University of London

M Phil Town Planning

# The local opposition to Energy-from-

# Waste incineration proposal

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## Abstract

In the 1990s in the UK, there have been a lot of Energy-from-Waste (EfW incineration) incineration proposals being rejected or delayed due to local opposition. This thesis explores the causes and the processes of local opposition to the proposals. It reviews the literature on theories about local opposition to siting EfW incineration plants to establish the pattern of interactions between stakeholders of the proposals constituting to the failure to gain local acceptance. It traces the development of policies that shapes the EfW incineration development. A case study which the developer was failed to gain permission to build is analysed. The data is collected through semi-structured interviews with some stakeholders. It concludes the factors leading to the failure to gain approval. It seeks alternative approaches to gain public acceptance. It also investigates possibly a new approach to link pollution control and planning control emerged in the strategies employed by the local authority in the scrutiny of the Environmental Statement produced by the developer.

## Glossary

Associate Energy Projects
Belvedere And District Campaign Against Pollution
Best Available Techniques Not Entailing Excessive Cost
Belvedere, Erith and Thamesmead Tackling Environmental
Ruin
Best Practical Environmental Option
Combined Heat and Power
Cory Environmental Limited
Department of Environment
Department of Trade and Industry
Environment Agency
Energy-from-Waste
Environmental Protection Act
Environmental Statement
Edomonton Solid Waste Incineration Plant
Greater London Council
Heavy Good Vehicle
Her Majesty's Inspectorate of Pollution
Integrated Pollution Control
Kent County Council
Local authority Waste Disposal Company
London Borough
London Planning Advisory Committee
London Waste Regulation Authority
Non-Fossil Fuel Obligation
North London Waste Authority
National River Authority
Powergen Combined Heat and Power Limited
Planning Policy Guidance
Royal Commission on Environmental Pollution
Refuse Collection Vehicles
South East London Combined Heat and Power
South East London Waste Disposal Group
Secretary of State
tonnes per annum
Waste Collection Authority
Waste Disposal Authority
Waste Regulation Authority

## Table of contents

CHAPTER 1: INTRODUCTION	10
BACKGROUND	10
Research method	11
STRUCTURE OF THE THESIS	14
CHAPTER 2: WASTE MANAGEMENT FRAMEWORK IN THE UK	15
INTRODUCTION	15
THE HISTORIC LANDSCAPE OF WASTE MANAGEMENT	15
THE POLICY FRAMEWORK	18
The waste management hierarchy	18
Proximity Principle	19
Landfill tax	21
Renewable energy	21
Operational plans	25
THE REGULATORY FRAMEWORK	33
Planning control	33
Building consent to power plant	36
Pollution control	38
Conclusion	41
CHAPTER 3: THEORIES ON LOCAL OPPOSITION TO THE DEVELOPMENT OF E	FW
INCINERATION PLANT	44
INTRODUCTION	44
DIVERGING VIEW ON LOCAL OPPOSITION	44
THE EMPOWERMENT OF THE LOCAL COMMUNITY	48
TRADITIONAL LOCATIONAL CONFLICTS: DECIDE-ANNOUNCE-DEFENCE (DAD)	50
New measures to resolve locational conflicts	52

Conclusion	59
CHAPTER 4: CASE STUDY ON LOCAL OPPOSITION TO EFW INCINE	RATION
PROPOSAL IN BEXLEY, LONDON BOROUGH	61
INTRODUCTION	61
BACKGROUND	61
The development process of the ESWIP	64
The development process of the SELCHP	68
THE LOCAL OPPOSITION TO EFW PLANT	
Cory's EfW proposal in Belvedere, Bexley, LB	
The details of Cory's proposal	
The local perception	
The public inquiry	
The spoiling strategy: AEP's proposal	115
The new Cory's proposal (Powergen's proposal)	
The chronicles of EfW incineration development in Belvedere	
Conclusion	
CHAPTER 5: CONCLUSION	
APPENDICES	138
REFERENCE:	145
List of tables	
Table 1: Number of licensed waste disposal and recovery facilities	in the $\Pi K = 1001$

Table 1. Number of licensed waste disposal and recovery facilities in the OK - 1991
(Petts and Eduljee 1994 p11)15
Table 2: Kent Waste Local Plan Progress (Source: Kent County Council)31
Table 3: Permits required for different scales of EfW incineration plant

Table 4 : Membership of UK environmental voluntary organizations (Robinson 1992)
(numbers in thousands)49
Table 5 : Progress of the Project Integra 58
Table 6: Population and waste generation in North London Waste Authority (Source
LWRA 1995 Appendix A5i, Appendix C1)65
Table 7: The waste amount of generated in SELWDG from 1981-88.    69
Table 8: Population and waste generation in the catchment area of SELCHP (Source
LWRA 1995 Appendix A5i, Appendix C1)72
Table 9: NFFO subsidies on SELCHP and ESWIP73
Table 10: NFFO subsidy on Cory's proposal in according year of the commencement
of operation80
Table 11: Site selection for the Cory's proposal
Table 12: The waste generated within the catchment area of the Cory's plant (Source:
Cory 1991 Table C.1)91
Table 13: Forecast of road traffic generation in the delivery of waste (Cory 1991a)92
Table 14: Total traffic generated. (Cory 1991a)92
Table 15: Bexley's cross-departmental task force
Lists of diagrams
Diagram 1: Outlook of ESWIP (Source: GLC 1979)67
Diagram 2: Working procedure of SELCHP (Source: SELCHP 1994)71

Diagram 4: The north elevation of Cory's original design (Source Cory 1991a) ......112

(Source: Powergen 1995)113
Diagram 6: Working procedure of AEP's proposal (I) (AEP 1995)119
Diagram 7: Working procedure of AEP's proposal (II) (AEP 1995)120
Diagram 8: An artistic impression of AEP's proposal (Source: AEP 1995)121
List of maps
Map 1: Locations of the EfW developments in London63
Map 2: Incineration proposals in Belvedere75
Map 3:Land use in the North Belvedere76
Map 4:Landuse and transport network in Bexley77
Map 5 : Locations of short-listed sites considered in the site selection for Cory's and
Powergen's proposals (Source: Powergen 1995)83
Map 6:Bexley's landuse policies in Belvedere (Source: Unitary Development Plan of
Bexley LB 1995)86
Map 7: Current and proposed main roads in Bexley96
Map 8: Locations of proposed developments of major pollution sources in East
London in 1990s108
Map 9: Site map of Cory's proposal (Source: Cory 1991a)114

Diagram 5: An artistic impression of Cory's second design (Powergen's proposal)

Map 6:Bexley's landuse policies in Belvedere (Source: Unitary Deve	elopment Plan of
Bexley LB 1995)	86
Map 7: Current and proposed main roads in Bexley	96
Map 8: Locations of proposed developments of major pollution	sources in East
London in 1990s	108
Map 9: Site map of Cory's proposal (Source: Cory 1991a)	114
Map 10: Site boundaries for the EfW incineration proposals in Belved	ere116
Map 11: Site map of AEP's proposal (Source: AEP 1995)	117

Map 12: Site map showing access for AEP's proposal (Source: AEP 1995).....118

## Lists of appendices

Appendix 1: Gaining Public Acceptance: Introduction (Source: European EfW
Coalition 1996)137
Appendix 2: Gaining Public Acceptance: Hampshire County Council: UK (Source:
European EfW Coalition 1996)140
Appendix 3: Gaining Public Acceptance: SELCHP, UK (Source: European EfW
Coalition 1996)141
Appendix 4: Gaining Public Acceptance: Brescia, Italy (Source: European EfW
Coalition 1996)142
Appendix 5: Gaining Public Acceptance: Hogdalvenverket, Sweden (Source:
European EfW Coalition 1996)143
Appendix 6: Gaining Public Acceptance: Hamm, Germany (Source: European EfW
Coalition 1996)144

## Chapter 1: Introduction

## Background

Many researchers have noted that many planning proposals for waste incineration with energy recovery or Energy-from-Waste (EfW incineration) proposals have been rejected, delayed or stopped due to local opposition. This points to the need to probe into what constitutes the bottleneck of EfW incineration developments. It appears to the author that there are two approaches: quantitative and qualitative. As regard to this background, the quantitative analysis on the number of proposals, which fail to get permission as a result of public opposition, will not contribute to the solution of this problem. Rather, the qualitative analysis on "why" and "how" do local people oppose to EfW incineration may reveal the gap between the public's perception and the priorities of the policy makers and the inadequacy of the current procedure of planning EfW incineration to bridge the gap.

### Aim and objectives:

The aim of this thesis is to develop a better understanding of the reasons behind local opposition to EfW incineration development.

The objectives are to:

- review the theories on the locational conflicts to establish the pattern of interactions between stakeholders in EfW developments leading to public opposition,
- review policy literature to identify the factors causing the re-emergence of EfW developments in the UK
- investigate how far the case study fits in the pattern established by the literature

review.

• Recommend any implications on the current policies in the light of the findings from the case study.

## Research method

Justification for the use of case study

In general, case study is the preferred strategy when "how" and "why" questions are being posed to investigate a contemporary set of events of which the investigator has little or no control. (Yin 1989 p13, 20) Case study helps to illuminate a decision or set of decisions: why they are taken, how they are implemented, and with what result. It has a unique strength to deal with different sources of evidences: documents, interviews and observations. It starts with a literature review to gain an overview on what is known on a topic to provide a framework for the understanding of the chosen case. The previously developed theory is used as a template with which to compare the empirical results of the case study. The theory has specified a clear set of propositions as well as the circumstances within which the propositions are believed to be true. The theory could then be used to interpret the case study.

#### Choice of case study

One of the criteria to choose a case is that the case represents an extreme or unique case. (Yin 1989 p47) The case chosen has some characteristics that make it suitable to exemplify the main drive of EfW incineration in the early 1990s. The case is the proposal made by Cory Environmental Limited to build a 1.5 million tonnes per annum EfW incineration plant in Bexley in 1991. It is chosen for the following reasons.

The proposal has a pivotal role in the EfW incineration developments in London. In 1990, the incineration capacity here has a throughput of 550,000 tpa, Edmonton Solid Waste Incineration Plant in Enfield, (ESWIP). In the early 1990s, there have been three EfW incineration proposals in London including:

- redevelopment of ESWIP to double the waste intake to 1.1 million tpa
- South East London Combined Heat and Power Plant (SELCHP) in Deptford with a waste intake of 450,000 tpa and
- Cory's proposal in Belvedere with a waste intake of 1.5 million tpa.

This would add up to a throughput of about 3 million tpa. Following this trend, the waste management plan for London produced by London Waste Regulation Authority (1995) proposed a waste management to achieve a split of 30% and 70% between EfW incineration and landfill by 2015. After the Cory proposal being rejected following strong local opposition, London Planning Advisory Committee (LPAC) and London Waste Regulation Authority (LWRA) together put another waste management proposal to achieve, by 2015, a split of, 70% recylcing and 30% disposal including EfW incineration and landfill. Part of the proposal is to impose a moratorium on EfW incineration proposals until 2002 or the time the new London-wide authority considered to be appropriate. If this is endorsed by the government, it may cause delay or halt to the redevelopment of ESWIP. The plot to reject the approved redevelopment of ESWIP follows the rejection of the Cory's proposal. The process in the opposing the Cory's proposal has led to the rethinking, of the waste management policy in London.

#### Data collection

The data collection methods are comprised of a mixture of documentary analysis and interviews.

There is a wide range of relevant documentary material, which includes:

- policy documents and analysis on waste management, energy and pollution control;
- literature on theories of locational conflicts;
- application documents, council minutes, the Inspector's report and the Waste Assessor's report; and
- local newspaper clippings.

The author has been very conscious not to be seen to side too heavily with any interest group. Being an oversea's student has the benefit of having a more neutral view of many things. This has been exploited in the semi-structured interviews that have been carried out with various actors:

- The developer
- Local government officers
- A campaign leader
- A local councillor
- A local newspaper reporter

## Structure of the thesis

Chapter 2 will investigate how the factors constituting to the historical landscape of waste management in the UK, the policy framework and the regulatory system for waste facilities development. It will point out the inconsistencies in the policy framework and the area if overlapping in the regulatory system.

Chapter 3 will review various theories on local opposition. The proponents of EfW incineration mainly perceive local people to be selfish and irrational in their opposition. However, some researchers have argued that local people are rational and act in the interest of public good in their objection. This chapter will outline a typical conflicting process in EfW incineration development. It will explore the new approaches to resolve conflicts.

Chapter 4 will first introduce the EfW incineration developments in London. Then, it would investigate the pattern of interactions leading to the failure of siting Cory's plant. Chapter 5 will conclude the factors leading to the local opposition to EfW incineration. It will investigate the significance of the approach used by the local authority to address pollution issues in the planning system.

## Chapter 2: Waste management framework in the UK

## Introduction

This chapter will describe the framework of waste management. Firstly, the historic landscape of waste management in the UK will be traced. Secondly, the policy framework on waste management emerged in the 1990s will be set out. Thirdly, the regulatory framework for waste management facilities will be outlined. Finally, the chapter will conclude the main difficulties faced by the regulators, the developers and the public in the new regime.

## The historic landscape of waste management

Table 1: Number of licensed waste disposal and recovery facilities in the UK - 1991 (Petts and Eduljee 1994 p11)

		Number
Landfills		4196
Civic amenity		559
Incineration		212
Waste	recovery	366
facilities		

In the early 1990s in the UK, the predominant disposal route for controlled wastes was landfill (85%), followed by incineration (4%) and sea dumping (4%). (Petts 1994) The recycling rate in the country was around 8% in 1995. (LPAC 1997) The landscape of waste management significantly differs from other developed countries. In the early 1990s, the percentage of municipal waste which was being incinerated in Japan was 72%, in Denmark was 65%, in Sweden was 55%, and in France was 42%. (RCEP 1993) In 1995, the rate of recycling was 6% in London, 50% in Nurnburg (Germany) is 50%, 32% in New York State and 28% in Toronto. (LPAC

## 1997 p7)

In the UK, geology and hydrogeology have provided for the exploitation of landfill to a greater extent than in countries such as Netherlands. The reliance upon the private sector to provide disposal and treatment capacity has inevitably encouraged the development of relatively low-capital-cost facilities.

In fact, the UK pioneered the systematic incineration of household waste. The first waste incinerator in the UK was built in 1878 in Nottingham. (Gandy 1994 p8) Initially, it was merely a means of sanitary disposal in urban areas but subsequently it also became a means of electricity production. By 1912 some 76 plants in the UK generated power from waste. (Santen 1993) However, the role of energy recovery from waste in the UK has been diminished by the withdrawal of local authorities from electricity supply. Local authorities were still made responsible for disposal of waste but no longer able to make a profit out of the electricity generated. Therefore, in 1991, only 4 out of the 30 plants in the UK for incinerating municipal waste recovered energy. In the UK, the use of incineration began to decline sharply from 1920s and 1930s onwards because of competition from cheaper waste disposal by landfill. (Gandy 1994) Mineral voids are very frequent in the British landscape, and landfill is a good way to refill them and to dispose of waste.

Since the1970s, there have seen increasing international concern over the environmental impact of waste disposal. In the UK in 1972, drums of cyanide waste indiscriminately were found to be dumped on open land near Coventry in the Midlands. The resulting national outrage was precipitated to the demand for tighter controls on waste disposal and caused the enactment of the Deposit of Poisonous Waste Act 1972 and later the Control of Pollution Act 1974, which both have been subsequently

replaced by the EPA 1990. In 1976, Seveso, Italy, experienced an environmental disaster of dioxin leakage. An uncontrolled exothermic reaction in a reactor at the Hoffman-La Roche Givaudan chemical plant caused an explosion. The ensuing release of some 10-22 pounds of toxic tetrachlorodibenso-p-dioxin contaminated soil and vegetation over 4450 acres of land, and killed over 100,000 grazing animals. Although there were no immediate injuries or loss of human lives, over 1000 residents were forced to flee, and many children subsequently developed a disfiguring rash called chloracne. In 1983, drums of dioxin-contaminated waste associated with Seveso incident disappeared on the way from Italy to undisclosed disposal site. Since then, the term "dioxin" has become frightening. Everywhere people have been then scared of anything associated with dioxin.

In addition to the economic disadvantages of incineration, the waste incinerator is one of the significant source of urban air pollution, including dioxins. Therefore, from the late 1970s to 1991, there were only few small waste incinerators built in the UK.

Other countries have faced serious problem of landfill shortages for a long time. Now in the UK, finding a suitable new landfill sites has also become more and more difficult For example, The London and South East Regional Advisory Committee (SERPLAN) has carried Waste Monitoring Survey in 1989 and 1991. It has identified a sharp fall of 18% of void space, which are potentially suitable for landfill purpose, in the South Eastern Counties and London during these two surveys. (LWRA 1995) ) The waste management industry is finding EfW incineration as the new disposal route. However, the new framework for waste management have emerged after last few decades of environmental discussion. It is no longer to perceive the EfW incineration as the only solution to the shortage of landfill sites.

## The policy framework

## The waste management hierarchy

The Treaty of Rome seeks to preserve, protect and where possible improve, the quality of the environment. In 1990, the European Union sets out the waste management hierarchy based on:

- i. minimising waste at source
- ii. recycling and reuse
- iii. landfilling as a last resort.

This resolution is carried forward into the Framework Directive on Waste (75/442/EEC as amended by 91/156/EEC and 91/962/EEC). The Framework provides the basis for the sustainable waste management. In 1992, the EC Fifth Environment Action Program identified action plans to implement the waste management hierarchy. The Program has set the following targets for municipal waste to be achieved by the year 2000:

- Stabilisation of quantities of waste generated at EC average 300 kg per capita
  (1985 level) on a country by country basis; not exceeding 300 kg per capita.
- ii. Recycling/re-use of paper, glass and plastics of at least 50% (EC average).
- iii. Community-wide infrastructure for safe collection, separation and disposal.
- iv. Market for recycled materials.
- v. Considerable reduction of dioxin emissions (90% reduction on 1985 levels by 2005)

## **Proximity Principle**

The proximity principle was originally agreed by the EC Member States in 1989 to limit the transport of hazardous waste and to ensure that all the larger States had their own facilities for its treatment.

The EC Fifth Environment Action Plan extends the application of the principle over the municipal waste and sets the target to stop export of municipal waste outside EC for In the UK in 1990 in "This common inheritance", the government final disposal. applies the principle to the region that "so far as practicable there should be adequate facilities within each region for dealing all waste which arises there." Nevertheless, the government went on to state that the Government recognises the need for flexibility. The government does not comment on the definition of region whether it is the boundary of a county or a grouping of counties in the regional planning. But, in general, the waste regulation authority made a view to conform to the principle by achieving self sufficiency within their area. The Waste Management Plan for Greater London prepared by the LWRA (1995 p63) indicates the need for London to become more self-sufficient in disposing of its waste in the long term. Kent County Council (1998a p9) (KCC) targets for disposing not less than 80% of household waste within the County by the year 2005. The proximity principle is to dispose of or manage waste close to the point at which it is generated. This principle is derived from the polluter pay principle. The area should be made to pay for the environmental cost for the pollution caused by their consumption and production. The transfer of waste may also cause environmental pollution in the course of transportation which should be discouraged. Nevertheless, this principle should not be overemphasised and should be placed in the context of technical and financial feasibility. Since the early 1990s, the

application of the proximity principle has made substantial progress. Firstly, the selfsufficiency is to be achieved on hazardous waste disposal within EC. Secondly, it extends the same requirement on the municipal waste disposal within EC. Thirdly, the UK government advocates the regional self-sufficiency. Fourthly, the county councils begin to response to the target for self-sufficiency within their area. The next step might be on the discussion of any implication of the proximity principle on the spatial distribution of waste facilities within a county. For a given amount of waste, the spatial distribution of the waste facilities is related to the size of waste disposal facilities. The simple rule is that the larger the size of the waste facilities and the smaller number would be waste facilities. This will give the benefit of economies of scale but at the cost spatial concentration waste facilities, which implies a specific area to pay environmental cost for further afield. On the EfW incineration, the subject of the Royal Commission on Environmental Pollution (RCEP) (1993) this thesis, commissioned Aspinwall & Company to study the effect of economies of scale of energy from waste incinerator. The study has advised that for incinerators disposing of municipal waste, the minimum optimal scale in technical terms should be regarded as 200,000 tonnes per year. The LWRA (1993 p79) conducted a study on the scale of EfW incinerator and the transportation. It arrived at the conclusion that a series of incinerators with 400,000 - 500,000 tpa would allow for Refuse Carrying Vehicles (RCVs) to deposit their loads directly at the facilities within a reasonable journey time. Direct delivery of waste from RCVs is preferable to avoid double-handling by eliminating the need for transfer stations. However, there is no government guidance on the acceptable scale of the EfW incineration proposal. The government allows the

market to determine.

## Landfill tax

The UK government introduced landfill tax in 1996. (Lean 1996) A levy of 7 pounds per tonne is charged on waste going to landfill. The levy will be reduced to 2 pounds per tonne for "inert" material such as soils and bricks. A total of 450,000 pounds a year is generated by this landfill tax. The same amount of money is used wholly to reduce employers' National Insurance contributions. This is to apply the ecological tax reform. The government is minded not to increase the burden on the society as a whole with the introduction of pollution tax. This implies the income from the pollution tax will alleviates the burden on the tax on employment. Therefore, the government did not accept the recommendations to use the fund generated from landfill tax to subsidise the waste management options higher in the hierarchy. The landfill tax will rise to 10 pounds per tonne from April 1999 and is expected to increase significantly over the next few years. The tax has already effectively reduced the price difference between landfill and waste processing. The further increase in landfill tax will accentuate the benefits of waste processing, and reinforce the need to landfill the minimum amount of unusable residue.

