

**UNIVERSITY OF ECONOMICS IN KRAKÓW**  
DEPARTMENT OF FINANCE  
CHAIR FOR INDUSTRIAL AND ENVIRONMENTAL POLICY

Outline of the PhD project of the title

**Municipal waste management in Poland and the Czech  
Republic**

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**KRAKÓW**

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## **1. RELEVANCE OF THE DISSERTATION TOPIC**

Since industrialisation and urbanisation in the 19<sup>th</sup> century, the management of solid waste is an essential part of municipal activity, aiming at the improvement of sanitary conditions. For most of the 20<sup>th</sup> century waste management consisted out of collection of refuse and its disposal in so-called waste lands outside of the cities. The recovery of waste material like fibres and scrap metal were undertaken by private businesses and the public side engaged in this activity only during periods of scarcity of raw material like wars. Changing consumption patterns during the 1950s resulted in an increase of household waste in Western societies and waste incineration became a widespread method of reducing the amount of waste to be disposed.

With the rise of the environmental movement in the 1960s waste became an issue of broader public concern and scientific interest. The understanding that existing landfilling practice may result in environmentally harmful brownfields led to the development of sanitary landfills and ended the practice of disposing hazardous industrial waste together with household waste. The awareness of the limits of natural resources and the energy crises of the 1970s led gradually to the introduction of recycling programmes, composting bio-degradable waste and energy recovery in waste incinerators. The waste treatment facilities necessary present investments exceeding the financial capacities of single small towns or rural communities and they have significant economics of scale effects. Therefore waste management became an issue of public policy on regional and national level. In the 1970s Western countries enacted laws on waste<sup>1</sup> and since then waste management can be considered one of the main elements of environmental policy.

In the 1990s the concept of sustainable development brought a broader understanding of environmental protection, linking it with economic and social aspects. This new approach meant for waste management that the focus shifted from “end-of-pipe” to holistic and integrated solutions. Since then waste management is understood as a part of the economy’s material cycle, this is expressed in the life-

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<sup>1</sup> The German “Act on waste disposal” from 1972 what was the first national law on waste, other Western European countries followed suite.

cycle assessment, where the environmental, economic and social impact of a product is seen from the “cradle to the grave”. Today’s policy on waste has a much wider scope than several decades ago, it includes a broad number of administrative, economic and voluntary action based instruments. Also the geographic scope has widened since international organisations like the UNEP, UNIDO and the OECD are dealing with waste management and with the Basel Convention from 1989 there is even an international regime dedicated only to waste.

Since the European Community deals with environmental issues waste is one of its elements. The 1973 “First Action Programme” resulted in the ‘Framework Directive on Waste’ (75/442/EEC). The directive is setting until today the main principles and objectives of waste management. The waste hierarchy says that the prevention of waste is superior to reuse and recovery whereas final disposal is considered only the last resort. The ‘polluter-pays principle’ means that costs for treatment and disposal of waste have to be borne by the owner or producer of waste. EU legislation on waste has developed in two directions; these are process-centred directives and product-centred directives (McCromick, 2001). The dual nature of waste, as a pollutant on the one hand and a secondary resource, hence an economic good on the other hand, made it necessary to include the principles of the Common Market into legislation. Process related directives shall guarantee the free movement of waste within the Community but avoid unfair competition through environmental dumping. The product centred-directives are a result of the life-cycle approach, like in the case of the “Packaging and Packaging Waste Directive.” The majority of legislation on waste is in the form of directives providing common definitions, defining goals and setting minimum standards or quotas for waste management. Within this framework the member states are free to decide in what way the policy is implemented nationally and in fact the national waste management systems differ significantly from each other.

