRD, in: Ifo-Institute: *Studien zur Umweltökonomik*, Munich 1989, Vol. 10.

in stages and should take account of the specific phases of development in the process of transformation. This means that during the first critical phase in which production, and therefore environmental pollution, is declining, environmental policy should not do anything to reduce growth even further. It is more important here to guide new investment in an ecologically desirable direction by defining a clear environmental policy concept with predefined rules and principles (e.g. long-term preference given to the environmental-licence approach). In addition, the state would also have to create incentives towards environment-friendly behaviour by means of a long-term ecology programme involving the construction of effluent treatment plants, the setting-up of environmental monitoring stations, changes in environmental liability legislation, and the introduction of environmental quality symbols.

### Cleaning up Contaminated Sites

One of the urgent problems to be solved in the medium-term if foreign investors are to be attracted into the country is the further drafting of rules of liability for past and future environmental damage to apply to privatized enterprises. Foreign investors, who are so important for the transfer of technology and know-how and for real capital formation, will hardly be prepared to take on the risks of environmental liability in addition to all the other marketing and political risks in Central and Eastern Europe. As it is very difficult to ascertain precisely, when inspecting an enterprise with a view to buying it, if and to what degree pollution exists, risk-shy investors are liable to suspect a greater degree of pollution than actually exists and to demand substantial discounts on the purchase price of enterprises to cover any potential environmental liability. In addition, investors might fear that the authorities could impose "post-dated" demands for contributions to cleaning-up costs at some future time, once the investor has made a substantial financial commitment. What investors need are flexible rules more likely to be interpreted in their favour, and not rigid rules which also allow scope for arbitrary bureaucratic decisions. Nevertheless, in the real world during system transformation, statutory provisions and regulations are rigid. A classic example of this is Poland. Foreign investors will hardly be prepared to accept a situation in which negotiations with local authorities based on the actual case in hand are the exception, and where it is only in very rare cases that investors are allowed the time necessary to introduce emission-reducing investments in stages. It is not normally possible in Poland to receive concessions as regards environmental regulations to facilitate rapid modernization of an enterprise.<sup>14</sup> Initially, however, it is especially important to attract direct investors on a wide

scale (only Hungary has had any great success in this regard so far) and to promote greater efficiency and higher economic growth by facilitating rapid privatization. At times when growth is high, the otherwise conflicting aims of ecology and economy are no longer such a problem, and market-conforming instruments such as licensing measures would stand a better chance of being implemented.

Foreign investors are not prepared to take on responsibility for cleaning up earlier pollution.<sup>15</sup> If investors are not discharged of this liability, they will not wish to purchase those divisions of an enterprise which suffer from former pollution – which makes them virtually worthless; that would still be the case even where a low level of expenditure on cleaning-up would make them profitable in the longer term and thus valuable both microeconomically and macroeconomically. Making exaggerated clean-up demands on investors may have the result of no clean-up at all, as well as lead to the scrapping of fixed assets which could otherwise still have been used effectively in production.

The problem area of inherited pollution has many facets to it. Although there is no inventory of past contamination in Central and Eastern Europe, the analysis of the present-day state of the environment and of environmental policy in the past gives us cause to assume that pollution could be found on the premises of almost all enterprises in the sectors of heavy industry, chemicals and pharmaceuticals. Uncertainties about the possible financial burdens involved in acquiring enterprises with suspected pollution can act as direct barriers to investment and growth.

The number of areas suspected of being contaminated in the traditional industrial regions of former East Germany is in the region of 50,000, which indicates the scale of the problem.<sup>16</sup> Since no records or documents on contaminated sites exist, the purchase by foreign investors of any state enterprise for privatization purposes is associated with high risks and an unquantifiable financial obligation for cleaning up. At the focal point of the discussion is the "polluter pays" principle. First preference

<sup>14</sup> T. Kolaja, W. Skarzynska: Zagraniczni inwestorzy w Polsce. Szansa dla srodowiska, pt. 1, in: *Zycie Gospodarcze*, 1992, No. 39, p. 4.

<sup>15</sup> Put more precisely, the problem referred to here stems from past, discontinued activities, the environmental effects of which nevertheless demand action here and now. It essentially consists of past storage, disposal and production sites which pose, or can be expected to pose, a threat to the environment in general and to human health in particular. Cf. Rat von Sachverständigen für Umweltfragen (= Expert Consultative Committee on Environmental Matters): Sondergutachten "Altlasten", Deutscher Bundestag, 11. Wahlperiode, Drucksache 11/6191, 1990, p. 18.