## **Renewable energy**

The Electricity Act 1998, which of course not intended to deal with waste matters, effects the fundamental changes in the economics of energy-from-waste (EfW) development through the subsidy on renewable energy. This has effectively re-defined the nature of waste to be one of the renewable resources for power generation. This

new role has not emerged not as a result of the debate on waste management but is indirectly linked to the nuclear energy policy. In 1988, the government announced the the subsidisation on nuclear energy through Non-Fossil Fuel introduction of Obligation. Its original intention was to help nuclear industry survive during the privatisation of the electricity supply industry. However, the environmentalist and the windpower industry pointed out that the nuclear energy is not the only non-fossil fuel. The government accepted the argument and therefore, there are two parts of NFFO: nuclear part and renewable part. Several years before that, the government had refused research and development support for renewable energy. By accident, the government has now committed to support the renewable energy. More surprisingly, EfW incineration came out to take the major share in the renewable part of NFFO. Among other renewables such as (landfill & sewage gas), wind power, hydro power, (energy crops, agriculture and forestry waste), the EfW incineration awarded about half of the total electricity in the first three orders of NFFO.

NFFO is a legal obligation on the Regional Electricity Companies to buy in certain amount of non-fossil fuel derived electricity. The basis of this obligation is that the costs of electricity generated from nuclear and renewable sources are higher than that generated from fossil fuel. The difference in costs is then reimbursed through a surcharge on Regional Electricity Companies. This surcharge is transferred to the consumers' bill. Currently, this surcharge is about 10-11% of consumer's bill and amounts to 1.3 billion pounds each year. (Natta 1995) Of this around 1.2 billion pounds goes to support nuclear power and the rest is available for renewables. The nuclear energy part of NFFO is to be cut down to meet the date of privatisation of nuclear plant and the deadline which EU's mandate to phase out subsidising nuclear power. (Loram 1995a) The renewable part was originally planned to have the same deadline as the nuclear power. However, after criticisms on the arbitrary nature of the deadline, the Government has amended the terms for new NFFO contracts for renewable to extend beyond 1998. Therefore, the cut off date for NFFO 1 and NFFO 2 was 1998. Then, from NFFO 3 onwards, the cut off date is beyond 1998 and the contract period is set to be 15 years to make it more close to the life time of the bidding project. In March 1993, the Government announced its intention to work towards a figure of 1500 MW of renewable energy generating capacity (3% of the UK total output) by the year 2000.

The NFFO supported renewable projects to find their own development cost but they got to pay a premium 'price' during the contracted period. The concept is to help the developers to recoup the capital during the period of NFFO contract and to be able to survive on normal price afterwards. This is the way to help the renewables entering the market. (Natter 1995)

The subsidy on energy from waste operation granted by NFFO 1 and NFFO 2 was about 20 pounds per tonne. (Leon and Soler 1993) The subsidy may decrease to 10 pounds per tonnes from NFFO 3 onwards. The subsidy of NFFO is giving the energy from waste industry a huge boost. Therefore in South East London, SELCHP at Deptford, Cory at Belvedere and National Power at Northfleet had proposed building energy from waste plants and successful bid for NFFO. (Loram 1995a p14) These three projects would compete for the same source of waste. However, so far only SELCHP has been built.

For the first three NFFO orders, the EfW technology band is open for all waste fired plant. However, there have been strong pressure to demand for the support of combined heat and power. Therefore, in NFFO-4 the EfW band specifies the technology to be waste fired combined heat and power (CHP). Nevertheless, the employment of the combined heat and power technology does not necessarily lead to the exploitation of the heat generated in the process. The EfW incineration plays a very important role in district heating in other European Countries. For example, in Gothenburg, Sweden's second largest city, 80% of all buildings are connected to the community heating network. (Loram 1996 p15) Most of the heat for the year-round base load is supplied by the 300,000 tpa mass-burn EfW plant. 70% of total heat demand in the city is met by EfW and heat recovery. The remaining 30% is accounted for by detached houses rounds the skirts, supplied by natural gas or electricity. The UK is poised to exploit the benefit of CHP. In 1993, the government sets to achieve 5000 MW of CHP by the year 2000. (Brown 1994 p174) The City of London has commissioned a CHP scheme to provide chilled water for air conditioning as well as hot water and electricity. The project is being developed by Citigen, a joint venture company established by British Gas and Utilicom to develop city centre CHP schemes. Selling heat is not a traditional activity in the UK, but it is actually the end result many of us want from our energy resources. From NFFO-4 onward, the government has made sure the new EfW mass burn plant will have the CHP technology in place. However, the question remained is to site the plant in proximity to the heat load and to develop network to export the heat. Experiences abroad have shown the environmental benefit to tap the heat from mass-burn EfW plant to serve community wide heating. There is therefore scope for fully exploiting the environmental benefits given by the EfW incineration.

In NFFP-4, one innovated EfW incineration technology is included - Fluidised bed combustion. This new technology can emit less nitrogen oxides. It can be switched off at night-time, and even over the weekend. However, for a given waste input, this would allow to build a larger plant and operate it for 17 hours a day, five days a week rather than a smaller plant, operated 24 hours a day, seven days a week. It can have the benefit to have economies of scale and to reduce the disturbances to the neighbourhood. It is the best available technology in the market.

NFFO is the single most important factor in determining the economics and technology of EfW incineration. Later, it can be seen how the NFFO dominates the decision making in the planning for EfW incineration plant.

## **Operational plans**

#### National waste strategy

EC Fifth Environment Action Plan requires the UK government to develop national waste management plan to put the waste management hierarchy in the national context. In specific waste facility development, the government sets the Best Practical Environmental Options (BPEO) as the procedure to test the acceptability of the proposal under the guide of the waste management hierarchy. In 1995, the government published "Making waste work", a white paper which is a non-statutory strategy. It explains the roles and responsibilities of the parties involved, sets targets for dealing with waste and indicates an implementation time scale. This is the first time the government has set out a framework for all those involved in the management of wastes. It has also discussed the BPEO for particular waste streams. It, however, does not comment on how the BPEO to be applied on the treatment of municipal

waste. However, it does set the national recycling target of 25% of household waste by the year 2000. RCEP (1993) urges the government to draw a national waste strategy based on the waste management hierarchy to provide a framework for the development of waste facilities for various waste management options. The Environment Act 1995 places a duty on the Secretary of State (SOS) to prepare a National Waste Strategy. In 1998, the government published another consultation paper on the waste strategy for England and Wales entitled "Less waste, more value". (Department of Transport, Environment and Region 1998) The government makes a view that:

- energy recovery should not be undertaken without first considering composting and recycling.
- but a move to a higher level of energy recovery will be necessary.
- there should be a substantial increase in recycling and recovery, particularly of household waste
- transport of waste should be reduced and a network of more local reprocessing facilities should be considered
- reliance on landfill should be reduced

The government has set out its vision for the future strategy. Seven key commitments, in no particular order, and are proposed. There are as follows:

- strong emphasis on waste minimisation
- use the hierarchy as a guide
- long term framework with targets
- increased public involvement

- increased use of economic instruments
- substantial increase in recycling and energy recovery
- engage public in increased reuse and recycling

The SOS aims to prepare a final strategy before the end of 1999. This will produce a framework for the decision making of the balance between various waste management options within the hierarchy. Therefore, it could be said that the statutory national waste strategy with clear indication of various targets for different waste management options will provide the basis for BPEO procedure. Nevertheless, the setting of target is more debatable than straightforward. In 1995, the London Waste Management Plan prepared by LWRA sets the target to achieve a split between EfW incineration and landfill of 30% and 70% by 2015. Two years later, the LWRA and the London Planning Advisory Committee (LPAC) proposes another waste management plan to achieve a split between combined reduction, re-use, recycling and disposal (landfill and EfW incineration) of 70% and 30% by also 2015. The two proposals would entail substantial different sets of infrastructures. This has already attracted innovative proposals and hot debate among the key players and the public. In the 1990s, it has seen a different regime for waste management in the light of waste management hierarchy. The UK is poised to create new waste management standards to fit in the new system.

### Waste Regulation Authority : Waste Disposal Plan (Statutory)

The section 50 of the EPA 1990 placed a new duty on Waste Regulation Authorities to prepare a Waste Disposal Plan. The Waste Disposal Plan investigated waste arisings and sets out the arrangements needed to treat or dispose of controlled waste so as to prevent or minimise pollution of the environment or harm to human health. The Waste Disposal Plan should be kept under review and must also have regard both to the likely costs of the arrangements and to their likely beneficial effects on the This new requirement made little changes to most of the English environment. Counties, but had a considerable effect on the then existing arrangements within Greater London. For non-metropolitan counties, the county council was both the waste disposal authority and waste regulation authority. However, in London, following the abolition of the Greater London Council in 1986, the waste regulation authority was passed to a new organisation, the London Waste Regulation Authority (LWRA), and the responsibility for waste disposal operations was passed to the London borough councils. The new adopted Waste Disposal Plans would supersede the plans produced by the Waste Disposal Authorities (WDAs) under the Control of Pollution Act 1974. Since April 1996, all the Waste Regulation Authorities have been absorbed in new Environment Agency (EA) since April 1996. The section 50 of the EPA. 1990 was then repealed. The Environment Act 1995 placed a duty on SOS to produce a statutory national waste strategy. The Act also indicated the EA would be instructed to carry survey to facilitate the making of the strategy. The EA has been carrying national waste survey to assist the making of the national strategy scheduled to be launched in 1999.

#### Waste Disposal Authority: Waste Management Strategy (non-statutory)

The EPA 1990 requires Waste Disposal Authorities to terminate any direct involvement in waste disposal operations, the options either to vest their existing disposal operations in a local authority waste disposal company (LAWDC), or to divest themselves completely of these operations by contracting out the waste disposal service. In order to make an informed decision the Waste Disposal Authority is advised to develop a non-statutory Waste Management Strategy which lays out clearly the basis of the waste service needed and the way in which this is to be secured. The Waste Management Strategy is to be built on the Waste Disposal Plan. The Waste Management Strategy seeks to add a further level of detail and looks at the interrelationship between the various options in the waste hierarchy to achieve an optimum solution.

## Waste Collection Authority (WCA): Waste recycling Plan (Statutory)

WCAs are the district councils in non-metropolitan counties and the unitary authorities themselves. The EPA 1990 requires Waste Collection Authority (WCA) to draw up plans for the recycling of household and commercial waste arising in their area. (Bates 1997 p112) The WCA should make an investigation into ways in which household and commercial waste can be sorted and packaged for recycling. It has to include in the plan as to the kinds and quantities of all controlled waste that it expects to collect. It needs to determine what are the facilities of recycling it need. It needs to inform the waste disposal authority (WDA) of the amount of waste reduction that would be resulted from the waste recycling plan. The WDA could object to that scheme if they have already entered into a contract with a waste disposal contractor including all or part of the amount of waste planned to be recycled.

The EPA 1990 also establishes a recycling credits system, which is the key element in the Government's market-based strategy to raise the level of recycling. The WDA must give a recycling credit to the WCA or any one who collects waste for recycling purposes. The credit, in respect of the retained waste, should represent the net saving that the WDA consider they would make from not having to dispose of waste. The recycling credit system appears to have had no impact on the recycling rate in London.

## (Gandy 1994 p60)

### Waste Planning Authority: Waste Local Plan (Statutory)

The Planning and Compensation Act 1991 introduced a requirement for local plan coverage of development involving the deposal of waste. The Waste Local Plan addresses the land use implications of both the Waste Disposal Plan and Waste Recycling Plans. It considers the need for sites and facilities in its area and proposes suitable locations and the planning criteria to apply to planning applications. The Waste Local Plan goes through the procedure for the adoption of a Development Plan. This is the only waste plan on which the public is to be consulted. The following table shows the adoption progress of Kent Waste Local Plan prepared by Kent County Council.

Date	The planning authority	The main stages
1992	Authorise plan preparation	Survey & initial drafting
Sept, 1993	Consider and approve for consultation	
Oct-Dec, 1993		Pre-deposit consultation and publicity
	Consider representations and determine content of draft plan	
Oct 1994		Deposited plan
		6-week period for objections (more than 3000 objections received)
	Consider objections	
June-Oct 1995		Public local inquiry for Inspector to hear outstanding objections
	Consider Inspector Report and his recommendations. Propose modifications.	
Oct 1996		Publish proposed modifications
		6-week period for objections (more than 3000 objections received)
	Consider objections to proposed modifications.	
April/May 1997		Publishedfurthermodificationswithadditional6weekforobjections.(More3000 objectionsreceived.)
Nov 1997	Notice of intention to adopt.	
March 1998	The plan was subject to a "hold" direction by SOS under the Regulation 23 of the Town and Country Planning (Development Plan) Regulations 1991. The plan was released without any change. Adopt	
11111011 1770	παυρι	

Table 2: Kent Waste Local Plan Progress (Source: Kent County Council)

On the other hand, Kent WDA has adopted the Waste Management Strategy in September 1998. Kent WDA intends to remain remote from the actual development process by making itself running independent of the council's waste planning process. This means that Kent WDA will let out waste contracts according to the Waste Management Strategy. The developer will have to find the suitable locations from the planning policies outlined in the Waste Local Plan. Currently, many of the proposals in the long term waste disposal contracts do not have planning permission and this will have to be sought over the next few years. All the longer term contracts are subject to a break clause, which enables the WDA to re-tender should the necessary development not secure planning permission. (KCC 1998b p31)

There are two problems associated with the waste management plan making.

- 1. Currently, the UK is still waiting for a statutory national waste strategy to indicate clearly the target for various waste management options.
- 2. There is a lack of the co-ordination in various waste plans. The public do not understand how the various plans work. The Waste Local Plan only considers the landuse application of need for waste disposal and recycling. There is no provision for the public to make a view to comment on the need for various facilities. The public opposes to certain locations to site waste facilities without being convinced for the need for such waste facilities. This constitutes the planning gridlock in the making of the Waste Local Plan and later the site specific development.

## The regulatory framework

## **Planning control**

In the UK, there has been a system of licensing of disposal and treatment facilities, which require a planning permission as a prerequisite. The Town and Country Planning Act 1990 and the Planning and Compensation Act 1991, provide for strategic and forward land-use planning and the control of new development through a system of planning permission. There is a presumption in favour of development under the 1990 Act, unless the planning authority considers the relevant 'material considerations' should override this presumption. Developer therefore have leave of appeal to the SOS for Department of Transport, Environment and Region against refusal of planning permission or unacceptable planning conditions and the SOS to hear this appeal by means of a local planning inquiry.

Furthermore, the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988 introduces new requirement to carry out Environmental Assessment , before development consent is granted, for certain types of major project which are judged to have potential significant environmental effects. The policy roots of Environmental Assessment in the EC can be found in first three European Community environmental action programs developed after the 1972 United Nations Stockholm Conference. Specifically the principle underpinning this policy was prevention of pollution at source, leading to pressure to consider the environmental implications of projects before their development. In 1985 the Council of the European Community approved an EA Directive (85/337/EEC). Member States were required to enact requisite legislation to implement the provisions of the Directive within their own legislative and institutional frameworks by July 1988. From then on, the developer is required to submit an Environmental Statement (ES), as part of the planning application, where an Environmental Assessment is required.

The need for an ES

The Town and Country Planning (Assessment of Environmental Effects) Regulations 1988 apply to two separate lists of projects:

- a. 'Schedule 1 projects', for which Environmental Assessment is required in every case;
- b. 'Schedule 2 projects', for which Environmental Assessment is required only if the particular project in question is judged likely to give rise to significant environmental effects.

The developments of landfill, EfW incineration and processing of household waste are placed under Schedule 2. In the draft EC Incineration Directive, there has been suggestion to include EfW incineration in the Schedule 1. In the UK, the developer is responsible for preparing the environmental statement he must submit with his planning application. For reference, in California, USA, the consultants are hired by the planning authority. Developer has to pay full cost of both consultants' cost. What follows will outline the procedure for the Environmental Assessment process in the UK.

#### Scoping

The purpose of scoping is to provide focus for the Environmental Assessment by identifying the key issues of concern and ensuring that they are subject to assessment at a level of detail appropriate to the scale of the project in question. In the UK, scoping is generally done in-house by the developer.

#### **Consultation**

The Regulations give a particular role in Environmental Assessment to those public bodies with statutory environmental responsibilities who must be consulted by the planning authority before a Schedule 1 or a Schedule 2 planning application is determined. Where the planning authority (or SOS) rule that Environmental Assessment is required, those bodies which are statutory consultees for the particular project in question will be notified and the developer will be informed accordingly. The effect of this notification is put those bodies under an obligation to provide the developer with any information in their possession, which is likely to be relevant to the preparation of the ES. It is up to developer to decide on consultation with these statutory bodies. Developer is encouraged to consult non-statutory bodies concerned with environmental issues, the general public, during the preparation of the ES. (DOE 1989 p11)

## **Publication**

ES does not have to be published until planning application is submitted. ES is sent to statutory consultees by the planning authority. A non-technical summary of ES is required to make its content readily understandable by the lay reader. ES has to be made available for sale to the public.

### Determination of adequacy

Local planning authority may commission consultants to comment on ES but cost has to be borne by authority. Otherwise ES is considered by planners in light of comments from statutory consultees. ES does not have to be formally deemed adequate but authority has powers to request further information.
## Control of the development

Planning authority may incorporate some mitigation measures in conditional planning permission or as part of legal agreement.

## Evaluation of the use of Environmental Assessment in the UK

Essex County Council has identified the following reasons as the constrains to the exploitation of the full potential of the Environmental Assessment (Petts 1995 p22):

## Resources and manpower implications on local authorities:

A study carried by the Institute of Environmental Assessment revealed that more than one in four local planning authorities had no experience in dealing with Environmental Assessment in 1995. The lower tier government is lack of experience and resource to deal with Environmental Assessment.

#### General perceptions of the Environmental Assessment:

As the ES is carried out either by the developer or his appointed consultant, there has been a general perception that Environmental Assessment may be steered in favour of the proposal. Concern raised about bias may manifest itself in a lack of emphasis placed on residual impacts of projects, that is those that cannot be fully mitigated.

#### Inadequate early consultation:

Inadequate and late consultation with the interested parties was claimed to be major reason leading to poor scoping of the assessment.

## Building consent to power plant

#### Procedure

Under section 36 of the Electricity Act 1989, the development of a power generating plant over 50 MW has to apply for a build consent from the Department of Trade and

industry (DTI). After the consent is granted by DTI, planning permission is deemed to be granted under section 90(2) of the Town and Country Planning Act, 1990. In this application procedure, the relevant planning authority is a consultee. If the planning authority objects to the application, a public inquiry has to be held unless the objection is withdrawn, or the SOS for DTI grants consent, subject to modifications or conditions that meet the objections of the local planning authority.

#### The need for an ES

Under the Electricity and Pipe-line Works (Assessment of Environmental Effects) Regulations 1989 an ES must be submitted to the SOS for DTI in connection with applications which are made to him for:

- i. the construction or extension of a nuclear power station;
- ii. the construction or extension of a non-nuclear generating station with a heat output of 300 MW or more;
- iii. the construction or extension of a non-nuclear generating station with a heat output of less than 300 MW where the SOS is of the view that the development would be likely to have significant effects upon the environment; and
- iv. the placement of land of an overhead line or the construction or diversion of a pipe-line of 10 miles or more in length, where the SOS takes the view that the project concerned would be likely to have significant effects.

## Demand for further information on ES

The Regulation 10 of the Electricity and Pipe-line Works (Assessment of Environmental Effects) Regulations 1990 provides for the SOS to direct applicant to produce any further information which he feels is necessary to proceed with the proper determination of the application. If the SOS is intended to issue the Regulation 10

direction on the applicant to provide further information, he will take into account the views expressed by those persons who have objected to the applicant, particularly, if any, the relevant planning authority.

## **Pollution control**

Process, emissions and discharges: Integrated Pollution Control (IPC) authorisation The EPA 1990, Part I introduced the new pollution control system, which has two parts: Part A and Part B.

## Part A process

Part A are the prescribed processes embracing some 5000 potentially most polluting industrial activities to be subjected to the IPC authorisation and regulated by Her Majesty Inspectorate of Pollution (HMIP) (since 1996 absorbed into the Environmental Assessment). The main thrust of the IPC is to mandate the industry to apply for prior authorisation to operate. Part A prescribed processes include "the incineration of any substance if the incinerator capacity is greater than 1 tonne an hour or more".

The IPC authorisation will consider the process and disposal in the end process. The applicant has to demonstrate to have used Best Available Techniques Not Entailing Excessive Cost (BATNEEC) to minimise emissions to the relevant environmental media (air, water, land), and in the selection of processes and plant. The applicant also has to apply Best Practical Environmental Option (BPEO) to dispose of the waste from the end process, in case of EfW incineration, they include the fly ash and bottom ash. One thing have to mention here is the regulator will only decide on the BPEO for the final disposal from the process. In case of EfW incineration, however, the input is

also a waste itself. The regulator will not comment on whether the EfW incineration is the BPEO for the incoming waste.

The IPC authorisation will prescribe the legal emission levels of various pollutants from the plant. The standards will be reviewed every four years taking into account the new pollution abatement technology.

### Impact of IPC on old waste incinerators

In the early 1990s, there were 30 municipal waste incineration plants. (Leon and Soler 1993) Under the Environmental Protection Act 1990, all the incinerators are required to be re-registered and subjected to the IPC control. All the incinerators are required to meet the new standards by December 1<sup>st</sup>, 1996 the latest. Most of the old waste incinerators could not meet the new standards.