The enlargement of the European Union over the post-socialist states of Central and Eastern Europe presents a challenge for the Community as well as for the new member states, as these countries were significantly lagging behind in their efforts of environmental protection. Waste management in the post-socialist EU member states

is a result three developments. Firstly the legacies of real-existing socialism, which resulted in the disposal of industrial and household waste in inappropriate landfills close to settlements counting for many of today's brownfield sites. Scarcities of resources, but not ecological considerations, led to the introduction of recycling or reuse schemes. During the transition period the situation improved somehow as the amount of industrial waste declined rapidly, but the newly established municipalities, who became responsible for waste management, did not receive sufficient financial support until the mid-1990s. This became visible when changing consumption patterns led to an increase of the amount of household waste. (Anderberg, et. al., 2000) During the pre-accession phase waste management law was brought into line with the EU requirements. Both countries transposed EU legislation into national law in 2000<sup>2</sup> and it became obvious that significant financial investment had to be undertaken to harmonise the waste management practice with the Union's standard. Therefore it is no wonder the waste sector accounts for a significant number of transition periods in the environmental chapter of the Accession Treaty.<sup>3</sup>

Poland and the Czech Republic were chosen as cases for this dissertation for several reasons. They are the biggest countries, terms of population, joining in 2004; their socio-economic structure, despite all differences, is comparable, what is essential for comparing their patterns of generation, composition and treatment of municipal waste. Also there exists more research on waste management in these two countries compared to Hungary and Slovakia. Furthermore the two countries are chosen as contrasting examples concerning the policy instruments in waste management. Beside the so-called "command and control" instruments that are required by EU law, Poland applies extensively economic tools in environmental policy, whereas in the Czech Republic voluntary activities and the integration of NGO play a crucial role (Sothorlin, 1999).

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<sup>2</sup> Polish Act on Waste (Dz. U.01.62.628) and Polish Act on packaging and packaging waste (Dz.U.2001.63.638) and respectively the Czech acts: č.185/2001 Sb. č.185/2001 Sb.

<sup>3</sup> Poland is granted temporary derogation for six environmental directives of which three are related to waste. For the Czech Republic it is one of three environmental directives. Act concerning the conditions of accession ..., 2003, Annex V and XII

The requirements from the EU make also institutional changes necessary. Recent years have seen developments, like the formation of associations of municipalities for waste management, the establishment of private recovery organisations or the privatisation of municipal waste management. Furthermore, new policy instruments were introduced; these e.g. are economic tools like product charges or volume-dependent waste fees or the support for voluntary actions and rising public awareness. Hereby it is important to keep in mind that waste management remains foremost a local issue and in Poland and the Czech Republic it is the municipalities deciding about the waste treatment methods. Therefore it is important to analyse the impact of the EU accession under specific local conditions.

Waste management practice in Central and Eastern Europe has to catch up a gap of several decades in comparison to Western European countries. Therefore it is of little surprise that research in these countries is still focussing on engineering, legal or financial aspects and for example there are yet no handbooks taking a multi-disciplinary approach like comparable US American or German publications<sup>4</sup>. Within the 5<sup>th</sup> and 6<sup>th</sup> Community Framework Programme a common methodology for analysing sustainable waste management in municipalities was developed. Through the participation of Polish and Czech researchers several case studies are now available (Šauer, et. al. 2003, Stypka 2004, Beigl and Saalhofer 2004, Szpadt, et. al., 2005) but so far no comparative studies on national level were undertaken in the new member states.

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<sup>4</sup> Example herefore are Cabernard (1995), Ackerman (1997), Bank (2000) and Porter (2002)

## 2. RESEARCH OBJECTIVES, RESEARCH QUESTIONS AND HYPOTHESES

The *main objective* of the doctoral research project is to identify the changes of municipal waste management in Poland and the Czech Republic through the process of EU accession and an assessment of its outcomes. The main objective can be divided into following *partial research objectives* which reflect the structure of the dissertation.

