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Hazardous Waste Management in Hungary

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PREFACE

This paper has been produced as part of IIASA's hazardous waste management work, which is the main component of the Institutional Settings and Environmental Policies project. The overall aim of this work, reflected in this paper, is to systematize our understanding of interactions between institutional and technical factors in policy making and implementation. The influence of institutional processes upon technical knowledge built into policy has been increasingly recognized. However, it has yet to be adequately clarified in comparative research on different regulatory systems. Institutional structures canot be easily transplanted from one culture to another. Nevertheless, through the normal flux of policy, institutional development slowly occurs anyway, in more or less *ad hoc* fashion. Comparative insight may help to direct reflection and adaptation in more deliberate and constructive ways.

This paper forms one draft chapter of an intended book on hazardous waste management. The reader will therefore notice references to other draft chapters in this study which are also being circulated separately, and which are available from IIASA. A full list is given overleaf. At this stage the papers are drafts, and are not intended for publication in present form. They are being circulated for review and revision.

I would like to thank those policy makers and others who have exchanged papers and information with us, and those who generously gave of their time and experience in the many interviews which form a substantial input to this work. A full list of acknowledgements will eventually be published.

THE HUNGARIAN COLLABORATION

This Hungarian case study was written by Ernö Kiss, under the supervision of Dr. Pal Tamas of the Institute of Sociology of the Hungarian Academy of Sciences. Assistance was also given by Drs. Janos Vecsenyi and Anna Vari of the Bureau of Systems Analysis of the Hungarian State Office of Technology. We are very grateful to these colleagues for their efforts and for hospitality during visits to Budapest. We are also grateful to Dr Istvan Kiss of the Bureau of Systems Analysis and secretary to the Hungarian National Member Organization (NMO), for his encouragement and facilitation of cooperation.

The research conducted by Ernö Kiss consisted mainly of interviews with relevant policy makers (and associated documentation) according to a schedule first provided by and discussed with IIASA's INS group. The collaboration evolved during 1983 and early 1984 via a series of informal working meetings in Budapest and at IIASA so that coordination was maintained with other research. A first draft case study was produced in early 1984 and responses to further questions produced another in March 1984. A final meeting was held in April 1984 at IIASA involving Dutch and Hungarian collaborators, leading to the present version of the case study.

As leader of the hazardous waste research I gratefully acknowledge the cooperation extended by Dr. G. Gonda, Director of the Hungarian State Office for Nature Conservation and Environmental Protection, and by his staff in the Hazardous Wastes Division, especially Dr. Attila Takacs, Deputy Director.

Brian Wynne
Research Leader
Institutional Settings and
Environmental Policies

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HAZARDOUS WASTE MANGEMENT IN HUNGARY

Ernö Kiss

INTRODUCTION

A comprehensive program for modernizing industry was launched in Hungary after World War Two. At the end of the 1960s, this was followed by the intensive development of mechanized agriculture. As a result the industrial and agricultural infrastructure has developed considerably over the last 30 to 35 years. The extensive development of the economy included tremendous growth in the chemical industry which increased production almost 34-fold over a 33-year period. This growth imposed increasing burdens on the environment including a considerable expansion in the types and amounts of hazardous wastes being produced. Since the late 1960s the question of the environmental and health hazards from hazardous wastes, emanating primarily from the chemical industry, has become an important issue.

Since the early 1970s, several cases of environmental pollution from hazardous wastes have been discovered. The first was the case of galvanic sludge produced by an automobile and truck works. It was found that heavy metal salts and cyanide had contaminated the subsoil and spread uncontrolled beneath a waste dump. In another case in Tatabánya, cyanide leached from a waste dump into a nearby reservoir and was detected by health authorities. In other cases, arsenic contamination was reported in areas of the Danube and Tisza Rivers. This pollution resulted from the unsafe storage of a catalyst at a chemical plant. In addition to these incidents studies on the harmful implications of hazardous wastes from abroad, mainly from the United States and the Federal Republic of Germany, called attention to the issue.

In 1971 the National Institute of Public Health* (OKI) decided to launch a study on industrial wastes. This study was carried out by ten provincial public health and epidemiological stations (KOJAL) with the voluntary cooperation of 140 industrial companies selected as representative samples. (see Appendix for an organization chart of government bodies regulating hazardous waste). In assessing the data, the Ministry of Health elaborated guidelines for storing and treating wastes hazardous to the environment and human health. These guidelines did not have the force of law but were recommendations for industry.

Before the establishment in 1979 of the executive State Office for Environmental Protection and Nature Conservation (OKTH), the Ministry of Health was the only authority with any responsibility relating to risk management from hazardous wastes. However its control was weak and indirect, since its main responsibility was general public health which focused its monitoring, research

* Part of the Ministry of Health. See Appendix for an outline description of the relevant institutional structure.

and control activities. Unless specific health problems were associated with an industry's waste management actions (as happened later at Vác, see below), it had no mandate to examine industrial waste practices. Perhaps because it was not seen by the cooperating industries as a potential "policeman", OKI was given good access to "internal" information. The "pilot" survey was followed up between 1978-80 with a much enlarged exercize covering 3,300 plants, involving 20 regional KOJALs. This later study was performed in the context of proposed formal legislation and control, and some have suggested that this new climate created a relationship which reduced the accuracy of the data supplied.

