

Waste Planning Applications Guidance on Addressing

Best Practicable Environmental Option (BPEO)



August 2004

**GUIDANCE ON ADDRESSING BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO) AS PART OF THE SUBMISSION OF PLANNING APPLICATIONS FOR WASTE MANAGEMENT FACILITIES.
August 2004**

'Decisions on waste management, including decisions on suitable sites and installations for treatment and disposal, should be based on a local assessment of the Best Practicable Environmental Option.' *Waste Strategy 2000*

INTRODUCTION

This guidance is intended to assist planning applicants and Development Control in their consideration of how development proposals for waste facilities implement the BPEO strategy in advance of preparation of the Worcestershire Waste Local Plan (Waste Development Framework) and the adoption of the Herefordshire Unitary Development Plan.

A study into the Best Practicable Environmental Option (BPEO) for the management of wastes arising in Worcestershire and Herefordshire was carried out between November 2002 and May 2003. It was based on forecast arisings of the three major waste streams; municipal solid waste

(MSW) commercial and industrial waste (C&I) and construction and demolition waste (C&D) in 2015/16. Each BPEO assessment considered a range of environmental criteria, as required by guidance, as well as financial costs and reliability of delivery, which comprise the practicability element of the concept. In order to make the assessment open, transparent and consultative, a comprehensive public consultation exercise was undertaken on the various options and the criteria for assessment. Conclusions from this study have informed a strategy for the management of wastes arising in the two Counties.

Worcestershire County Council and the Herefordshire Council adopted the BPEO strategy at their respective Cabinet meetings held on 10 July 2003. It is intended to be instrumental in the preparation of waste policy, and in determining planning applications for waste management facilities.

The Final Technical Report, together with associated reports and updates, can be viewed at:

www.worcestershire.gov.uk/home/cs-environment/cs-env-bpeo-waste-man and www.herefordshire.gov.uk/bpeo.

CONTEXT OF BPEO

The BPEO concept was first outlined in the Fifth Report of the Royal Commission on Environmental Pollution (RCEP) in 1976, as an extension to the concept of 'Best Practicable Means', a principle used in air pollution control since the Alkali Act in 1874.⁽¹⁾

The RCEP's Twelfth Report, '*The Best Practicable Environmental Option*' (1988) developed the concept, showing that it involved a balancing of criteria, including technology, financial costs and pollution impacts. This Report provides the commonly quoted summary of BPEO as:

'the outcome of a systematic, consultative and decision-making procedure which emphasises the protection and conservation of the environment across land, air and water. The BPEO procedure establishes, for a given set of objectives, the option that provides the most benefits or the least damage to the environment as a whole, at acceptable cost, in the long-term as well as the short-term.'⁽²⁾

The approach promotes the identification of the option that provides the optimum balance in terms of emissions and discharges to land, air and water, so as to minimise harm and ensure the protection of the environment, taking account of what is affordable and practicable.

(1) *Air Pollution Control: An Integrated Approach*. Fifth Report of the Royal Commission on Environmental Pollution, 1976. Paragraph 14, page 3; Paragraph 271, page 76; and paragraph 275, page 77.

(2) *Best Practicable Environmental Option*. Twelfth Report of the Royal Commission for Environmental Pollution, 1988. Paragraph 2.1, page 5.

THE REQUIREMENT TO ASSESS THE BPEO

The concept was introduced into UK legislation through Part I of the Environmental Protection Act 1990, specifically for processes regulated under Integrated Pollution Control (IPC). Here, BPEO applied to pollutant emissions from individual sites, and was closely related to concept of Best Available Techniques Not Entailing Excessive Cost (BATNEEC).

BPEO is at the core of the Government's policies for sustainable waste management presented in *Waste Strategy 2000*, which describes the concept as '*...the technique that should be used for making waste management decisions...*'⁽³⁾ Part 2 of *Waste Strategy 2000*, includes a section on *Determining the Best Practicable Environmental Option*. More recently, the Strategy Unit's 2002 report *Waste Not Want Not* defines the '*secure management of waste in line with the BPEO and their own local strategy*'⁽⁴⁾ to be a local authority responsibility.