The most significant pollutants from old incinerators were hydrogen chloride, sulphur dioxide, oxides of nitrogen, mercury, cadmium, lead, dioxins and particulate matter. The reasons for poor performance of the old incinerators were old technology, poor initial specification of combustion and pollution control equipment and lack of operational control procedures. To meet the new requirement, the old waste incinerators had to install particulate abatement system and the gas control system and also to control the incineration temperature to reduce dioxins production. The old design has an incineration temperature of about 800°C which helps the formation of dioxin. The new requirement is to maintain at 850°C for more than 2 seconds in order to minimise the productions of dioxins.

## Part B process

Part B processes are regulated by local authorities for the control of air pollution only. Incineration plants with a capacity less than 1 tonne per hour falls in this category.

#### Waste disposal and treatment: Waste Management Licensing

The Part II of the EPA 1990 and the Waste Management Licensing Regulations (1994) sets out the licensing system for the management of controlled waste. Facilities and mobile plant which dispose of, keep or treat controlled waste (other than prescribed processes covered by the Part I) require a waste management licence from the WRA (since 1996 absorbed into Environmental Assessment). The planning permission is a prerequisite for the licence.

## Pollution regulator

The Environment Agency established in 1996 has taking over responsibility from the HMIP, WRAs, National Rivers Authority and some responsibilities from DOE (Department of Transport, Environment and Region since 1997). It is now responsible for IPC authorisation and waste management licensing. The table below summarises various scenario on the permits necessary to build and operate an EfW incineration plant.

Scale / tpa	Pollution control		Planning	Build consent
-			permission	from DTI
			from Waste	
			Planning	
			Authority	
			(County	
			Council or	
			Unitary	
			authority)	
	Prior IPC	Air pollution		
	authorisation	control		
	from EA	regulated by		
		local authority		
< 8,760		~	~	
(=1X24X365)				
8,761 -	~		~	
700,000*				
> 700,000	<ul> <li>✓</li> </ul>			<ul> <li>✓</li> </ul>

Table 3: Permits required for different scales of EfW incineration plant

\* National power proposed to build an EfW in Northfleet having a throughput of 700,000 tpa capable of producing 49 MW.

## Conclusion

New market environment for waste management

The landscape of waste management in the UK has been set for great changes. The UK's traditional reliance on landfill as the main route of waste disposal is forced to change by the running out of void space coupled with the landfill tax introduced in 1996 and the incoming EU and national regulatory standards. The waste management service is now fully privatised after the removal of operation involvement from the waste disposal authority following the privatisation of waste collection service some time ago. Today, market processes play increasingly significant role in the spatial distribution of sites and the patterns of waste movement around the country. (Davoudi 1999 p22) Nevertheless, the waste management hierarchy sets the principle in prioritising the use of various options. The government has emphasised to use the

waste hierarchy as a guide. It is a time when the waste management industry has to innovate new product to fit in the new framework. In addition, there has been development to apply the proximity principle to more specific area. The careful working out of the proximity principle will enable a more equitable spatial distribution of waste facilities with regard to cost effectiveness. Now, what happened in the waste management provides a good lesson from which we can learn more about the interactions between the market and the regulations. The case study later in the thesis highlights one important move from one waste management company in response to the new market environment.

#### The relationship between pollution control and planning control

The development of EfW incineration needs both the IPC authorisation and planning permission. The Environmental Assessment is inserted in the planning system by the Town and Country Planning (Assessment of Environmental Effects) Regulations 1988. Clearly, the IPC is about the technology with no regard to the consideration of location. The planning system is about the environmental impact in a particular area assuming the technical standards to be enforced by the IPC. There is a need for the planning authority to develop the rational decision making system on assessing the environmental impact. Later in the case study, the local planning has tried to develop an approach on assessing the acceptability of air pollution emission from an EfW proposal.

## Impact of the Electricity Act 1989

The Electricity Act 1989 has provided substantial subsidy for EfW incineration through the NFFO. It has a fundamental impact on the economics of the EfW incineration. In addition, it provides a new route of application for the development of

EfW incineration plant with an output of over 50 MW. Such application is to be made to the DTI rather than the local planning authority. This leads to the result that the EfW incineration plant is to be determined by the central government. large Furthermore, the department made responsible for the decision making is concerned more about the national strategic development of power supply rather than the national strategic waste management. In fact, the power plant with an output in the region around 50 MW is by no means to be considered as a big power plant, compared with gas-fired power plant usually with a size of 500-1500 MW. However, the EfW power plant with an output of 50 MW is enormous in terms of the capacity of waste intake. Take the example of the EfW incineration plant proposed by National Power at Northfleet, the plant would produce 49 MW by taking 700,000 tonnes per annum (tpa) of waste, which almost equals to all of Kent's domestic waste. The application procedure for large incinerator with the throughput more than that of one county is very likely to cause confusion and suspicion among the public. The case study will demonstrate the impact of the Electricity Act 1989 on the process EfW incineration development.

Next Chapter will deal with the issue of the public perception on environmental pollution. It has an important effect on EfW incineration development process.

## Chapter 3: Theories on local opposition to the development of EfW incineration plant

## Introduction

Public opposition has caused delay and failure of EfW incineration development throughout the developed world. (Petts 1995, Lake 1993) Different perceptions of the causes of public opposition would lead to different tackling strategies. In some countries, the perceived knee-jerk of local opposition has led to a more centralised decision making process. (Wolsink 1994) In other countries, there have been attempts to introduce a fair share process in siting these facilities. (Lake 1993) This chapter investigates the development of perception on local opposition to EfW incineration development and then provide a framework for a case study on the public opposition to a EfW incineration development.

Firstly, this chapter will deal with the diverging views on local opposition to the development of EfW incineration plants. On the one hand, local people are seen to be selfish and irrational in their opposition. On the other hand, they perceive themselves as being treated unjustly. There is no trust between the developer and the public. Secondly, it will describe a model for the traditional siting conflicts. Thirdly, it will discuss the factors empower the community to oppose EfW incineration proposals. Fourthly, it will explore new approaches to solve conflicts in siting EfW incineration.

## Diverging view on local opposition

The public resistance to EfW incineration proposals and other locally unwanted facilities is usually accounted for in terms of the Nimby (Not-in-my-back-yard) attitudes held by local residents. "Almost every proposal to establish a waste

management facility will be subject to the Nimby syndrome. Many proposals will therefore be rejected and will have to go through the appeals procedure..." (LWRA 1995 p98) The Nimby effect is commonly put forward as a ground for opposition, especially by bodies in favour of the construction of installations. The motive behind Nimbyism is often seen by industry and politicians as merely being based on selfinterest and/or irrational fears (Petts 1995) Nimbyism is usually referred to the local opposition against any kind of development which disturbs their locality, without being prepared to explore how far a particular proposal really might affect their place. (Healey and Davoudi 1998) Waste is regarded as one of the 'collective disutility'. This means that it is a problem that from a collective point of view requires to be properly solved but to the solution of which the individual actors consider they have little reason to contribute. (Lidskog and Elander, 1992) The disadvantages that EfW incineration plant could have on local people range from a possible decrease in the value of property, to more common interests, such as related to air pollution, noise and disturbance. However, the Nimby syndrome blames local protests using environmental grounds to guise the defence of their own interests. "Environmental concerns may be raised but these may actually be secondary issues instead of the real concerns of the community. Environmental issues are usually more pervasive in a battle against developers." (Bosley and Bosley 1988 quoted in Wolsink 1994 p856) Consequently, Nimbyism is ascribed to have created regions reluctant to take on the costs of project that benefits other sections of the country. Therefore, it is seen as an

obstacle to the realisation of public good and contributes to the overall downgrading of the well being of the society as a whole. In the Nimby framework, the selfishness and irrationality of local people generates locational conflicts that prevent the attainment of societal goals.

The use of term "Nimby" always offends the local community in question and hampers the communications between conflicting parties. It disqualifies local people's objections by saying that they are selfish and have no regard for the public good. Lake (1993) argued that the decision to castigate Nimby as irrational and selfish is a political decision. He pointed out that promoters of locally unwanted facilities are politically organised and communities are not.

Clearly, the meaning attached to the Nimby syndrome do not do just in taking communities' viewpoints. There has been a large amount of literature trying to demonstrate that local opposition is beyond the considerations of self-interests. They argued that Nimbyism is an expression of people's needs and fears and a case of highly legitimate action in the protection of the long term interest of the society. (Lake 1993,

Lidskog and Elander 1992)

From the local perspective, to site an EfW incineration plant is a reverse development. Environmental risk of waste treatment of a region is concentrated spatially in a particular area. The risk would actually cause the locality an economic loss.

A danger is economically real as soon as it is socially perceived as a danger. Enterprises can rapidly lose market share if the idea is spread that their products (or production processes) are environmentally harmful, and landowners may see decreasing value of their land as well as property owners of their houses, this is because of people's perception of a sited facility. Thus, a siting may constitute a kind of local 'ecological expropriation' which will transcend conventional borders between different interests. (Lidskog 1997 p241)

Local people do not accept that EfW incineration proposal would serve the public good.

The public continues to question the building of incineration plants as long as alternatives, which include waste reduction, have not been given sufficient consideration. On the other hand, public support for incineration installations increases when it becomes clear that bodies concerned and the industry which favour the construction already have waste reduction programmes in operation. (Wolsink 1994 p862)

This view fits in the Waste Management Hierarchy, which is both adopted by UK and EU. (Santen 1993) In addition, the willingness of local people of EfW incineration proposal depends very much on whether they think that they have got a fair share of the burden. Lofstedt (1996) has evaluated public reaction to the development of two UK waste tire incinerators: These two waste incinerators were both built by the same company but in two different communities. One of them was accepted by the corresponding hosting community but the other not. He found out that the issue of responsibility was important. In case of the community that accepted the waste incineration proposal, it was felt that the town made a significant contribution to the waste tire problem as they manufactured 90% of UK tires. Therefore, they believed that they should be responsible for disposing some of the tires. The other community, on the other hand, had no local tire making industry and hence, they felt little responsibility for disposing waste tires. The issue of responsibility is important in determining the degree of public acceptance of an incinerator proposal. With regard to treating municipal waste, people generally accept the responsibility of treating waste generated in their area but are more reluctant to accept waste from outside. This idea corresponds to the Proximity principle adopted by the Government:

Present UK government policy recognises the 'proximity principle' ... that wastes should be disposed of as close as possible to the point where they arise. (RCEP 1993 p81)

The people in a chosen area for EfW incineration development would question the decision to make them bear the cost of the larger area. If local people perceive that their interests have not been protected, they will see themselves left only one option to stop the proposal - protest.

The above arguments indicate that local people are rational in objecting EfW incineration plants. The EfW incineration development may cause the local people economic damage. Local people question the substance of the translation of two of the fundamental waste management policies in the site-specific development. Currently, the only criteria for siting of a EfW incineration plant are profitability, safety and legality. There is no provision for local people participation in the decision making process. Local people's opposition in that sense should be seen as a failure on the part of the policy makers and the present siting process. The core of local people's objections is about the feeling of injustice to the development process. People do not regard the current procedure as fair.

## The empowerment of the local community

Lake (1993) points out that locational conflict is hardly a new phenomenon. He uses various studies in North America to conclude that the locational conflict on a capita basis was essentially the same in the nineteenth and twentieth century. However, the important difference is the rate at which opponents have succeeded in blocking construction of locally unwanted facilities. The public now recognise that it is possible to stop facilities by working with community groups and national environmental organisations. (Kunreuther, Slovic, and MacGregor, 1996)

In the last two decades, the environmental awareness of general public is greatly increased. Studies estimate that about 8% of the British population (4.5 million) are

members of environmental groups .(Garner1996) Table 1 shows that between 1971 and 1990, the membership of the environmental groups examined dramatically increased by 454%.

Table 4 : Membership of UK environmental voluntary organisations (Robinson 1992) (numbers in thousands)

	1971	1990
Civic Trust	214	300
Friends of the Earth	1	200
National Trust	278	2031
Ramblers' Association	22	82
Royal Society for Nature Conservation	64	212
Royal Society for the Protection of Birds	98	885
World Wide Fund	12	110
Total	689	3820
% increase		454%

The increase in numbers of members means a dramatic increase in power of mobilisation of the environmental groups. Now, typically 80 per cent of the population in developed countries express a high level of concern about their environment. (Burke 1995) In the 1989 Elections for the European Parliament, the "green" parties in the UK got some 15% of the vote, which reflected public disquiet about the state of the environment. European polls indicated that the average level of concern about the environment went up 11 per cent between 1988 and 1992. (bid) The public's expectations of effective governmental action on environment continue to grow. Many people share the view that the environment is deteriorating, becoming noisier, dirtier and more dangerous to health. Everyone is influenced by scares about pollution and its effects. People's involvement in the environmental campaign may vary from the participation in civil disobedience activities to the voting for parties with better environmental agenda. The public are now refusing to leave decision making to experts. "The public has increasingly recognised that embedded within scientific and

technical decisions are choices that result in the authoritative allocation of values and benefits in society ." (Lynn 1996)

"In the 1980s, the idea that environmental policy was essentially antagonistic toward a process of economic growth was crushed." (Robinson 1992) This was signified by the Mrs. Thatcher's speech that no generation should have freehold to environment. At last, the Conservatives found an approach to justify their concern on environmental protection. Politicians from all parties, not only "green parties" have then started to pledge more commitment on taking environmental protection action to canvass votes. Local people now understand how to mobilise campaigns to get political support in order stop siting facilities which are thought to have a detrimental effect on the environment. .

## *Traditional locational conflicts: Decide-Announce-Defence (DAD)*

Dennis Ducsik (quoted in O'Hare, Bacow and Sanderson 1983) proposed the "Decide-Announce-Defend" (DAD) model to describe traditional locational conflicts.

In the first stage, the developer makes a series of technical choices with his engineer, market analysts, and lawyers. It typically has no interaction with local government nor those would be affected by their decisions. Because it lack eminent domain power, it often keeps these decisions secret until the appropriate land has been optioned, initial environmental reports made, and one particular site chosen as the best.

It then announces the technology and site package to the public. If it mentions alternatives, these often seem factitious. Their strong position sets the stage for conflict.

Then, it begin to apply for planning permission and IPC authorisations. On its submission for planning permission, the public gets their first opportunity to be heard. People with strong concerns about the project and those who don't thoroughly understand it approach this opportunity defensively. They have no reason to expect the developer to change their mind, alter the project, choose another site, or heed the public's concern. In fact, the public perceive themselves as only having power to delay or stop the project - because the developer has taken an apparently firm position, they must likewise be intransigent in order to protect themselves. In the end, this decision-making process breeds conflict and opposition, without providing constructive methods for incorporating people's concerns and resolving differences.

In view of the environmental conflicts in the last few decades, Environmental Assessment has been developed with an aim to assess the impact of proposed developments before the permission to built to be granted. It is intended to provide a process for more informed decision making. This means Environmental Assessment should not only involve gathering information about environmental consequences of some planned activity and finding a suitable site but also invites the general public to become involved in concrete decision-making processes. In this way it becomes possible to make use of the knowledge and views of the general public. As an additional effect, this will also have the result that the knowledge of the general public increases too. This idea is that environmental considerations should be taken into account and citizens should gain influence when Environmental Assessment is used. However, in reality, the Environmental Assessment author, employed by the developer, often seems to strive to convince reader that the investigated activity will not have any serious environmental impact. Therefore, the environmental statement (ES) which

concludes the findings of the Environmental Assessment will be seriously questioned under the scrutiny of the planning authority's expert. The public who cannot understand the technicality involved with the ES will receive it with great suspicion. This will lead to strong debate on the different aspects in doing the Environmental Assessment such as scoping, the standards and the information collecting procedure. It usually leads to substantial delay in the decision making and in no way helps to gain the public's trust. The Environmental Assessment will not be able to alleviate the people's worries unless it is made to be more open in terms of

- 1. considering of alternatives and site selection,
- 2. creating a process to formulate an agreed scoping; and
- 3. establishing a data collecting standard.

## New measures to resolve locational conflicts

There are two approaches to resolve locational conflicts. One path that has been advocated by a number of researchers is to work toward increasing public trust in the EfW incineration siting process. While it is much too soon to express either optimism or pessimism about the likely success of this strategy, it is a significantly challenging problem that at the moment appears to have no easy answers. A second path leads in the direction of siting processes that don't rely on trust, or rely on it only minimally. (Kunreuther, Slovic, and MacGregor 1996)

Only a rejection of Decide-Announce-Defend model would lead to a successful siting solution. (Wolsink 1994) "A study of 29 waste facility siting cases, both successful and unsuccessful, across the United States and Canada revealed that successful sitings were characterised by an atmosphere of trust between the proponent and the host

community. By examining those factors which led to the actual construction of a facility, two features stood out: having a broad-based public participation process and the perception by host community residents that the facility was the best solution to their waste problem." (Kunreuther, Slovic and MacGregor 1996)

### Fair siting process

In the early 1990s, bowed to the forces of public resistance to siting new facilities, New York City developed a Fair Share Siting Process. (Weisberg 1993) The Process aimed at delivering the fair distribution among communities of the burdens and benefits associated with city facilities. It has acknowledged that all public facilities both provide benefit and pose some level of burden on their neighbours. There are several implications on the siting process. Firstly, the need of the public facilities has to be established from the very beginning. Unless there is widespread agreement on the need for a facility, no site is acceptable. The proponents of a new facility have to document and justify the need for a new or expanded facility. The public have the opportunities to debate not only on the suitability of a site but also on government policies that create the need for the facility. Secondly, it admits that overconcentration can be a problem. No community should carry a disproportionate share of this responsibility, nor should any community freely avoid it. Thirdly, it encourages minimising the size of regional facilities to lessen local impacts and increase broad distribution. It discourages undue concentration. The degree of concentration is an important factor to be weighed against considerations of need, cost and service efficiency. Fourthly, it provides for a public participation to assess site alternatives and to ensure that facility design and operation afford appropriate community protections.

## Public involvement

On public participation, researchers have identified one of the reasons for strong local opposition to EfW incineration development as the failure to involve the public earlier in fundamental discussions of needs and alternatives. (Petts 1995) Healey and

Davoudi (1998) explore the effectiveness of various participation models in UK to arrive a final decision that the public will generally consider to be acceptable. They have examined three participatory models, namely 'traditional consultation', 'partnership' and 'strategic consensus-building' and argued that the most recently developed model would be more likely to arrive at an acceptable solution on waste planning. According to 'traditional consultation' model, a plan is first prepared by experts and then put out for public consultation. At that stage, only the active stakeholders will be aware and make comments on it. The plan will be revised and then subjected to inquiry process. Other stakeholders will start to scrutinise the plan at this stage. The inquiry processes set the forum for two-sided conflicts and escalate the scale of disputes. In the 'partnership' model, key players are brought in to generate mutual understanding and strategies from the very beginning of the development process. However, the problem with this model is that other stakeholders who have not been brought in from the start, will challenge the plan and accuse the partners of being secretive, In 'strategic consensus-building', all the stakeholders are identified and involved from the very beginning of making of the strategies. This is to reduce conflict in the later policy testing phase. This model improves public participation in decisions

by

a. effective empowerment of the public;

b. a fair decision; and

c. active support of the final decision as being the best that can be achieved in the circumstances. (Petts 1995 p522)

## Consensus building in Hampshire

In the late 1980s, there were five old waste incineration plant (without energy recovery) which reached the end of their design life and were due to be close before November 1996 when the new air emission standards operated. At that time, the main

recycling in the County was the reclamation of ferrous materials from the ash. In addition to these five incinerators, the County Council also relied on landfill sites in the western and northern parts of Hampshire and the Paulsgrove landfill site in Portsmouth. In 1989, the Hampshire County Council produced a Waste Management Plan as a combined Waste Disposal Plan and non-statutory planning policy document included the provision for EfW incineration development. The NFFO subsidy geared the Council to propose a single large plant with an waste intake of 420,000 tpa. In November 1991, the County Council tendered out the waste disposal contract in according to the requirement of the EPA 1990. The planning application for a 420,000 tpa EfW plant was lodged to the County Council at the site selected by the County Council at Quartremaine Road in Portsmouth. The site housed one of the old incinerators. The proposed EfW plant was intended to dispose of all the household waste in Hampshire. The City of Portsmouth was set to become an unitary authority by 1996. The proposal met strong local opposition. Eventually, the City Council of Portsmouth also opposed to the proposal. The application was "called-in" for determination by SOS for the Environment, and the County Council resolved that they would have refused permission if it had not been. (Letter from Hampshire Waste Services on 1<sup>st</sup> February, 1999) Later, the applicant withdrew the application when it looked likely that the SOS would refuse permission.

Then, the County Council re-started the drafting of the waste disposal plan with a proactive public involvement program. The new approach aimed at examining the options for dealing with household waste and seeking a broad base of public support for a strategy, which could be translated, into new facilities. A draft strategy was produced to form the basis of the discussion. Independent public consultation

consultants were employed to devise and run the public involvement program. The key component of the community involvement program was the formation of several Community Advisory Fora. Potential participants were approached after careful community analysis. They were provided with all the relevant information and training. At the end of the process, the groups suggested that while major emphasis should be put into waste reduction and recycling, EfW incineration would be needed as part of an integrated waste management strategy. However, they expressed considerable residual concern over environmental effects and the adequacy of monitoring of plant.

