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West of England Waste Management & Planning Partnership

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Joint Residual Municipal Waste Management Strategy

May 2008

Bath & North East Somerset Council

Bristol City Council

North Somerset Council

South Gloucestershire Council

Executive Summary

The West of England Waste Management and Planning Partnership (The Partnership), consisting of Bath & North East Somerset (B&NES), Bristol (BCC), North Somerset (NS), and South Gloucestershire (SG) Unitary Authorities, has developed this Joint Residual Municipal Waste Management Strategy (Joint Waste Strategy) to define the strategic framework for managing residual waste over the period 2007 to 2027 through a four phase approach.

This Joint Waste Strategy has been developed in response to the significant challenges facing the management of municipal waste in the UK; including local, national and international obligations in terms of environmental targets and policies.

The Landfill Allowance Trading Scheme targets have prompted a focus for the Partnership to develop a new strategy to deal with the challenges of diverting biodegradable municipal waste from landfill. This strategy must establish a framework to deliver the mechanisms, contracts and infrastructure needed to meet future targets.

Preparation of this Strategy has been underpinned by the following 'vision' agreed by all four of the Partnership authorities:

The four local Authorities in the West of England area are working together to develop, in consultation with local residents and other stakeholders, a range of facilities for the treatment of residual municipal solid waste.

These will deliver significant reductions in the amount of waste, particularly biodegradable waste, being sent to landfill sites. They will also maximise the efficient recovery of resources and encompass environmental, social and economic factors.

Each local authority will maintain a long term commitment to increase waste reduction, reuse, recycling and composting, and will move toward a longer term aim of achieving zero waste.

This vision statement highlights the authorities' dedication to waste management and in a very general sense it sets an outline for achieving the desired goals. Currently the Partnership authorities perform well (in a UK context) in the areas of waste minimisation, recycling and composting but there is still a quantity of residual waste that will need to be managed and ultimately disposed of. This waste is usually collected from householders in black bags or wheeled bins, or is deposited by them at household waste recycling centres and is described as 'residual waste'. As this is a Municipal Solid Waste (MSW) strategy, commercial and industrial (C&I) waste, which comes under the local authorities' control, is also considered. This Strategy only considers the management of residual MSW and it is intended to sit alongside the authorities' existing waste management strategies, which include schemes for waste minimisation, reuse and recycling.

Phase 1 – Waste reduction and source segregation
Immediate and ongoing

Phase 1 of this Strategy focuses on waste reduction and source segregation in the immediate future and ongoing. Each authority retains individual responsibility for waste minimisation activities, recycling and residual waste collection services as these areas are deemed best designed and delivered on a local basis, responding to local residents' views and wishes. However, the Partnership has produced a Joint Position Statement on Reduce, Reuse and Recycle which summarises past and future planned activity in those areas.

The Joint Position Statement serves to illustrate the history of how each council has progressed to its current position. The agreed programmed service improvements and future action plans to achieve or surpass the new national targets. An overarching aim is to reduce the residual waste that remains to be disposed of through treatment and/or the recovery of energy and/or materials.

Foremost in importance in dealing with waste is the Partnership's commitment to adhere to the Waste Hierarchy. This principle firstly requires maximum emphasis be placed on reducing the amount of waste produced, followed by policies to encourage reuse wherever possible and to offer recycling or composting opportunities for materials that cannot immediately be reused.

A proposal for an enhanced programme of joint waste reduction and recycling activity has been drafted and a business case is to be produced in the first quarter of 2008. There is considered to be significant scope for joint publicity campaigning to assist in further raising awareness of reduction, reuse and recycling initiatives. The Partnership is committed, as a minimum, to meeting the national household waste recycling targets of 40% by 2010, 45% by 2015 and 50% by 2020.

The Partnership will explore and deliver further opportunities to improve source segregation performance through their Programmed Service Improvements (PSI).

Phase 2 – Interim treatment to meet short-term LATS allowances
Seek to commence contract process in 2008

Phase 2 focuses on the Landfill Allowances from now until at least 2015. The required landfill diversion will be achieved by implementation of a suitable contract in 2010/11.

Modelling has been undertaken to project future waste arisings and source segregation performance to meet the requirements of the Landfill Allowance Trading Scheme. This has shown that without some form of secondary waste treatment facility the Partnership will fail to meet the targets from 2010/11 onwards. This could potentially lead to the Authorities having to purchase permits or face fines which would have a major financial implication for the Authorities.

The Partnership is planning a contingency LATS trading scheme for the period to 2015, but recognises that securing diversion through treatment is preferable.

Soft market testing has been conducted to explore available treatment technology solution(s) to meet their short-term shortfall against their LATS allowances. The soft market testing revealed that at present, there is no existing facility in the area. The Partnership is therefore progressing discussions with industry to explore in more detail available treatment technology solution(s) to meet the short-term shortfall against LATS allowances.

The treatment technology is not yet determined. Through soft market testing the Partnership has established that the market is likely to offer innovative technologies including biostabilisation (Mechanical Biological Treatment (MBT)/ Biological Mechanical Treatment (BMT) type technology), or autoclaving processes. Whilst the deliverability risks of these technology options would be considered through a competitive tendering exercise, these technologies were appraised in the Technology Options Appraisal.

The Partnership cannot yet establish a specific contract duration, but realises the short term LATS risk is from 2010 to 2015. It is however likely that a contract will be between five and ten years duration to realise best value. Therefore this option may overlap with Phase 3 described below.

B&NES may seek to extend Phase 2 beyond 2015 whilst also pursuing a long term residual waste solution that is outside of a PFI contract (see B&NES Phase 3)

The other Partnership members BCC, NS and SG will pursue Phase 2 with the intention of subsequently procuring a long term residual waste solution supported by Defra PFI credits (see BCC, NS and SG Phase 3).

