# THE IMPLICATIONS OF ACCESSION FOR WASTE POLICIES AND INDUSTRIAL PRACTICES: HUNGARY AND THE EUROPEAN UNION

## Zsuzsa Gille

Department of Sociology, University of Illinois at Urbana-Champaign

European Union Center University of Illinois at Urbana-Champaign Champaign, IL February 2004

# ABOUT THE AUTHOR

Zsuzsa Gille is Assistant Professor of Sociology at the University of Illinois at Urbana-Champaign. Her field of study includes Environmental Sociology, Sociology of Knowledge, Globalization, Cultural Studies, and Eastern Europe.

### **ABSTRACT**

The hope that prevailed immediately after the collapse of state socialism was that Eastern Europe's environmental pollution would be "swept away by democracy and economic rationality." While with time such expectations have become more modest, some of the same hopes are now resurfacing as the accession of most former socialist countries to the European Union becomes imminent. Most environmentalists and policy experts anticipate an improvement in regulatory standards, in law enforcement, and in the availability of funding for environmental purposes. The purpose of this paper is to evaluate whether and how such expectations are being met in one area of environmental policies in Hungary, a country among the first wave of candidates to be admitted to the EU.

The hope that prevailed immediately after the collapse of state socialism was that Eastern Europe's environmental pollution would be "swept away by democracy and economic rationality" (Solomon, 1990, A14). While with time such expectations have become more modest (Andersen, 2002; Andrews, 1993; Bochniarz and Kerekes 1994; Gille, 2000a, 2000b, 2001; Kaderják and Powell, 1997; Kindler, 1994; Manser, 1993), some of the same hopes are now resurfacing as the accession of most former socialist countries to the European Union becomes imminent. Most environmentalists and policy experts anticipate an improvement in regulatory standards, in law enforcement, and in the availability of funding for environmental purposes. The purpose of this paper is to evaluate whether and how such expectations are being met in one area of environmental policies in Hungary, a country among the first wave of candidates to be admitted to the EU.

The area I will examine here is waste. While according to Western European reports, the environmental accession requirements grew increasingly less significant in the enlargement negotiations (Environment Daily, 1999a, 1999b —much to the disappointment of some industrial lobbies and environmental organisations in the West (Friends of the Earth, 2002; Stirith, 2000) – the Hungarian newsreader was compelled to form an entirely different impression. Reports in the Hungarian media about the progress made in meeting the accession requirements frequently mentioned waste legislation on the "to-do-list" of several candidate countries, as well as of Hungary. In the latter, it was primarily the delay in ratifying the Act on Waste Management and its enforcement regulations that kept the Commission admonishing the country for not fulfilling the accession requirements quickly enough. Given that in the Hungarian adoption of the Acquis Communautaire, it was the environmental chapters that were lagging behind the others as well as behind the agreed-upon deadlines, waste legislation appeared as the single greatest obstacle to joining Europe (Environment Daily, 1999b; Environment Daily 2000). Instead of concluding from this that Hungary's waste practices and policies, or the domestic expertise in this area were backward and that the country's waste situation carries the symbolic burden of non-Europeanness, as it is often the case in representations of the region, we must look into why it was exactly that waste legislation was held up.

I will demonstrate that a key reason for this delay is the fact that the European Union itself has been sending mixed messages to Hungary. Officially, the EU stands for preventative policies, primarily waste reduction and secondarily reuse. In practice, however, its economic constituents as well as its aid encourage remedial end-of-pipe technologies, such as waste dumps and incinerators. Not only does this create confusion in legislation and institution building in Hungary, and thus delay, it also establishes a practice that may lock in a certain path of development (Stoczkiewicz, 2001) that will be increasingly difficult to steer away from later. This is made all the more ironic by Hungary's waste history which from 1949 to the late 1980s favoured preventative waste policies, rendering the present trend more a return to the past of the West than a step forward.

In order to understand the changes and challenges of harmonising waste legislation, it is important to put the EU's and Hungary's waste issues in their proper historical contexts. Therefore, first I will review the EU's and Hungary's past waste policies and only after that historical overview will I analyse the challenges brought on by joining the European Union. In that main part of the chapter, I will compare requirements for sustainable development and for satisfying requirements for EU accession. In conclusion, I will evaluate how these sometimes

contradictory requirements are met, and what the compromises made by Hungary imply for the country's future waste practices.

### I. Ecological Modernization in the European Union's Waste Policies

The European Union first started to elevate environmental concerns to communal legislative actions in 1973 when it passed what came to be known as its First Environmental Action Program (EAP). The latest EAP passed was the Sixth one. It is these general programs that define the direction and tasks of environmental legislation in the period to come (ranging from four to nine years). Most legislation is passed in the form of directives written and proposed by the European Commission, examined by the European Parliament and the Council of the European Union.

The first piece of legislation concentrating on wastes was the Framework Directive on waste (75/442/EEC) passed in 1975. The ways in which this directive has been amended and modified by numerous subsequent directives illustrates very clearly changes in ways of thinking about environmental problems, which in turn express the public's changing environmental concerns. Initially, most of the EU's waste policies remained in a remedial paradigm, tackling environmental problems post facto through end-of-pipe technologies. Such technologies with regards to waste primarily include landfilling and incineration. These regulations included the aforementioned first EU directive on waste, the Waste Oils Directive (75/439/EEC), the Hazardous Waste Directive 78/319/EEC (later replaced by the 91/689/EEC), and the Titanium Dioxide Directives (78/176/EEC, 82/883/EEC), the Sewage Sludge Used in Agriculture Directive (86/278/EEC), and the Municipal Waste Incineration Directive (89/369/EEC and 89/429/EEC). While in 1981 the Council issued a Recommendation concerning the reuse of waste paper, it was not until 1989, five years after the Brundtland Report coined the concept of sustainable development, that the Community Strategy for Waste Management established waste prevention as a top priority (Gervais, n.d.). It is from this time that we can speak of an accepted "waste management hierarchy" (in order of priority): 1) minimization; 2) reuse (without chemical transformation of waste's material); 3) material recovery (recycling); 4) energy recovery (some forms of incineration); and 5) final disposal (landfill, incineration).