Planning Policy Guidance Note 10: Planning and Waste Management (PPG 10) clearly states that: '*WPPAs should consider the provision of waste management facilities within the context of ... the best practicable environmental option...*'⁽⁵⁾

(3) *Waste Strategy 2000*. Part 2, paragraph 3.2, page 27. DETR, May 2000.

(4) *Waste Not Want Not - A Strategy for tackling the waste problem in England*. Box 8, page 45. Strategy Unit, November 2002.

(5) Planning Policy Guidance Note 10: Planning and Waste Management. Paragraph A1. DETR, October 1999.

Consideration of BPEO is becoming prevalent in **case law** too. In two recent Public Inquiries, both for the development of energy from waste plants, the Inspectors' decisions discussed BPEO. At Kidderminster the Inspector observed, in concluding that there had been no realistic BPEO in that case, that any such assessment should have followed the *Waste Strategy 2000* approach.⁽¹⁾ Whilst the Inspector at Hull,⁽²⁾ concluded that the proposal could not be demonstrated as forming part of an integrated waste management strategy, and did not represent the BPEO for dealing with municipal wastes in that area.

THE BPEO STRATEGY FOR WORCESTERSHIRE AND HEREFORDSHIRE

The BPEO assessments were based on forecast waste arisings of the three waste streams in 2015/16 from both Counties, and considered a range of environmental and practicability criteria. The BPEO for each waste stream is outlined below.

Municipal Solid Waste (MSW)

The BPEO for MSW meets the statutory targets for recycling and composting household waste set by Government as part of the Best Value regime, and the non-statutory targets for the recovery of municipal waste set out in *Waste Strategy 2000*, and has been defined so as to meet the diversion requirements in Article 5 of the Landfill Directive.

This option requires:

- a combined level of recycling and composting of at least 33% of MSW;
- a maximum of 22% MSW disposed of to landfill; with
- the balance being managed through a form of thermal treatment.

Commercial and Industrial Waste (C&I)

The BPEO for C&I waste complies with the *Waste Strategy 2000* target that aims, by 2005, to reduce the amount of C&I waste landfilled to 85% of that which was landfilled in 1998.

This option requires:

- increasing recycling to at least 73% of C&I waste;
- a maximum of 23% C&I waste disposed of to landfill; and
- maintaining the current level of thermal treatment at 4%.

(1) Appeal Ref. APP/EI855/A/01/1070998. British Sugar Site, Stourport Road, Kidderminster. Paragraph 128, page 24; and paragraph 142, page 27.

(2) Appeal Ref. APP/V2004/A/02/1082545.

Construction and Demolition Waste (C&D)

The BPEO for C&D waste involves a year on year increase in recycling and subsequent reduction in landfill.

This option requires:

- recycling at least 76% C&D waste; with
- a maximum of 24% of C&D waste disposed of to landfill.

FACILITY REQUIREMENTS

The options chosen in the BPEO assessment require separate management facilities for Worcestershire and Herefordshire. Therefore, careful consideration will need to be given to the size and allocation of capacity for each new facility.

Table A Indicative Facility Requirements for Worcestershire and Herefordshire

WASTE STREAM	FACILITIES		
	Materials Recovery Facilities (MRF)	Composting	Thermal Treatment
Municipal Solid Waste	2	2	2
Commercial and Industrial Waste	2	0	0
Construction and Demolition Waste ⁽¹⁾	0	0	0

To meet the **BPEO for MSW** would currently require an additional materials recovery facility (MRF) and composting facility in North Worcestershire, together with a thermal treatment facility in Central Worcestershire. In Herefordshire, an additional MRF, composting facility and thermal treatment facility would be required. Neither authority requires additional landfill capacity.

(1) No new facilities are indicated as much of this waste stream is expected to be managed using mobile plant.

It should be noted that thermal treatment could include technologies such as gasification (a process which uses indirect heat to convert materials into fuel gases) or pyrolysis (a process which uses indirect heat to convert materials into gases and liquids, both of which are used as fuels) as well as incineration with energy recovery. Gasification and pyrolysis technologies are still developing and could well come forward during the period to 2015/2016.

If, during the timeframe of the BPEO, it becomes possible to increase recycling and composting rates generally (which may in turn require larger or additional facilities) the need for two thermal treatment facilities, and/or the size of those facilities, could be re-assessed.