Phase 3 – Meeting 2020 LATS diversion
Commence procurement, to implement a contract in 2011

Phase 3 of this Strategy recommends that BCC, NS and SG adopt as its Reference Project, Energy from Waste in order to meet 2020's landfill allowances (with a risk buffer). This Reference Project will be used as a yard stick against which tenders will be evaluated.

The requisite capacity is likely to be around 160,000 tonnes, which is deliberately sized so as not to present a barrier to future improvements in waste reduction, reuse, recycling and composting. This facility is sized to meet the estimated shortfall against LATS allowances to 2020 when BCC, NS and SG have known and definite obligations to divert BMW from landfill. Modelling currently indicates that a 160,000tpa capacity EfW facility would enable BCC, NS and SG to landfill BMW within its LATS Allowances (allowing for a risk buffer).

Where sites and market opportunities are favourable, BCC, NS and SG would actively wish to investigate the potential for Combined Heat and Power output from an EfW facility

BCC, NS and SG recognise there is no shortcut to getting a major contract procured, a facility planned, consented constructed and commissioned. The current programme developed by the authorities suggested that a facility may be operational by 2015. This programme was confirmed during the soft market testing exercise by the industry.

The Technology Options Appraisal, the consultation, the funding options appraisal and industry representatives at the soft market testing have suggested that EfW is a preferable and deliverable technology option.

BCC, NS and SG have considered its LATS risk to 2020, it has considered the deliverability of a facility, and it has considered the sites being short listed through the planning process. Findings show that not over-sizing a facility i.e. building to a capacity that meets LATS allowances to 2020 (with a risk buffer), allows flexibility for changes in waste arisings, and critically does not prevent increased source segregation performance i.e. does not present a future barrier to waste reduction, reuse and recycling. Phase 3 encapsulates this flexibility and would complement a longer running technology option contract under Phase 2 [1].

Phase 3 will form the basis of an Expression of Interest to Defra for PFI credits

B&NES Phase 3 – 2020 LATS diversion through best technology treatment option

B&NES Cabinet have considered proposals for the four Phase approach and is fully supportive of working in partnership for Phases 1, 2 and 4, however, B&NES does not wish to participate in Phase 3.

B&NES intend to work in partnership to procure Phase 2 facilities to treat its residual waste stream for a 10 year period (2010-2020) whilst during this time developing further zero waste initiatives and source segregation of recyclables.

B&NES will then consider with the partnership whether an extension to the Phase 2 contract is appropriate, assess any viable alternatives that may exist at that time, and work jointly to determine if the partnership will move into a Phase 4 procurement at around 2025.

Phase 4 – Longer-term treatment contract
Commence procurement once Phase Three is implemented

Beyond 2020, ***Phase 4*** of the Strategy involves building and developing further waste treatment facilities/processes to continue to increase waste diversion, explore new treatment technologies and use the lessons learned from previous Phases to continue to meet targets.

[1] This size is based on the technical mass balance and waste flow modelling updated from the Technology Options Appraisal. This takes account of the 2006/07 revised PSI, housing allocations in the draft Regional Spatial Strategy and LATS allowances to 2020.

In the longer term, beyond 2020, there is great uncertainty in the waste industry about which emerging technologies will be proven; including the pyrolysis/ gasification technology being piloted as part of the Defra New technologies Demonstrator Programme. Equally, we have yet to discover how the LATS will function or what quantity of residual waste there will be. These uncertainties are inherent in Phase 4 and in effect this Phase will be determined by the outcomes of previous Phases and industry development.

Future sensitivity modelling may indicate that additional facility(s) could be phased to track future LATS risk. The sizing and number of facilities will take account of any future waste reduction and improvement in source segregation performance. It will also take account of outcomes from Soft Market Testing, from implementing Phase 3, performance of the New Technologies Demonstrator Project pilot plant, sites and planning issues arising from the adoption of the Development Plan, and sensitivity modelling of impact of multiple sites/ multiple modules. Facility(s), if required, are anticipated to be operational by 2018/19. No treatment technology is prescribed, though there may be a link with either Phase 2 or Phase 3.

Contents

1 Introduction

1.1 The Purpose of this Strategy

This Joint Residual Municipal Waste Management Strategy (referred to as the "Joint Waste Strategy") has been produced by the West of England Waste Management and Planning Partnership (referred to as the "Partnership"), consisting of Bath & North East Somerset Council (B&NES), Bristol City Council (BCC), North Somerset Council (NS), and South Gloucestershire Council (SG).

This Strategy is intended to create a framework for managing residual municipal solid waste (MSW) generated in the West of England area in a sustainable manner. The Partnership recognises that waste management is changing rapidly and that a local authority's role now extends beyond more than the simple collection and disposal of waste.

National and European legislation is the driving force behind the need to manage waste in a more sustainable way. Local Authorities are required to reduce the amount of biodegradable municipal waste (BMW) that they dispose of to landfill in line with the European Landfill Directive targets or face economic penalties under the Landfill (Scheme Year and Maximum Landfill Amount) Regulations 2004.

The Department for the Environment, Food and Rural Affairs (Defra) policy guidance states that *Long-term strategic planning is vital to all Authorities in securing both the infrastructure and service developments necessary to deliver more sustainable waste management. It is Government's view that all Local Authorities should either produce or contribute to a strategy or equivalent* [2]. The Partnership was formed in 2005 with the intention of developing a strategy to manage residual waste, to provide the necessary infrastructure for managing the waste in a more sustainable manner and to meet increasingly demanding legislation.

It is fundamental that a waste strategy is in place to steer all important decisions and commitments. The Joint Waste Strategy is intended to provide a structure for the management of residual waste in the long-term.