In 1993, the Fifth EAP, called *Towards Sustainability*, made several steps towards what came to be known as Integrated Product Policy, the title of a White Paper from 2002. The essence of these newer sets of regulations is to integrate environmental and economic policies, that is, to incorporate environmental concerns into economic planning and technological innovation from the beginning rather than saving them as add-on, expandable, features. It is in this spirit that numerous waste-related legislations were passed in the last ten years. Some of these established economic incentives, such as eco-taxes (e. g. the compulsory minimum tax rate on mineral oil introduced in 1993), while others laid down the principles of environmental certification, including eco-labelling and audit systems such as EMAS (Council Regulation No 1836/93). Yet another group of regulations focused on defining the duties of producers and consumers aiming for full (cradle-to-grave) responsibility for products, most recently, in the areas of packaging waste (94/62/EC), the wastes of electrical and electronic equipment (expected to be passed in 2002), and vehicles (2000/53/EC). As a result of these changes in environmental paradigms, the principles of present EU waste legislation are the following (often referred to as the five P's):

- 1. Prevention Principle: top priority should be given to waste prevention and minimization;
- 2. Proximity Principle: waste should be disposed of as close as possible to where it is generated;
- 3. Producer Responsibility Principle: waste producers should bear cradle-to-grave responsibility for any damage caused by the waste they generate;
- 4. Polluter Pays Principle: polluters should bear the costs of safe management and disposal;
- 5. Precautionary Principle: waste management strategies should not take risks even if the causal relation between waste and damage is not fully proved.

Such changes were initiated and supported by a new model of production management, collectively referred to as industrial ecology. In the words of Robert M. White, the president of the USA's National Academy of Engineering, "the objective of industrial ecology is to understand better how we can integrate environmental concerns into our economic activities" (White, 1994: v). In terms of waste practices, industrial ecology has meant planning for reuse of products (after their initial life-span is over), establishing cradle-to-grave product responsibility, minimizing toxic by-products and in general increasing eco-efficiency.

Many debate whether this trend is real or whether it is simply clever public relations on the part of corporations trying to limit the punitive effects of environmental regulations. Proponents of ecological modernization theory, whose focus is broader than the individual firm, however also agree that a transition in environmental discourse and practice has begun in these countries, with the Netherlands and Japan leading the way (Hajer, 1995; Mol 1995; Spaargen and Mol, 1992). Their argument is that even though environmental protection previously tended to focus on how to 'safely' displace hazards from production, and environmental politics concentrated on the distribution of hazards, now the intention is to keep and solve the problem of emissions and wastes within the sphere of production. It is in production that emissions can be reduced or prevented, and it is in production that by-products can be re-used or recycled. Such an internalization of environmental externalities is now seen as consistent with efforts to increase efficiency and even as conducive to technological innovation. Furthermore, relying on the environmental Kuznets curve, it has been argued that environmental impacts may become decoupled from economic growth. In other words, changes in management and new innovations will lead to economic growth that no longer spurs commensurate increases in emissions or wastes.

Independently of the accuracy of these views, I would also argue that a qualitative change has occurred in environmental discourse. Acknowledging the change, however, does not necessarily mean endorsing them. Environmental modernization theory in itself doesn't say anything about absolute volumes of waste or emissions, power, costs and the role of the public. So, it is with this critical note, that I suggest that ecological modernization theory can offer us a vantage point from which to interpret the implications of Hungary's accession to the EU for her waste practices.

#### II. Hungary's Waste Past

Visual, textual and statistical representations all describe state socialism as a wasteful social order. Visual representations of state socialism, such as Antonin Kratovchil's photos in the 1990 special issue of the *New York Times Magazine*, invoke the image of the state socialist landscape most familiar in the West--a grey still life composed of shoddy goods, of people wearing poor, idiosyncratic clothes surrounded by houses that look like they could fall apart at any time, and of piled up garbage and filth. The juxtaposition of images of poverty with images of debris, dirt, toxic wastes, and degraded nature tells a story about state socialism that has been retold for many decades; megalomaniac, yet outdated, industrialization that left a good portion of society in poverty, generated tremendous amounts of waste, and caused environmental destruction.

Textual representations in journalistic accounts and scholarly works blame these conditions on poor management of the economy and outdated technology. "Open hearth steel manufacturing and other outdated, inefficient technologies are still widely used by East European and Soviet industries," says the study of the World Watch Institute in an explanation of state socialist wastefulness and pollution (World Watch Paper 99, n.d: 11). In addition to backwardness, a "faulty, mismanaged economic system," has been also invoked as a key cause of environmental degradation.

Statistical data usually applied by studies done in the international financial and aid hubs and by scholarly works like to point out that state socialist countries' emissions/GDP, emissions/per capita and waste/GDP indexes, as well as material and energy intensities have been significantly higher--often multiples of--Western equivalents (Hughes, 1990; World Watch Paper 99). The result, as a *New York Times* author puts it, is "mountains of garbage. Literally, garbage" (Lewis, 1990: A21).

The textual, visual, and statistical representations all suggest that state socialism was wasteful, both in the sense of squandering resources and in the sense of being full of wastes: it produced too many rejects, too much waste and garbage, and too many outdated superfluous goods. Despite the infamy of many aspects of central planning, many socialist states, including Hungary, also pursued rigorous waste reuse and recycling and to a lesser extent waste reduction. In Hungary, one of the first economic laws of Stalinist leadership aimed at organizing the reuse of waste materials for industry. Between 1950 and 1959 thirty-four central regulations on the collection, storage, delivery and price of waste materials were issued. In the reform period of Hungarian state socialism, that began in the mid-1970s, emphasis shifted from reuse and recycling to reduction that was encouraged with financial incentives. In 1981, the state implemented a system of monitoring, then rare even in the West, that obliged companies to prepare material flow charts and material balances in order to facilitate the tracking of toxic byproducts in the production process and to discover inefficiencies. These material flow charts and material balances can be seen as precursors to voluntary environmental standards, such as ISO and EMAS.

While not entirely successful even in their own terms, some of the state's policies made significant progress. As a result of the new reform waste regulations implemented in 1981, by 1987 it was claimed that more than half of the total waste generated was reused. Progress in the field of plastic wastes was especially spectacular as their reuse increased by 200%, and with this,

20% of total plastic wastes were reused (NÉTI, 1987: 6). While the program did not achieve its stated goal of substantially increasing the portion of secondary raw materials among industrial inputs (KSH, 1988), it turned out to be quite successful in finding uses for potentially dangerous wastes. Before the implementation of the 1981 Waste and Secondary Raw Material Management Program, only 17-18% of hazardous wastes were reused or recycled (Tudományos Ismeretterjesztő Társulat, 1980), while in 1982 the figure was 21% and by 1986 it was 29% (Árvai, 1990). Back then hazardous waste was defined differently than it is in either the EU or Hungary's present system of classification, thus making cross-national and historical quantitative comparisons difficult. However the fact that now the rate of recycled wastes of all types is close to zero in Hungary (see below) should alert us to the possibility that Hungary's state socialist waste policies worked and that the waste discourses of the postsocialist era do not.