To meet the **BPEO for C&I** waste requires increased recycling rates, achieved through two additional MRFs. This would also enable the two authorities to meet the targets for the reduction of landfill set out in *Waste Strategy 2000*. The MRFs should, where possible, be co-located with similar facilities as required for the MSW stream.

The **BPEO for C&D** waste is to reduce landfilling and increase recycling. Any other management methods are likely to be inappropriate due to the nature of this waste stream. The waste treatment is likely to be carried out on construction or demolition sites, existing quarries, or at other waste management facilities, using mobile plant.

It is important to note that *Table A* above is only an indication of the number of new facilities that may be required. The adopted BPEO strategy may be accomplished through either a lesser number of larger capacity facilities, or a greater number of smaller facilities. An indication of appropriate capacity ranges for each type of facility is provided below. It should be remembered that the economies of scale for thermal treatment plants are much more critical than for MRFs and composting facilities.

Composting	10 000 tpa - 60 000 tpa
MRFs	30 000 tpa - 80 000 tpa
Thermal Treatment	50 000 tpa - 114 862 tpa

It is also important to note that there are many advantages to co-locating facilities, and that it is common for MSW and C&I waste to be treated in the same facility. As such, the facilities in *Table A* for these two waste streams might be combined on a smaller number of sites.

PROVIDING THE BPEO STRATEGY: ALTERNATIVE PROCESSES OR TECHNOLOGIES.

It cannot be expected that eventual waste management arrangements will exactly match a particular BPEO in terms of process or technology. Both Councils acknowledge that it will be important to retain an element of flexibility when considering applications for waste management facilities. In this respect proposals for alternative processes or technologies will need to indicate the number, size, capacity and broad locations of intended facilities. This will enable an assessment to be made of how the proposal may contribute to the adopted BPEO Strategy (see below). Processes or technologies put forward as an alternative to those that comprise the BPEO for a particular waste stream will have to clearly demonstrate how the impact of that process, or technology, will be equal to, or not significantly greater than, those that have been modelled for the adopted strategy.

CONTRIBUTING TO THE BPEO

A framework for assessing how usefully the proposed development contributes to the adopted BPEO strategy is provided. This comprises of a series of questions with guidance notes.

How does the proposal contribute to the strategy? ... Stage one

Both planning authorities will assess any significant waste management proposal against the set of criteria set out in *Table 1*. Applicants are encouraged to discuss their proposals with the relevant planning authority at an early stage, to ensure their submitted application contains all relevant information.

Applicants should ensure that their proposals demonstrate positive and useful contribution toward the approved BPEO strategy. The following set of questions is not necessarily an exhaustive list, but it addresses the key issues in considering the appropriateness, or otherwise, of any significant waste management facility within the context of the approved BPEO strategy.

Capacity

The approved BPEO strategy establishes minimum levels of recycling/composting. Exceeding the minimum levels is to be encouraged. However this should not result in a significant overprovision in the capacity for recycling viz-a-viz the capability to recycle/compost MSW arisings within the two counties; nor impact adversely on the viability of providing other facilities required to achieve integrated waste management within the two counties.

Exceeding the maximum percentages identified for thermal treatment, and disposal to landfill, would not be the BPEO and should be avoided.

Questions

1. Does the BPEO strategy require additional capacity or limit additional capacity?
2. Does existing capacity meet the BPEO strategy requirements?
3. What is the capacity of the plant proposed and how proven is the technology ?
4. If additional capacity is required, then does the proposed facility provide a sensible contribution to the overall need for this management route?

Composting

The modelled BPEO strategy is based on 16.5% composting of MSW arisings in 2015/16, which amounts to 84 232 tonnes. *Table A* indicates a need for two additional composting facilities. Each might be expected to contribute 10 – 60 000 tpa capacity, with the remainder made up of small scale community and on-farm composting schemes.

Materials Recovery Facilities (MRF)

The modelled BPEO strategy is based on increased recycling for all waste streams. As such, four additional MRFs are indicated as necessary to enable increased recycling for MSW and C&I wastes. Each new facility might be expected to contribute to 30 - 80 000 tpa capacity, whilst MSW and C&I wastes may be treated at the same facility.