This Joint Waste Strategy only considers the management of residual municipal waste and it is not intended to replace each Authority's existing and emerging waste reduction, reuse and source segregation strategies. The Partnership has prepared a Joint Position Statement on Reduce, Reuse and Recycle (referred to as the 3Rs statement) to illustrate each Authority's achievements to date in that area and agreed future plans. This area remains the responsibility of each of the partnering authorities along with collection services. A proposal and business case for a joint waste reduction campaign and publicity work is in development.

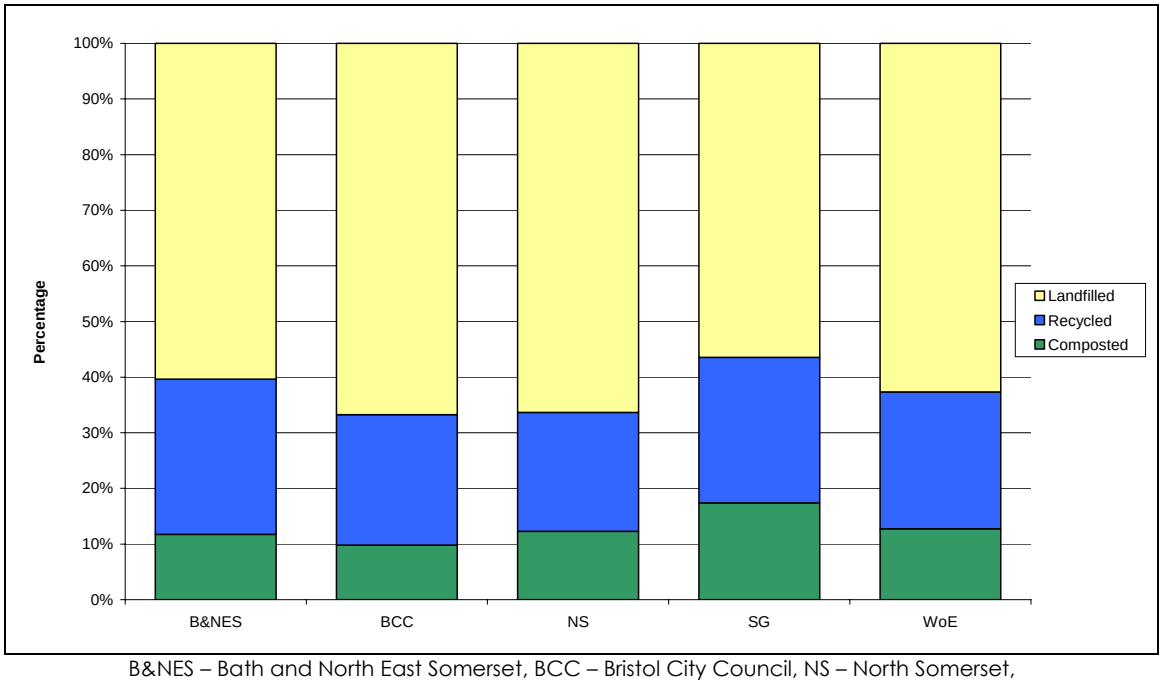
[2] Defra, 2005, Guidance on Municipal Waste Management Strategies, July 2005, p5

In addition, the Partnership is preparing a Joint Waste Development Plan Document (referred to as the "The Development Plan"), which will identify development control policies and make provision for a network of waste management facilities to deal with all waste arising in the area.

This Joint Waste Strategy uses a working definition of residual municipal solid waste (MSW) as: 'MSW containing materials that have not been source segregated for either reuse, or recycling and composting and sent for reprocessing'[3]. Residual MSW may include trade (commercial and industrial (C&I)) waste which comes under the Authority's control.

Currently the majority of the residual waste produced in the West of England is disposed of to landfill sites. The majority of these landfill sites are located outside the region. The total quantity of municipal waste managed by the Partnership and the various quantities diverted in 2006/07 through composting and recycling schemes are shown in Figure 1-1. It should be noted that Figure 1-1 includes all municipal waste, not just household waste, and therefore the recycling and composting percentages differ from published BVPIs (Best Value Performance Indicators).

Figure 1-1 Total municipal waste arisings and destinations for the West of England, 2006/07



B&NES – Bath and North East Somerset, BCC – Bristol City Council, NS – North Somerset, SG – South Gloucestershire, WoE – West of England

This Joint Waste Strategy acknowledges that there should be major changes to The Partnership's waste management practices and maintaining the existing levels of service is not an option. This Joint Waste Strategy sets out the

[3] McLanaghan S, 2002, Delivering the Landfill Directive: the role of new and emerging technologies, http://www.cabinetoffice.gov.uk/upload/assets/www.cabinetoffice.gov.uk/strategy/technologies-landfill.pdf Last accessed 9 December 2007

objectives and proposals for waste treatment and disposal that will apply across the area, and the options for meeting performance standards and targets.

1.2 The Strategy Vision

The Joint Waste Strategy vision is intended to provide a 'clear, non technical statement of the direction of travel [4]. The Vision has been adopted in order to influence and guide the work and activities of the Partnership and is as follows:

The four local Authorities in the West of England area are working together to develop, in consultation with local residents and other stakeholders, a range of facilities for the treatment of residual municipal solid waste.

These will deliver significant reductions in the amount of waste, particularly biodegradable waste, being sent to landfill sites. They will also maximise the efficient recovery of resources and encompass environmental, social and economic factors.

Each local authority will maintain a long term commitment to increase waste reduction, reuse, recycling and composting, and will move toward a longer term aim of achieving zero waste.

1.3 Who has Prepared this Strategy?

1.3.1 The West of England Waste Management and Planning Partnership

This Strategy has been prepared by the Partnership, which comprises the four unitary Authorities of Bath and North East Somerset (B&NES), Bristol City (BCC), North Somerset (NS) and South Gloucestershire (SG). The four Authorities within the Partnership have statutory responsibility for the collection, recycling, treatment, disposal and planning of municipal waste management.