In sum, during the 50 years of central planning in Hungary, the state established an extensive infrastructure of waste registration, collection, redistribution, reuse, and recycling. Even though the emphases of Hungary's waste policies changed over time, there has been an ongoing public discourse on the amount and sources of waste in industry and agriculture. Furthermore, partially as a result of waste laws and a profound cultural propaganda on waste reuse, bordering on the cult of waste, the public in Hungary had a strong material conservationist attitude. This mentality could have been built on as an important cultural asset in reforming (not scrapping) Hungary's environmental policies; instead, it has been all but eradicated. The socialist waste infrastructure had numerous shortcomings including a tendency to encourage waste production to fulfil waste quotas, ignorance of pleas to facilitate safe waste dumping, and undemocratic enforcement of waste laws. While it is necessary to acknowledge these flaws, it is also necessary to debunk the one-sided picture that socialist Hungary did not care about waste.

So why are these "achievements" ignored? One of the main reasons is that statistical data prevailed in the representation of centrally planned economies, but more importantly, that such statistics concentrated on ratios of waste/GDP, rather than on waste/per capita or ratios of recycling of industrial waste--data that would have demonstrated faults with Western waste practices and would have highlighted the advantages of state socialism, or at least could have presented a more balanced picture. This way, perhaps, the functioning elements of socialist waste policies could have been preserved. Second, "indigenous" economists mostly informed by neoliberal paradigms themselves despised the state's intervention in the economy, including policies of waste reduction and reuse. Third, these waste policies and practices, while not entirely unknown to Western academics and journalists, were not considered to be of an environmental nature, but rather merely a curious element of central planning, and thus their significance was left unexplored. Finally, we must not ignore that the increasingly visible and the truly horrendous environmental record of state socialism in Eastern Europe and the Soviet Union simply dwarfed any positive achievements of state socialism's relationship to the environment.

So why insist on the importance of this other environmental legacy of central planning in Hungary now? First of all, arguably, there is a remarkable similarity between the abovementioned industrial ecology and ecological modernization discourse observed in the West, on the one hand, and Hungary's past waste practices on the other. If that is the case, then, what are the reasons and consequences of the EU's treatment of Hungary as innocent of any kind of environmental regulation, especially any progressive ones? And if now it seems that Hungary is indeed lacking effective waste policies, should not we look for the causes not in Hungary's socialist legacy but in the demands of a liberal world made upon her? That is, is it possible that

in order to meet the EU's economic criteria--a liberal market economy purged from the state's "interventions"-- Hungary had to return to the past of the West: a free market unfettered by environmental and conservation principles? I think raising these questions, even if presently we may not have all the answers, is unavoidable if we are truly interested in the meaning of the EU's presence in postsocialist Hungary and the environmental implications of that presence. This is what I will turn to in the next section.

#### III. EU Accession and Hungary's Dilemmas

Hungary applied for EU membership even before state socialism collapsed (in 1988), but membership and especially its ultimate ratification was not taken for granted until relatively recently. This is important to realize when we look at the kind of decisions various governments made concerning the environment, and waste in particular, since 1989. From the beginning there were two pressures that Hungary and the other postsocialist countries in Europe faced: an economic transition (often referred to as marketisation, privatisation, or liberalization) and an environmental revolution. The latter referred to an expectation that the new regimes would not only disclose and clean up the pollution caused by central planning, but that they would also avoid the kinds of development that led to the degradation of nature both in the West and in the East.

Two models circulated in public discourse about how to achieve both ends simultaneously--the economic rationalism and the environmental modernization paradigms. The initially strongest expectation has been that liberalization will automatically improve the state of the natural environment. This is the assumption that informs this transition discourse, which, adopting Dryzek's (1997) terminology, might be called the 'economic rationalism discourse.' Many activists and experts, however, hoped that Eastern Europe, enjoying the Veblenesque advantage of late-comers, could draw lessons from the mistakes of Western capitalism and build an economic system in which environmental concerns were integrated from the beginning instead of being saved for later as add-on features. Taking this course, however, would have required a more active role for the state, at least a more direct relationship between industry and government than the economic rationalism discourse sees as necessary.

Up until the middle of the nineties, postsocialist legislative events (or non-events, as the case might be), and actual waste practices conformed more to the economic rationalism model than to the ecological modernization paradigm (Gille, 2000). To the extent that liberalization, especially in the shape and form dictated by the IMF and World Bank, demanded a much-reduced role for the state both as owner and regulator, this 'Wild East' period of the postsocialist transition may be seen as inevitable.

Economic rationalism manifested itself in the following markers: Privatisation meant that the state lost control not only over the means of production but also of waste materials, and, without a simultaneous new waste legislation, had a radically reduced ground on which to influence the fate of production wastes. The privatisation of retail translated into an easy evasion of previous obligations of grocery stores to take back bottles and jars for a deposit, which, with the simultaneous explosion in disposable packaging, meant a sudden accumulation of packaging wastes that neither consumers nor the garbage collection companies were able to handle. Soon, garbage collection ceased to be a gratis public service provided by municipal governments (at

least in large cities), but since real incomes kept declining through the first half of the nineties, most people and businesses resorted to illegal dumping. The sale of the almost forty-year-old state waste collection company, MÉH, to a French corporation, for one, imposed radical limits on the scope of its activity, that is, the range of waste materials and circle of suppliers. Since the company was in a monopolistic position, this single privatisation had national consequences.

Under such circumstances, it would have been crucial to pass new legislation redefining the duties of waste producers and scope of authority of the state. Instead, Hungary's comprehensive waste act, which got stuck several times in each phase of its making, didn't take effect until January 2001. What's more, existing regulations were withdrawn or made unenforceable due to legal, economic, and political uncertainties. The fate of the extensive Hungarian deposit-refund system is well captured by Hungarian economist, Kaderják (1997:169):

With respect to deposit-refund systems, the common experience of the CEECs [Central and Eastern European countries] is rather that during the period of transition formerly well-performing systems have been partly destroyed (for example, deposit-refund systems on bottles or car batteries).