1. Establishing a definition of sustainable municipal waste management which shall serve as a theoretical basis for the further research.
2. Introducing the main principles and methods of waste management and their evaluation from a sustainability development point of view.
3. Analysing the EU policy on waste management regarding its effects.
4. Presenting Polish and Czech waste management practice prior to EU accession and changes ever since.
5. Assessing waste management in Poland and the Czech Republic against the performance in the EU-15 and against criteria of sustainable development.
6. Identifying the relation between the different ways of waste management policy was implemented and its outcomes.
7. Summarising the main changes and outlining the possible future development in Poland and the Czech Republic and giving recommendation for a more sustainable waste management in post-socialist EU countries.

From the above introduced objective the *main research question* can be formulated as such: “What changes in municipal waste management have occurred in Poland and the Czech Republic through the accession to the European Union and what are their outcomes from a sustainable development point of view?”

This main can be divided into several *partial research questions*:

1. What kind of policies was chosen in Poland and the Czech Republic and what differences occurred in waste management practice?
2. What are the relations between changes in the policy on waste management and the effects in practice?
3. Do these changes lead to a more sustainable form of waste management?

Basing on the questions mentioned above, the following *hypotheses* can be formulated:

1. The different ways of implementing European Union's waste management policy leads to different effects in waste management practice.
2. Harmonising Polish and Czech waste management with EU standards makes waste management more sustainable.
3. The degree of sustainability depends on the way the EU standards are implemented in the country.

### **3. RESEARCH APPROACH AND METHODOLOGY**

The multi-disciplinary nature of the dissertation topic requires research methods from different fields of science. The first chapter on sustainable waste management gives an overview on the state of research from the perspective of environmental, economic and political science. The literature analysed contains monographs, scientific articles and research papers. In the following chapter the most important methods of waste prevention and treatment are introduced and various approaches for the analysis and assessment of waste management policy and practice are presented and classified. This chapter bases strongly on literature from the field of environmental engineering and environmental economics.

The chapter on waste management in the European Union can be divided into two parts, firstly an analysis of the Union's policy on waste management and its outcome and secondly a presentation of waste management in three selected old member states. This approach is chosen because environmental policy is an area in which the authority is shared between member states and the European Union. The selected have chosen different approaches to waste management: Germany<sup>5</sup>, the best performing country in waste management, has the tendency to set higher standards than the EU requires, leading to higher cost too. The United Kingdom, a country generally considered advanced in environmental protection, has chosen a low cost and low standards path in waste management. Spain, finally, is generally lagging the

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<sup>5</sup> For environmental performance of EU countries see, Borzel (2000) p 148-155. Esty, et.al. (2006), p. 3 and EEA (2003) p. 161

furthest behind in environmental protection, but in recent years strong political and financial efforts were undertaken in this area.

The chapters on Poland and the Czech Republic will be divided into three parts. The first parts present the situation before EU membership respectively, with special focus on the outcome of the pre-accession process, followed by a presentation of the present state of waste management policy and practice. Both chapters conclude with three case studies on local waste management. These case studies have two purposes, firstly an illustrative, meaning the effect of policy changes on national level is shown on the local level and secondly an exploratory, meaning to gain data on waste management that are not available on national level. The choice of municipalities is limited because only municipalities that have conducted waste sampling analyses on the composition of waste deliver the data necessary for modelling. For reasons of comparison the Polish and Czech municipalities should be of comparable size. Therefore case studies will cover the capital cities (Warszawa, Praha), major cities (Kraków, Brno) and smaller towns (Żywiec, Znojmo).

The chapters on the EU, Poland and the Czech Republic have a theoretical-empirical character. The literature includes primary resources, like legal and political documents or stakeholder papers, scientific articles and research papers on environmental protection in general and waste management. The empirical part draws on statistical material from international and national agencies, as well as local institutions. In the empirical part two different approaches are taken, the material flow analysis by Brunner and Rechberger (2003) and the life-cycle analysis by Boer and Boer (2005)<sup>6</sup>. Both methods provide software tools for the modelling and prognosis of municipal waste management in the light of sustainable development. The results are compared with existing case studies to verify their validity. The policy related part of case studies are based on the recommendation of R. Porter (2002).