Thermal Treatment

Thermal Treatment and Other Technology proposals will require careful consideration, particularly with respect to economies of scale in relation to each plant, and how capacity requirements will be split between the two Counties. The BPEO strategy establishes that the balance of MSW arisings, taking account of recycling/composting and landfill, that is a maximum of 45% of MSW (229 725 tpa) should be managed through thermal treatment, and identifies an indicative need for two plants, one in

each County. Economies of scale are likely to affect the practicability of any plant and an illustration of the economies of scale for energy from waste plants is shown at *Annex A*.

Pilot Facilities

Conversely, if a plant were to be proposed as a pilot project, it should only deal with a very small fraction of MSW, about 2% maximum. Pilot facilities, for novel technologies, should not be discounted simply on the basis that the Strategy has not identified them as the BPEO. They could contribute to the BPEO by advancing new technologies for waste management, but should be limited in size and capacity.

Location

The proximity principle forms one component of the BPEO, requiring that waste be disposed of as near to its place of origin as possible. This study is not intended to be a full assessment of the proximity principle – but a consideration of the proposed location in the context of existing facilities and waste arisings.

BPEO is concerned with local environmental preferences, and total road transport distance was included as an assessment criterion in the BPEO study as a proxy for the concern over road traffic congestion in the area.

There are many advantages to co-locating facilities and it may be appropriate to co-locate a MRF and a composting facility at a thermal treatment facility. It is also common for MSW and C&I wastes to be treated in the same facility.

Any new facility will only be planned and built if demand for that facility exists. Consequently, if waste minimisation efforts are more effective than predicted the size and/or number of facilities required in the future will be reduced.

To ensure any new facility is compliant with the approved BPEO it should be demonstrated that it is suitably located, as well as managing an appropriate amount of waste.

Questions

1. Is there an existing facility in the vicinity of the proposed development?
2. Would the proposal provide the same, or different, operation as any nearby existing facility?
3. If operations are different – is there any synergy between them?
4. If operations are the same – is there a need for two facilities within this area?
5. Where is the proposed facility intending to receive waste from?
6. Is this an appropriate area having regard, for example, to the final disposal of any residual materials arising from the treatment facility?

Essentially, these questions seek to discover if the proposal deals with waste from within an appropriate geographical area. The concern is that a proposal may appear to contribute to the BPEO by providing additional recycling or composting capacity (for example) but in reality it involves transporting waste further than is necessary. However, this consideration will not be so relevant for thermal treatment proposals. As the BPEO assessment only indicates a need for two facilities between the two Counties, it will therefore be a more strategic, than local, operation.

IS THE PROPOSAL BPEO COMPLIANT?

The following *Table 1* should now be completed to establish what is being proposed in terms of operation, and how that fits in with existing facilities, **before** moving onto *Stage Two*.

TABLE 1 Stage one: Details of proposed and existing facilities

NB: The aim of the table is to ascertain basic information about a proposal. It does not imply a preference order between technologies.

<i>Operation</i>								
MSW	C&I	C&D		What is proposed?	Capacity (tpa) Proposed	Existing	Broad Location (eg North, East, South West or Centre of County) Proposed	Existing
Min 33% <i>Indicative need for new facilities</i> 2 MRFs 2 compost sites	Min 73% <i>Indicative need for new facilities</i> 2 MRFs	Min 76% <i>Indicative need for new facilities</i>		Recycling and Composting				
Up to 45% <i>Indicative need for new facilities</i> 2 plants	Existing 4% <i>Indicative need for new facilities</i> None	None <i>Indicative need for new facilities</i> None		Thermal treatment				
To meet BPEO strategy targets <i>Indicative need for new facilities</i> Dependent upon input to strategy	To meet BPEO strategy targets <i>Indicative need for new facilities</i> Dependent upon input to strategy	To meet BPEO strategy targets <i>Indicative need for new facilities</i> Dependent upon input to strategy		Other technology				
Max 22% <i>Indicative need for new facilities</i> None	Max 23% <i>Indicative need for new facilities</i> None	Max 24% <i>Indicative need for new facilities</i> None		Landfill				

How does the facility contribute to the strategy? ... Stage two

If the conclusion drawn from *Stage One* is that the proposed development sensibly contributes to the Strategy, then it could be BPEO compliant. A series of questions, looking at what the waste management facility is intended to achieve, now need to be asked, to determine if the proposal is the BPEO for the particular waste stream it proposes to deal with. *Table 2* summarises this process.