NGOs have also started calling on the EU to retain this positive legacy of state socialism, where it still exists (NGO Response, 2001). The mentioned system of monitoring established in the 1980s that made evaluation of a firm's waste activities easy and transparent by obliging firms to prepare material flow charts and material balances was also dismantled (Romhányi, 1995; Takáts, 1996).

Exactly at the time of a deep economic crisis and great uncertainty, the mentioned state funds for the rationalization of material and energy use were eliminated, and even though there were proposals to include eco-taxes in the new tax system to create a fund for environmental purposes, these were ignored or watered down to such an extent that, the new system, as one former ministry official wrote, "in the case of waste reuse, ... function[ed] as an actual counterincentive" (Takáts, 1990). The first half of the nineties, therefore, witnessed the victory of the free market, and more specifically that of the economic rationalism paradigm. The state retreated from the economy and was left without sufficient income to motivate producers in environmentally friendly directions. Further, the reduction of the state apparatus left it illequipped to enforce what regulations remained or slowly passed and in general, it found itself much discredited to intervene on behalf of an environmentally conscious economic transition.

It was not until the middle of the 1990s that a change in direction started to be noticeable. The new Law on Environmental Protection, passed in 1995, laid down producers' reporting obligations and it introduced a number of eco-taxes, such as environmental load fees, use contributions and product charges. The latter initially had been imposed on fuel, tires, refrigerators, refrigerants, packaging materials, and batteries [Act LVI of 1995] introduced in 1996.<sup>2</sup> The amount of the charge is reduced by half for those products that are environmentally friendly. The revenues from these are, in turn, earmarked for investments that abate pollution as well as for waste recuperation and recycling. The long awaited hazardous waste act was also put in force in 1996. Both the latter and the Law on Environmental Protection were looked upon as transitional measures that would be revised once the EU-conform Act on Waste Management was ratified, which, as mentioned, took many years longer than expected. What changes are now

needed in order to meet EU requirements? In order to understand Hungary's tasks, we need to know what characterized the country's waste situation and how it differed from that of the EU. (Add footnote: The adoption of the environmental chapter of the Acquis started in 1999. I am using data from 2000, which did not considerably differ from data in 1995, based on which, if necessary, the environmental criteria for accession and funding targets were or could have been decided.)<sup>3</sup>

Hungary produces roughly 70 million tons of waste, with 28 million tons being biomass.<sup>4</sup> Out of this non-biomass waste, roughly 70% is production waste and 6% is municipal waste (with municipal liquid waste roughly 11%).(add footnote: due to the inconsistency in Hungararian data collection, in which some authorities categorized data according to the hazardousness of waste, others according to their origin, and for example one cannot tell exactly how much of hazardous waste is generated in production versus in consumption, the totals of these data don't add up to 100%.) 4% of all wastes (roughly 3.4 million tons, that is, 8% of nonbiomass waste) is hazardous. 5 In comparison, the EU's municipal waste ratio without liquid waste is 14%, which means that in Hungary, the share of municipal solid waste is considerably lower, than that in the EU. This reflects not so much a "lower developmental stage," as it is commonly implied, but a state socialist past, where consumption was shunned and economic growth was forced, even if it meant high waste-ratio production and thus high levels of industrial waste. High waste ratios did not constitute a problem for a social order that, as mentioned above, ruthlessly pursued 100% recycleability. In sum, the difference between the EU and Hungary is not simply that of quantity, indicating a lower stage on the same developmental trajectory, but of quality, due to a difference in developmental trajectories.

The rate of recycling for municipal solid waste in Hungary is 3% compared to the EU's average 15%. The existing rates of recycling in former socialist countries are similar to several of EU member countries' rates (such as those of Ireland and Portugal), but in general are lower than average rates in the 1980s. In contrast to this difference in municipal waste data, the recycling rate for hazardous wastes is 20% in Hungary as compared to 8% in the EU. Given that dumping and incinerating hazardous waste is environmentally more risky then recycling, we should welcome this variation and study what allows Hungary to surpass the allegedly environmentally more progressive EU in this regard.

Out of the country's 3,000 municipalities, 2,700 have landfills, or as it is often pointed out, there is a dump in practically every village, true, this includes "the smallest ditch, as a ministry representative said (Farkas 2003). There are 665 registered and municipally run landfills for municipal waste, of which only 15% meets current technological standards. In addition, however, there are also 620 smaller dump sites, not registered and most likely not fulfilling safety requirements. There is one major hazardous waste incinerator in the country, in Dorog, with a capacity of 25,000 tons/year, and there are some minor incinerators, some recently built, and some older cement kilns, which add up to an overall capacity of 85,000 tons for hazardous waste incineration. There is also just one modern hazardous waste landfill, in Aszód, which only takes wastes for final (rather than temporary) disposal, 10,000 tons a year. Its overall capacity is 300,000 tons that is not expected to be filled until about 2020. Therefore, assuming no import and export of hazardous wastes, Hungary cannot incinerate more than 3% of its hazardous wastes. The overall amount of waste incineration cannot be ascertained from the data available because it is lumped together with other types of elimination, such as the desiccation of liquid municipal waste, but possibly others, too, which the official of the environmental ministry

in charge of the data base I am using was unable to identify. However, the overall ratio of incineration is unlikely to be more than 10%. Compared to the practice of many EU countries that incinerate as much as a quarter of their *total* wastes and that have dozens of incinerators, Hungary's rates seem very low.

Accession countries on the average have higher industrial waste/per capita ratios than EU members, the reverse of the mentioned municipal waste ratio difference. My estimates however do not allow extrapolating from these averages to Hungary. Her industrial waste per 1000 USD of GDP is 72kg, which can be said to be in the middle range of existing EU countries, and well below, Finland's 118 kg and the Czech Republic's staggering 288 kg. Similarly, and even more unambiguously, with 490 kg of municipal wastes per capita, Hungary seems to belong more to the West, than to the East, should we insist on such simplified characterizations. Its municipal waste per capita is higher than any other candidate country's we have data for, and even higher than that of some EU members.

In sum, the areas in which Hungary's waste situation seems to be significantly and structurally different from the EU's are: a) Smaller proportion of municipal wastes among total wastes generated; b) Significantly smaller proportion of reuse and recycling, except in hazardous wastes; c) Significantly smaller proportion of incineration than the EU average. Consequently, these differences are leading to a higher rate of landfilling and a lower capacity for hazardous waste treatment through modern landfilling and incineration techniques. While it is getting more difficult to make the claim that Hungary seems underdeveloped based on her waste generation structure and "waste-efficiency" indicators, another commonly made claim, here in the words of a study by regional experts, that "the situation in the Central and East-European countries resembles to a high degree the situation in OECD countries in the 1980s when landfilling was the main disposal technique," is not completely off the mark (Eurowaste, 2000).