Building on the consensus from the public consultation, an integrated waste management strategy named as "Project Integra" has been developed through the cooperation of the County Council, the two unitary authorities of Portsmouth and Southampton, the 11 district councils and the waste disposal contractor. The web site for Project Integra is *http://www.integra.org.uk*. The County Council with two unitary authorities of Portsmouth and Southampton have jointly prepared and adopted Waste Local Plan in their area. They are also committed themselves as joint Waste Disposal Authorities and Waste Planning Authorities to the Project Integra. The 25 years of Hampshire's waste disposal contract was awarded to Hampshire Waste Services (HWS) to deliver the Project. HWS is required to provide the required infrastructure, including material recovery facilities, transfer stations, composting centres, three energy recovery incinerators and an anaerobic digestion plant. The Project Integra aims to meet the government's target of recycling 25% household waste by the year 2000, and eventually a rate of 40%. The Project Integra has divided Hampshire into three operational areas: North, South-east, South-west. Each area is to be sited a EfW plant. The community fora continue as local contact group to provide meeting point

for local people to discuss about the particular proposals in the Project.

Waste Management Option	Infrastructure	Status
Recycling	Kerbside collection system for over 50% of households (largest in UK)	operating
	Three Materials Recycling Facility	operating
Composting	osting Household Waste Recycling Centres:	
	produce 10,000 tpa soil conditioner, sold at 5	
	pounds per tonne	
EfW	Site: Quartremaine Road, Portsmouth, old	applying
Integra South East	incinerator site, next to the Europe's largest	
	Material Recovery Facility	
	Waste intake: 165,000 tpa	
	Electricity output: 14 MW	
	Planning application: submitted in August 1998,	
	expects to be determined by this summer, 1999.	
	IPC: to be submitted in February, 1999.	
	Technology: mass burn	
	Emission standard: the draft EU Incineration	
	Directive (adopted in German and Netherland),	
	higher than the UK standard	
Integra North	Site: Chineham, Basingstoke	applying
	Waste intake: 90,000 tpa	
	Planning application: submitted in October,	
	1998, expects to be determined by end of 1999.	
	IPC: to be submitted in April 1999	
Integra South West	Site: Marchwood area	
	Waste intake: 165,000 tpa	
	Planning application: Summer, 1999	
	IPC: 1999	

 Table 5 : Progress of the Project Integra

After being defeated in proposing to use one single large EfW incinerator for the whole county, Hampshire County Council has innovated new approach to the waste management in the UK. It has included all the stakeholders from the very beginning to prepare a plan which has a bearing on both landuse planning and the tendering of waste disposal contract. The plan has identified the infrastructures needed for various waste management options to comply with the waste management hierarchy. The original size of EfW plant is broken down into three smaller ones. This heeds the proximity principle.

## Conclusion

This chapter has explored ways of interpreting and resolving the locational conflicts associated with the siting EfW incineration plants. Firstly, the benefits of facilities to the communities at large have to be seen in relation to the costs perceived by local people. So far, there is no acceptable fair measure to distribute this disutility just like other citizen duties such as tax and jury. The people in prospective hosting areas of such facility may feel that they are being treated unjustly. Secondly, this situation leads to Decide- Announce- Defends type conflicts. Thirdly, after several environmental disasters in the last two decades, the public have lost confidence in the experts. The public doubt the criteria and the assumptions by which the experts make their risk assessments. Both the national and local environmental groups have been formed over the last two decades of the environmental movement. These groups have empowered the local area with the resource and knowledge to organise their opposition. Local opposition is able to halt the siting of locally unwanted facilities. Fourthly, new approaches have emerged to resolve locational conflicts. Local people are no longer seen as selfish and irrational but as legitimate stakeholders in the decision making process. There have been also attempts to establish the principles and processes of fair facility siting.

Hampshire County Council has steered a way out of the gridlock for planning waste facilities. It demonstrates the need for proactive consultation to draw a plan having regard to the waste management hierarchy and the proximity principle.

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## Chapter 4: Case study on local opposition to EfW incineration proposal in Bexley, London Borough

## Introduction

In the context of the discussions in Chapter 2 and 3, this chapter will investigate the nature and the process of local opposition to an EfW incineration development in Bexley. The main thrust of this chapter is to unfold the considerations of different stakeholders in making their decisions and the pattern of interactions. Firstly, it will briefly introduce the background information on the EfW incineration developments in London during 70s to 90s, the developer and Bexley, LB. Secondly, it will present the development process in the Decide-Announce-Defend model. In Chapter 2, the Decide - Announce - Defend model has been introduced to describe the pattern of interactions where there is an absence of trust between the stakeholders in a development process. In the chosen case, an absence of trust took dominance over the whole process. Therefore, the model will help to unfold the story to show how the mistrust was build up and how it determined the course of action of various stakeholders. Finally, it will conclude why local people developed strong resistance against Cory's proposal.

## Background

In the early 1990s in London, there were one EfW incineration plant in operation: Edmonton Solid Waste Incineration Plant (ESWIP) in LB Enfield and the other one in construction: South East London Combined Heat and Power Plant (SELCHP) in LB Lewisham. (Blank sheet)



## The development process of the ESWIP

ESWIP was commissioned by the Greater London Council (GLC) in 1971 and was located near the North Circular Road. It was the biggest in UK at the time it was built. It was designed to incinerate over 550,000 tones per annum (tpa) and generate 20 MW of electricity (GLC 1979). The GLC's original strategy was to build five or six EfW incineration plants around London. (LWRA 1995) Each was to have been around 500,000 tpa capacity, the maximum capacity to permit direct delivery of waste from Refused Collection Vehicles (RCVs). Suitable sites were earmarked at an early dates, taking into consideration of catchment areas of waste arisings. However, after the ESWIP was faced with high costs and protracted "teething" troubles and the availability of lower cost landfill, no other incinerators were built during the life of the GLC. (ibid.)

After the demise of the GLC, the ESWIP became under the control of the North London Waste Authority (NLWA) which are comprised of LBs of Barnet, Camden, Enfield, Hackney, Harrigey, Islington, and Waltham Forest with a population of 1.5 million and generate 680,000 tpa of waste (LWRA 1995 Appendix C1).

LB	Population	Waste generated / tpa
Derect		110,000
Barnet	302,000	113,000
Camden	183,000	105,000
Enfield	262,000	91,000
Hackney	181,000	91,000
Haringey	202,000	80,000
Islington	174,000	100,000
Waltham Forest	218,000	88,000
Total	1,522,000	668,000

Table 6: Population and waste generation in North London Waste Authority (Source LWRA 1995 Appendix A5i, Appendix C1)

Basically, the ESWIP receives waste from the above 7 LBs but however it also takes waste from other LBs and further afield as well. In 1991, it received 280,000 tpa of waste from within the NLWA and 122,000 tpa from other LBs. Together, it treated 400,000 tpa of London waste in that year. (ibid.) Furthermore, it was contracted to import 75,000 tpa of waste from Germany in 1994. (ibid. p39) Since the early 1990s, the plant managed to export 34 MW (more than the designed value 24 MW) electricity to the national grid. The plant was awarded with NFFO 1 contract in 1990. (LWRA 1995 p39) As it approached the end of its design life, the NLWA made an application under the 1989 Electricity Act to the Department of Trade and Industry to rebuild and expand the ESWIP plant on the same site in the early 1990s. The new plant was designed to double the waste throughput to 1.1 million tpa and to export 90 MW electricity to the national grid. (ibid.) The 1989 Electricity Act provides that the development of a power plant with a capacity over 50 MW requires the consent from the Secretary of State for Trade and Industry. Planning permission may be deemed to be granted under Section 90(2) of the Town and Country Act, 1990 if consent is approved under the Electricity Act, 1989. In 1993, the Department of Trade and Industry (DTI) granted consent to the NLWA to rebuild the ESWIP and directed that planning permission to be granted subject to planning conditions after consultation with the LB of Enfield and the National River Authority (since 1996 absorbed into EA). (ibid. p39) There has been no notable debate on the proposal and also no reports of any public opposition to this proposal.



# Edmonton Solid Waste Incineration Plant

**GLC** Public Health Engineering

## The development process of the SELCHP

Following the break up of the Greater London Council in the 1986, the South East London Waste Disposal Group, which were comprised of the LBs of Greenwich, Lewisham and Southwark, conceived of the idea of using EfW incineration as the alternative mean of disposal for domestic and commercial waste in their area. EfW incineration technology appeared to them as the alternative as the local landfill sites were reaching capacity and costs were expected to rise. (Caddet 1996) They reported to have commissioned three independent studies which all came to the conclusion that EfW incineration as being the most favourable disposal route. In 1989, the South East London Combined Heat and Power Limited (SELCHP) was formed by a joint venture between seven organisations: the two principal shareholders being Associated Energy Projects plc. (AEP) and Martin Engineering Systems plc, holding each holding 49.5% and the minor shareholders which include the London Power Company shares. Limited (Subsidiary of London Electricity plc), LBs of Lewisham and Greenwich, ISS Mainmet Limited (District Heating Specialist), Liang Technology Group Ltd. LB of Southwark pulled out in that stage. There have been different reasons given to account for the dropout of LB of Southwark. The Waste Reduction Officer for the LWRA saw LB of Southwark chose to withdraw in order to focus on recycling. (Gandy 1994 p67) However, LBs of Greenwich and Lewisham stated that the SELCHP would not compromise any recycling projects. Their contracts with the SELCHP allows the waste to have a wide calorific value band of 7 - 10 MJ/kg, and provides for this to be adjusted to 6.5 - 11 MJ/kg. (ENDS 1994 p27)

The LWRA (1995 p99) accounts the pull out for the reason that the project was being

financed under the auspices of one of Europe's largest utility companies. Nevertheless, the time that LB Southwark made their decision matched that of the introduction of the NFFO. The NFFO was introduced under the Electricity Act 1989. This issue will be discussed later in the thesis.

Before the formal submission of the planning application, on 27<sup>th</sup> February 1989, the Secretary of State has directed the council "not to grant permission on the application without special authorisation" from the Secretary of State. (LB Lewisham 1989) Director of Economic Development and Estates of LB of Lewisham submitted the planning application on behalf of SELCHP on 12<sup>th</sup> June 1989. In response to the public scepticism, in late 1989, LB Lewisham financed the Residents' Steering Group 5000 pounds to employ the Environmental Resources Limited to conduct a review of the Environmental Statement submitted by the SELCHP. The general tune of the review of the Environmental Assessment is very supportive of the waste incineration development. The review still considers that the SELCHP would take the waste generated from LB Southwark. "The plant will be the major waste disposal facility for Greenwich, Lewisham and Southwark." (Residents' Steering Group 1990 p15.) In addition, it considers the substantial increase in the amount of waste generated in the three boroughs during 1986/7 and 1987/8 pointed to the need to consider a capacity to cope with such increase. (Table 4) The final proposed plant had a design capacity to incinerate 420,000 tpa which provided 20% increase on the 1987/88 value. (SELCHP 1994 p8)

Year	Total amount of waste	% increase	
	generated in SELWDG		
81/82	232000		
82/83	237000	2%	
83/84	238000	0%	
84/85	241000	1%	
85/86	245000	2%	
86/87	274000	12%	
87/88	349000	27%	

Table 7: The waste amount of generated in SELWDG from 1981-88.

There were not extensively organised local oppositions to the SELCHP proposal. On 15<sup>th</sup> March 1990, the LB Lewisham Planning Authority agreed that the proposal is acceptable in principle. However, it should be "subject to no direction being received from the Secretary of State, authorise the Borough Planning Officer to approve the proposal with certain conditions. (ibid.) On 21<sup>st</sup> May 1990, the planning permission was deemed to be granted to the SELCHP by the Secretary of State. The council supported SELCHP's idea to set up and maintain a forum for discussion with local residents. This resulted in the formation of an Incinerator Monitoring Group (IMG). It was comprised of the members of the public. The chairperson of the group can attend SELCHP board meetings. (DTI 1994)

In this development, the local authorities involved, LB Lewisham in particular, have played multiple roles. LB of Lewisham supplied SELCHP a selection of sites. As only a minor shareholder, they submitted the planning application on behalf of the SELCHP. They also acted as conflict mediator to finance the Residents' Steering Group to conduct a review of the Environmental Statement. They are also the planning authority to determine the application. In view of the multiple roles played by the local authority, the Secretary of State directed the council not to grant permission without his special authorisation.

The turnkey design and construction contract was undertaken by Martin Engineering Systems plc. On-site construction commenced in October 1991, the plant fired its first refuse in November 1993 and by March 1994 it had reached full capacity. The plant has since been operating by AEP. (ECOTEC 1995)

## Diagram 2: Working procedure of SELCHP (Source: SELCHP 1994)

#### POWER GENERATION

Steam leaves the boilers at a temperature of 395°C and 46 bar, and is fed directly to a single 32 megawatt [MW(e)] steam turbine generator in the Turbine Hall **(15)**.

Steam from the turbine can be used to produce maximum electricity output; alternatively, some or all can be diverted to the steam/water heat exchangers to heat the future District Heating network. Steam is also used to preheat the combustion air for the refuse burning process in the Air Preheater (**16**). As there is no source of cooling water on the site it has been necessary to provide a bank of air cooled condensers (17) to condense the exhaust steam from the turbine. They are forced draught units mounted on a steel structure and the fans are equipped with variable low speed drives to prevent audible noise emissions.

Electricity is generated at 11 kV and transformed up to 132 kV for export to the electricity supply system which passes very close to the plant.

## HOW THE PLANT WORKS

13

23

Refuse collection vehicles (1) tip the solid waste - without presorting into the storage pit (2) from where it is transferred by overhead cranes (3) to the feed hopper (4) of the stoker feed chute. Hydraulic ram feeders (5) provide controlled charging of refuse onto the surface of the Martin reverse-acting stoker grate (6).

The forced draught fan (7) supplies primary air via the undergrate air zones to the burning refuse layer on the stoker grate (6). This fan and the overfire air fan (8) draw the air from the refuse storage pit area thus preventing the egress of unpleasant odours from the plant.

The heart of the System for waste combustion is the stoker grate itself **(6)**. The grate surface is sloped downwards from the feeder end towards the residue discharge end and is comprised of alternate steps of fixed and moving grate bars. The moving grate steps perform slow stirring strokes against the grate slope. This ensures that the burning refuse layer is continually rotated and mingled to form an even depth of bed and red hot mass is pushed back to the front end of the grate. In this way an intense fire builds up immediately at the front end of the grate, with all combustion phases (such as drying, ignition and combustion itself) taking place simultaneously.

Burned out residues are transferred at the bottom of the stoker grate, by an ash discharger (18) and by the residue handling system (19) and deposited in the residue pit (21). During the transfer, ferrous metals are removed by the magnetic separator (19).

The energy released by the process is recovered in the boiler. In this unit, the furnace walls and the division walls between the boiler sections (9) are of solidly welded membrane design. The superheater (10) is carefully sited in the multi-pass boiler whilst the economiser section (11) is in the fourth pass. The economiser is followed by the lime scrubber reactor (12) where a fine spray of a lime (from the lime storage silo (22)) and water mixture is introduced into the flue gases. This has the effect of neutralising acid gases contained in the flue gases and as the lime/salts cool, heavy metals condense onto the particulates. This particulate matter is removed from the gas stream by the baghouse filter (13) and the now clean and dedusted flue gases are ejected to atmosphere by the induced draft fan (14) via the 100 metre tall chimney.

Flue gas treatment residues are stored in the ash silo (23). Both these residues and the burned out ash residues and separated metals from the stoker grate are loaded onto transport within the building and removed from the site. Ash and flue gas treatment residues are landfilled and the metals are recycled.
SELCHP now receive waste from LB Lewisham, Greenwich, Westminster and Bexley.

LB	Population In 1995/95	Waste generated / tpa In 1991
Lewisham	232,000	141,000
Greenwich	212,000	103,000
Westminster	187,000	214,000
Bexley	220,000	88,000
Total	851,000	546,000

Table 8: Population and waste generation in the catchment area of SELCHP (Source LWRA 1995 Appendix A5i, Appendix C1)

SELCHP were originally conceived as a combined heat and power plant for being the most economic viable option.(DTI 1994 p10) The heat generated was planned to replace the use of fossil-fuel fired boilers to provide district heating for a network of 7500 local homes in LB Southwark. Initially, the plant was designed to provide 24 MW electricity and 50 MW thermal output. This will give a thermal efficiency of the plant in excess of 60%. (Letter from the Commercial Manager of SELCHP in 1996) In other developed countries, the EfW incinerators are integrated in the provision for the district heating. In Sweden's second largest city, Gothenburg, 80% of all buildings are connected to the community heating network. Most of the heat is supplied by the 300,000 tpa EfW incineration plant. (Loram 1996)

However, for the duration of the NFFO contract, the revenues from the electricity sales outweigh potential revenues from heat sales, and SELCHP decided to postpone implementation of the heat-supply component until after completion of NFFO contract in 1998. Therefore, without any heat output, SELCHP has supplied 34 MW electricity to the national grid since in operation. But, the plant can only then only achieve a thermal efficiency of 22%. The decision to postpone the district heating by SELCHP is understandable from a commercial point of view. The sale price of heat is only 1p/kWh while that of electricity under the NFFO 2 is 6.5p/kWh. (Loram 1995) The NFFO have made the originally most commercially viable and environmentally friendly district heating scheme for SELCHP become economically unattractive during the contract period.

NFFO have major impacts on the two operating EfW incinerators in London. The table below gives the amount of subsidy each plant have obtained during their NFFO contracts.

	ESWIP	SELCHP
Electricity output	34 MW	34 MW
Length operated under NFFO	1991 to 1998	1994 to 1998
contract	8 years	5 years
NFFO subsidy per kWh	=0.0655 pounds (premium price) = 0.0405 pounds/ kWh	– 0.025 (normal price) /kWh
Total subsidy from NFFO	= 34 000 kW X 24 h X 365 X 8	= 34 000 kW X 24 h X 365 X 5
	X 0.0405 pounds/kWh	X 0.0405 pounds/kWh
	= 96.5 million pounds	= 60.3 million pounds

Table 9: NFFO subsidies on SELCHP and ESWIP

# The local opposition to EfW plant

## Cory's EfW proposal in Belvedere, Bexley, LB

The third EfW incineration development in London was proposed by Cory Environmental Limited (Cory). It was a purely merchant EfW incineration proposal. In April, 1991, Cory proposed building the world's largest EfW incinerator in the north of Belvedere, Bexley. The plant would incinerate 1.5 million tonnes of waste per year and export 130 MW of electricity to the national grid. The estimated cost was 200 million pounds. The proposed plant was awarded NFFO contract in 1991. Cory planned to start operation in 1995.

Cory Environmental Limited was originally called Wm Cory and Son Ltd. The company was established in 1896. Ocean acquired Wm Cory and Son in 1972. Cory are now a wholly-owned subsidiary of Ocean Group plc and manage all of the Group's UK environmental interests. (Ocean 1997) Cory had not had any previous experience in constructing or operating EfW incineration plants.

In 1991, Cory had landfill contracts with the LB of Kensington and Chelsea, Lambeth, Wandsworth, Hammersmith and Tower Hamlets to dispose of a total of 550,000 tonnes of waste per year at their landfill site at Mucking, Essex. However, Cory has not previously had any commercial connection with Bexley. In 1997, Cory had a turnover of 86.4 million pounds, a total operating profit of 9.8 million pounds and a capital employed of 34.7 million pounds.

Bexley LB lies in the south-east edge of London. It has an area of 24.9 square mile and a population of 220,300 in 1991. It was formerly part of Kent. It became a London Borough along with the establishment of the Greater London Council in 1964. It generates approximately 88,000 tonnes of municipal waste per year. Between 1990 to 1997, this waste was collected and transported by road to Essex and Kent, where it was disposed of in landfill sites. Bexley has several very old heavy industrial areas. The north Belvedere is such an area. For more than hundred years, there have different kinds of heavy industry situated there including fertiliser factory, been chemical factory and the UK's largest sewage treatment plant. One of the chemical plants is under the Control of Industrial Major Accidents Hazards (Cimah). In the 1990s, there have been three incineration proposals in the north of Belvedere. These includes one sewage waste sludge incinerator and two EfW incinerators. In the wider surrounding areas, there have been eight developments with significant pollution emissions proposed in East London. The north of Belvedere is one of the main employment areas in Bexley. Since 1980s, the local authority has sought measures to regenerate the area.









Cory's proposal was met with strong local opposition. The following part will unfold the conflict in following sections:

- The details of Cory's proposal
- The local perception
- The public inquiry
- The spoiling strategy: AEP's proposal
- The new Cory's proposal (Powergen's proposal)

## The details of Cory's proposal

## The best time for EfW incineration development

The early 1990s is the cream time of EfW incineration development in the UK. There are four factors:

- a. The landfill cost was expected to increase with the forthcoming introduction of landfill tax and more stringent pollution measures such as the need for aftercare of landfill sites.
- b. The introduction of the IPC regime had an effect to phase out all the old waste incinerators, most of them were without energy recovery. The Government should be keen to see the new technology entering the market to replace the existing stocks.
- c. Under the Environmental Protection Act 1990, the waste disposal authorities were required to terminate any direct involvement in waste disposal operations, the options being either to vest their existing disposal operations in a local authority waste disposal company, or divest themselves completely of these operations by contracting out the waste

disposal service. In either case, the waste disposal contracts have to be subjected to the compulsory competitive tendering.

d. The NFFO introduced in 1989 provides substantial subsidy of EfW incineration plants.

The last factor had the greatest impact on the financial viability analysis of EfW incineration proposals. Two points of NFFO are important for the consideration:

- a. The total NFFO subsidy depends on the amount of electricity under contract. Therefore, the greater is the output of electricity, the greater is amount of the NFFO subsidy the plant can get.
- b. Introduced in 1989, NFFO was set to end in 1998. Therefore, the sooner the plant can operate, the greater amount of the NFFO subsidy the plant can get.