<sup>16</sup> Umweltbundesamt: Jahresbericht 1991, Berlin 1992, p. 274.

is normally given to asserting this principle in Western market economies. But it is frequently no longer possible to ascertain the identity of the polluter, or if he can be ascertained, he is not in a position to pay. These problems will occur more and more during the course of privatization in Central and Eastern Europe. Many former enterprises will close down and it will be almost impossible to establish who caused the pollution. Furthermore, contamination of the soil may have occurred at a time when there were no legal rules against it, and where it was in accordance with the knowledge available to users at that particular time. Since environmental legislation was very liberal in many areas for many decades in socialist economies, it would be very difficult today to prove that the activities of an enterprise which operated at that time were illegal. For these reasons, it is more likely that past contamination will have to be cleaned up on the basis of the "common charge" principle. It is possible to apply the "polluter pays" principle to privatized enterprises which are responsible for earlier environmental pollution but in practice this will be the exception rather than the rule.

### Sharing the Costs of Cleaning Up

Statutory measures in the area of rehabilitating contaminated sites in privatized enterprises are still very incomplete, and the subject was only officially put on the agenda of the privatization debate in 1992. In the Polish Ministry for Privatization, it is assumed that the state, which already faces the prospect of major problems with government borrowing, is unable to assume financial responsibility for clean-up operations of an unknown amount.<sup>17</sup> It is in the interests of both the ministry and potential investors to have a reliable estimate of the degree of pollution and a delimitation of the responsibilities of both parties. An independent surveyor is called in to determine the degree of pollution on the premises of privatized enterprises. This examination leads to a list being drawn up of necessary clean-up costs. This estimate tends to be vague in many cases as, for example, there are no regulations in Poland for keeping soil clean if it is not used for agricultural purposes. Dutch standards have been taken over as a pragmatic solution. It is assumed that pollution will be cleaned up using the methods currently known. The final result is the conclusion of a contract in which clean-up costs are shared between the state and the future investor. For the purpose of determining how the clean-up responsibilities are to be shared, not only the list of the costs involved, but also an estimate of the real dangers of consequential damage emanating from the pollution play an important part. The funds allocated are held in escrow and the investor can only use them for the purpose designated in the contract.

The Czech Republic has solved the problem of cleaning up pollution in the case of foreign investors in a slightly different way.<sup>18</sup> Foreign investors are only liable for the environmental conditions on the actual premises of the enterprise; accordingly, it is in each investor's interest to determine the exact degree of contamination or pollution prior to purchase. This makes it necessary to cooperate with former works managers and the relevant municipalities. On the basis of a new law, up to 50% of the proceeds from privatization are held in escrow to be available for any clean-up measures which become necessary later, but which are not absolutely necessary in the first instance.

In former East Germany, pollution is cleaned up primarily using public funds; private funding only comes into consideration in very few cases, and the policy of the *Treuhandanstalt* aims to discharge any risk of corporate liability for pollution; the costs of cleaning up are assumed by the *Treuhandanstalt* or by the state.<sup>19</sup>

Only if the state sets the course for permanent economic growth and environment-friendly structural change sufficiently early in the process of transformation, will it be possible to gain greater scope for the gradual cleaning up of inherited pollution. Lack of funds makes it necessary to set priorities for rehabilitation, which may also be combined with job creation measures. Finally, environmental instruments based on market principles will become necessary in the medium term as a concept far more effective than interventionism in isolated cases; given the traditional administrative and economic bureaucracy in ex-CMEA countries, this especially will prove difficult to implement. Encouragement could be given, for example, by targeted aid from the EC.

<sup>17</sup> Cf. T. Kolaja, W. Skarzynska, op.cit.

<sup>18</sup> D. Arbess: One-stop shopping in Czech Privatisation, *Financial Times*, 15th September 1992, p. 20.

<sup>19</sup> In addition to funds from the federal budget (via the "Expansion in the East" Project - "*Aufschwung Ost*"), finance is also available from the municipal loans programme of the Reconstruction Loan Corporation in conjunction with the Deutsche Ausgleichsbank, from the European Reconstruction Programme, and from the common task funds for improvement of the regional economic structure and for improvement of the agricultural structure and protection of the coastline. Revenue from two new public charges will also be available for rehabilitation programmes in future, namely the refuse charge which it is proposed should generate total revenue of approx. DM 5 billion (of which DM 2 billion are to be spent on cleaning-up operations) and a sulphur dioxide charge, the proceeds of which will be used entirely for rehabilitation work in former East Germany. Private-sector investors are absolved of responsibility for dealing with past pollution burdens. On funding for cleaning up past contamination in eastern Germany, see: Der Bundesminister für Umwelt, Naturschutz und Reaktorsicherheit (ed.): *Eckwerte der ökologischen Sanierung und Entwicklung in den neuen Ländern*, November 1990, pp. 44-47; K. Zimmermann: *Umweltpolitische Perspektiven in den neuen Ländern*, in: *Aus Politik und Zeitgeschichte*, supplement to the weekly *Das Parlament*, B 39-40/92, September 18, 1992, pp. 3-13, esp. p. 8. See also H. Belitz et al.: *Ökologische Sanierung und wirtschaftlicher Strukturwandel in den neuen Bundesländern*, Berlin 1992.