There are two problems with the statement, however. One is related to the misinterpretation of Hungary's waste past. As mentioned, in the 1980s Hungary actually favored recycling to landfilling much more than it does now, and possibly more than the OECD did then, as well. The other problem is that Western European countries have not made much progress in developing alternatives to landfilling either, which still comprises close to two-thirds of the treatment options for municipal waste (European Environment Agency, 1999). Furthermore, unlike Hungary, the EU has not yet managed to uncouple its waste generation from economic growth; in the last ten years economic growth averaged 6% in the EU, while waste generation grew by 10% annually. In Hungary, according to latest governmental data, overall waste generation declined from 106 million tons in 1990 to 68.7 million tons in 2000, during which period economic growth while initially negative, in the second half of the nineties was around 5%. True, an increase in waste generation has been registered since then and further increases are expected in the next few years.

Such data, however, were not made available or used as context at the time the European Commission established the accession requirements for former state socialist countries. The EU departed from three assumptions: 1) Hungary, as with all former socialist countries, has no environmental waste legislation to speak of; 2) she lacks the technical and institutional infrastructure necessary for implementing modern waste management methods; and 3) without Western assistance, Hungary is incapable of implementing progressive change. As a Market Analysis from 2001 stated, "Most of the current environmental difficulties arise from the fact

that environmental policy was virtually non-existent under the communist regime" (Trade Partners UK, 2001: 2.). The inscrutability and the etatism of state socialist waste policies reinforced the conviction in the early 1990s that Hungary must start from a blank page, which first requires that the old is demolished. According to some sources, the collapse of the state apparatus tore apart existing scientific and policy collaboration and put promising projects on hold. It would be worthwhile to investigate whether this sudden rupture and the idea that we must start anew made the adoption of the environmental (and especially the waste) chapter of the *Acquis* slower than was necessary.

Based on the discrepancies between Hungarian and EU waste practices (if not principles), the EU had two major concerns. First, it wanted to make sure that by admitting Hungary (and other former socialist countries) it would not unduly add to environmental problems caused by wastes. That the EU has such fears is apparent from studies lamenting that its waste output would double, given present-day data, when the first wave of candidate countries joined. Not only will Enlargement worsen the EU's waste statistics, it is also feared that candidate countries' loose environmental standards will offer an undesirable competitive advantage. It is curious that at the end of the eighties and early nineties, it was exactly this looseness, though not of regulation, but of enforcement, that lured EU-constituent businesses to the region. It seems as if the EU itself couldn't decide between its environmental principles and its economic interests. For example, in 2002 it granted exemptions to Hungary, along with most other candidate countries, in fulfilling EU requirements concerning waste policies. Hungary received a four-year exemption from implementing EU-conform legislation on hazardous wastes, on the recovery and recycling of packaging wastes, and a fifteen-year grace period in the area of urban wastewater treatment.

Indeed one cannot appreciate the full relevance of the Enlargement unless we treat the European Union not merely as a bundle of legal and institutional arrangements, as it usually is done in studies of the Eastern Enlargement, but also as a powerful global actor that represents and is supported by specific (rather than universal) economic interests. From-within critiques of the Union often bring attention not merely to the commonplace of democratic deficit, but with a positive spin, to the corporate voices that have control over many decisions and resources. Similarly, one should not take it for granted that catching up with the European Union with regards to waste treatment capacities is merely a humanitarian or environmentalist goal. While the EU sees itself as the environmental conscience of the world, and has played important leadership roles in numerous environmental issues in the international arena, actual legislation, policy, and aid within its environmental activities seem to reflect certain biases. In this respect, I will address two different modes of presence of the EU in former socialist countries and examine the extent that these different modes are complimentary or contradictory to the EU's presence as a set of laws. I will look at what effects certain EU-constituent businesses and then EU aids have on Hungary's future waste practices.

As no market analysis of Eastern Europe fails to mention, the big opportunity for environmental business in the region comes from former socialist countries' desire to join the EU. "The goal of EU accession is the main driver for improvement of the environment in Hungary and the recent attention given to the latter (after a sluggish start) by the Hungarian Authorities looks set to continue," says a UK analysis (Trade Partners UK, 2001: 2.). This is good news for investors. "The size of the Hungarian environmental market was valued at US\$700 million in 1997 and was expected to rise about 40% to the end of 2000. Further growth

between 2000 and 2010 is expected" (Trade Partners UK, 2001: 3.). A study published by Frost and Sullivan also emphasizes that, "by far the most important driver of the (municipal waste management) market over the forecast period is expected to be EU expansion and harmonisation, leading to the increasingly urgent need to raise standards and improve infrastructures" (quoted in Davies, 2000: 3.) The study commissioned by the U.S. Department of Commerce also implies that with Western doors closed to Hungary, the country's environmental record is unlikely to improve without outside intervention. As noted by Svastics (1999: 1), "The fact that Hungary became a member of the OECD in 1996 and subsequently made a commitment to joining the European Union (EU) has increased government attention to environmental issues." The same study explicitly laments that "municipal waste incineration is very scarce in Hungary" (Svastics, 1999: 8).

Indeed, the mentioned "shortage" in waste treatment capacity has been seen as a magnet for Western firms, increasingly unable to sell their facilities in the EU. Let us note, however, that a weakened state (see above) unable to enforce environmental regulations, or the laxness of some of these regulations themselves, have been just as important in attracting waste investors to the region as the capacity shortage. The years immediately following 1989 saw a veritable "waste-rush" of multinational incinerator corporations to the East, as I analyzed earlier (Gille 2000b). (move to footnote, because it appears in my previous EP article.) [Between 1988 and 1995 there were an estimated 18 million tons minimum of annual incinerator capacity proposed just in Russia, the Baltics, Hungary, Poland, the Czech Republic, and Slovakia, with about 93% of these capacities offered for export by Western countries. Put another way, about 187 facilities were proposed in the region, with Germany and Austria leading the way, accounting for 30% of the offers.