The most important economic reason for Cory to propose to build the world's largest EfW incinerator in Belvedere could possibly be the subsidy from the NFFO contract. Cory conceived the idea of EfW incineration proposal in Belvedere in the year of the introduction of NFFO. (Cory 1996)

Year of commencement of operation	Total amount of NFFO subsidy on Cory's proposal	Million pounds
1994	130 X 1000 KW X 24 h X 365 days X 0.0405 pound/kWh X 5 =	255
1995	130 X 1000 KW X 24 h X 365 days X 0.0405 pound/kWh X 4 =	204
1996	130 X 1000 KW X 24 h X 365 days X 0.0405 pound/kWh X 3 =	153
1997	130 X 1000 KW X 24 h X 365 days X 0.0405 pound/kWh X 2 =	102
1998	130 X 1000 KW X 24 h X 365 days X 0.0405 pound/kWh X 1 =	51

Table 10: NFFO subsidy on Cory's proposal in according year of the commencement of operation.

(NFFO subsidy per kWh

=0.0655 pounds (premium price) - 0.025 (normal price) /kWh

= 0.0405 pounds/ kWh

Cory can benefit from the economies of scale to offer a gate fee of 15 pound per tonne.

The gate fee of SELCHP is thought to be over 20 pounds. (Taylor 1993 p15)

In the late 1980s, Cory had 550,000 tpa waste disposal contract from LBs. The EfW incineration development would help them to maintain and grow in the waste disposal market in the expectation of the shortage of landfill sites in South East. The EfW incineration proposal would reduce the amount of waste disposed at their landfill site in Mucking, Essex and therefore extend its life. Since landfill is the operational standard for waste disposal, Cory planned to achieve a gate fee of the proposed EfW incineration plants that could be competitive with that of landfill. This might help them not only to transfer all the current landfill waste disposal contract to the new contracts for EfW incineration plant but also to be competitive over other landfill and EfW incineration operators. The landfill disposal gate fees in the South East was around 8-12 pounds per tonnes. (Taylor 1993 p15) With the expectation of the forthcoming landfill tax, the gate fee of landfill would be increased to around 15-20 pounds. The gate fee for the Cory's 1.5 million EfW incineration plant would be substantially less than 15 pounds. Their gate fee will enable themselves at commercial advantage over landfill and EfW incineration operators.

## Public consultation

Cory has contacted the statutory consultees set out in the requirement of ES. Nevertheless, Cory did not collaborate with the consultees on the site selection, the scoping for the Environmental Assessment and in the production of the ES. This paved for the disputes on the criteria in site selection and the approach to ES.

### Site election

In the site selection, Cory reported to have considered site selection according to the following six criteria:

- a. <u>River access</u>: 24 hour river access.
- b. Size: site of at least 3 hectares.
- c. <u>Electricity connection</u>: connection to the national grid, within short distance.
- d. <u>Planning Status</u>: zoned for heavy industrial use.
- e. <u>Road access</u>: good non-residential road access.
- f. Availability: having an owner willing to sell
- (Nightingale 1993 p19)

Cory (1991a) had identified eight potential sites along both banks of the River Thames. Three are on the north bank of Thames, the remainder on the South. Those on the North Bank were:

- A) Becton Gas works, LB Newham
- B) Thames Road, Barking, LB Barking and Dagenham
- C) Oliver Road, West Thurrock

and on the South Bank:

- D) Thamesmead riverside site
- E) Borax site, Norman Road, Belvedere
- F) Belvedere Power Station, Belvedere
- G) Ashville Properties, Crabtree Manor Way, Erith
- H) Crayfordness, Dartford



Map 5 : Locations of short-listed sites considered in the site selection for Cory's and Powergen's proposals (Source: Powergen 1995)

1431/2718/12.4.85/08/98

After an initial examination of the potential sites, those on the North bank were rejected because the road-borne waste market was primarily on the South side of the river. The site at Thamesmead was rejected because it was not zoned for industrial development. The site at Dartford was rejected because it had no electrical connection within easy reach, and access by river was not possible due to navigational difficulties.

The remaining three sites were:

- E) Borax site, Norman Road, Belvedere
- F) Belvedere Power Station, Belvedere
- G) Ashville Properties, Crabtree Manor Way, Erith

The site selection process is summarised in the following table.

Criteria \ Site	Α	В	С	D	E	F	G	Η
Size	$\checkmark$	$\checkmark$			$\checkmark$		$\overline{\mathbf{v}}$	
Electricity		$\checkmark$			$\overline{\mathbf{v}}$			
Connection								
Planning status	$\checkmark$		$\checkmark$				$\checkmark$	
Road Access								
Availability					$\overline{\mathbf{v}}$		$\checkmark$	
River Access					$\overline{\mathbf{v}}$			

Table 11: Site selection for the Cory's proposal

### Planning history of the site

The site was formerly used by Borax Consolidated Limited back in 1899 when the company was formed by merging a number of UK and American companies with interests in Borax refinery. The site was used for industrial purposes very much earlier and was one of the oldest industrial sites in that part of Kent (Reid 1980) The site lies on the southern bank of the River Thames in Belvedere and comprises approximately 3.1 hectares of redundant land and buildings, part of former Borax Works site. The land is approximately 5 meters above mean sea level. The site has a river frontage of 168 meters and there is a small jetty. The Thames riverside public footpath runs between the site and the jetty. To the east of the site between it and the Belvedere Power Station there is another public footpath which runs from Norman Road to the Thames riverside footpath.

The site along with other lands to the east, south and west are allocated for industrial use in the Bexley Borough Plan. The Draft Deposit Unitary Development Plan designates the site, together with lands to the west as a Special Industrial Zone. The Special Industrial Zone provides the potential for the development of waste incinerator plant.



Bexley Borough Boundary

Environment	Policy Nos.
Metropolitan Green Belt	
Metropolitan Open Land	TAL2, ENV11-12
Green Chain Boundary	
Urban Open Space	ENV15
Areas of Metropolitan Importance for Nature Conservation	ENV18
Employment Areas	
Special Industrial Zones	
Other Industrial Area Policies	

#### Movement

Road Proposals and Improvements	тз
Primary Roads	T2
Principal Roads	Τ4
Secondary Roads	Τ4

#### Thameside Special Policy Areas

A	Thamesmead - Belvedere Development Sites	S1
B	Land at Crossness	S2
С	Belvedere Power Station	54

### **Development partners**

Because of lack of investment, the UK incinerator industry had no substantial recent experience in the EfW incineration technology. However, EfW incineration has been more developed in Switzerland, Germany and France. Cory had looked to those countries to find the technology supplier for their proposal. Six suppliers of EfW incineration plants were investigated, Von Roll Group of Switzerland was appointed to carry the overall design and to supply incineration units and Lurgi of Germany was asked to supply gas cleaning plant. The Von Roll Group was founded in 1823, employs They have been engaged in the planning, design, 8900 people world-wide. construction, commissioning, operation and maintenance of facilities for the treatment and incineration of domestic and industrial wastes throughout the world. They have installed more than 486 municipal and industrial incineration units in 231 plants worldwide. These plants have an aggregate installed incineration capacity of more than 30 million tpa, the largest of them installed in the USA for municipal solid waste burning having a design capacity of 745,000 tpa. This plant is served by 3 incineration units of a nominal rating of 28.3 tonnes/hour. Fifty nine boilers of the Von Roll design used in Cory's plant have been installed and successfully operated world-wide for EfW incineration. (Taylor 1993) The Cory's plant consists of 5 individual incineration units. Each unit has a nominal rating of 38.5 tonnes/hour. The size of the incineration unit proposed for Cory's plant is the largest of Von Roll design. It represents an increase of 36% of on the greatest size of Von Roll previous designs. (ibid. p6) Lurgi employ 40,000 people world-wide and has an annual turnover exceeding DM 20 billion. They specialise in designing and building systems for the removal of dust and

gaseous pollutants from exhaust gases emitted by plant in the cement, iron and steel,

non-ferrous metals, chemical glass and automobile industries, as well as from power generation and refuse incineration plants. They have designed and built approximately 95 of these units in 65 plants throughout the world for municipal solid waste, chemical waste and sewage sludge incinerators.

The waste treatment process is basically comprised of the waste incineration and the gas cleaning. The five Von Roll incineration units would burn 1.5 million tpa of waste, producing superheated system used to generate 130 MW electricity for delivery to the national grid. Combustion gases would be treated in the Lurgi gas cleaning system before being exhausted to the atmosphere by the induced draught fans through the stack. The flue gas cleaning system would include special features for the removal of nitrogen oxide, heavy metals and dioxins.

Cory also sought partner to operate the plant as they did not have any experiences in managing power generation plant or EfW incineration plant. Midland Electricity was once said to be one of a leading candidate to join the venture. (Thomas 1991) However, they could not identify the operating partner before making their application.



Potential waste contracts within the catchment area of the proposal and the traffic impact

Unlike other EfW incineration proposal in the similar time, Cory was unable to define their catchment area. Cory's proposal is purely a merchant EfW incinerator. It was not coming from any waste management strategy of any local authority. Moreover, it was not even built to serve the borough where it was to be sited. There was no statutory waste management strategy for whole London. Before the introduction of the EPA 1990, the Waste Disposal Authority which is the individual London Borough was required to produce the Waste Disposal Plan for their area. The EPA 1990 places a duty on the LWRA to produce the Waste Disposal Plan for the whole Greater London to replace the plans produced by individual boroughs. LWRA was not able to adopt a Waste Disposal Plan at the time it was absorbed into EA in 1996. Therefore, there has been a policy vacuum in waste management at time when Cory's proposal was coming out.

Cory did estimate that a 2.5 million tonnes per annum of potential waste disposal contracts within the catchment area of to feed the plant.

Boroughs	Waste generated Tpa	Disposal Route in 1991
WRWA (Wandsworth, Lambeth, Hammersmith, Kensington) and Tower Hamlets	550,000	Cory landfill contract held until 2002
Westminister and City of London	300,000	Landfill – contract ends 31.3.95
Bromley and Bexley	250,000	Landfill – contract end 1992 (Bexley) and 1996 (Bromley)
Kent CC (NW only)	300,000	Landfill – approximately 2 years capacity remains
Greenwich, Lewisham, Southwark	340,000	Landfill – contract ends mid-1992
Croydon, Merton, Sutton, Kingston	440,000	Landfill- contract ends 1993
Newham, Barking, Redbridge, Havering	380,000	Incineration/landfill – contracts end 1997
Total	2,560,000	

Table 12: The waste g	generated within the	he catchment a	rea of the C	'ory's plant (	Source:
Cory 1991 Table C.1)	)				

Cory then had 550,000 tpa of waste disposal contract. They had anticipated to secure waste disposal contracts for an additional 900 000 tpa, initially 650 000 tpa by the end of 1995 and a further 250 000 tpa in 1997.

Without the definitive idea of the catchment area, Cory only assessed the traffic impact from the development according to the assumption that 850 000 tones per annum of wastes would be transported by river and other remaining 600 000 tones per annum of wastes would be transported by road.

Waste delivery	Total weight tpa	Average weight per vehicle tonne	No of traffic generated in one year	No of traffic generated in one hour (assuming 44
				nours/week)
By Bulk Road vehicles	270,000	13	20,770	10
By Bulk Road vehicles	250,000	15	16,667	8
By Refuse Collection Vehicles (from LB Bexley)	80,000	6	13 333	6
Total	600,000	Total		24

Table 13: Forecast of road traffic generation in the delivery of waste (Cory 1991a)

Table 14: Total traffic generated. (Cory 1991a)

24
1.36
1.38
27

Cory offered to enter section 106 to specify the routes to be used by vehicles delivering waste to the site.

### Access Road

Norman Road provides the road access to the proposed plant. Norman Road is a private road and not under the maintenance of public funds. The London Borough of Bexley indicated then that they have no plan to adopt the road. The average width of the road is 6.2 m.(Cory 1991a) Cory satisfied with the existing width. They stated that the minimum feasible width for a road of this type is 6.0 m. The road is virtually straight and therefore, no extra width is required to allow for articulated vehicles manoeuvres. (ibid.)

Application process

Cory submitted its application to the Department of Trade and Industry under section 36 of the Electricity Act 1989 on 11<sup>th</sup> April 1991.

## The local perception

### General

Cory adopted an approach to keep confidential about all the details of the development before their submission of their application. However, local people had seen people carry out surveys in the area. Therefore, the rumours and speculations about Cory's proposal spread and were brought to the attention of the local media. (Interview with a local newspaper reporter 1998)

One week before Cory made their formal application to the Department of Energy, a local newspaper reported the Cory's proposal with the title "Riverfront earmarked in secret power plan". (Mercury April 4<sup>th</sup>,1991) Both the Bexley Council and the London Waste Regulation Authority were reported to have little information about the Cory's proposal. The secretiveness of Cory caused suspicion among the local media, some local councillors and local environmentalists to made them vigilant of any further development of the proposal.

Local people and the local authority were very suspicious of the application procedure. The application procedure was perceived by local media as an attempt by the developer to exploit the loophole under the Electricity Act 1989 to escape the scrutiny of planning procedures by the local government. (New Scientist August 3rd, 1991) There was a feeling among the local people that the procedure used by Cory had bypassed the council's planning powers and rendered the community powerless to intervene. (Kentish Times, January 14<sup>th</sup>, 1993) Bexley council protested that such a development proposal with actual or potential environmental consequences of wide dimensions should be determined otherwise than by the Secretary of State for the Environment. The Bexley strongly disputed the fact that the President of the Board of Trade would be called upon to determine an electricity generating proposal where issues were mainly environmental and also affected the direction of strategic waste management policies for the South East and London in particular. (Nightingale 1993 p82) The new application procedures had caused a lot of confusion to local people. They tried to contact the DOE for information only to find to be told the other government department is responsible. A local planning said that the Electricity Act should never have conceived of a EfW incineration plant, which can generate more than 50 MW electricity. He consider SELCHP to be a very large EfW incinerator which only generates 36 MW electricity. (Interview with planning officer 1998)

#### The local government

Bexley Council saw Cory's proposal to be detrimental to their plans in the whole borough not only in Belvedere. The Council had actively promoted the economic development within the Borough by encouraging new investment, practical support for existing industry, supporting new enterprise and improving labour skills during 1980s. Bexley have intended to attract industrial and housing development into their area. The council have carried a lot of physical developments and infrastructures targeting to foster a positive investment climate. In particular, employment area in Belvedere and Erith (east of Belvedere) had been given high priority to increase employment.

The success of the Council's strategy was reflected by some 500 firms being assisted between 1983 and 1992, resulting in the creation or retention of 5,000 jobs. (Nightingale 1993 p84)

Cory's proposal would only bring huge mass of waste by lorries and barges through roads and river to Bexley. This would heavily damage the image of Bexley. Bexley feared that would have an adverse effect on the timing and value of land and property sales in the immediate area. The Local Government and Housing Act 1989 had already limited the range of assistance that could be made to the council. This made Bexley to further rely on the promoting a positive perception of the area to attract investment. The council considered the Cory's proposal would damage the work already undertaken by the council towards creating a positive investment climate in the Belvedere area. This would Bexley an unenviable reputation from having the world's largest incinerator and investment values would be affected accordingly. The council particularly worried about possible negative impacts on food industries, which had provided a significant amount of employment. Some larger employers in this sector were attracted to the area or undertook major reinvestment during 1980s. The council saw this employment base would be threatened if customers of these firms perceived the area as unsatisfactory for processes involved in the manufacture of food products. The fact that the plant would be ideally sited to make good use of the East London Crossing and the proposed Thamesmead Road exacerbated fears of negative perception of the plant. The image of the industrial development areas would be seriously harmed by the proposed large incinerator.

Confidence in the area would be undermined and would deter prospective investors. It was expected that property values would fall, with a consequent knock on effect of deterring further development. (Nightingale 1993 p 85)



Map 7: Current and proposed main roads in Bexley

Bexley opposed to Cory's proposal in August, 1991. A cross-departmental task force of 40 people strong was established to deal with the Cory's proposal. (Interview with local government officials) Around 500 000 pounds plus staff resources were spent on this proposal. Together, Bexley was thought to have put more than 1 million in this project. It employed Rendel Science and Environment to review the ES. It had also employed a top lawyer to deal with the Public Inquiry.(ibid.)

Department	Involvement
Planning	Development Control:
Department	To take it through all the processes as a planning application.
_	To carry out the public consultation.
	Planning Policy:
	To work with the planning policy framework related to this
	project.
Engineering	To study the volume and the impact of the traffic generated.
Department	
Work and	To figure out what would be the impact on the department in running
Services	the waste disposal contract.
Department	
	To work with external consultants to consider the impact of the
	proposal beyond the borough's boundary to put a case at the public
	inquiry on the waste disposal for London and regions.
Legal	To provide guidance on the legal framework of the public inquiry.
Department	
	To employ a Queen's Counsel and a junior counsel to represent the
	council at the public inquiry.
Finance	To identify the budget that the task force could work with
Department	
Economic	To assess the economic impact of the project.
Development	
Department	
Environmental	To put a case on how the town planning legislation could be applied
Health	to the way the pollution affects land.
Department	
	To work with the external consultants to study the environmental
	impact of the project on different media.

Table 15: Bexley's cross-departmental task force

#### The local community

There have been a general mistrust on the industrialists and the pollution regulatory authority HMIP among the local community. (Interview with local government officers and campaign leader 1998)

Belvedere was an industrial area containing many factories. The residents had complained of suffering from many problems created by industry during last decade. Of particular concern were the multiple sources of pollution, which led to difficulties in HMIP ascribing specific emissions to particular factories after incidents.

One of the constant pollution threat to the local area is a large quantities of chlorine is stored in at a fertiliser factory located at about 2 km to the east of Cory's site. The factory has kept changing names initially, Burt and Harvey, subsequently Diamond Shamrock, then May and Baker, now Rhone Poulenc. In 1985, there was a serious herbicide leak from the factory. The incident killed foliage about half a mile radius around the plant and caused the people's gardens dying. (Interview with campaign leader 1998) People had experienced symptoms of irritated eyes, sore throats and tiredness. (Nightingale 1993 p162) Local people said that HMIP came to the site to carry out investigation but the company refused them to enter and inspect the factory. HMIP did not insist to inspect the factory and was therefore unable to identify the source. Finally, HMIP reported that they could not tell which company cause the problem.

Of particular concern were the multiple sources of pollution, which led to difficulties in authorities ascribing specific emissions to particular factories.

There had been numerous incidents, usually followed by hollow promises of non-repetition.

(Nightingale 1993 p162)

Since 1985 there had been over 30 recorded incidents connected with or directly caused by pollution in Belvedere. There had been a great many incidents related to local industries over the past few years. Some had been short and dramatic for example fires; others had been insidious - leaks of chemicals which had gone on for long periods, causing danger to people and damage to animal and plant life.

At the time of writing up the thesis, there had been several pollution accidents happened in Belvedere. Two of them came out within weeks. On July 1<sup>st</sup> 1998, a 3000 litre tank of dichlorophenol overheated leaking two kilos of the chemical at Nufarm works in Crabtree Manorway North (about 2 km to the east of Cory's site). (Newsshopper August 12<sup>th</sup>, 1998) Nufarm is under the Control of Industrial Major Accidents Hazards (Cimah). There are totally 12-14 such installations in London. The factory has triggered fire alarm once every week in according to the regulation. This practice has added to the anxiety of local people. (Interview with a local councillor 1998) Another incident happened on August 10<sup>th</sup>, 1998, at 4.00 a.m., an explosion occurred at the Croda Resins factory in Crabtree Manorway South triggered the automatic fire alarm. "Two plastic tanks, each containing 750 kilos of the chemical styrene, had ruptured. The chemical had become unstable in the sudden hot weather and had reacted with itself." (Newsshopper August 12<sup>th</sup>, 1998) Local people felt unprotected to the potential danger once more and particularly were not happy about not being informed of the incidents. The Environmental Agency said that this was because neither was an injury risk to local people. (Newsquest London Ltd August 19th , 1998)

The mistrust of HMIP is indisputable among local people. All the resident groups in

the area are of the view that:

HMIP involvement was too distant and failed to reassure local people. It had been acknowledged that HMIP was over-stretched and could not guarantee sufficient pro-active involvement. There was no requirement to consult local community. (Nightingale 1993 p208)

Therefore, local people were very worried about proposal of building the world's largest waste incinerator plant.

Local people do not trust the technology. They perceive themselves exposed to great

environmental danger. They do not feel protected from the threats from the potential

of the environmental accidents. to have any protection to this from happening. The

see HMIP to be more interested in protecting the industries. HMIP is accused to poise

to believe in the companies technical capacities to deal with the problems. (Interview

with a campaign leader 1998)

HMIP has been long criticised for their cosy relationship with the industry.

The Industrial Air Pollution Inspectorate, that preceded HMIP, was criticised by the Royal Commission on Environmental Pollution as having too close a relation with the industry it is meant to control. (Rydin 1993 p200)

Not only in the UK, but also in the USA, waste-disposal facilities have become a focal

point for environmental concerns and intense public opposition.