The Authorities believe working in Partnership offers them economic, environmental and social advantages, including:

- Maximising economies of scale;
- Minimising environmental impacts;
- Minimising transport requirements; and
- Providing best value for the tax payer.

[4] Defra, 2005, Guidance on Municipal Waste Management Strategies, July 2005

The West of England Waste Management and Planning Partnership

- **Bath & North East Somerset Council**
- **Bristol City Council**
- **North Somerset Council**
- **South Gloucestershire Council**

The Partnership intends to also greatly improve the self sufficiency of waste management in the area. The concept of Self Sufficiency as present within European law is expressed nationally through PPS10 planning guidance [5]. Self sufficiency is referred to as: *"individuals, communities and organisations taking responsibility for their waste"*. The Partnership will consider this principle in decision making and will aim to maximise self sufficiency in waste management.

1.4 The Scope of the Joint Waste Strategy

The Joint Waste Strategy has been developed in accordance with Defra guidance on the preparation of Municipal Waste Management Strategies[6], although this Joint Waste Strategy is not typical because it primarily considers the management of residual MSW. Other elements of a typical strategy that are addressed in 'sister' strategies developed by the Partnership and the four Unitary Authorities include:

- Waste reduction and awareness raising (described in the 3Rs Statement);
- Recycling and composting strategy (described in the 3Rs Statement). Infrastructure, operations and collection services remain the responsibility of each individual Authority; and
- Healthcare waste, construction and demolition waste, agricultural waste and minerals waste (addressed in the Development Plan).

Further details are contained within the Partnership Authorities individual existing strategies:

- A Waste Strategy for Bath & North East Somerset 2005-2010

[5] Department for Communities and Local Government, July 2005, Planning Policy Statement 10: Planning for Sustainable Waste Management

[6] Defra, November 2005, A Practice Guide for the Development of Municipal Waste Management Strategies.

- Household Waste Management Strategy – Proposals for Managing Bristol's Household Waste in more Sustainable Ways over the next 25 Years. Published February 2000;
- North Somerset Council Municipal Waste Management Strategy 2005-2008; and,
- South Gloucestershire Local Waste Strategy.

This Joint Waste Strategy excludes the consideration of any locations for waste management facilities. The Development Plan will address this issue. Waste Managers and Planners are working closely to ensure both the Joint Waste Strategy and Development Plan will both inform and complement each other.

1.4.1 Waste Development Plan Document (the Joint Waste Core Strategy)

In parallel with the development of the Joint Waste Strategy, the four Waste Planning Authorities across the Partnership have united to develop a Joint Waste Management and Planning Strategy for the West of England. This strategy is being formalised through a Joint Waste Development Plan Document. The Government Office for the South West (GOSW) refer to this as the Joint Waste Core Strategy, but for the purposes of this document, and so as to avoid confusion it is referred to as the "Development Plan".

The vision for the Development Plan is [7]:

"The West of England will take responsibility for its own waste and through a joint Waste Development Plan Document will make provision for a network of waste management facilities. This network will be consistent with the Waste Hierarchy principle, take account of the environmental, social and economic needs of the area, and assist in moving towards the longer aim of achieving zero waste."

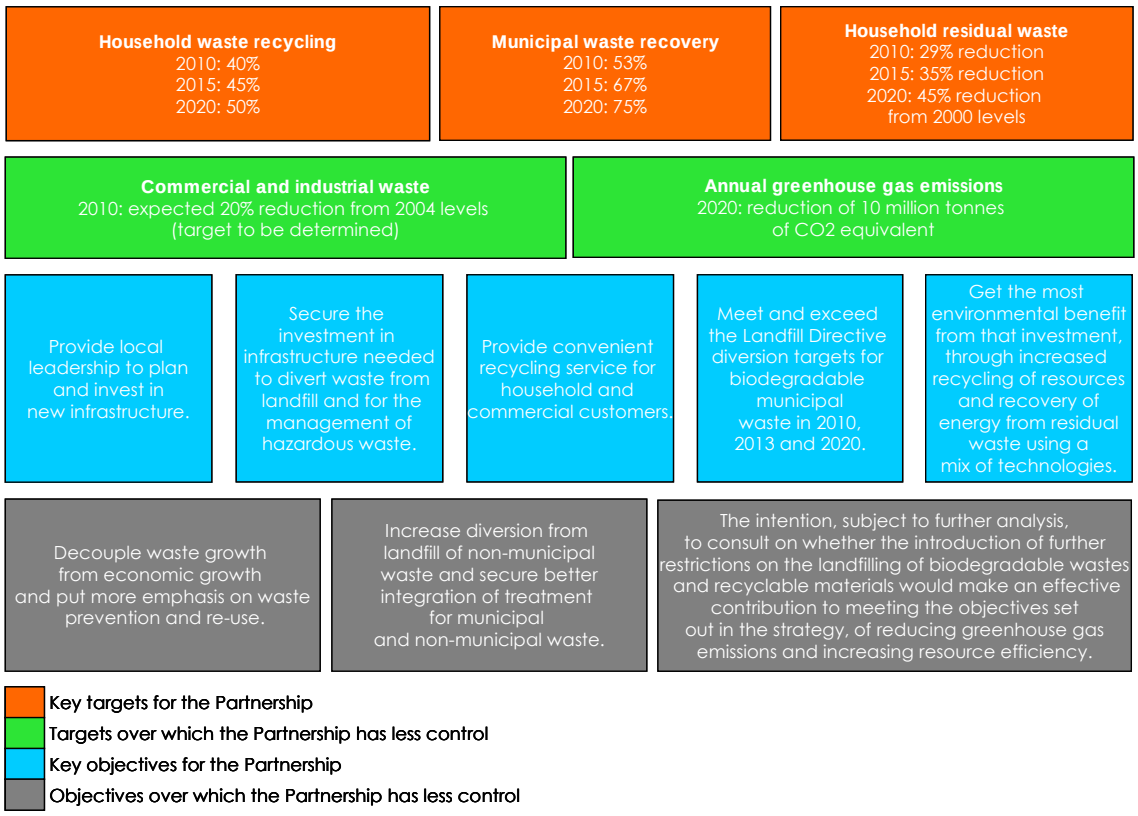
Further details on the Development Plan are provided in Section 2.3.5.