Part 1 Practicability

Details of the proposed technology should be assessed to ensure the proposed facility is the BPEO. These include: what are the inputs and outputs; is it reliable; what is the end product; and what is the market or final disposal place of the end product(s).

For materials recovery/sorting and composting proposals, the main effect will result from the nature of the input material – ‘clean’ (pre-sorted) or ‘dirty’ (unsorted) for a MRF; mixed or green waste for composting – as this will affect the end products. The main assessment will be achievement or bettering of recycling/composting targets and consideration of the resultant materials; in particular how the reclaimed materials are utilised (such as recovered, reused, made into new products or used as a refuse derived fuel) or finally disposed of.

For thermal treatment there are a number of technologies, which are proven in terms of their reliability, but new and innovative technologies will continue to come forward and require assessment. The use of

existing technologies will also need consideration, for example Anaerobic Digestion (AD) has a successful history for green waste, but not necessarily for mixed wastes.

Questions

1. What is the facility proposing to accept in terms of waste material?
2. What is the recovery rate for the facility, and what materials are recovered?
3. What is the end product and is there a market for it?
4. Does it provide a significant diversion from landfill?
5. How are recovered/residual materials finally disposed of after treatment/processing?
6. Is there another operational or reference plant in the UK? If so where, and what is its scale and throughput?

Thermal treatment plant should be producing energy that can be used to power the facility and can be exported to the national grid. However, mechanical-biological treatment (MBT) plant would produce a new material from the waste. This material may be used to fuel another plant as a refuse derived fuel (RDF) or may be recognised as a biologically stable product that can be landfilled, it may also be used as a raw material to make new products with.

Transporting waste out of County to another thermal treatment plant would not be achieving the aims of self-sufficiency or the proximity principle. Disposing of large amounts of material to landfill will not contribute to diversion targets, and would be very unlikely to be the BPEO, particularly if it would lead to the amount of waste deposited in landfill being more than the 22% specified in the BPEO Strategy.

Question 6 above is intended to help assess the reliability of the proposed treatment plant. Novel and innovative technologies need to demonstrate practicability, cost-effectiveness and that the Strategy targets can be achieved. Scale is important to usefully compare proposals. Alternatively a pilot scheme may be proposed. Throughput refers to the type and quantity of waste to be treated at the facility – it is not a useful exercise to compare an AD plant that only accepts agricultural and green waste with an AD plant proposed to accept mixed MSW.

If the proposal satisfies these practicability criteria, then it could be the BPEO and its environmental effects can then be considered.

Part 2 Environmental effects

This assessment of environmental effects in determining the BPEO for a waste stream, is not intended to equal that of an environmental impact assessment, although it is recognised that there may be some overlap between the two requirements. It is looking at whether there are significant differences, in terms of environmental impacts, between what is proposed and those technologies examined in the BPEO study.

It is possible that larger facilities may also require a statutory Environmental Statement and the two aspects could usefully be combined.

THE ADOPTED BPEO WASTE STRATEGY

The adopted strategy establishes that:

- composting, recycling, and thermal treatment technologies are the BPEO for municipal solid waste;
- recycling is the BPEO for C&I waste and C&D wastes.

Careful consideration should be given to the environmental effects of any proposal, whether or not it is one of the treatment technologies identified by the BPEO strategy. However, if a materially different technology is proposed, and there are likely to be significant adverse environmental effects, then the proposal will be very unlikely to be the BPEO.

Is the proposal the BPEO for the waste stream?

If the proposal has passed the assessment at *Table 1* then it may be part of the BPEO strategy. However, *Table 2* is concerned with the details of the technology proposed, and to determine if it really does contribute usefully to the adopted strategy.

Table 2 should be completed, with reference to these notes. It is likely that answers will need to be provided on a separate sheet, as full justification will be required to demonstrate whether or not a proposal contributes positively and usefully to the adopted BPEO strategy.

Next Steps

The proposal will then need to be assessed in terms of specific siting issues, including the possible need for an Environmental Statement under the relevant Environmental Impact Assessment Regulations, as part of the normal development control considerations in assessing the planning application.

It is strongly recommended that pre-application discussions with the County Planning Authority are undertaken about any significant waste management proposals.