A principal reason for this is that the public has grown more cynical and mistrustful of government and industry. The public no longer regards those stakeholders as having requisite legitimacy. (Kunreuther 1996 p109)

In Bexley, in response to the world's largest incinerator proposed by Cory, the local people protested that:

The area should not be asked to carry any more such pollution burdens. (Nightingale 1993 p162)

The local Labour Party organised petition against Cory's proposal within weeks of the announcement of Cory's proposal. It formed a campaign group: Belvedere, Erith, Thamesmead, Tackling Environmental Risk (BETTER). BETTER worked with another local environmental group Belveredere and District Campaign Against Pollution (BADCAP) to organised campaign activities. BADCAP has long local experience in local pollution campaign. Firstly, they collected 1000 signatures to back the local authority to object to the proposal. Secondly, they organised a health survey on the perception of the local pollution problem. They have got back more than 800 replies. The Director of Health of the local authority backed the survey and arranged expert to offer help on analysing the data. Thirdly, they collected more than 27,000 signature petition to present at the public inquiry.

#### The local EfW operator

The scale of Cory's proposal would enabled it to offer the lowest gate fee among EfW incineration operators. SELCHP feels the threats from Cory's proposal.

Cory conceived of the shape of EfW incineration proposal in 1989. LB Southwark withdrew from the SELCHP project in the same year. The Cory's proposal may offer a gate fee in the region 13 pounds which is nearly half of that of SELCHP. Cory later in the public inquiry indicated that they could get the waste disposal contract from LB Southwark should their plant approved and built. Losing the waste disposal contract from LB Southwark means SELCHP could then only secure two third of their waste treatment capacity from the two remaining LBs. The financial arrangement of the plant is based on the stability of waste intake. Therefore, the dropout of LB Southwark had increased financial risk to SELCHP.

#### All stakeholders are threatened

All the stakeholders: local people, local authority and the local EfW incineration operator, were threatened by Cory's proposal. Cory had not poised to negotiate with any of them to include their view in the proposal. All the stakeholders felt their interests had not been protected but were going to be damaged by Cory's proposal. To stop the Cory's proposal seemed to them as the only option to protect themselves.

#### Cory reduced the scale of development

After meeting with strong local opposition, Cory reduced the size of plant to 1.2 million tonnes per annum in May 1992. Bexley Council could modify its stance towards the proposal. However, Bexley council maintained its objection towards the proposal. In June, 1992, the DTI announced the public inquiry to be held in October

in the year.

## The public inquiry

The public inquiry was started on October 6<sup>th</sup>, 1992 and ended on January 7<sup>th</sup>, 1993. The inquiry time was 28 days.

#### Community involvement

BETTER managed to get two experts, Christoph Ewen from the OKO Institute in Germany and Paul Johnson from Greenpeace, to present at the public inquiry on their behalf. The former has represented many environmental groups in the public inquires for EfW incineration proposals. He had pointed out the technology used by Cory is not the best available technology. He said that instead of the conventional waste incineration unit used by Cory, the fluidised bed EfW incineration unit will emit one-fourth the nitrogen dioxide emitted by the former. The resident group, Greenwich Action to Stop Pollution produced a photo showing the thermal inversion occurred below the top of the canary wharf. This is accepted by the Inspector as the evidence to question some assumptions Cory have made to predict the pollution impact. 16 residents had given evidence at the public inquiry. 299 written objections were sent to the Inspector. The Inspector commented that "a very large number of written objections have been made to the Cory proposal, by individuals, groups, organisations and companies." (Nightingale 1993) A lot of local people involved in the public inquiry for the first time.

## Council's arguments

The public inquiry is planning in nature. The arguments must be in accord with the section 54A of the 1990 Town and Country Act:

Where, in making any determination under the planning acts, regard is to be had to the development plan, the determination shall be made in accordance with the plan unless material considerations indicate otherwise.

Among other things, the Inspector considers that there are three arguments made by the Bexley Council having clear elements of landuse implication.

1. Over-development:

Although the Cory's site is designated to be suitable for incineration plant development, the Bexley Council objected not to have an incineration plant at the site but disputed the scale proposed. Bexley disputed that the size of the site was not able to accommodate the plant satisfactorily. The council stated that that the letter of objection from Ashville Properties indicating that the Ocean Group originally sought a 4.86ha site. If footpath and dyke were excluded from the calculation, the site coverage is 51%. The main incinerator building would be placed very close to the northern, western and southern boundaries of the site with a maximum gap around the perimeter of 8m, but significantly less at several pinch points. The plant would cause damage to the amenity of 2 public footpaths running through the application site. A footpath user, on approaching the building, would immediately become aware of the activity related to the reception hall, and the intensity of that use, which was not the most desirable of activities. The plant was intrusive to the neighbouring buildings. The Inspector considered that the application site is too small to satisfactorily accommodate the large building with its intensive use, resulting in a dominating and detrimental impact on adjoining uses, and the building lacking a proper spatial relationship and having a poor site layout, contrary to planning policies.

#### 2. The narrowness of Norman Road:

Cory considered the existing width 6.2m to be satisfactory. It had a view that the minimum feasible width for a road of this type is 6.0m. Cory stated that they would resurface, and if necessary reconstruct, the carriageway, widening it to 6.4m and kerbing both sides.

The council disputed the ability to widen Norman Road to 6.4m. They argued that even where the drawings indicated that a width of 6.4 m could be obtained, there might be difficulties in providing that width because of the need for a camber on the road. The council mentioned the national standard as set out in "Roads and Traffic in Urban Areas" and its own standard both requiring such a road to have a minimum width of 7.3m with a footway of 1.8m. It pointed out while the width of lorries carrying ISO containers to the site was 2.5m, the overall width of each vehicle including wing mirrors, was 3.1m.

The Inspector observed that the total width between vertical obstructions was accepted as being 7m, and 6.9m in one place. He considered the road width of 6.4m together with vertical obstructions on both sides would allow very little space between vehicles and roadside obstructions, when HGV's passed in opposite directions. There would be effectively no room for pedestrians and cyclists, although it was accepted that there were relatively few cyclists and pedestrians using the road.

The Inspector considered the existing condition of Norman Road to be unsatisfactory. He saw the works proposed by Cory was unable to improve it to meet the local and national standards.

### 3. Cumulative pollution level:

In the early 1990s, there were simultaneously several developments of significant air pollution impacts in East London. The Bexley Council had failed to convince HMIP the need to carry out study into the combined impact of the developments. (Newsshopper July 15<sup>th</sup> 1992) Therefore, LB of Bexley together with other four local authorities the LBs of Newham, Havering, Greenwich and Barking and Dagenham appointed Rendel Science and Environment in July 1991 to advise on the assessment of the potential environmental impacts associated with a number of proposed developments in the East Thames Corridor, including the Cory's proposal. (Nightingale 1993) It is the first time, a large computer model has been running that way to try to predict the air quality over the following few years not just involving the Cory's proposal but other known developments. (Interview with local government officials 1998)
## Map 8: Location of proposed developments of major pollution sources in East London in 1990s



- **1. SELCHP EfW incineration plant**
- 2. Greenwich Power Plant
- 3. Tate and Lyle Boilers
- 4. Beckton Sewage Sludge Incinerator
- **5. Barking Power Plant**
- 6. Crossness Sewage Sludge Incinerator
- 7. Cory EfW incineration plant
- 8. AEP EfW incineration plant

The Inspector accepts that the air quality in the area is poor at times. He said that resolution of existing air quality problems is not for his consideration. He concluded that Cory's proposal would not add so significantly to the pollution (Nightingale 1993 p232, 235-236) He do not consider the prevailing poor air quality as a consideration for the refusal. He judges the acceptability of the Cory's proposal on the amount of pollution from the proposal rather than the total resulting air quality.

Although the result from the study did not prove combined impact would cause the air quality standard to be exceeded, it represented an approach to link the pollution control and planning control.

In 1993, RCEP (1993) recognises the need to conduct combined impact studies should there be several developments with significant pollution emission proposed at the similar time. It recommends the developers of those developments should jointly conduct the study. It also recommends that:

Planning authorities should take account of prevailing air pollution levels when considering what would be suitable locations for incinerators, and HMIP should arrange to provide them with the information about air pollution levels needed for this purpose. (RCEP 1993 p85)

After the public inquiry, HMIP carried out a study similar to that have been done by the Bexley Council. They published a paper in December 1993 entitled An Assessment of the Effects of Industrial Releases of Nitrogen oxides in the East Thames Corridor, which took into account the effects of the Cory's proposal. Its conclusion was that the proposed new sources on nitrogen dioxide emissions do not cause the EC Guide Value for  $NO_2$  to be exceeded in any part of the study area where the level is not already breached. RCEP (1993) indicate clearly the existing air pollution level is a consideration for siting incinerator and the acceptability of an individual pollution source is determined by the acceptability of the total resulting air quality.

The Inspector had refused the Cory's proposal on the grounds of over-development and the narrowness of Norman Road. However, the council's novel approach to the link between pollution control and planning control has opened up the discussion on the necessity of carrying out cumulative impact studies and the weight of existing air quality to the determination of a planning application.

### Cory making changes

Cory had made several important changes during the inquiry. On the second day of the public inquiry, they introduced a new design, which included the new provision of cooling towers. On cross-examination by the Bexley Council, Cory admitted that they were aware of the need for cooling towers one year before the start of the public inquiry. The Inspector had raised the case for adjournment. On resisting the adjournment, Cory had then agreed that their original application was on outline basis and prepared to obtain subsequent approval of details. The Inspector allowed to proceed the inquiry on this ground but maintained the possibility of "a delay in respect of the cooling tower variation, to give opportunity for consultation and possible objection." (Nightingale 1993 p6) The Bexley Council had pointed out that the cooling towers had been sited so close to the footpath. They suggested that the towers were potentially a great source of noise nuisance and would cause damage to the enjoyment of the footpath by the public. (ibid. p127) Towards the end of the public inquiry, Cory announced to have purchased new lands to meet some of the objections raised by the Bexley Council. Among other things, Cory suggested that the lands could be used to

re-site the cooling towers. The inspector had therefore adjourned the inquiry for more than one month to allow parties to re-consider their cases. However, the inspector considered the newly acquired lands were not part of the application site and would be disregarded in the consideration of the application. He commented that several changes had indicated "a lack of preparedness on the applicant's part and of the difficulty of squeezing a building of this size and character onto the site." (ibid. p240) The campaign groups also resented the changes. "The picture Cory had given was of an ill-conceived and ill-thought out scheme. It was considered unfair that earlier witnesses had given evidence on the basis of the old plans and had not been crossexamined on the new aspects. (ibid. p208)





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### The spoiling strategy: AEP's proposal

After the public inquiry for the Cory's proposal, Bexley invited tenders for the waste contract. Associated Energy Project (AEP) and Cory were two of the companies bidding for. (AEP 1995 and Powergen CHP 1995)

AEP is one of the major shareholder of SELCHP. In January 1995, AEP submitted planning application to the Bexley Council to build an EfW incineration only treating 78 000 tonnes per annum of municipal waste generated by Bexley next door to Cory's proposal. The plant would produce 4.1 MW of electricity. It employs the fluidised bed combustion technology. The gate fee of this plant is said to be 38 pounds.(LWRA 1995) On one hand, the council had granted the planning permission to AEP with the condition that "the incinerator will be built only following an award of the Bexley LB contract for waste incineration at this site." (Bexley LB 1995b p49) On the other hand, Bexley awarded four-year waste contracts to SELCHP. The four year short term contract would commence in January, 1997. (Bexleyheath and Welling Times December 21<sup>st</sup>, 1995) AEP has not yet signed the s106 agreement. SELCHP is said to be likely to be awarded the long term waste contract. (Interview with a local councillor) This had tactically put a virtual incinerator with an approved planning permission next door to the Cory's site. There is no financial incentive for AEP to proceed the construction if they could now obtain the Bexley's waste to feed SELCHP. After losing the waste contract from Bexley and finding another approved EfW incineration proposal on next door, Cory had been held in great difficulties to justify their proposal.







Map 10: Site boundaries of Cory, Powergen and AEP plants



Map 10: Site boundaries of Cory, Powergen and AEP plants



and a start is and



The local opposition to Energy from Waste incineration proposal

119

(tpa = tonnes per annum)







Diagram 7: Working procedure of AEP's proposal (II) (AEP 1995)





### The new Cory's proposal (Powergen's proposal)

In the first inquiry, there are some criticisms on the Cory's technology including using a size of waste incineration unit never tried elsewhere. Cory removed two contractors responsible for providing waste incineration units and gas cleaning equipment. In May 1995, they appointed Powergen Combined Heat and Power Limited (Powergen), a subsidiary of Powegen plc, to submit the proposal on their behalf. It was responsible for the development and the operation of the plant on a 'build, own, operate' basis. Cory would supply the plant with waste. Powergen only submitted an outline application. It indicated a contractor selected through competitive tendering would undertake the detailed design. The new site area was increased to 6.3 hectares from 3.1 hectares. Additional land was acquired to widen the access road to meet the objection. The plant would incinerate 1.2 million tones per annum of municipal waste to but generate 140 MW of electricity (compared with 103 MW in the previous proposal). (Bexley 1995a) The application met even stronger public opposition. More than 5000 letters of objections to the proposal were sent to the Department of Trade and Industry. This was one of the biggest number of letters of complaints among the planning inquires apart from that of the nuclear plant. (Kentish Times November 2<sup>nd</sup>, 95, Interview with campaign leader) Both LPAC and LWRA indicated the Powergen's proposal. HMIP also agreed to involve as pollution experts in the forthcoming public inquiry. In addition, the Bexley Council had quizzed Powergen a long list of questions on every single detail of the submitted Environmental Statement under the provision of the Electricity Act 1989. The questions were complied by DTI and sent to Powergen. Powergen had not proceeded with their proposal as the pace of

the Cory's first proposal. They had remained silent to the questions sent to them by DTI. In December 1996, DTI instructed Powergen to answer the questions by the end of January, 1997; otherwise, the Government would presume the company quitting the project. But in the following month, Powergen announced to drop out of the proposal. Two months later, Powergen had returned the answers. In August, Powergen formally pulled out the Belvedere incineration scheme. Cory maintained that they were still finding a partner to submit the application once again in July 1998.



Date	Cory's proposal	AEP's proposal	PowerGen's proposal
			(Cory's second
the set by set		·	proposal)
April 10 <sup>46</sup> , 91	Cory applied to the		
	Department of Energy to		
	build a waste to energy		
	plant capable of treating		
	1.5 million tones per		
Amount 7th 01	Deuleu council chiested		
August 7,91	Bexiev council objected		
	Comu's proposal		
November 01	Cory's proposal was		
	awarded contracts from		
	Non-Fossil Fuel		
	Obligation		
May 1992	Local group conducted		
101ay, 1772	health and pollution		
	survey.		
May, 92	Corv reduced the size of	· · · · · ·	· · · · · · · · · · · · · · · · · · ·
	plant to 1.2 million tpa.		
	Bexley Council could		
	modify its stance towards		
	the proposal.		
June, 92	DTI announced a public		
	inquiry into Cory's		
	proposal.		
July 30 <sup>th</sup> , 92	First pre-inquiry		
August $25^{\text{m}}$ ,	Bexley council		
92	maintained its objection.		
September	Second pre-inquiry		
11 <sup>-</sup> , 92	Although Deviler	· · · · · · · · · · · · · · · · · · ·	
September, 92	Although Bexley		
	council urged Hivilf to		
	inquiry the inspector		
	ruled that they would		
	not.		
October 6 <sup>th</sup> .	The public inquiry	· · · · · · · · · · · · · · · · · · ·	
92	started.		
October 7 <sup>th</sup> ,	Cory announced a new		
92	design for the		
	incineration plant. The		
	new design included a		
	new shape appearance,		
	the extra provision of six		
	cooling towers and the		
	separation of the four		
	flues.		
October 9 <sup>th</sup> ,	Royal Fine Art		
92	Commission welcomed		1

## The chronicles of EfW incineration development in Belvedere

Date	Corv's proposal	AEP's proposal	PowerGen's proposal
			(Corv's second
			proposal)
	the Corv's new design		
October 7 <sup>th</sup> to	The inquiry was		
October 13 <sup>th</sup>	adjourned due to a		
	family baraayamant of		
92	the Inspector		
November	Come approximated that it		· · · · · · · · · · · · · · · · · · ·
november	Lory announced that it		
25,92			
	lands. However, no		
	advised application to		
	incorporate the extra		
	lands in the site was		
	made.		
November	The public inquiry was		
$26^{44}$ , 92 to	adjourned to provide		
January 5 <sup>th</sup> ,	time for various parties		
93.	to re-consider their cases		
	as a result of the re-		
	siting of the cooling		
	towers and the		
	acquisition of the new		
	lands by Cory.		
January 7 <sup>th</sup> ,	End of the 28 days		
93	public inquiry of which		
	there were 2 evening		
	sessions.		
July, 93	HMIP issued the		
	authorisation of		
	Integrated Pollution		
	Control to Cory's plant.		
November, 93	Cory had gained control		
	of additional land		
	alongside Norman Road		
	which would be used to		
	widen and improve		
	Norman Road.		
December, 93	HMIP published a paper		
	in December 1993		
	entitled 'An Assessment		
	of the Effects of		
	Industrial Releases of		
	Nitrogen Oxides in the		
	East Thames Corridor',		
	which took into the		
	account the effects of the		
	Cory's proposal. "Its		
	conclusion was that the		
	proposed new sources on		
	nitrogen dioxide		
	emissions do not cause		
	the EC Guide Value for		
	NO <sub>2</sub> to be exceeded in		
	any part of the study area		

Date	Cory's proposal	AEP's proposal	PowerGen's proposal (Cory's second proposal)
	where the level is not already breached.")		
March, 94		London Borough, Bexley invited tenders for waste contracts.	
June, 94		AEP submitted its tender with a proposal to build a waste to energy plant only for treating Bexley's waste.	
April 12 <sup>th</sup> , 94	The Secretary of State endorsed the recommendation made by the Inspector to refuse the Cory's application.		
June, 94			Cory announced its intention to submit the proposal once again.
January, 95		AEP submitted planning application to Bexley Council to build a waste incineration plant treating 78 000 tonnes per annum of municipal waste generated by Bexley. The plant would produce 4.1 MW of electricity was proposed to site next to the Cory's site.	
May, 95			Powergen has submitted the proposal on the behalf of Cory. Powergen would be responsible for the operation and Cory would be responsible for supplying the former with waste to feed the plant.
August, 95			London Planning Advisory Committee saw the proposal was unacceptable in terms of strategic planning policies for waste, traffic and transport.
August, 95			London Boroughs of Havering, Greenwich, Newham and Barking and Dagenham objected to the proposal.

Date	Cory's proposal	AEP's proposal	PowerGen's proposal
			(Cory's second
			proposal)
		4	Hampshire County
			Council disputed the
			practice of out of county
			waste disposal coming
			with the proposal.
August, 95			HMIP accepted that they
			should be involved as
			experts in pollution
			control in the
			forthcoming public
			inquiry.
August, 95			Bexley Council opposed
			unanimously to
			PowerGen's proposal.
October, 95		······································	The London Waste
			Regulation Authority
			voted unanimously
			against PowerGen's
			proposal.
November, 95			More than 5000 letters
1.0,000,00			of objections to the
			PowerGen's proposal
			had been sent to
			Department of Trade and
			Industry
November 95			DTI sent 190 questions
			to quiz Powergen on a
			number of issues
			ranging from air quality
			and traffic to public
			heath and noise These
			questions were based on
			130 questions that raised
			by Beyley Council
December 95	······	Bexley awarded four-	cy bonicy counten.
200011001, 75		vear waste contracts to	
		SELCHP of which AFP	
		is a major shareholder	
		The four year short term	
		contract would	
		commence in January	
December 96			The DTI imposed a
<b>D</b> (((1))(1), 70			deadline on DowerCon's
			13-month silence to the
			100 questions sent by it
			The DowerCon should
			answer the questions by
			the and of Ionucre 1007
			otherwise
			Covernment the
			Government would
			presume the company

Date	Cory's proposal	AEP's proposal	PowerGen's proposal
			(Cory's second
			proposal)
			quitting the project.
December, 96			Powergen dropped out of
			the proposal. Cory stated
			that they were still
			committed to the
			Belvedere waste
			incinerator.
March, 97			PowerGen answered 190
			questions that the
			government had sent to
			it.
August, 97			Powergen formally
-			pulled out the Belvedere
			incineration scheme.

## Conclusion

Cory's development process is characterised by:

- a. They had maintain secretiveness in the planning process. The decision making process was very centralized. They have not recognised the legitimacy of other stakeholders to take part in the decision making process. These stakeholders include: the local authority, local people and other EfW incineration operators and equipment providers.
- b. After the announcement of their proposal, all of other stakeholders perceived the proposal constituting substantial threats to their interests.
- c. The other stakeholders made any every efforts to stop Cory's proposal in order to prevent the perceived damage to their interest from the proposal.

This is typically a Decide-Announce-Defend type of development, which sets to breed conflicts and deems to be unacceptable to local people.

In the early 1990s, the government renewable energy through NFFO have shaped the landscape of the EfW incineration developments. The sudden flood of EfW incineration proposals is caused by the massive NFFO subsidy with a deadline of 1998. Enticed by massive subsidy, electricity generating companies and waste management companies have flocked to put forward large EfW incineration proposal without having regard to the issues of public acceptance and strategic waste management policies. Therefore, most of the proposals are being rejected or delay due to public opposition. To make the EfW incineration proposal more acceptable, it is vital to review the subsidy mechanism of NFFO. The present practice do not allow time for planning and construction. The time taken into careful planning would reduce the time the operator to be benefited under the NFFO. The careful planning is therefore discouraged and penalised. To provide for a better mechanism for EfW incineration, time should be allowed for planning and public consultation and an upper limit of the size should be imposed in order to provide a level playing field for various operators. The EfW incineration industry have started recognise the importance of openness in the planning and operation of the plants. (European EfW incineration Coalition 1996, Appendix 1-6) The Decide-Announce-Defend model represents the negative pattern of interactions leading to the failure of siting. European Commission (1998) have conducted cross-national study to identify the positive factors leading to successful waste facility siting. Their research was based on the analysis of seven cases in seven countries. The countries in their project were: Spain, Italy, France, The Netherlands and Switzerland and two Eastern European countries, Slovenia and Hungary. One important factor they have identified is the stake management:

A careful stake management is a necessary ingredient of the recipe for success. Apart from the stress on the best technology, and location within existing industrial estates, one should obviously refer to the question of the means, therefore, the attempts to find the negotiable issues, and readiness to alter the project in order to adjust the proposed plant with some other issue of public and private interest, and the attitude toward negotiation and bargaining are very important elements for facilitating success. (EC 1998 p224)

## Chapter 5: Conclusion

This thesis aims to study the cause and the process of the local opposition to EfW incineration development. It is to investigate underlying factors constituting the public resistance to accept EfW incineration plants in their area.