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<sup>6</sup> Both methods were developed within the European Urban Waste Management Cluster Project of the 5<sup>th</sup> Community Framework Programme. (Wastesolutions, 2005)

In chapter six the findings from the chapters above are scrutinised in three separate comparative analyses. The material flow and life-cycle analysis are applied on national data to assess the environmental, economic and social effects of the existing waste management model in Poland and the Czech Republic. Hereby the problem occurs that some of these data are not available for the whole country and therefore have to be estimated. These estimations will partly base on data from the case studies and experiences of comparable countries. In the following part both countries' policies on waste management are compared. The comparative analysis of policy instruments and institutional arrangements shall help to explain the different outcomes in environmental indicators. The chapter concludes with a comparative study on regime building of Poland and Czech Republic on the one side and the old EU member states on the other, basing on the works of Buclet (2000, 2002).

The dissertation concludes with a summary of the main changes that have occurred through EU accession and a prognosis of the possible future development of both countries' municipal waste management and recommendations for Poland, the Czech Republic as well as other post-socialist EU member countries.

#### **4. OUTLINE OF THE DISSERTATION**

##### **Introduction**

##### **I. Conceptual framework of sustainable waste management**

1. Introduction to sustainable development
2. Environmental aspects of waste generation and treatment
3. Economic aspects of waste management
4. Waste management as an object of public policy

##### **II. Principles and methods of waste prevention and treatment in the European Union**

1. Community legislation and policies in the field of waste management
2. Classification of waste and the hierarchy of waste treatment methods according to EU standards
3. Methods of recovery and disposal of municipal waste
4. Environmental-economic methods for the assessment of waste management practice
5. Present state of waste management in the EU and selected member states

##### **III. Waste management in Poland and the Czech Republic in the framework of EU accession**

1. Development and state of waste generation and treatment in Poland and the Czech Republic
2. Harmonisation of waste management practice with the standards in the European Union
3. Changes after accession and the present state of waste management
4. Selected local cases of waste management

**IV. Comparing waste management in Poland and the Czech Republic in the light of sustainable development**

1. Comparison of the national policies and instruments applied
2. Comparison of waste management applying life-cycle analysis and material flow analysis
3. General evaluation of the changes in municipal waste management in the light of sustainable development
4. Future development of the waste management system in Poland and the Czech Republic

**V. Policy recommendations for other Central and Eastern European Countries**

**Conclusions**

**Table of figures and graphs**

**Bibliography**

## 5. SCHEDULE OF DISSERTATION

Providing lectures at Cracow University of Economics and the Jagiellonian University	10.2003 – 06.2006
Study of introductory and theoretical literature	10.2004 – 9.2005
Environmental conference at the University of Economics in Prague	10.2006
Study of literature on waste management in Poland and the EU	10.2005 – 05.2006
First publication on waste management	12.2005
Development of the empirical methodology	07.2006 – 10.2006
Research stay at the Masaryk University in Brno	09.2006 – 02.2007
First meeting with PhD advisor prof. dr hab. K. Górka	12/2006
Study of literature on waste management in the Czech Republic	11.2006 – 01.2007
First draft of the PhD project (Karta Programowa)	01.2007 – 03.2007
Continuation of lecturing at Cracow University of Economics and the Jagiellonian University	od 02/2007
Preparation for the opening of the dissertation procedure at the Faculty of Finance of Cracow University of Economics	04.2007
Writing of the theoretical chapters	03.2007 – 05.2007
Writing of the chapter on the European Union	06.2007 – 07.2007
Preparation of the second publication on waste management	06.2007
Collection of statistical material from municipalities and conducting empirical research	08.2007 – 09.2007
Participation in the workshop EASY-ECO in Mogielany	08.2007
Writing of the chapters on Poland and the Czech Republic	10.2007 – 11.2007
Writing of the comparative and concluding chapters	11.2007 – 02.2008
Completion of the dissertation	03.2008
Planned date for the defence	Spring 2008

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