1.4.2 The Waste Strategy for England 2007

This Joint Waste Strategy has been developed to take into account the targets and objectives set out in the Waste Strategy for England 2007 [8]. The key targets and objectives as set out in the Waste Strategy for England 2007 are shown in Figure 1-2. The targets and objectives highlighted in orange and blue are items over which the partnership has major control and/or responsibility. The remaining items, highlighted in green and grey, are targets and objectives within the Waste Strategy for England 2007 over which the Partnership has less influence but is aware of.

[7] Further information on the Development Plan is available at www.rubbishorresource.co.uk
[8] Defra (May 2007) *Waste Strategy for England 2007* http://www.defra.gov.uk/environment/waste/strategy/strategy07/index.htm Last accessed 9 December 2007.

Figure 1-2 Key targets and objectives from the Waste Strategy for England 2007



In Figure 1-2 the term "recovery" means to obtain value from wastes through:

- Recycling;
- Composting;
- Other forms of material recovery (such as anaerobic digestion); and
- Energy recovery (combustion from direct or indirect use of the energy produced) or from the manufacture and use of a refuse derived fuel in gasification, pyrolysis, or other technologies.

1.5 Strategy Timescale

The Joint Waste Strategy is intended to create a framework for managing residual municipal solid waste that arises in the West of England area for approximately the next 20 years. It is anticipated, nevertheless, that waste treatment facilities implemented through this Strategy will still be operating for some time after that.

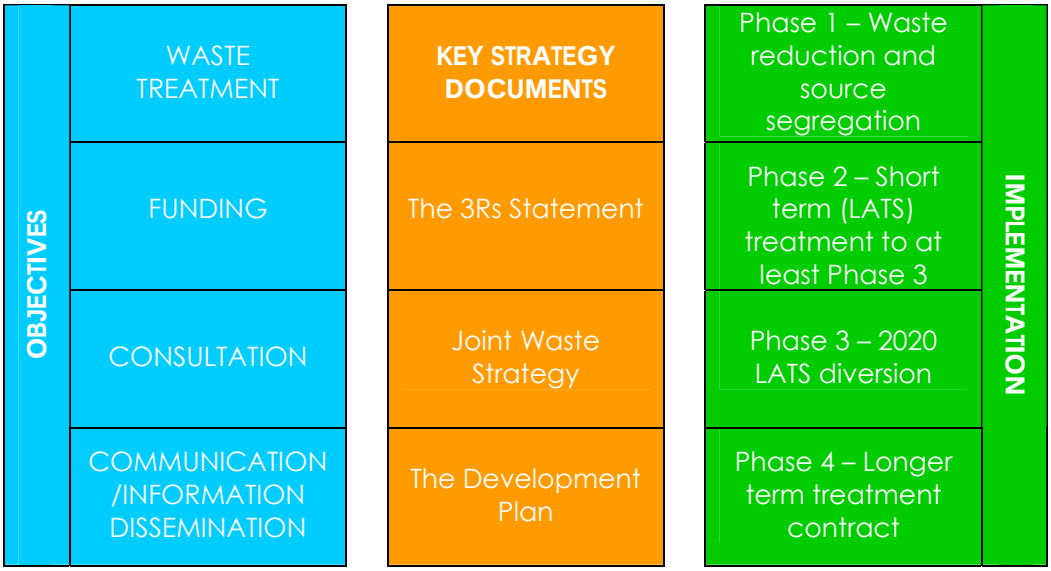
Waste management is a dynamic area and there is uncertainty about legislation and technology beyond the short to medium term. For this reason certain sections of the Joint Waste Strategy will be under constant review. In particular, targets, action plans, and monitoring arrangements will require regular updating. This Strategy has been developed as a flexible framework, one that can move with and embrace changes in MSW arisings, targets and treatment options.

There will be times when significant changes need to be made to the Joint Waste Strategy to reflect changing commitments and investments. As a matter of protocol the Joint Waste Strategy will be fully reviewed at least every five years by the Partnership.

1.6 What is the Joint Waste Strategy?

The Partnership has developed a Joint Waste Strategy framework that it envisages delivering through a deliberate and flexible four phased approach. Figure 1-3 illustrates how the phased strategy fits with the Partnership's overall objectives and their three main strategy documents.

Figure 1-3 The Partnership's objectives, strategies and implementation plan



Phase 1 is about a sustained approach to reducing the quantity of MSW and in particular the quantity of residual MSW that is generated in the Partnership's area. This is about coordinating communications on encouraging waste reduction and improving the source segregation of materials for reuse, recycling and composting. The Partnership is performing well in terms of recycling and composting but it can do better. All four Authorities are looking at ways to improve performance by getting the public to source segregate more materials. Each authority has set itself the target of, at least meeting, if not exceeding the Waste Strategy for England's target of 50% recycling and composting by 2020.

Phases 2, 3 and 4 are about managing the residual MSW that remains after source segregation. Even with all the effort that is currently made and with the improvements predicted, it is estimated that a significant quantity of MSW will still need to be managed.