In chapter 2, it has discussed the various interpretation on local resistance to siting EfW incinerators. From the proponents' points of view, local resistance to siting such plants among other facilities is the expression of selfishness which implies local people enjoy the benefit of such facilities but refuse to be responsible to share the cost. On the other hand, local people perceive themselves to be imposed unfair share of burden. Local people are becoming more and more cynical as the result of their lost of trust in the industry and the regulator alike. Some researchers start to investigate the problem in terms of locational conflicts. They point out that the locational conflicts are not a new phenomenon. What's new is the capacity of local people to stop the siting of facilities. Environmental disasters in the last two decades have engendered a growth in the environmental awareness and a decline of deference in experts in most developed countries. People are not more politically organised to question the decisions made by the experts whether they are on behalf of the developer and local people.

There have been new approaches to build trust by acknowledging the right of all the stakeholders in the decision making process on EfW incineration developments or other facilities siting. One eminent example in the UK is the EfW incineration development in Hampshire. The traditional approach to site EfW incineration plant was failed. The County Council employed a new approach by identifying all the

stakeholders, empowering them to make their views and involve them in the decision making process. This has fostered a ownership of the final decision among the stakeholders.

Chapter 3 set out the policy and regulatory framework for waste facilities development in the UK. The fundamental principles of waste management are the waste management hierarchy and the proximity principle. Duties have been placed on the central and local government to produce various waste management plan under the guide of the above principles. There are two problem coming out. First, there is still a lack of complete set of national and local plans. Second, there is a lack of coordination between different plans such as the Waste Disposal Plan, the Waste Mangement Plan, the Waste Local Plan. It points to the need to improve the speed of plan making the streamline the plan. Given the controversy of the nature of waste, it will be a formidable task for the planner. In the 1990s, new regulatory framework is emerged. The overlap between the planning system and the Electricity Act 1989 poses a great concern for the proper application process for large incinerator. The planning control and the pollution control is still finding their roles in relate to one another.

Chapter 4 investigates why and how Cory's EfW incineration proposal failed to gain approval. It introduces the background of one operating and one approved EfW incineration plants in London. This provides the context of EfW incineration market in London. The operation of EfW incineration market have been dictated by the NFFO. ESWIP in Enfield have been approved to rebuild to increase the waste throughput to 1.1 million tonnes with a power output of 90 MW electricity. SELCHP in Lewisham have postponed the district heating for the sake of generating more electricity under the NFFO contract. The energy policy has directed the EfW incineration plants to seek the maximum electricity output at the expense of any other considerations such as, energy efficiency, strategic waste management and public acceptance. Cory's proposal was picked as it exploits fully all the advantages given by the energy policy to the detriment of all other stakeholders: the local authority, the local community and the existing EfW incineration operators.

In the Cory's planning inquiry, the Bexley Council have explored a new approach to link the pollution control and the landuse control. They have argued that the prevailing air quality should be a consideration on the decision to grant potential high emission source. The concept is the permission of an additional source of pollution should be judged in according to the environmental potential in the area. If the environmental potential is on the verge of full exploitation, stronger justification for an additional source of emission is needed for its approval. RCEP (1993) appeared to endorse this concept and recommend HMIP to provide data for local planning to judge the suitable sites for EfW incineration development. This is quite a logical development. The environmental potential. If the environmental potential have been nearly fully exploited, local people should not be asked to bear more without strong justification. This points to the need of monitoring and predicting local environmental potential to provide the basis for suitable development and fair share of environmental burden.

Kent County Council has exploited this concept to build a air quality model to monitor the ambient air quality and to provide a tool to judge the acceptability of the air pollution impact from the high polluting proposal within its area. (Street 1997) In the very beginning, the County Council sanctioned money on hiring consultant to establish the North Kent Air Quality Model to review the air quality impact from the proposed gas-fired power plant in AES Medway in 1990. The air quality model indicates the acceptability of the proposal and this leads to the support of the County Council towards the proposal. Before the air quality model was in place, the County would ask advice from HMIP to comment on the resulting air impact which usually caused delay to the application. The air quality model provides a ongoing ready tool for the planning authority in the Environmental Assessment. The model runs for each new project. It will also be updated by the new background level and if particular proposal is refused. The running cost for new project is to be paid by the developer as performing its duty for the Environmental Assessment. The effect can reduce the cost to local authority and increase the validity of Environmental Assessment. The model has been refined to cover the whole Kent area. In the light of the current government's air quality, there is a need for other areas to learn the experience from Kent. Environmental Assessment is instrumental in this process by providing a standardised model and practice throughout the country. This will ensure the model might be fitted together to give the whole picture in the UK.

To conclude, the Cory's proposal demonstrated the recipe for mistrust.

- Cory excluded any other stakeholders in their decision making process.
- The NFFO subsidy has encouraged them to build the greatest possible plant within the shortest time.
- The local area has been suffered from long history of environmental pollution.

The Bexley Council have brought about the local environmental approach to link the pollution control and planning control in two respects:

- the cumulative impact of several sources of pollution should be used as a criteria to judge the acceptability of the projects, and;
- the prevailing air quality should be a material consideration.

It is appropriate to review the NFFO subsidy on EfW incineration.

If EfW incineration continue to be subsidised under NFFO, conditions should be imposed on how waste can be regard as renewable resources. All other forms of renewable energies such as wind share the characteristic of being localised. There are no restrains on NFFO contract to EfW to limit the need of the transportation of waste and the import of waste. It is the case now the government subsidise heavily the EfW incineration operator to import and treat the waste from Germany and later may be from other European countries or USA as well. It is against the proximity principle agreed by EU. In addition, the use of renewable energies is to generate energy in a sustainable manner. The energy efficiency should be of paramount importance.

Therefore, there may two appropriate conditions to add on the NFFO contracts for EfW incineration.

- a. The NFFO contract should limit the need of transportation of waste. This could be done by imposing a condition to limit the transportation for under a certain distance. This could be guaranteed by the prospective of long term waste contracts.
- b. The NFFO contract should require the operator to operate at certain level of thermal efficiency say 60% to ensure the operator has incorporated the district

heating in their proposal. This could be guaranteed by the prospective heat contracts.

Cory's third proposal is forthcoming, in the light of the finding of this thesis.

The author considers the following points may be relevant in order to make their proposal acceptable:

- a. The new proposal should have definite catchment area.
- b. The new proposal should work in according to the waste management plans in the catchment area. It means there is a need to cater for the provision of various waste management options in according to the waste management hierarchy.
- c. The new proposal should have a size in conformity with the Proximity Principle. In the South East, most counties express to achieve self-sufficiency within their boundaries. In Hampshire, the one single size of incinerator catering for the whole county is demonstrated to be not acceptable.
- d. The new proposal is better to incorporate proactive public consultation to convince the community in the catchment area that due regard has been paid to the waste management hierarchy and the proximity. Otherwise, it is likely to encounter another huge public opposition leading to the substantial delay.

# Appendices



# EEEQC European Energy-from-Waste Coalition



Public perception research shows that one of the main reasons for a negative response to waste facilities is the failure to involve the public early on in fundamental discussions in order to gain support for an integrated approach to waste management.

Local authorities and managers of energy-from-waste plants therefore need to involve the public in the planning stages of their waste management strategy, to address the concerns of the local community and gain their acceptance.

EWC has put together a number of case studies describing how local authorities and managers of energy-from-waste plants throughout Europe approached the public to reach a consensus on development proposals.

E ach case study is an example of how a particular community gained the public's acceptance in circumstances that differ from country to country. All approaches profiled have produced successful results. The ways in which the public can be consulted vary and include:

- seminars with site visits
- forming a community advisory forum
- international conferences
- open house to visitors
- newsletters
- opinion surveys

The studies can be used as a starting point for developing individual communication programmes. If you need more information please contact:



rue d'Arlon 50 - B-1000 Brussels Telephone (32-2) 280 19 33 - Facsimile (32-2) 280 18 83

Gaining Public Acceptance : Case Studies

## Appendix 2: Gaining Public Acceptance: Hampshire County Council

Hampshire is a county situated on the south coast of England with a population of 1.5 million. In 1993 Hampshire County Council proposed an integrated waste management strategy to address the waste needs of the community. A new approach was used which included two and a half years of the most extensive public consultation on household waste ever undertaken by a local authority in the UK. The techniques employed by Hampshire make an instructive case for other authorities in their search for effective ways of identifying public concerns and achieving consensus.

#### Waste Management Strategy

**Public Perception** 

At the end of the 1980s, Hampshire had five ageing incinerators without energy recovery facilities that did not meet new emissions standards. It was becoming difficult to find acceptable landfill sites and the proximity of the site to housing (400m).

council was facina the pressure of increasing waste. The County Waste Management Plan (Hampshire County Council, 1989) recognised the need for an integrated approach to waste management for three reasons: landfill sites were rapidly filling up, existing incinerators did not European meet emission standards, and the quality and level of recycling needed improving. In November 1991 a planning application was submitted to provide an EfW



facility with a 400,000 tonnes per annum capacity on a site selected by the County Council in Portsmouth.

The proposal met with strong opposition from members of the local community. There were concerns about air emissions, health risks, visual impact, noise, traffic and the

> These people felt that the waste plan placed too much emphasis on the energy recovery option, to the detriment of waste minimisation and recycling. It was also felt that the plant was too big.

Hampshire's stand at a local exhibition

### A New Approach

In 1993 a voluntary public involvement programme was developed by Hampshire County Council Waste Disposal Authority to examine the options for dealing with household waste. A draft strategy was published forming the basis of discussion. It made clear that the strategy would be changed in the light of public comment.

The community involvement programme started with a dialogue around the need for a range of options; it was agreed that a single option solution such as 'all landfill' would not be technically or politically acceptable.

Independent consultants, skilled in public consultation and involvement, devised and ran the programme with the county council. They formed a number of Community Advisory Forums (CAF) consisting of a panel of citizens. Each CAF comprised people with different interests, ages and ethnic representation. The maximum size was eighteen and each forum was chaired by an independent member of the local community. Each forum met for three hours once a month over a period of five months. Their task was to:

- act as a sounding board for the development of an integrated waste management strategy
- identify issues and areas of concern about different waste management options
- provide feedback to county and district councils
- comment on the proposed range of options for communicating information to the general public

#### Evaluation

The public consultation procedure was very successful and there was a high attendance rate. People were genuinely interested. Forum members were supplied with information - both for and against different waste management options. Only members could participate in meetings, although these were open to public and press. Visits to facilities and a one-day seminar were arranged, including presentations by UK and overseas experts.

Response cards received from the public after the consultation process indicated 96% support for the strategy, with respondents preferring incineration to landfill. 70% of survey respondents felt that energyfrom-waste (EfW) was the most acceptable way of treating waste that could not be recycled.

The seminars with site visits proved to be one of the most successful methods of communicating information, allowing people to form their own opinions and to contribute to discussions. Unstaffed exhibitions and newspaper coverage were not as effective as the seminars, but it was recognised that a mix of methods had benefits. The most ineffective method of consultation was an open public meeting.

Building of a new energy-from-waste plant is currently scheduled to start in 1997. Both a waste minimisation programme and a recycling system are currently being implemented demonstrating Hampshire's integrated waste management strategy. The public can therefore see that EfW is also fulfilling its role as a true complement to the other options.

40
# Appendix 3: Gaining Public Acceptance: SELCHP, UK

SELCHP is an energy-from-waste plant serving south-east London. Situated in Lewisham, it is the result of an initiative undertaken in 1988 by the London boroughs of Lewisham, Southwark and Greenwich. Together they formed an organisation - the South East London Combined Heat and Power Consortium - from which SELCHP takes its name. From the outset, SELCHP's approach has been based on consultation and co-operation.

#### Waste Management Strategy

#### **Public Perception**

In 1986, the south-east of London was faced with the increasing scarcity and environmental problems of landfill. A new waste management strategy had to be found and plans for the construction of an energy-fromwaste plant were proposed. In 1989, SELCHP Ltd was formed, a joint venture company between the public and private sectors comprising AEP (a subsidiary of CGC) and MES (a subsidiary of CNIM) as major shareholders with the London boroughs of Lewisham and Greenwich, London Electricity, Laing Technology and ISS Mainmet (minority shareholders).

Today, 420,000 tonnes of waste are treated annually by an operating/administrative staff of 55 persons which, in addition to 34 MW electricity, will provide heat and hot water to 7,500 homes. Designed to internationally accepted standards, SELCHP meets all the requirements laid down by local, national and EU legislation. Before the plant was built, the main concerns of the public were focused on air emissions, noise, visual impact, and traffic.

Some people felt that SELCHP's waste strategy would impact adversely on local recycling initiatives and there was some opposition by pressure groups.

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#### **A New Approach**

SELCHP began its public consultation process two and a half years before construction and continues to maintain an open relationship with the public.

The first step was an in-depth feasibility study into the viability of an energy-fromwaste facility. Concerns about emissions, noise and the environment were addressed by carrying out an environmental impact assessment. The assessment was independently verified as positive, and in 1990 conditional planning permission was granted after further studies into noise, landscaping and architecture.

SELCHP used the services of independent public consultation consultants when developing their strategy which included:

- seminars
- talks and meetings
- visits to other energy-from-waste plants
- opinion surveys
  newsletters and videos
- exhibition and advice centre during

The SELCHP energy-from-waste plant has attracted worldwide interest and is always open to visits by the public. Strong opposition was addressed by responding with consistent factual information.

open days at the local council offices

**Evaluation** 

The public consultation process undertaken by SELCHP was very successful. The public gained a better understanding of its community's waste management strategy and SELCHP now has the public's full support. Visits by local schoolchildren have been encouraged with much positive feedback.

During the consultation process, SELCHP participated actively in an Incinerator Monitoring Group (IMG) made up of local residents who had access to operational details. The chairperson attended SELCHP board meetings. They still meet today and SELCHP is very much a part of local community activities.

With success on this scale, the system is being re-evaluated by UK waste managers. SELCHP is seen as the UK's flagship energyfrom-waste project. Its success has facilitated the development of similar joint ventures across the country.

141

# Appendix 4: Gaining Public Acceptance: Brescia, Italy

Brescia is located in the north of Italy, to the east of Milan, near the Alps. In 1991 Brescia presented its waste management strategy to the public at an international conference on energy-from-waste. It was the first public meeting to discuss the development of Brescia's waste strategy and proposals for an energy-from-waste plant. After a lengthy process to inform the public about Brescia's waste, approval to build the FfW plant has finally been issued by Brescia City Council.

## Waste Management Strategy

## **Public Perception**

Brescia began work on its waste management strategy in 1991 with an initiative called 'Brescia Integrated System for Waste Management', of which energy-from-waste formed one important option within an integrated waste management strategy. Other facilities for recycling and composting are located nearby.

The building of Brescia's energy-from-waste plant is now scheduled to start in 1997. It will burn 266,000 tonnes of household waste per year producing 120 Gwh of electricity and 350 Gwh of hot water for district heating. The energy recovery facilities will provide the equivalent of 90,000 tonnes of coal, equal to about one quarter of the electricity and heat delivered to Brescia in 1992. Initially, the public knew very little about waste management options and learned about the issues involved through public consultation activities introduced by Brescia.

Current Italian legislation does not encourage the building of new EfW plants and the public in Brescia is often against allowing any type of facility that they believe to be a potential source of dioxins. There is little support to the move from landfilling to waste incineration with energy recovery.

About 20 homes are located within a radius of 1 km from the plant. The main concerns of the public in Brescia were traffic pollution and damage to the environment.



# was set up comprising members of the local government and public. The committee

outlined the project to the public at the first international conference on waste to energy in Brescia.

In 1991 a technical and scientific committee

Between April and July 1992, Brescia held a series of presentations and debates about the project with the technical committee and the town council. The site of the plant was discussed and decisions were always made with the unanimity of all members. Other activities included a special communication programme for informing the public, designed on the basis of an opinion survey and comprising:

- community meetings
- exchange of letters

A New Approach

- local media coverage
- special report on environmental compatibility

In May 1993 a second international conference was held in Brescia called 'Towards New Environmental Solidarity'. It provided the opportunity to present to the public the experiences of similar waste to energy projects in Darmstadt and Heidelberg in Germany, Hoorn in The Netherlands, Malmö in Sweden and Seattle and Norfolk in the US.

#### Evaluation

Brescia's public consultation process was very successful in informing the public and local government. In August 1993 the City Council approved construction for Brescia's energy-from-waste plant.

# Appendix 5: Gaining Public Acceptance: Hogdalvenverdet, Sweden

Högdalenverket is located about 13km south of the centre of Stockholm. It has been an energy-from-waste facility for domestic waste since 1970. The plant initially produced electricity only, but in 1979 it was converted into a combined heat and power station which raised the facility's output to 24 MW power and 154 MW heat. 50 people are employed at the plant on a regular basis.

#### Waste Management Strategy

#### **Public Perception**

In the mid 1980s, another boiler was installed to enable Högdalenverket to deal with all domestic refuse - about 220,000 tonnes annually. About 90% of Högdalenverket's district heat production and electric power is supplied by the plant. The facility has been equipped with pollution control systems to comply with legislation on emissions in the European Union.

Högdalenverket is therefore exemplary regarding emissions control and is fully integrated into community planning, addressing specific concerns such as odour control and establishing traffic patterns to divert vehicles from residential areas for minimal disruption to the community.

Högdalenverket meets the stringent requirements of 17 BimSchV (the German emissions law for incinerators). This is important for Sweden, which is using its state-of-the-art incinerators to clean persistent micro-pollutants, such as dioxins, PCBs and other organochlors, from the environment. That these stringent requirements can be consistently and reliably met over the operating years is one of the key factors to demonstrate the potential of energy-fromwaste. The public perception of energy-from-waste plants in Sweden is very good. Greater environmental awareness of the population, with importance placed on public opinion when shaping policies, means that Sweden's public acceptance of energyfrom-waste is more developed than in other countries.

Strict Swedish emissions controls have also largely reassured the public that energyfrom-waste can be operated as an environmentally sound industrial practice.

#### A New Approach

Högdalenverket was tested under Sweden's Environmental Protection Act by the National Franchise Board. There was very little opposition to Högdalenverket's waste management strategy since the environmental impact is, and is perceived to be, minimal.

Public consultation measures undertaken by Högdalenverket included:

- community meetings
- local media coverage
- visits to the plant



Evaluation





The Högdalenverket site near Stockholm

# Appendix 6: Gaining Public Acceptance: Hamm, Germany

Hamm is situated in the north of Germany in Nordrhein-Westfalen about 100 km from Düsseldorf. The town uses 245,000 tonnes of waste from 586,000 inhabitants from Hamm and the surrounding area to produce 85,000 Mwh electricity annually. The energy-from-waste plant at Hamm is the cleanest private facility in Germany. Work to modernise the plant was started in 1991 and completed in 1994. In 1995 there were 94 staff working at the plant.

#### Vaste Management Strategy

### **Public Perception**

Hamm's waste management strategy for domestic and industrial waste includes waste minimisation, composting and energy recovery from waste. Waste Management Deutschland took over the existing plant and staff in 1989 and adapted it to meet the new technological standards (17 BimSchV). It is one of the few private energy-from-waste plants in Germany. When the plant was taken over in 1989, concerns mainly focused on noise, traffic, damage to the environment and health. Modifications were made to the boiler and combustion chamber after tests were carried out together with in-house experts and the universities of Essen and Bochum. These brought the incinerator into line with strict new technological standards (17 BimSchV).



Waste Management Deutschland is part of the Waste Management International group with experience in building and operating 28 energy-from-waste plants worldwide.

Energy-from-waste incineration has become a more acceptable waste treatment method in Germany because there is greater awareness of the relative environmental impact of all options. In fact, German law requires incineration as a method of waste pre-treatment prior to landfill. Strict regulatory controls have helped to increase public confidence in the process.

#### A New Approach

The management of the Hamm energyfrom-waste plant informed the public about their waste management strategy in a very honest and open way. It was possible to visit the plant at any time and there were always people available to answer questions. For example, the names and phone numbers of people in positions of responsibility at Hamm's energy-from-waste plant were distributed in a letter that was sent to every resident in Hamm and the neighbouring areas.

Independent experts conducted studies to inform the public in more detail about Hamm's waste management strategy. The plant's activities comprised:

- group discussions which included a series of presentations
- an open house day giving the public the opportunity to visit the plant and talk to its operators
- local media coverage
- exchange of letters

#### Evaluation

Hamm's open and caring communication strategy was very successful and the plant can now rely on the total support of the community. The public understands that the energy-from-waste plant is treating their own waste in a way that benefits the community, not only in terms of energy recovery. Profits made on the sale of energy are put back into the community.

The plant at Hamm remains close to the people and is currently organising a youth football tournament for the community. An open house day is still held annually.