At least among the upper reaches of society, well-articulated awareness of environmental problems began as early as in other countries. In 1974 the Popular Patriotic Front held a well-attended, and publicized meeting on environmental problems from which led to several initiatives. Subsequently, environmental problems in general were addressed by high-level, comprehensive policy initiatives on environmental protection. This resulted in the enactment of Law II/1976 on the protection of the human environment. This law provided the general framework for further legal regulations on environmental protection, but was not specific enough to act as a means of the effective regulation of hazardous waste disposal.

Even after 1976 each producer still deposited and "disposed" of wastes (some later classified as "hazardous" under the legislation) at their own discretion outside the premises of the company — unless the manner of disposal led to effects violating other public health regulations. Often such wastes were disposed of with municipal garbage or "stored" by the plant

This lack of special treatment for hazardous wastes was due mainly to a lack of direct legislation giving authorization to inspect. Fundamentally, there was little planning, when designing industrial facilities, for the treatment and re-utilization of wastes produced. Only a small number of companies have invested in waste disposal technologies. For example, an oil refinery has voluntarily built an industrial incinerator. In other cases, incinerators of smaller capacity were built by the Chinoin Pharmaceutical Works and the Nitrokémia Chemical Works. However, apart from these sporadic examples, industrial wastes of unknown quantity and composition appear to have been continuously deposited in the environment, i.e., in ditches, gullies, and other dumping sites, including untreated waste dumps at industrial plants.

Unsolved environmental problems and generally rising awareness contributed to the establishment, in 1977, of the National Council for Environmental Protection and Nature Conservation (OKTH). This was created by the Council of Ministers as an advisory body. In addition, a State Office (the executive body) for the National Council was also founded. In 1979, the State Office of the OKTH was granted sole authority for dealing with air pollution and for nature conservation, and shared responsibility, together with the Ministry of Health, for noise and hazardous wastes.

Law II/1976 on environmental protection, the basis for the foundation of the National Council for Environmental Protection and the State Office, only very gradually provided a statutory framework for the regulation of industrial wastes. With the knowledge gained through its earlier survey, OKI called attention several times in the 1970s to the need for formal control of hazardous wastes. However these demands floundered for several reasons: the relevant department of the Ministry of Health was being reorganized and anyway had

only an indirect connection to the issue; there was only circumstantial scientific evidence of causal connections to local health problems; OKTH, although being planned, was not then in existence: and because the Industry Ministry was more concerned with problems of production. The Ministry that guided and commissioned the second OKI survey for example, was not a Health or Environmental Ministry, but the Ministry for Housing and Town Development. However, in 1979, a disastrous situation arising from improper waste disposal in the small Hungarian town of Vác stimulated urgent action not only to deal with that specific problem, but with more general remedies as well.

THE CASE OF THE CHINOIN PLANT IN VAC

The Chinoin Pharmaceutical Works, near Vác, used one location for storing raw materials and by-products. But since 1952 on the company used it to also dispose of wastes. This disposal was performed partly in an open air burning pit and partly by landfill. In 1977 the county council and the local water authority outlawed both disposal practices. However, the accumulation of wastes continued. By the spring of 1980 the huge pit had become full and was surrounded by approximately 12 thousand barrels of various toxic, flammable, and explosive chemicals. In addition, the barrels were not always sealed and most were unsuitable for transport. Through the intervention of the then Ministry of Heavy Industries, a licence from the Ministry of Health was obtained for a one-time, open-air burning. This burning had to be interrupted, however, because of the high level of air pollution indicated by measuring instruments located in the region. Burning was later continued, after some additional precautions were taken.

Towards the end of the 1970s, in certain parts of Vác the drinking water system became suddenly turbid, yellowish, and smelled of chemicals. Public concern was aroused throughout the town and it was publicized in the media. Numerous diseases with symptoms of vomiting and diarrhea occurred. According to the county Department of Health approximately 20% of the population was affected. This situation continued for a long time with all initiatives to remedy the situation foundering in red-tape. Finally, in several stages, a number of wells, primarily in the Vác-South water basin, were closed and have not been reopenend since. The population began carrying drinking water from other sources. Many local inhabitants who worked in Budapest brought drinking water in cans there for their families. Naturally car owners had a distinct advantage, but car ownership is low.

The Water Department and the Public Health Department received many queries about the quality of the water but responded that the drinking water was safe. This was in fact true, according to Hungarian standards. One of the leaders of the county Public Health Department later admitted in a statement concerning the outbreak of disease that the reason for their reassuring replies to public concern was that they did not want "to create a panic"! Despite this frankness, they admitted that wells had been closed, not because they caused disease, but because one standard requires that drinking water should not have any unusual taste or smell.