Most proposals for significant waste management facilities are likely to be subject to the requirements of Environmental Impact Assessment under The Town and Country Planning (Environmental Impact Assessment) Regulations 1999 (as amended). Further advice on these requirements can be found in the following publications:

DETR Circular 2/99 - The Town and Country Planning
(Environmental Impact Assessment) Regulations 1999.

DETR (2000) Environmental Assessment: A Guide to the Procedures.
DOE (1994) Evaluation of Environmental Information for Planning
Projects: A Good Practice Guide.

TABLE 2 Stage Two: Detailed assessment - Assuming the proposal has passed Stage One testing

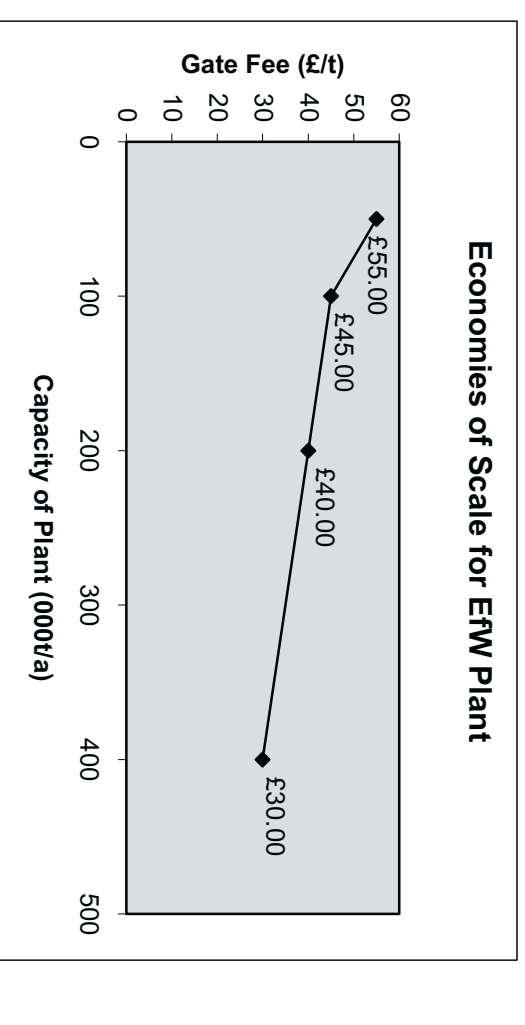
		Part 1		Part 2		BPEO?
Operation	Technology Examples	Practicability Questions	Answers require justification	Contribution to strategy?	Environmental effects Does the proposal vary materially to that examined in the BPEO report?	Big tick if proposal is the BPEO
Recycling	Clean MRF	1. What is the input? (material rather than quantity) 2. What is recovery percentage?		Good: BPEO	Unlikely to be very different to that proposed in strategy	
	Dirty MRF			Poor: not BPEO stop assessment		
Composting	Green waste	2a. What is the output? (material rather than quantity) 3. What is the end product? 3a. Is there a market?		Good: possibly BPEO	None - BPEO Yes - with insignificant effect: BPEO Yes - with detrimental effect: not BPEO stop assessment	
	Mixed waste			Poor: not BPEO stop assessment		
Thermal Treatment	Mass burn	4. What is the recycling/ composting percentage? 5. What is the final disposal place and method? 6. Is there any operational plant in the UK? 6a. What is its scale? 6b. Has the technology a proven reliability?		Good: possibly BPEO	None - BPEO Yes - with insignificant effect: BPEO Yes - with detrimental effect: not BPEO stop assessment	
	Fluidised bed			Poor: not BPEO stop assessment		
Other Technology Examples	Pyrolysis	Autoclaving Anaerobic Digestion MBT with RDF combustion		Good: possibly BPEO	None - BPEO Yes - with insignificant effect: BPEO Yes - with detrimental effect: not BPEO stop assessment	
	Gasification			Poor: not BPEO stop assessment		

Annex A

Economies of Scale for EFW

ECONOMIES OF SCALE FOR EFW

Capacity of Plant (000t/a)	Gate Fee (£/t)	Capital Cost range (£m)
50	55	15 - 20
100	45	25 - 35
200	40	40 - 60
400	30	75 - 100



Source:

Energy from Waste: A good practice guide. CIWM, November 2003.

The report quotes its source of these figures as Cabinet Office, 2002.