The residual MSW needs to be managed in a way that reduces the quantity of biodegradable municipal waste (BMW) that is landfilled. The Partnership has

tough targets on the quantity of BMW it can landfill. These are contained in the Landfill Allowance Trading Scheme (LATS) which sets allowances that the Partnership should not exceed. These allowances are ultimately set by the European Union and then by Defra [9]. The main aim is a reduction in the quantity of methane emissions generated by landfilling because methane is a greenhouse gas and a contributor to climate change.

In spite of the considerable commitment to improving recycling and composting (Phase 1) it is predicted that the Partnership will need to divert more BMW from landfill. Phase 2 starts now. The Partnership is looking for a technology solution to manage the projected shortfall against its LATS allowances. This solution must divert sufficient quantities of BMW from landfill from 2010 for at least five years. There are a number of technologies that can do the job but in the short term technology is likely to involve either mechanical and biological processing; biostabilisation; autoclaving; or advanced thermal treatment. The Partnership is exploring with industry what the option will finally look like.

Phase 3 is about meeting the Partnership's landfill allowances until 2020. It is likely that Phase 3 for BCC, NS and SG will come into being whilst Phase 2 is still operating i.e. complementing each other. Phase 3 needs to manage a significant quantity of residual MSW to meet the landfill allowances; this is in the order of 160,000 tonnes per annum. This capacity has been carefully considered so as not to present a barrier to future improvements in source segregation i.e. more recycling and composting than is currently estimated. The Partnership does not want to take unnecessary risks in meeting its landfill allowances to 2020; in short, it needs to put in place low risk, deliverable technology options.

The Partnership has assessed the risks and benefits of a number of technology options. It has done this in consultation with key stakeholders, the public, with Defra and with the waste management industry. BCC, NS and SG consider, on balance, that an Energy from Waste technology can meet their requirements and offer best value for money for Phase 3. This technology can be delivered at the scale required and it performed well in the technology options appraisal process (see also Section 4.3). If sites and market opportunities are favourable, the Partnership would also like to harness the efficiencies and potential of combined heat and power. It is anticipated that a Phase 3 solution will run for 20 to 30 years and be supported by PFI funding.

B&NES consider that a 25 year PFI procurement is an unacceptable financial risk for the Council in relation to the potential scale of change in residual waste tonnages requiring treatment. B&NES will therefore focus its attention to Phases 1, 2 and 4 and will not take part in the Phase 3 procurement.

Whilst Phase 2 and Phase 3 are being delivered, the longer-term, Phase 4 is being planned for. There is considerable uncertainty over the longer term projections of waste arisings, for example, because there is uncertainty over how many houses will be built after the period this Joint Waste Strategy considers, and how well Phase 1 performs. When Phase 2 comes to an end

[9] Landfill (Scheme Year and Maximum Landfill Amount) Regulations, 2004

there may still be residual MSW that needs treating i.e. above and beyond the quantity being treated in Phase 3. The risks and performance of technologies option(s) utilised in Phase 2 will be more certain, indeed other technologies that are emerging through demonstration projects may be well established by that time. Phase 4 considers these uncertainties.

This Joint Waste Strategy provides progressively more detail on how and why this four phased approach has developed. What is clear, however, is that developing a flexible strategy framework is a prudent approach to adopt. The Partnership knows that enabling the four phases to overlap is a critical success factor in delivering on targets, managing waste in a more sustainable way and seeking best value.

1.7 Consultation

The Partnership acknowledges that this Joint Waste Strategy has to be developed with the views and wishes of the local residents in mind, since the householder, who is responsible for generating the significant proportion of the waste that must be managed, has such a crucial role to play. It is also important that all other organisations and individuals who have a stake in the process are engaged, including commercial waste management operators who will provide many of the services, technologies and investment required to deliver positive change.

The Strategy has therefore been written alongside an extensive consultation campaign with the public, the waste management industry and with stakeholders. Two consultations have taken place; the first in June/ July 2006 and the second in February/ March 2007. A third consultation, specifically on the Preferred Options for the forthcoming Development Plan is scheduled to take place in December 2008.

The remainder of this Joint Waste Strategy details where the Partnership is today, where it wants to get to, in waste management terms and by when. It will then set the framework for what it must do to get there and how it intends to get there i.e. how it intends to implement this Joint Waste Strategy.

2 Where Is The Partnership Today?

This section provides a baseline review of the Partnership Authority's current waste management position and includes the following elements:

- An outline of existing key policy and legal requirements;
- Roles and responsibilities of the Authorities;
- Contextual information about the West of England and each Authority;
- Analysis of waste data; and
- Forward projections of waste quantities.

2.1 Socio-Economic Situation in the West of England

The West of England area, which consists of the four partner Unitary Authorities, has an enviable track record in innovation, creativity and connectivity. Each partner Authority area is different in its physical as well as social and economic geography. These differences also bring with them different waste management challenges and these characteristics need to be taken into account when making decisions about waste management.

Over the last ten years, the area's population has grown faster than the UK average. It is predicted that the West of England population will continue to grow more than the UK average. It is predicted that by 2026 the population will have grown by an average of 16%. This population growth presents a challenge for the Authorities especially when it comes to dealing with the steadily rising amounts of waste that an expanding population currently tends to generate.

The nature and characteristics of each area are very different as shown in Table 2.1. For example, BCC covers an area less than a third of B&NES, but has double the population, generating contrasting waste management challenges.

The West of England area falls under the jurisdiction of the South West Regional Assembly (SWRA). The assembly is a partnership of councillors from all local Authorities in the region and representatives of various sectors with a role in the region's economy, society and environment. It covers an area of 23,829 square kilometres from Gloucestershire, Dorset and Wiltshire to the Isles of Scilly, and represents a population of almost five million. The South West Regional Assembly exists to promote the economic, social and environmental well-being of all who live and work in the region. It reviews and develops wide ranging strategies at the regional level to provide an over-arching vision for the South West.