Because of the contamination, more than one-third of the potable water supply for Vác, Gödöllö and Dunakeszi, as well as for 14 other small communities, temporarily ceased . The Institute for Water Quality Protection of the Water Management Research Center of the National Water Authority investigated the case. Results obtained from their analyses (using a modern mass

spectrometer) showed that the materials contaminating the water were primarily various solvents (such as 1-butanol, benzene, and toluene). The water samples, based on the groundwater flow, were taken from more than 20 observation wells drilled especially for this purpose. Knowledge of the Chinoin plant and other pollution sources in the area made it certain that the bulk of contamination by solvents originated from the plant. Experiments conducted with small mammal and human blood cell cultures indicated detrimental health effects.

Many relevant authorities, institutions, and responsible persons had been well aware for years of the possibility of the water being contaminated in Vác, but no action was taken. Several weeks before the scandal broke, the Chinoin plant had already been cleaned up. The sudden disposal by burning had occurred not only because of the fear of adverse publicity, but because the Council of Ministers decided to make a government committee and its chairman personally responsible for remedying the uncontrolled dumping that had been going on. The public scandal had engendered the creation of an ad hoc decision structure which cut clean through the normal bureaucratic complexity.

HAZARDOUS WASTE LEGISLATION

In part as a result of the Vác scandal, in 1980 the State Office of the OKTH started to develop more precise legislation for addressing the problem of hazardous wastes, at that time still undefined. This legislation was prepared by the Department of Environmental Protection of the State Office in cooperation with experts appointed by the Ministry of Health, which had conducted the two waste

surveys had extended their earlier waste survey into a second, much larger study. The basis for this collaboration was provided by an order of the Council of Ministers. This conferred the responsibility for dealing with toxic chemicals in the environment on the National Institute for Public Health (OKI) and on the local public health departments (KOJAL). In November 1981 a law was passed by the Council of Ministers to deal with hazardous wastes. This became known as the "Initial Order."

First of all, the group drafting the legislation attempted to define the concept of hazardous wastes. However, because this concept is difficult to define, lists of chemical compounds vary greatly from country to country (see Dowling and Linnerooth, in this volume). Therefore the Initial Order gave a general definition, but did not specify the properties and tests which would define hazardous wastes per se; instead a list was compiled containing various kinds of wastes deemed to be hazardous, and this was included as an appendix of the order. This list drew heavily from lists compiled in the Federal Republic of Germany. It was put together by waste experts in the Department for Environmental Protection of the OKTH. Informal contacts with experts in other Ministries such as Public Health were also used, and their analysis of the 1978-80 survey data also acted as an input to the regulations. These included specific norms (not yet enacted) for proper treatment of given wastes.

A draft of the order was circulated among the ministries and state authorities concerned and a compromise order was worked out. There were some objections by the Ministry of Industry concerning the timing of the order. As in other countries, they wanted to develop a treatment and disposal facility network before control legislation was imposed but were overruled.

In addition to governmental circulation, the initial draft was discussed in public, including discussions with companies, trade unions, scientific committees, committees of the Union of Technical and Scientific Associations, and by the organizations of the Patriotic Popular Front. However, according to the law on governmental circulation, only the opinions of other government agencies had to be considered; the opinions of public interest groups did not need to be considered.

An unexpected reaction of the companies concerned was a general sense of relief, because at least the order eliminated a highly uncertain situation. They did complain, however, that their administrative burdens would increase with the compulsory reporting of their hazardous wastes, and that they would face additional costs in connection with the legally required storage and neutralization of hazardous wastes. Nevertheless, the Initial Order was put into force on January 1, 1982.

The Initial Order was supplemented by executive instructions by the Ministries of Industry, Agriculture, Building, Transportation, Finance, and Defense. In addition, a regulation issued by the State Office gave a formula for calculating the penalty for offenses under the hazardous wastes law. This formula took into consideration the nature of the violation, amount of waste, and its hazard classification. The primary aim of the penalty was not to provide income for the budget (although the penalties are paid into the account of the Central Environmental Protection Fund) but to influence the companies involved. The increased expenses of improperly disposing of wastes and thereby polluting and endangering the environment, it was hoped, would force the companies to comply with the regulations and to modify their processes or develop technologies for recycling wastes. Therefore, the order and its penalties were viewed not as

punishments but as incentives.

The first penalty actually imposed was in 1983. Most penalties are appealed by the companies, and the legal procedure up to the time of actual payment of the penalty is quite lengthy. Based on the present data a total of 160 million forints have been assigned in 129 cases but only 80 million forints have been collected. (For comparison, in 1982 a total of 210 million forints in penalties for air pollution were paid.)*

There are some legal loopholes which make implementation of the order impossible in special situations. For example:

1) The order does not apply to non-profit organizations or to very small, for-profit ones.