Unfortunately, EU accession is unlikely to deter such imports. The National Waste Management Plan (OHT) for 2003-2008 is planning six new incinerators even though in the parliamentary debate of the OHT, one reader considered the four or five original excessive (Parliamentary Committee Minutes, 2001). Furthermore, it states that "Hungary must have a nation-wide incineration capacity of 170 thousand t/year," which means a double of its present capacity. The plan plainly puts profitability concerns before environmental and social ones:

In certain sensitive regions of the country (e.g. where industrial activities are concentrated, where the geological conditions are special, where tourism represents a seasonal change, or where more of these factors are present simultaneously) construction of an incinerator can only be postponed for a period of time, but in the long term there is no alternative for (sic!) the disposal of waste remaining. [National Waste Management Plan, 2002, 28.]

Was it the pressure of such lobbies or was it the Western opinion that Hungary is backward in terms of its incinerator capacity that compelled the authors of? Or is it the synergy between the backwardness discourse and the economic interests that put their stamps so powerfully on the future waste practices of the country? And if so, how does this synergy come about and how is it reproduced?

First, the EU tells Hungary what waste treatment capacities it needs to have in order to be accepted as truly European, then it provides the "aid" to fulfil the requirements, and finally, most of this aid makes its way to back the pockets of EU-constituent producers of environmental technologies. There are three main funds that were established for assisting former socialist

countries in their transitions and in adopting the *Acquis*. The earliest one was PHARE, followed by ISPA (Instrument for Structural Pre-Accession Aid), for transportation and environmental objectives, and SAPARD (Special Aid for Pre-Accession in Agriculture and Rural Development) for agricultural and regional development. Among Hungary's ISPA Funds, waste management projects received priority. Out of the total amount of ISPA contribution between 2000 and 2002 (547 million Euros), 30% percent were awarded to various waste management projects (not counting waste water treatment—another area of preference).

I do not have access to data to be able to determine whether technologies or firms from the EU are the most common beneficiaries of these projects, and most of the bidding is still open, but clearly, firms from Western Europe have an advantage in this market, after all they know best what will truly conform to EU standards. Market analyses also demonstrate that east Europeans prefer Western environmental technology to domestic alternatives (Regional Environmental Center, 1997). It is also a little concealed fact that non-EU firms are excluded from bidding on projects to be completed with EU funds (unless through their European subsidiaries), much to the annoyance of the US and Canada. North-American market studies explicitly lament the small and decreasing share of US companies in the East European waste technologies market, which now, with the departure of the US giant, Waste Management Inc., seems to be irreversible. Such an exclusion makes it clear that the primary aim of "environmental" aid is not for Eastern Europe to adopt the environmentally most beneficial solutions through a truly open bidding, to have the ability to choose according to the principle of 'Best Available Technology,' but rather to turn the region into a market for Western European goods. <sup>10</sup>

The compromise of environmental principles becomes even clearer when we notice that the bidding announcements for these waste projects are about building new landfills. With the pretext that old, dangerous landfills have to be eliminated, the Hungarian National Waste Management Plan aims at establishing a network of regional dumps, so all settlements would have a landfill for municipal solid waste within a 30 kilometre radius. The defenders of the Hungarian National Waste Management Plan argue that it is at this density that landfills become profitable (Parliamentary Committee Minutes, 2001). But if the goal to reduce waste amounts is achieved, won't that change the profitability calculations? Furthermore, how does this plan get us closer to the EU ideal of reducing the share of landfilled wastes?

Or are policymakers motivated more by blindly following the mentioned Proximity Principle than by decreasing waste and dumping? While the Proximity Principle according to which waste should be disposed of as close as possible to where it is generated works great in countries where there is already a network of legal and up-to-date dumps, in the candidate countries, where the existing network is insufficient either in safety standards or in capacity, it may act as an unintended inducement to build dumps and thus further marginalizing waste prevention goals. More importantly, however, as long as only waste dumping receives generous EU funding, and waste reduction receives nothing other than the obligatory symbolic gestures in programmatic documents, the policy emphasis on landfill capacity-building will reinforce existing motivation for end-of-pipe technologies, and, on the long run, will lock in future waste practices making a (hypothetical) move in a more preventative direction less and less feasible.

The practical consequences of both EU aid and EU business may be too early to see, but if Hungary's National Waste Management Plan is any indication, end-of-pipe technologies are

still the favoured method of dealing with unwanted materials. In fact, the Plan aims to radically overhaul the existing economic incentives for recycling and reuse in order to relax restrictions and penalties waste producers presently face. While a new policy tool, a weak alternative to the existing system of product charges, was allowed to pass at the end of December 2002, the Hungarian Parliament voted against the further relaxation of the producers' responsibility in the product charges system. It is clear, nevertheless, that the pressure from industry to loosen waste legislation and especially to forego economic incentives for waste minimization and recycling remains unrelenting. In this often-fierce struggle between industrial lobbies and environmentalists, the meaning of Europeanness is also contested.

Since Europe is a powerful symbol, most participants in the debate do try to define their positions as closer to that of the EU. There are several difficulties in evaluating such claims. First, it is never clear whether the reference is EU law or EU practice. In that regard, it may be said that the National Waste Management Plan does not conform with EU ambitions. The plan places reuse and recycling above incineration and dumping in the waste management hierarchy, while EU practice still favours dumping.<sup>11</sup>

Second, in the case of democracy and economic reforms, it is relatively clear what policies conform with the EU. In the case of waste policy tools, however, the answer is much more ambiguous. While the EU lays down the desired principles and goals of waste management in directives which the member countries adopt in the course of a few years, how a member country's state apparatus will go about achieving those goals remains in the scope of national authority, and thus varies. As a result, there are diverse systems in place within the EU in the different areas of waste management, and not all are equally effective, and presumably not all are equally practical in the case of Hungary. There is quite a variety especially in methods of achieving EU objectives concerning packaging wastes and recycling. While environmental activists are still demanding the maintenance and strengthening of the mentioned system of product charges, and the reinstitution of deposit systems, their opponents (occasionally Ministry officials, and the association representing manufacturing interests) point to various EU principles protecting the uninhibited working of the market. During the screening process, for example, the EU objected to product charges since those ultimately act as subsidies for production costs. (Since product charges are supposed to be pumped back to the companies for extending their reusing and recycling capacities, product charges could be seen as a form of subsidy.) The EU also prohibits obligatory deposits on packaging materials since those may function as hidden import duties, as Belgium's recent example shows.

There is also the question of which set of laws and policy tools can actually guarantee that Hungary will be able to fulfil its promises to achieve 50% in its rate of recycling by 2006 (in accordance with the temporary exemptions mentioned). Considering all these constraints—in quotas, policy tools, and principles—and the existing diversity in practices, EU-conformity turns out to be a slippery term, but that is exactly why it so adaptable to political agendas of all kinds.