Table 2.1 A comparison of socio-economic facets of each Authority

Unitary Authority	Area (Miles ²)	Population	No. of households (2006/7)	Unemployment (at the end of 2006[10])	Predicted population growth rates (by 2026)[11]
B&NES	220	175,000[12]	74,800	2.4%	11.9%
BCC	68	394,000[13]	177,300	4.5%	13.3%
NS	144	201,400[14]	85,800	2.0%	22.7%
SG	308	248,000	106,000	3.3%	17.9%

2.2 Governance, Structural and Partnership Working Arrangements

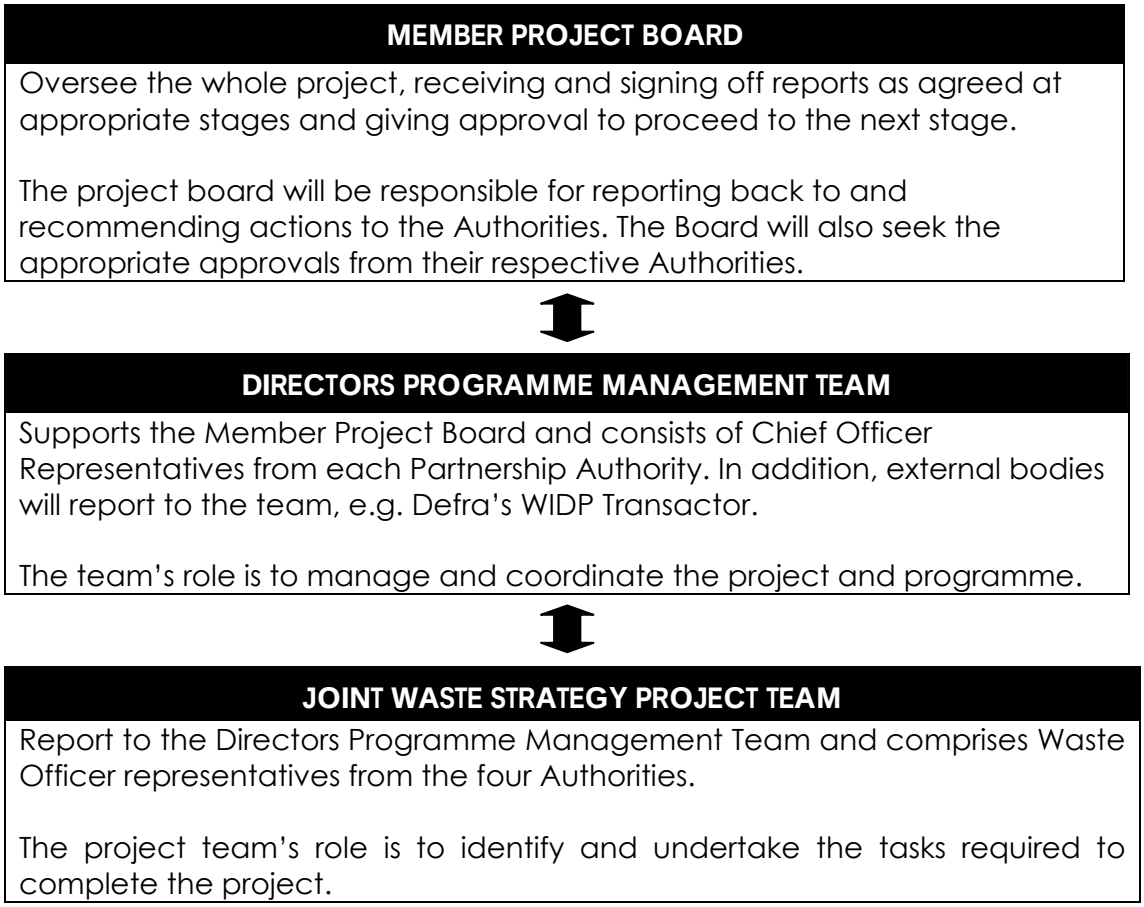
A Member Project Board has been set up that comprises Executive / Cabinet Members responsible for waste and planning issues from each of the partner authorities. This Board currently operates to a Memorandum of Understanding and Terms of Reference (Appendix A), but key policy decisions must be referred back to each of the authorities' relevant Cabinets or Executives for approval.

A Directors Programme Management Team (DPMT), which comprises chief officers and advisors has been set up and reports to the Member Project Board. The waste, planning, legal and finance functions of the UAs are represented on the DPMT.

Waste and Planning Project Teams with officer resource inputs from each authority have been in place to progress the technical work activities, with external consultancy support procured as required. An informal arrangement exists to share procurement and management responsibility of consultants with each authority taking a lead in different work areas. Legal, Finance and other technical support is drawn in as needed. The project organisation and the roles are shown in Figure 2-1.

[10] Intelligence West, West of England Core Economic Indicators http://www.intelligencewest.org.uk/economy/data/Unemployment%20Rate%2096-2006.xls Last accessed 9 December 2007
[11] Intelligence West, Mid-Year Population Estimates http://www.intelligencewest.org.uk/population/data/revised2004basdpopproj.xls Last accessed 9 December 2007
[12] Figure for 2006. Bath & North East Somerset: A Portrait - Issues for Bath & North East Somerset http://consultations.bathnes.gov.uk/inovem/consult.ti/Core_Strategy/viewCompoundDoc?docid=31924&partid=32116 Last accessed 4 December 2007
[13] E-Democracy takes shape in Bristol http://www.idea.gov.uk/idk/aio/5581000 Last accessed 9 December 2007
[14] North Somerset Brief, http://www.gos.gov.uk/497666/docs/220636/309014/nsomstatbrf.doc Last accessed 9 December 2007

Figure 2-1 Project roles



An appraisal of the procurement funding and contract options available showed that there are clear merits in undertaking some or all of the procurement of residual waste infrastructure in partnership. It also suggested that there are a number of critical success factors in delivering a successful, efficient joint procurement to enable the above benefits to be realised. These may include:

- Political commitment to work in Partnership, and to deliver the agreed outcomes of the project. The Member Project Board, Strategic Directors Programme Management Team and Waste and Planning Officer teams are committed to work in partnership and to adopting and delivering the Joint Waste Strategy;
- An efficient governance structure. This is being considered by the Member Project Board; and
- An equitable inter-Authority agreement. This is being considered by the UAs' finance officers.