2) The sewage sludge of communal sewage plants is not regarded as a hazardous waste (although this is often hazardous).

3) The order stipulates that, in case of a direct and serious danger to the environment, environmental protection authorities can stop the activity producing the hazardous waste. However, the ministry controlling the waste-producing company may cancel such an order for economic reasons.

Besides these legal loopholes, the small number of the environmental protection staff may also reduce the chances of implementing the order. There are 16,000 potentially hazardous waste-producing plants in Hungary, and there are only about 30 to 35 inspectors. For example, in the region of Budapest alone , there are about 7,000 potentially hazardous waste-producing plants, but only three inspectors. With this ratio, given even inspection, a given waste-

* 1 million forint = approximately 24,000 US dollars

producing site can be personally inspected by one of the inspectors only once every 11 years!

In addition to the above problems, the correction and extension of the list of hazardous wastes is also an important question. It is obvious that structural changes of the economy and technological development are likely to produce additional hazardous wastes not included previously in the initial list. Therefore, the initial order requires that each new industrial waste be regarded as hazardous until declared non-hazardous. Most other countries list properties and tests which define a waste as hazardous and thus "listed" for regulation. The waste producer is responsible for such tests. In Hungary a company which produces a new waste can apply for an exemption from the hazardous waste regulations. The Department of Public Health must then test the waste to either place it in one of their three categories of hazard in the list or exempt it. Final decisions are made by the OKTH and Ministry of Health. The tests include measurement of pH, oxygen demand, flammability, solubility, heavy metal concentration, organic solvent content, and microbiological tests.

The Initial Order regulates four main issues: (1) inspection of waste production, (2) storage, (3) neutralization, and (4) ways of directly preventing environmental pollution.

INSPECTION AND RECORDING OF HAZARDOUS WASTE PRODUCTION

According to the Initial Order, each generator of hazardous waste must complete a questionnaire form giving both the daily and annual amount produced and the, method of collection, storage, pretreatment, and neutralization of their hazardous wastes. The data required to be reported were selected so

as to meet what the State Office defined as the the "minimum" information needed to protect the environment. The aim behind the data-definition is a complete materials-balance of the processes involved. This is in practice a very detailed data exercise if properly conducted. The questionnaire contains over 100 different questions. For example, companies are required to detail which section of their plant give rise to which particular wastes, and an associated "technology tree" describing the plant and process must be submitted with the waste details.

The data will eventually be stored in a computer in the Institute for Environmental Protection. The completed forms are controlled by the local inspectorates of the State Office, by the local stations of the Institute, and finally, when needed, by the Department of Wastes of the Institute, "Control" here means mainly a "desk evaluation" of the plausibility of the data provided. On occasion, however, inspectors conduct random on-site examinations, check the methods of storage, and ask companies to provide accountings of materials-balances and the full amount of the waste reported. These inspectors are chemical engineers, all of whom have at least a general knowledge of the process involved but many have an extensive knowledge. Inaccuracies are caused by the fact that the companies are not familiar with methods for conducting a waste-oriented materials balance, with the consequence that the data are in many cases distorted.

To date some 60% of hazardous waste generators have sent in more or less adequately filled in forms. These, however, had to be repeatedly queried and checked. So far, only about 50% to 60% of the reported data (i.e., 30%-36% of overall) can be considered complete and produced to be processed by the computer. The reliability of the data to be processed by computer is influenced by

several factors. The most important of these are:

(1) In the companies which produce the majority (according to some estimates, about 70%) of hazardous wastes, the accounting for materials and technological descriptions of processes usually are focused on end-products, so that the kind and quantity of the wastes produced often cannot be identified. Usually, only subjective estimates are provided. subjective.

(2) In case of sludges, which are a very common physical form, wastes contain a variable proportion of water and only the solid portion is dangerous. This water content, which may be as high as 90%-97%, cannot be determined accurately.

(3) Variations in production processes due to normal fluctuations in conditions, management, and workforce practices, etc., cause waste volumes and compositions to vary uncontrollably within surprisingly wide limits.

(4) Producers do not always continuously record production levels. Often the records are made on a quarterly basis, so knowledge of any short-term changes is hidden.

In order to increase the reliability of the data reported, the State Office intends, in the future, to influence the Ministry of Finance to change its accounting method, so that the kinds and quantity of wastes produced are also recorded.

Records are kept not only by the State Office, but also by the Inspectorate of Chemical and Explosive Materials of by the Ministry of Industry. This Inspectorate conducted a separate study of a limited sample of hazardous waste pro-

ducers between 1978-80. This study included 670 sites of 337 firms. The data included origin of the waste, amount and type of waste, and a description of its chemical properties. This description included solid content, water content, flammability, toxicity, solubility, etc. This survey identified 210–220,000 tons of hazardous waste disposed of annually by deposition and 130–140,000 tons incinerated.