Why get upset about laws? They can be changed after all, one might say. While laws and policies are indeed reversible, their effects may not be. The postsocialist transition and Hungary's subsequent Europeanisation is not only about markets and law. These radical transformations require and call for a new kind of culture and a new kind of subjectivity. The way in which a postsocialist society goes about joining the West will produce a certain kind of consumer, employee, or manager. The thrifty and waste-conscious material culture that developed under state socialism today may seem as backward and contrary to "European" consumerism, rendering preventative waste policies less attractive and achievable at a much

greater social cost. It is hardly a surprise that despite the 5<sup>th</sup> Environmental Action Programme, waste generation is on the increase in the EU itself. Similarly in Hungary, short of explicit policy tools to rein in consumption, it seems that even the more modest waste-efficiency-increasing plans will fail.

#### **IV. Conclusion**

The EU has been sending mixed messages to Hungary. On the face of it, the EU is for preventative waste policies and is concerned about the environmental effects of economic growth. This is the position espoused in the Environmental Action Plans, the Directives, and the programmatic studies. However, when we look at actual practices, particularly investments and economic and infrastructure requirements, the EU stands for unsustainable development and for putting economic interests before environmental interests. Given the contradictory sets of expectations placed on candidate countries, it is not surprising that environmental harmonisation was lagging and that business interests were dominating the legislative process in the individual accession countries. Can environmental civil society turn this trend around?

The European Commission has loudly solicited NGO participation in the accession negotiations, but as these NGOs now lament, this has been merely a symbolic gesture. First, NGOs were excluded from committees deciding about granting ISPA and SAPARD funds, which, as mentioned, is where numerous decisions with long-term consequences were made. Second, the meetings between the Environmental DG and green NGOs of the region have been futile. The NGOs, armed with data and expert studies in the best spirit of professionalism, demanded introducing accession requirements to safeguard their countries' biodiversity from the adverse ecological effects of meeting other EU requirements, in the areas of infrastructure (road construction) and agriculture. Yet, the Commission repeatedly prevented its comments and opinions made at these meetings from being printed in the resulting summaries of the minutes, because they "did not want to be held accountable later for not fulfilling promises made there" (Anonymous 2001). Ultimately, there were no practical steps taken to enforce NGO-suggested accession conditions. Symbolic gestures for civil society involvement will obviously produce symbolic rather than real results. Whether NGOs and social movements have more leverage once inside the EU structure remains to be seen, but their role in holding the EU to its principles will surely remain crucial.

#### **Endnotes**

- 1. Reform economists argued already in the 1970s that harder budget constraints and more independence for enterprises in investment decisions--in sum, a free market--would force them to use natural resources more sparingly and with greater care. For detailed discussions and evaluations of the reform economists' approach to environmental problems, see DeBardeleben (1985) and Gille (1997).
- 2. Product charges on transportation fuel had been in effect since 1992 (Lehoczki and Balogh, 1997).
- 3. The following data are complied from the Hungarian National Waste Management Plan, about which more later. As the members of the Hulladék Munkaszövetség, the most important Hungarian NGO dealing with waste issues pointed out, the data are incomplete and do not add up (Kukabúvár 2002). Indeed, I found it hard to navigate the data provided especially for comparative purposed. In light of these valid criticisms, I restrict myself to reporting on the most basic figures.
- 4. According to Hungarian lawmakers this is made up of agricultural and forestry residues entirely recycled through biological cycles.
- 5. Roughly one quarter of it is comprised by red mud resulting from aluminium production.
- 6. Hungarian data in the National Waste Management Plan show 6% of hazardous wastes are treated by incineration and other forms of elimination.
- 7. Reliable and comparable data on incineration are very hard to come by the even according to the EU's own offices.
- 8. An example is the waste dump registry initiated by the Alliance of Technical Professionals in the 1980s.
- 9. My calculation is based on Greenpeace data from Gluszynski and Kruszewska (1996).
- 10. This is not to imply that North-American technologies are environmentally friendlier.
- 11. This was pointed out by several participants of the meeting of the Parliamentary committee evaluating the draft of the HWMP in June 2001 (Parliamentary Committee Minutes, 2001), however, the final Plan does not establish a clear and concrete preference for recycling either.

#### References

- Andersen, Mikael Skou. 2002. "Ecological Modernization or Subversion?" *American Behavioral Scientist*, 45(9): 1394-1416.
- Andrews, Richard N. L. 1993. "Environmental Policy in the Czech and Slovak Republic." In A. Vári and P. Tamás (eds.), *Environment and Democratic Transition: Policy and Politics in Central and Eastern Europe* (pp. 5-48). Boston: Kluwer Academic Publishers.
- Anonymous 2001. Personal interview. Hungary.
- Árvai, József. 1990. *Hulladékgazdálkodás*. (Waste Management.) Budapest: Budapesti Müszaki Egyetem, Mérnöktovábbképző Intézet.
- Bochniarz, Zbigniew, Sándor Kerekes and Kindler, József. (Eds.) 1994. *Designing Institutions for Sustainable Development in Hungary: Agenda for the Future*. Budapest: Környezettudományi Központ.
- Davies, Steve. 2000. *The Private Sector and Waste Management in Central and Eastern Europe* 2000. London: PSIRU. Available at: www.psiru.org.
- DeBardeleben, Joan. 1985. *The Environment and Marxism-Leninism: The Soviet and East German Experience*. Boulder, CO: Westview Press.
- Dryzek, John S. 1997. *The Politics of the Earth: Environmental Discourses*. Oxford: Oxford University Press.
- Environment Daily. 2000. "Hungary's environmental performance assessed." *Environment Daily*, No. 742 (April 12, 2000). Available at: www.environmentdaily.com.
- Environment Daily. 1999a. "EU environmental accession talks begin." *Environment Daily*, No. 663. (December 9, 1999). Available at: www.environmentdaily.com.
- Environment Daily. 1999b. "Environment takes back seat in EU Enlargement." *Environment Daily*, No. 624. (October 14, 1999). Available at: www.environmentdaily.com.
- European Environment Agency. 1999. *Environment in the European Union at the Turn of the Century*. Available at: http://waste.eionet.eu.int/.
- Eurowaste. 2000. The Final Report on the Project Waste Management Policies in Central and Eastern European Countries: Current Policies and Trends. Available at: http://www.eurowaste.org.
- Friends of the Earth. 2002. Enlargement Plans Still Sideline Environment. Press Release on December 13, 2002. Copenhagen, Denmark.
- Gervais, Caroline. n.d. "An Overview of European Waste and Resource Management Policy (Executive Summary). Royal Society for Nature Conservation.
- Gille, Zsuzsa. 2001. "Social and Spatial Inequalities in Hungarian Environmental Politics: A Historical Perspective." in P. Evans (ed.), *The Politics of Urban Livelihood and Sustainability* (pp. 132-161). Berkeley, CA: University of California Press.
- \_\_\_\_\_. 2000a. "Cognitive Cartography in a European Wasteland: Multinationals and Greens Vie for Village Allegiance." in M. Burawoy, et al. *Global Ethnography: Forces, Connections and Imaginations in a Postmodern World* (pp. 240-267). Berkeley, CA: University of California Press.
- \_\_\_\_\_. 2000b. "Legacy of Waste or Wasted Legacy? The End of Industrial Ecology in Hungary." *Environmental Politics*, 9(1): 203-234.
- \_\_\_\_\_. 1997. "Two pairs of Women's Boots for a Hectare of Land: Nature and the Construction of the Environmental Problem in State Socialism," *Capitalism, Nature, Socialism*, 8 (4): 1-21.
- Gluszynski, Pawel and Kruszewska, Iza. 1996. Western Pyromania Moves East: A Case Study in Hazardous Technology Transfer. Available at: http://www.rec.hu/poland/wpa/pyro-toc.htm.