4

## Reference:

- Allan, G. and Skinner, C. (1991), Handbook for research students in the social science, The Falmer Press, London.
- Associated Energy Projects (AEP) (1995), Proposed Waste to Energy Facility for London Borough of Bexley: Planning Application Supporting Statement, London.
- Bates, J. H. (1997), UK waste management law, Sweet and Maxwell, London.
- Bexley, London Borough (1992a), Town Planning Sub-committee (Special) and Development Committee (Special) on 25th August: Cory's proposed refuse to energy plant.
- Bexley, London Borough (1992b), **Town Planning Sub-committee (Special) and Development Committee (Special) on 25th August: Proposed Sewage Sludge Incinerator.**
- Bexley, London Borough (1995a), Special Planning Control Committee on 31st August: Application by Powergen CHP Ltd. to Secretary of State for Department of Trade and Industry for Waste to Energy Plant.
- Bexley, London Borough (1995b), Special Planning Control Committee: Plan No:95/0062F - Application by Associated Energy Projects plc to construct a new waste to energy combined heat and power plant
- Bexleyheath and Welling Times (April 14<sup>th</sup>, 1994), p1, Cory waste burner plans defeated.
- Bexleyheath and Welling Times (August 27<sup>th</sup>, 1992), p1, Venue victory.
- Bexleyheath and Welling Times (August 6<sup>th</sup>, 1992), p1, Venue cloud looms over inquiry.
- Bexleyheath and Welling Times (December 21<sup>st</sup>, 1995), p7, Contract for waste service.
- Bexleyheath and Welling Times (December 3<sup>rd</sup>, 1992), p3, **Protesters anxious as** burner firm buys land.
- Bexleyheath and Welling Times (February 16<sup>th</sup>,1995), p1, Rivals united in Cory fight.
- Bexleyheath and Welling Times (January 14<sup>th</sup> 1993), p14, Burner inquiry awaits verdict.

Bexleyheath and Welling Times (January 7<sup>th</sup>, 1993), p1, Final days of waste burner

## public inquiry.

Bexleyheath and Welling Times (July 13<sup>th</sup>, 1995), p1, **Burner protest blazes**.

- Bexleyheath and Welling Times (July 7<sup>th</sup> 1994), p1, Cory burner fight is on again.
- Bexleyheath and Welling Times (March 23<sup>rd</sup>, 1995), p1, Groups united against latest burner plans.
- Bexleyheath and Welling Times (May 11<sup>th</sup>, 1995), p1, **Burner foes squaring up for** inquiry.
- Bexleyheath and Welling Times (October 8<sup>th</sup>, 1992), p1, Burner inquiry has been adjourned.
- Bexleyheath and Welling Times (September 7<sup>th</sup>, 1995), p1, **Inquiry will be held into** incinerator.
- Blundy, M, Commercial Manager of SELCHP (1996), Letter sent to the author on November 29<sup>th</sup>.
- Brown, M. (1996), Combined heat and power: postive progress in the UK, Energy Policy, February, pp173-177.
- Burke, T. View from the inside: UK environmental policy seen from a practitioner's perspective, in Gray (1995).
- Carter, N. and Lowe, P. The establishment of a cross-sector Environment Agency, in Gray (1995)
- Cory (1991b), Application to build and operate Belvedere Waste-Fired Power Plant: Volume 2.
- Cory (1996), Centenary Souvenir Issue 1896-1996, Municipal Journal Limited, London.
- Cory Environmental Limited (Cory) (1991a), Application to build and operate Belvedere Waste-Fired Power Plant: Volume 1.
- Davoudi, S. (1999), A quantum leap for planners, Town and Country Planning, January, Vol. 68 No.1.
- Davoudi, S., Questions and Answers in M.E.L. Research (1998).
- Davy, B. (1996), Fairness as Compassion: Towards a Less Unfair Facility Siting Policy, Risk, Vol 7, pp99- 108.
- Department of Environment (DOE) (1994), Sustainable development: The UK strategy, HMSO, London.

- Department of Trade and Industry (DTI) (1994), Energy from municipal solid waste: SELCHP, Lewisham extended renewable energy case study, London.
- DOE (1992), Waste Management Paper No.1: A review of options, HMSO, London.
- DOE(1989), Environmental Assessment: A guide to the procedures, HMSO, London.
- Dorius, N. (1993), Land use negotiation: reducing conflict and creating wanted land uses, Journal of the American Planning Association, Vol 59, No1, Winter, pp101-106.
- DTI (1994), Letter to Cory Environmental Limited on April 12<sup>th</sup> (Reference No: BSE 257/P53/5).
- DTI (1996), Energy from Waste: A guide for local authorities and private sector developers of municipal solid waste combustion and related projects, ETSU, Oxfordshire.
- DTI(1995), Letter to Cory Environmental Limited on November 10<sup>th</sup> (Reference No: BSE 257/P53/8).
- Dunwoody, S. (1994), Community Structure and media risk coverage, Risk, Vol 5, pp193-202.
- ECOTEC (1995), Financial Options for Renewable Energy Projects: case study: Limited Resource project financing for a waste incineration plant, ECOTEC, UK.
- Erith and Crayford Times (July 16<sup>th</sup>, 1992), p1, Cory waste will spread: warns expert.
- Erith and Crayford Times (July 2<sup>nd</sup>, 1992), p3, Swords drawn for incinerator battle.
- Erith and Crayford Times (June 18<sup>th</sup>, 1992), p1, Campaigners win fight for Cory inquiry.
- Erith and Crayford Times (June 25<sup>th</sup>, 1992), p1, Anti-burner groups plan joint tactics.
- Erith and Crayford Times (June 6<sup>th</sup>, 1991), p1, **Burning with anger: Protest grow** over energy plant.
- European Commission (EC) (1998), Research on the Socio-economic aspects of environmental change -summary, Luxemboury.

European EfW Coalition (1996), Gaining public acceptance, Brussels.

- Fiorino, D. J. (1990), Citizen Participation and Environmental Risk: A survey of institutional mechanisms, Science, Technology and Human Values, Vol 15, No 2, Spring, pp226-243.
- Freudenburg, W. R. (1992), Nothing recedes like success? Risk analysis and the organisational amplification of risks, Risk, Vol 3, pp1-10.
- Friedman, S.M. (1994), Error! Bookmark not defined., Risk, pp203-212
- Gandy, M (1994), Recycling and the politics of urban waste, Earthscan, London.
- Gandy, M (1995), Political conflict over waste-to-energy schemes: The case of incineration in New York, Land Use Policy, 12(1), pp29-36.
- Garner, R. (1996), Environmental Politics, Prentice Hall, New York.
- Gerrad, S. (1994), Hazard, risk and waste management: The constant struggle for public tolerability PhD Thesis for East Anglia University
- Gerrad, S. (1994), Hazard, risk and waste management: The constant struggle for public tolerability, PhD Thesis for East Anglia University
- Gray, T. S. (1995), UK Environmental Policy in 1990s, Macmillan Press, London.
- Greater London Council (GLC), (1979), Edmonton Solid Waste Incineration Plant, GLC, London.
- Greenberg, M. (1993), Proving environmental inequality in siting locally unwanted land uses, Risk, Vol 4, pp235-246.
- Greenberg, M., Schneider, D. and Parry, J. (1995), Brown field, a regional incinerator and resident perception of neighbourhood quality, Risk, Vol 6, pp241-250.
- Gubby, T., The statutory sustainable waste strategy and tools for planning, in M.E.L. Research (1998)
- Haigh, N. and Lanigan, C., Impact of the European Union on UK environmental policy making in Gray (1995)
- Healey, P. and Davoudi, S. (1998), **Participation in waste planning: theoretical considerations**, Proceedings of the Third National Conference, M.E.L., Birmingham.
- Johnson, B. B. (1993) Advancing Understanding of Knowledge's Role in Lay Risk Perception, Risk, pp189-201.
- KCC (1998a), A household waste strategy: adopted, KCC.

- KCC (1998b), Kent Waste Local Plan: adopted, KCC.
- Kentish Times (27-Aug-1992), p11, A burning issue.
- Kentish Times (April 13<sup>th</sup>, 1995), p9, Burner bid delayed.
- Kentish Times (April 6<sup>th</sup>, 1995), p3, Burner proposal unites groups.
- Kentish Times (August 11<sup>th</sup>, 1994), p3, **Council could join fight against burner**.
- Kentish Times (August 13<sup>th</sup>, 1992), p3, Anger at choice of venue for burner inquiry.
- Kentish Times (August 18<sup>th</sup>, 1994), p17, Waste deal under offer.
- Kentish Times (August 20<sup>th</sup>, 1992), p3, Council will mount strong opposition to waste burner.
- Kentish Times (August 27<sup>th</sup>, 1992), p11, A burning issue.
- Kentish Times (August 5<sup>th</sup>, 1993), p3, Incinerator gets all clear.
- Kentish Times (August 7<sup>th</sup>, 1991), p8, United front against power burner.
- Kentish Times (December 24<sup>th</sup>, 1996), p5, **Powergen's part in Incinerator scheme** remains in doubts.
- Kentish Times (December 3<sup>rd</sup>, 1992), p5, **Top doctor warns of burner pollution**.
- Kentish Times (January 14<sup>th</sup>,1992), p14, Burner inquiry awaits verdict.
- Kentish Times (January 9<sup>th</sup>, 1995), p8, Campaigners warn of foreign waste threat.
- Kentish Times (July 20<sup>th</sup>, 1995), p5, Angry campaigners fight fire with fire.
- Kentish Times (July 23<sup>rd</sup>, 1992), p3, **Burner campaign hots up as pre-inquiry date** looms.
- Kentish Times (March 27<sup>th</sup>, 1997), p3, **Power company returns incinerator** questionnaire.
- Kentish Times (March 9<sup>th</sup>, 1995), pp8-9, The Burning issue.
- Kentish Times (May 18<sup>th</sup>, 1995), pp6-7, **Burning issue is back again**.
- Kentish Times (May 21<sup>st</sup>, 1992), p3, Health probe into air pollution.
- Kentish Times (May 25<sup>th</sup>, 1995), p9, **Blighted for generations**.
- Kentish Times (November 11<sup>th</sup>, 1993), p3, **Burner verdict now imminent**.

- Kentish Times (November 12<sup>th</sup>,1992), p4, **Burner anger grows**.
- Kentish Times (November 18<sup>th</sup>, 1993), p3, No smoke without fire, claims Griffin.
- Kentish Times (November 19<sup>th</sup>, 1992), p4, Voice of the people.
- Kentish Times (November 26<sup>th</sup>, 1992), p5, **Burner campaign goes into the red**.
- Kentish Times (November 2<sup>nd</sup>, 1995), p7, Officials want more details on waste burner proposal.
- Kentish Times (November 4<sup>th</sup>, 1992), p9, Protesters start burner evidence.
- Kentish Times (October 12<sup>th</sup>, 1995), p.3, Dustbin Burner resisted.
- Kentish Times (October 1<sup>st</sup>, 1992), p3, Burner campaign enlists Euro Expert.
- Kentish Times (October 22<sup>nd</sup>, 1992), p13, **Protesters unhappy at progress**.
- Kentish Times (October 5<sup>th</sup>, 1995), p3, **Tory MP backs council's burner objection** stance.
- Kentish Times (September 10<sup>th</sup>, 1992), p10, Anti-burner groups maintain pressure.

Kentish Times (September 17<sup>th</sup>, 1992), p10, Cory inquiry dates set.

- Kepplinger, H. M. (1994), Error! Bookmark not defined. Risk, pp213-222.
- Kunreuther, H., Slovic, P. and MacGregor, D. (1996), Risk Perception and Trust: Challenges for Facility Siting, Risk, Vol 7, pp109-118.
- Lake, R. W. (1986) **Resolving locational conflict**, Centre for Urban Policy Research, New Jersey.
- Lake, R.W. (1993), **Rethinking NIMBY**, Journal of the American Planning Association, Vol 59, No1, Winter, pp87-93
- Lanouette, W. (1994), Error! Bookmark not defined., Risk, pp223-234.
- Lean, G (1996), Waste not, want not at last a tax everyone likes, Independent September 29<sup>th</sup>.
- Lewisham LB, Director of Economic Development and Estates, (1990), Planning application documents for SELCHP.
- Lidskog, R. (1997), From conflict to communication? Public Participation and Critical Communication as a Solution to Siting Conflicts in Planning for Hazardous Waste, Planning Practice and Research, Vol 12, No 3, pp239-249.

Lidskog, R. and Elander, I. (1992), Reinterpreting locational conflicts: NIMBY

and nuclear waste management in Sweden, Policy and Politics, Vol 20, No 4, pp249-264.

- Linnerooth-Bayer, J. and Fitzgerald, K. B. (1996), Conflicting Views on Fair Siting Processes: Evidence from Austria and the U.S, Risk, Vol 7, pp119-128.
- Linnerooth-Bayer, J. and Löfstedt, R. E. (1996), Fairness and Siting: Introduction to a Symposium, Risk, Vol 7, pp1-2
- Löfstedt, R. E. (1997), Evaluation of Siting Strategies: The Case of Two UK Waste Tire Incinerators, Risk, Vol 8, pp63-74
- London Borough of Lewisham, Director of Economic Development and Estates 1990 Planning application documents for SELCHP Application date: 12th June 89 Completed: 15th Sept 89
- London Planning Advisory Committee (LPAC) (1997), Towards a London Waste Strategy Overview, The Environment Agency and LPAC, London.
- London Waste Regulation Authority (LWRA) (1995), The Waste Management Plan for Greater London 1995-2015, LWRA, London.
- Loram, R. G. (1995a), Renewable energy life after NFFO 3, Energy World, April, pp13 -17.
- Loram, R. G. (1995b), Energy from waste '95, Energy World, July/August, pp15 -16.
- Loram, R. G. (1995b), Energy from waste '95, Energy World, July/August, pp15 16.
- Loram, R. G. (1996), Integrated waste strategy and other musings, Energy World, May, pp15-16.
- LPAC (1998), **Planning for waste in London: Supplementary advice**, Report No. 13/98 Agenda No.7., London.
- Lynn, F. M. (1990), Public participation in risk management decisions: The right to define, the right to know, and the right to act, Risk, Vol 1, pp95-104.
- M.E.L. Research (1998), Proceedings of the Third National Conferences, Birmingham.
- Mazur, A. (1994), Error! Bookmark not defined., Risk, pp189-192.
- McGarity, T.O. (1990), Public Participation in Risk Regulation, Risk, Vol 1, pp103-.114
- Michael Blundy, Commercial Manager of SELCHP (1996) Letter sent to the author

### on 29th November

- Mitchell, C. (1996), Book review: Renewable Energy in the UK: Financing options for the future, **Energy policy**, Vol 1, Jan., p125.
- Network for Alternative Technology and Technology Assessment (Natta) (1997) Natta guide to the NFFO beginners, Natta Newsletter, Vol.97, p29.
- New Scientist (August 3<sup>rd</sup>, 1991), Waste Disposal, p11.
- Newsquest (London) Ltd (August 19<sup>th</sup>,1998), **Chemical leak sparks terror**. http://www.thisissouthlondon.co.uk/thisis\_sl/bexley.
- Newsshopper (August 12<sup>th</sup>, 1998), p1, Chemical Firm Explosion.
- Newsshopper (August 27<sup>th</sup>, 1997), p8, **Powergen pulls plug on deal**.
- Newsshopper (August 5<sup>th</sup>, 1992), pp4-5, Incinerator battle begins in earnest.
- Newsshopper (December 2<sup>nd</sup>, 1992), pp4-5, Cory's land buy-up brings inquiry to an abrupt halt.
- Newsshopper (July 15<sup>th</sup>, 1992), p68, Air pollution fight begins.

Newsshopper (July 22<sup>nd</sup>, 1992), p76, Rally will open clean air fight.

Newsshopper (November 11<sup>th</sup>, 1992), pp7-8, Cory Inquiry: Enters final phase.

- Newsshopper (November 18<sup>th</sup>, 1992), pp4-6, Experts fly in from Europe.
- Newsshopper (November 4<sup>th</sup>, 1992), pp4-6, Clash over definition of the proposed new energy plant.
- Newsshopper (October 21<sup>st</sup>, 1992), pp5-6, Row breaks as design for plant goes for revamp.
- Newsshopper (October 28<sup>th</sup>, 1992), pp4-6, Protesters still ride an ever-changing storm.
- Newsshopper (September 16<sup>th</sup>, 1992), p12, Fury as inquiry plans gag protests.
- Newsshopper (September 23<sup>rd</sup>, 1992), p8, Cory speak out on waste plan.
- Nightingale, R (1993), Inspector report on Belvedere Waste-Fired Power Plant (BWFPP), Department of Trade and Industry, London.
- O'Hare, M Bacow, L and Sanderson, D (1983), Facility Siting and Public Opposition, Van Nostrand Reinhold Company Inc, USA.

Ocean Group (1997), Annual Report and Accounts 1997, London.

Peters, H. P. (1994), Error! Bookmark not defined., Risk, pp241-250.

- Petts, J (1995) ,Management Strategy Development: A case study of community involvement and consensus-building in Hampshire, in Journal of Environmental Planning and Management Vol. 38, No4, pp519-536.
- Petts, J. (1995), Environmental Assessment: Good practice, Construction industry research and information association, London.
- Petts, J. and Eduljee, G. (1994), Environmental impact assessment for waste treatment and disposal facilities, John Wiley and Sons, UK.
- Powergen CHP Ltd (1995), Environmental Statement for the proposed Thameside Energy from Waste Power Station in London Borough of Bexley, Environmental Resources Management, Oxford.
- Powergen CHP Ltd (1997), Thameside Energy from Waste Power Station Regulation 10 Response
- Reid, E (1980), Borax at Belvedere, TEAM Vol 5, Issue 4.
- Renn, O. Webler, T. and Kastenholz, H (1996), Procedural and Substantive Fairness in Landfill Siting: A Swiss Case Study, Risk, Vol 7, pp145-154.
- Renn, O., Webler, T. and Johnson, B. B. (1990), Public participation in hazard management: the use of citizens panels in the U.S., Risk, Vol 1, pp197-206.
- Residents' Group in Bexley (1993), Final Submission to the Public Inquiry for Belvedere Waste-Fired Power Plant, Residents' Group, London.
- Residents Steering Group (1990) Review of the SELCHP Environmental Assessment, Environmental Resources Limited
- Robinson, M. (1992), **The greening of British party politics**, Manchester University Press, Manchester.
- Rose, H., Case studies, in Allan and Skinner (1991).
- Rose, J. B. (1993), A critical assessment of New York City's Fair Share Criteria, Journal of the American Planning Association, Vol 59, No1, Winter, pp97-100.
- Royal Commission on Environmental Pollution (RCEP) (1993), Seventeenth Report: Incineration on waste, HMSO, London.
- Rydin, Y (1993), The British Planning System, Macmillan, London.
- Sandman. P.M. (1994), Mass Media and Environmental Risk: Seven Principles, Risk, Vol 5, pp251-260.

- Santen, A.V. (1993), Incineration: Its role in a waste management strategy for the UK, Waste Planning, No8, pp3-8.
- Schierow, L. J. (1996), Dioxin: Reassessing the Risk, Risk, Vol 7, pp7-18
- SELCHP (1994), Turning waste into Energy, SELCHP, London.
- Shrader- Frechette, K (1990), Scientific method, anti-foundationalism and public decision making, Risk, Vol 1, pp23-33.
- Shrader-Frechette, K. (1995), Evaluating the expertise of experts, Risk, Vol 6, pp115-124.
- Singer, E. & Endreny, P.M. (1994), Error! Bookmark not defined. Risk, pp261-270
- Smith, C. (1993), Waste incineration and the Environment, Waste Planning, Vol 9, Sept, pp7-17.
- South East London Combined Heat and Power Consortium 1989 **Proposed refused** fired combined heat and power plant at Landmann Way in the London Borough of Lewisham: Environmental Impact Assessment
- Street, E. (1997), "EIA and pollution control", in **Planning and Environmental Impact Assessment**, Weston, J. ed, Longman, UK
- Taylor, R (1993), Waste Assessor's Report on Belvedere Waste-Fired Power Plant, Department of Trade and Industry, London.
- The Mercury (April 4<sup>th</sup>, 1991), p1, Riverfront earmarked in secret power plant.
- The Mercury (May 2<sup>nd</sup>, 1991), p7, 'Bonfire' power row smoulders.
- Thomas, D (1990), Power-from rubbish scheme, Financial Times, August 6<sup>th</sup>, p4.
- Thomas, D (1991), **Plans for waste burning power station submitted**, Financial Times, April 11<sup>th</sup>, p11.
- Thompson, P. B. and Dean, W. (1996), Competing conceptions of risk, Risk, Vol 7, pp361-372.
- Thomson, T. (1996), Unsiteability: What Should It Tell Us?, Risk, Vol 7, pp169-178.
- Vari, A. (1996), Public perceptions about equity and fairness: siting low-level radioactive waste disposal facilities in the U. S. and Hungary, Risk, Vol 7, pp181-192.
- Warren Spring Laboratory (1991), Review of Municipal Solid Waste Incineration in the UK: Executive Summary, DTI, London.

- Weir, D (1988), The Bhopal Syndrome: Pesticides, environment and health, Earthscan, London.
- Weisberg, B. (1993), One City's Approach to NIMBY: How New York City developed a fair share siting process, Journal of the American Planning Association, Vol 59, No1, Winter, pp93-97.
- Wolsink, M. (1994), Entanglement of interests and motives: assumptions behind the NIMBY-theory on facility siting, Urban Studies, Vol 31, No. 6, pp851-866