Hazardous wastes produced in Hungary that are not recorded accurately by the various surveys can be divided into four categories:

1. Hazardous wastes which are produced in such large quantities that they were simply omitted from the list in the Initial Order on pragmatic grounds. These include such wastes as red mud produced by smelting of aluminum, and mineral sludges.

2. Hazardous wastes which are processed by specialized companies, e.g., animal proteins.

3. Hazardous wastes which are burned in small-capacity incinerators of the waste generators, neutralized chemically, bound by special procedures, e.g., embedded in bitumen or ash, are transported abroad for incineration, or recycled for use in production.

4. Particularly hazardous wastes "temporarily stored" by the waste generators. (In fact the distinction between "temporarily stored" and "deposited" is extremely difficult to make.)

In order to improve centralized control of hazardous waste disposal, the State Office of the OKTH has submitted a proposal to the State Committee for Planning recommending the establishment of a country-wide network for treating hazardous wastes.

A NATIONAL NETWORK OF TREATMENT AND DISPOSAL FACILITIES

In 1980, the State Office of the OKTH commissioned the Institute for Environmental Protection to design a network of treatment and disposal facilities bearing in mind the existing data on waste generation. The design was completed in 1980 and included plans for constructing five incinerators and designating eight new landfill locations. In discussions submitting the proposal the President of the State Office of the OKTH and the Minister of Industry reached an agreement. Because the majority of hazardous wastes are produced by the industry, the Ministry of Industry was put in charge of organizing and financing the national network. Hungarian law follows the same principle as in western countries, that the producer is responsible for the waste it generates. The Inspectorate for Chemicals and Explosive Materials of the Ministry of Industry was charged with this work. In 1982, the State Committee for Planning approved the establishment of the country-wide treatment and disposal network although responsibility for its financing remained a problem to be negotiated. In 1983, the State Office of the OKTH set the technical standards for treatment and storage of hazardous wastes.

In establishing this network several difficulties have arisen:

1. In Hungary, there are very few geologically and morphologically suitable areas for landfills. Most of the country is covered by porous sedimentary rocks. There are only a few argilaceous regions with low rates of permeability. In addition, there are no abandoned salt mines such as those in the FRG, which could be used as controlled dumping grounds. Fifty-one potential locations were tested by geologists, and only a limited number were found to be suitable.

2. The regions found to be suitable are being subjected to detailed geological examinations. If approved, the institute responsible for the investment must apply to the county council for permission to use the location. However, at this level there have been serious difficulties. County officials try to avoid, in all possible ways, the establishment of what have been called "poison cemeteries" in their area, for the simple reason that they are afraid of losing their popularity. People are afraid of "poison cemeteries" because in previous years, media debate and official prevarication has created confusion in connection with the water contamination in Vác. "Dangerous" wastes have evoked uncertainty and fear in the man-on-the-street. This particular issue is very prominant in public perceptions of environmental risks in Hungary.

3. Present economic difficulties in Hungary do not favor the establishment of a capital-intensive network which puts a heavy burden on available resources. This situation is aggravated by additional circumstances. It has already become evident in the design phase currently underway that the main units of the incinerators can be acquired only by import from western countries. Funds for establishing what is essentially a pollution control network can only be provided from financial sources normally used for technological development. There is, therefore, direct competition, in the very same budget, between funds for new production technologies, which might entail reduced wastes, and clean-up technologies to manage wastes from existing technologies. Furthermore, because of peculiarities of investment in Hungary, parts of the proposed network are relatively

more expensive than is the case of a foreign establishment of similar capacity. For example, in the FRG a landfill with a capacity of 70,000 tons per year could be operated by a staff of five, while one designed in Hungary would require 50 to 60 persons.

4. Management of the waste plants is to be carried out by a consortia of waste producer industries helping to finance the plant and plant customers, and local authorities. However, industrial companies in Hungary cannot be forced to invest in the waste treatment network. Therefore, there is no state-enforceable guarantee of industry participation and financial investment. Also, the State agencies involved have taken a long time negotiating their proportional responsibilities for capital financial input. The overall uncertainty has led to cutbacks in the planned network, even though this will mean a shortfall of treatment and disposal facility supply in relation to demand.

Some of these difficulties will be illustrated by the following case study.

The Siting of a Landfill in Zsámbék

The relevant county council agreed to geological investigations in the vicinity of the village Zsámbék, in the county of Pest, in an area deemed to be suitable for a hazardous waste landfill. A layer of clay was found in one section of the area, which with respect to both its permeability and size, is the geologically most suitable site in Hungary.

The population was officially informed by the local council of its intention to establish a "poison cemetery." The population was afraid (partially due to

prevailing confusion surrounding the earlier Vác scandal) that its drinking water would become contaminated, and began to protest against the establishment of the site.