- Hajer, Maarten. 1995. The Politics of Environmental Discourse: Ecological Modernization and the Policy Process. Oxford: Clarendon Press.
- Hughes, Gordon. 1990. Are the Costs of Cleaning Up Eastern Europe Exaggerated? Economic Reform and the Environment. London: Centre for Economic Policy Research.
- Kaderják, Péter and James Powell (eds.) 1997. *Economics for Environmental Policy in Transition Economies: An Analysis of the Hungarian Experience*. Cheltenham, UK: Edward Elgar.
- Kindler, József. 1994. "Evaluation of Economic, Social, and Political Preconditions for a Successful Implementation of the Institutional Reform." In Z. Bochniarz, R. Bolan, S. Kerekes, and J. Kindler (eds.), *Designing Institutions for Sustainable Development in Hungary: Agenda for the Future* (pp. 119-151). Budapest: Környezettudományi Központ.
- KSH (Központi Statisztikai Hivatal--Central Bureau of Statistics). 1988. Központi fejlesztési programok. A melléktermék- és hulladékhasznosítási program 1987: évi eredményei. (Central Development Programs: The By-product and Waste Reuse Program.) Budapest: Központi Statisztikai Hivatal.
- Kukabúvár. (Editorial). 2002. "Mennyi hulladék képződik Magyarországon?" (How much waste is generated in Hungary?). *Kukabúvár*, 8(3). Available at: http://www.kukabuvar.hu/kb29/kb29 36html.
- Lehoczki, Zsuzsa and Zsuzsanna Balogh. 1997. "Hungary." In J. Klarer and B. Moldan (eds.), *The Environmental Challenge for Central European Economies in Transition* (pp. 131-192). UK: John Wiley and Sons.
- Lewis, Flora. 1990. "The Red Grime Line." New York Times (April 10): A(21)L.
- Manser, Roger. 1993. *The Squandered Dividend: The Free Market and the Environment in Eastern Europe*. London: Earthscan Publications Ltd.
- Mol, Arthur P. J. 1995. *The Refinement of Production: Ecological Modernization Theory and the Chemical Industry*. Utrecht: Van Arkel.
- NÉTI. 1987. "Az anyag nem vész el, csak drágább lesz: Feltáratlan kincsesbányáink" (The material does not get lost only gets more expensive: Our unexplored treasure mines.) *Mai Magazin*, March, 187: 6.
- NGO Response from Candidate Countries (on the Sixth Environmental Action Programme. 2001. Available at: http://www.czp.cuni.cz/6EAP/EENGO.html.
- Parliamentary Committee Minutes. 2001. Minutes of the June 13<sup>th</sup> meeting on the National Waste Management Plan of the Article 56 in the 2000 Waste Act. Available at: http://emil.alarmix.org/sajto/jegyzokonyv2001jun13II.html.
- Regional Environmental Center. 1997. Demand for Environmental Technologies in the Czech Republic, Hungary, Poland and Slovakia: A "Showcase Europe" Market Research Project. Budapest, Hungary.
- Romhányi, Gábor. 1995. Personal interview. Budapest, Hungary.
- Solomon, Laurence. 1990. "The Best Earth Day Present: Freedom." Wall Street Journal CCXV (April 20--Eastern Edition): A14.
- Spaargen, Gert and Arthur P. J. Mol. 1992. "Sociology, Environment, and Modernity: Ecological Modernization as a Theory of Social Change." *Society and Natural Resources*, 5: 323-344.
- Stirith, Jernej. 2000. "Enlargement and the New EU Environmental Action Programme." *Metamorphoses*, No. 17. Budapest, Hungary: Regional Environmental Center for Central and Eastern Europe.
- Svastics, Kinga. 1999. "Waste Management, Hungary, Industry Sector Analysis." Available at: http://www.tradeport.org/ts/countries/hungary/isa/isar0005.html.
- Takáts Attila. 1996. Personal interview. Budapest, Hungary.

- \_\_\_\_\_. 1990. "A hulladékok káros hatása elleni védelem jogi, müszaki és gazdasági szabályozása" (The legal, technical and economic regulation of protection against the harmful effects of wastes.) In J. Árvai (ed.), *Hulladékgazdálkodás*. (Waste Management), (pp. 140-145.) Budapest: Budapesti Müszaki Egyetem, Mérnöktovábbképzö Intézet.
- Trade Partners UK. 2001. "Environment Market in Hungary." Available at: www.tradepartners.gov.uk/ text/environment/hungary/profile/overview.shtml
- Tudományos Ismeretterjesztő Társulat. 1980. *Környezetvédelmi elöadói segédanyag* (Textbook for Environmental Protection). Budapest: Tudományos Ismeretterjesztő Társulat.
- White, Robert M. 1994. "Preface." In B. R. Allenby and D. J. Richards (eds.), *The Greening of Industrial Eco-Systems* (pp. v-vi). Washington, DC: National Academy Press.