Further examinations have proved that although the clay layer naturally has a sealing effect, the groundwater flow under the clay is not directed towards the village. In addition, the water supply of the village will soon be provided from the Karst Water Basin in the course of a coal mining program to be completed in the near future. Nevertheless, the protests continued, and the county council therefore decided to deny the licence for the site. When the president of the OKTH personally exerted pressure on the county, they "mobilized" the parliamentary representative of the Zsámbék district, who interceded with the Minister of Housing and Public Construction. He argued successfully that if the proposal resulted in such social unrest, a suitable clay layer should be sought elsewhere. At that time, the specialists of the OKTH were confident that they would find another clay-layered site and they did not push to keep the site in Zsámbék open through other government processes. However, an alternative site is yet to be located. Today they regret this decision.

THE CURRENT SITUATION

Because of these difficulties, the planned size of the national network has been reduced. From five incinerators and eight landfills, the State Committee for Planning now hopes to establish one incinerator and three landfills. In February 1984, the situation is as follows:

1. The network is designed to contain an incinerator with a capacity of 30,000 tons per year and three landfills with a total capacity of 40,000 tons per year. These would be established and operated by an association of 178 companies concerned.

2. Forty-five percent of the investment costs would be provided by the companies, fifty percent by loans, and the remainder from the Central Fund for Environmental Protection of the State Bank for Industrial Development.

3. However, even these greatly reduced estimates of investment costs are twice as large as the available resources. These estimates are also highly uncertain, since no final decisions have been made as to the actual technology for the incinerator or the landfills.

4. According to the current - but still not final - plans, the first landfill would start operation in 1986–87, the second one in 1987, and the third in 1988, while the incinerator would start in 1988–89.

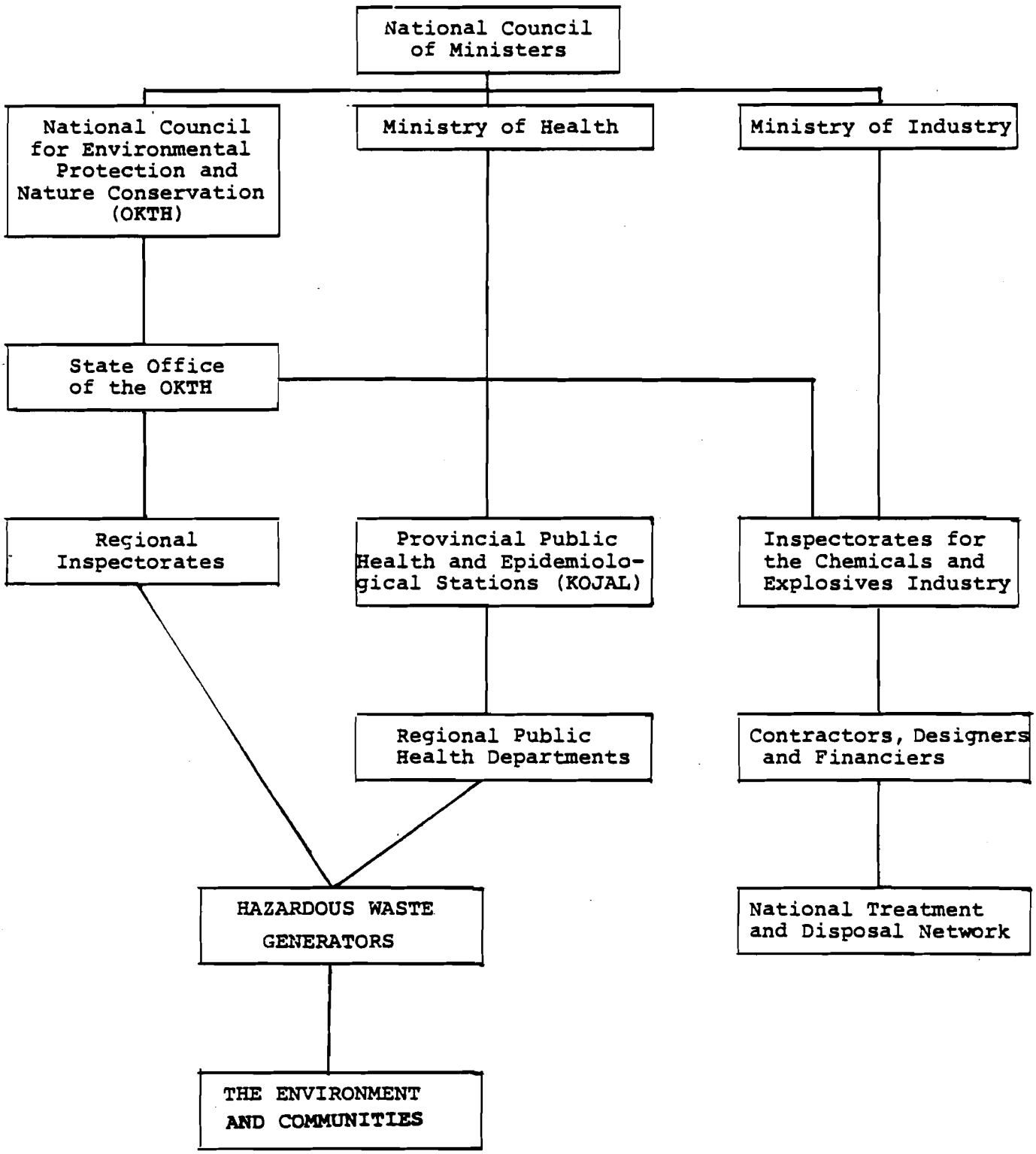
5. This reduced capacity network, will not be accepted as final by the State Office of the OKTH. It will still insist on eventually establishing the entire network (of eight landfills and three incinerators). They interpret the present plan as only a first phase.

APPENDIX: THE OVERALL INSTITUTIONAL SYSTEM FOR CONTROL OF HAZARDOUS WASTE

The following diagram outlines the various administrative bodies in Hungary responsible for hazardous waste management and their relationships.

The Regional Inspectorates for Environmental Protection and Nature Conservation, responsible in the first instance for checking the fulfilment of the Initial Order, naturally give their attention to the local environment and communities. In the case of hazardous waste regulation they monitor more directly the waste producers than environmental media.

The longer-established Regional Services for Public Health and Epidemiology are authorised less directly to check the waste producers. However, their primary task in relation to hazardous wastes is to conduct initial official examinations, of environmental areas and communities found to be contaminated with hazardous wastes. The two regional services cooperate, if not officially in many cases in a concrete way. The effectiveness of this cooperation however, is primaily a function of the personal relations between the local workers of the parallel regional services. There appears to be little conflict or competition between these regulatory arms, and this loose-knit, informal collaboration creates no extra problems for waste producers.


National Council of Ministers
National Council for Environmental Protection and Nature Conservation (OKTH)
Ministry of Health
Ministry of Industry
State Office of the OKTH
Regional Inspectorates
Provincial Public Health and Epidemiological Stations (KOJAL)
Inspectorates for the Chemicals and Explosives Industry
Regional Public Health Departments
Contractors, Designers and Financiers
HAZARDOUS WASTE GENERATORS
National Treatment and Disposal Network
THE ENVIRONMENT AND COMMUNITIES

The Management of Hazardous Waste in Hungary

by Ernö Kiss

COMMENTARY

by

Brian Wynne

From the perspective of the IIASA comparative project, the following points are the most interesting about the Hungarian case:

1. When one looks at the evolution of the public issue and the first phase of policy making, namely legislation, one finds that Hungary is little different from Western countries - indeed many hazard criteria and other norms have been more or less directly exchanged, e.g., from the FRG, and used in the Hungarian legislation.

However, the national institutional relationships between industry and government have a direct effect upon the implementability of legislation. Hungarian industry is centrally planned and financially supported in certain ways, and especially in the larger industries there is no market competition. However, there is no central State *dictation* to industry, which is remarkably free to manage its own affairs. Thus industry may, for example, choose not to participate in the planned waste treatment and disposal infrastructure which is meant to be consortially financed and run. It is even free to export wastes, so long as it has the collateral business to pay the necessary foreign currency. Note that this is a less restrictive framework than those in Hesse, Bavaria, and Denmark.

There are of course economic incentives which are designed to encourage participation, and good waste .management practice generally; examples are higher charges for customers who do not invest in the planned network's treatment and disposal plants, and the fines system. In theory, excessive fines should make it optimal for an industry to decide instead to pay less money to be a part-financer of the infrastructure, or at least pay to be a customer of proper facilites. However the fines and incentives appear to be ineffective as a means of tightening up waste disposal. This is so because lack of competition, established state support, and the national commitment to avoid unemployment together mean that an industry might get away with paying fines for lax waste mangement to one state agency, whilst obtaining a subsidy to avoid bankruptcy from another. It is difficult to gauge the true extent to which this happens, but existing institutional arrangements (which may of course be defensible on wider grounds) appear to allow it.

Overall therefore, there is the paradox that this centrally planned economy has little *institutional* resources to implement an urgently necessary national treatment and disposal infrastructure. There is no guarantee that industry will use and thus protect the viability of the infrastructural investment once in place. This institutional problem interacts with and exacerbates already-severe investment capital shortages.

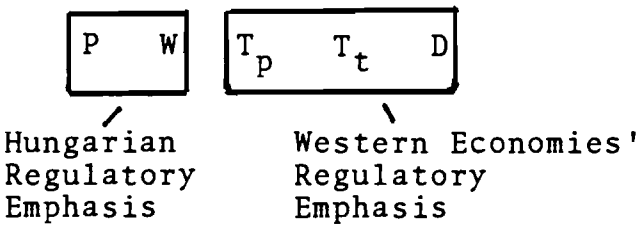
2. The various potential points for regulation delineated in the schema discussed in chapter two were as follows:

industrial production	P;
waste generation	W;
transport	T_p;

treatment T_t;

disposal D.

The Hungarian system of regulation places its weight upon the first two. The reason for this is that, as a centrally planned economy, it already has the institutional arrangements and accepted cultural practices which allow easy state agency access to "internal" industrial process data. Western economies, on the other hand, have no such traditions, indeed they have dominant cultural values and entrenched interests which maintain the norm that such information is private property in a competitive environment. It is argued, largely successfully, to be a sacred industrial right to maintain this privacy. The comparative situation is therefore as depicted here:



The disadvantages of the typical western situation were discussed previously, namely that the most important, widely-agreed-to as necessary mode of regulation, (moving towards less waste-producing processes or technologies, at least controlling the composition of wastes which are unavoidable, and encouraging recycling) is the least accessible to regulation. The Hungarian institutional arrangements in principle overcome this problem, but in practice the financial resources needed to convert the information at this level into actual regulatory effects are in very short supply. Nevertheless, the system focuses attention at this more strategic point, even to the extent that there is

no transport trip-ticket system in Hungary, and indeed very little transportation of hazardous wastes goes on. Most is "stored" or treated on-site.

The data compilation on production technology-trees, material balances, and waste outputs may in the end be less accurate than its elaborate framework suggests. Nevertheless, it appears that once it is available in computerized form, it will for the reasons already given, be better than corresponding data fr[illegible] most if not all other countries. Furthermore, a very real extra benefit may lie in the indirect effect of the data gathering, in that it makes industrial managers more sensitive to the waste dimension in design, planning and routine decisions, via the very exercise of producing such detailed data for the regulators.

3. The Hungarian case seems to substantiate the view expressed in our work, that there are significantly different strategic definitions of hazardous waste management as a policy issue. In Hungary there seem to have been no scientific debates about specific risks of given compounds and wastes, and little formal risk analysis. The risk estimates implicit in other countries' hazard lists have been adopted, and government scientists have used informal judgment to decide whether waste descriptions from the industrial data surveys qualified the waste as a listed waste. These judgments have not been subject to formal review or justification. The problems of developing an industrial infrastructure have been more pressing than the need to formalize and refine a risk assessment regulatory approach

4. In Hungary as elsewhere, public concern and media debate about environmental risks is a very significant element in policy implementation, especially over siting. Although the economy may in some respects be less highly developed than many western countries, education is widespread and the

culture is sophisticated and articulate, with a strong tradition of independent journalism to sustain this.

The question of social attitudes and policy implementation is discussed in the final chapter of this study. It is clear from this case history (particularly the Vác situation) that in Hungary, as elsewhere, public outcry created more effect and cut more bureaucratic knots more rapidly than the patient, intra-governmental efforts of the public health Institute (OKI).

5. One especially interesting comparative issue is the experience of the relevant state agencies in conducting the necessary (informal and public) bargaining, both "internally" between different state and industrial interests, and "externally" with local authorities and public groups. For example, responsible regulatory agencies in different countries vary with respect to the *formal* powers and constraints which affect the implementability of regulation policies. But they vary in their *informal* constraints too. If serious international agreements on harmonizing waste mangement regulations were ever achieved, such comparative institutional understanding would become especially important in order to have a realistic appreciation of the likelihood of actually *implementing* consistent regulations rather than merely paying lip service to the ideals.

6. One point which emerges from the Hungarian case is that centrally planned systems cannot necessarily overcome the institutional realities of inter-departmental fragmentation much better than others can. For example, for arbitrary reasons, issues as propagated by bodies (such as the KOJAL's of OKI pushing hazardous wastes as a probem), often fall between the attention frameworks of bodies which might put them clearly on the policy agenda. As the Hungarian case study describes, the relevant department of the Ministry of Health was being reorganized when the scientists and local inspectorates began

demanding policy attention for hazardous waste control. The OKTH was only just coming into being - "everywhere there were new faces, new roles, new people"* - and no effective attention. Interest and responsibility fell between, rather than upon, the Health, Housing, and Industry Ministries and their various Institutes, to the extent that they performed different surveys of waste arisings when they needed such data. Thus the Institute of Chemicals and Explosives performed a further survey for the Industry Ministry over and above OKI's, when the Ministry of Industry became involved in the planning of the national treatment and disposal infrastructure.

It appears that it was mainly locally generated concern from the inspectorates, and public scandal generated by the Vác issue, which created the impetus for policy action leading to the 1981 Order. This has been undermined by the delays in the plan for the national treatment and disposal network. A new round of implementation problems has begun, dissipating the original impetus towards effective policy management.

In order to make further advances much would now seem to depend upon the ability of the relatively young bureaucracy of OKTH to negotiate and bargain within and outside government, and upon the strength and clarity of public opinion on the need for national control, (which means at least the national treatment and disposal network). It may well be that a scientific risk-benefit assessment approach will come to the fore to justify different positions in the severe competition for state resources that will figure centrally in the next phase of the issue

* Comment by Ernő Kiss

HAZARDOUS WASTE POLICY MANAGEMENT
— INSTITUTIONAL DIMENSIONS

Further Case Studies