There is an overall commitment to working in Partnership, however, each Phase of the waste strategy has been assessed by each Authority to ensure it is appropriate for their local aspirations.

The Partnership recognises that the decision on which procurement process should be adopted for implementing the various Phases of this Strategy will need to be considered by the Partnership's legal and procurement officers.

The political commitment to date has been unfaltering. There was excellent engagement by the Member Project Board in the first draft of the Joint Waste Strategy, the technology Options Appraisal process and the public consultations.

Research and consultation between the authorities is currently taking place to identify alternative governance options for the major procurement process, as this will require a much more robust unified decision-making arrangement.

Indicative budgets (for the preparation and process costs of this Joint Waste Strategy, Development Plan and joint procurement of new waste treatment facilities) have been prepared and included in each authority's medium-term financial planning process, following all Executive/Cabinet approvals in December 2006.

Work is underway to update the financial commitment which will be required to deliver the project in its entirety, including the need for additional internal and external specialist expertise and staff resources and including major procurement funding options (PFI, Prudential Borrowing etc). Provision may also be required for land acquisition and planning applications.

A basis for apportionment of the project process costs has been agreed and further work is being undertaken to determine future arrangements. The partnership has been successful in securing external funding support from Defra mainly, but also Government Office South West, totalling £244,000.

2.3 Key Policy and Legal Requirements

This Strategy takes due regard of the current key legal and policy requirements which may impact on residual waste management. It also aims to anticipate and include emerging legislation. Figure 2-2 outlines current legislation, regulation and guidelines that will influence the Partnership's residual waste management policies and strategies. Guidelines and codes of practice may not have a statutory basis but they often provide a valuable framework from which local and regional strategies can develop. A more detailed breakdown of the requirements of each item is provided in Appendix B – Current Waste Legislation.

Figure 2-2 Current relevant legislation, guidance and strategies

EU LEGISLATION

Waste Framework Directive 1975
Landfill Directive 1999
Ozone Depleting Substances Regulation 2000
Thematic Strategy on the prevention and recycling of waste 2005
WEEE Directive 2006
Registration, Evaluation and Authorisation of Chemicals (REACH) 2006
Groundwater Directive 2006
Directive on packaging and packaging waste 1996
Directive on Batteries and Accumulators 2006
Environmental Liability Directive 2004
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment 2002
International Shipments of wastes 2006
Directive on Hazardous Waste 1991
End of Life Vehicles (ELV) Directive 2000
Animal By-Products Regulations 2003

UK/ENGLAND ACTS

Control of Pollution (Amendment) Act 1989
Environmental Protection Act 1990
Waste Minimisation Act 1998
Household Waste Recycling Act 2003
Waste & Emissions Trading Act 2003
Planning and Compulsory Purchase Act 2004
Clean Neighbourhoods and Environment Act 2005
Local Government and Public Involvement in Health Act 2007

UK/ENGLAND REGULATIONS

Environmental Protection (Duty of Care) Regulations 1993
Controlled Waste Regulations 1993 (as amended)
Waste Management Licensing Regulations 1994 (as amended)
Landfill Tax Regulations 1996(and relevant Budget announcements)
The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1998 (as amended)
Pollution Prevention and Control (England and Wales) Regulations 2000 (as amended End of Life Vehicles Regulations 2003
Landfill (Scheme Year and Maximum Landfill Amount) Regulations 2004
The Landfill Allowances and Trading Scheme (England) Regulations 2004
Animal By Products Regulations 2005 (as amended)
End-of-Life Vehicles (Producer Responsibility) Regulations 2005
Hazardous Waste Regulations 2005
The List of Wastes (England) (Amendment) Regulations 2005
The List of Waste Regulations 2005
Landfill (England and Wales) (Amendment) Regulations 2005
Landfill (England & Wales) Regulations 2005 Revisions
The Landfill Allowances and Trading Scheme (England) (Amendment) Regulations 2005
Renewables Obligation Order 2006 (currently under review and to be superseded as amended)
Producer Responsibility Obligations (Packaging Waste) Regulations 2007
The Transfrontier Shipment of Waste Regulations 2007
The Waste Electrical and Electronic Equipment (Waste Management Licensing) (England and Wales) (Amendment) Regulations 2007

UK/ENGLAND POLICY AND STRATEGY

Planning Policy Statement 10 (PPS10) Waste Management
Planning Policy Statement 11 (PPS11) Regional Spatial Strategies
Regional Waste Strategies
The Waste Strategy for England 2007

UK/ENGLAND GUIDANCE

Best Value in Waste Management
Guidance on the Household Waste Recycling Act 2005
Guidance on monitoring mechanical biological treatment (MBT) and other pre-treatment processes for the landfill allowances schemes (England and Wales) (2005)
A Practice Guide for the Development of Municipal Waste Management Strategies (MWMS) (2005) (as amended)
Technical Guidance WM2 Hazardous Waste

THE PARTNERSHIP

3Rs Statement – Joint Position Statement on Reduce, Reuse, and Recycle
The Development Plan
This Joint Waste Strategy
A Waste Strategy for Bath & North East Somerset 2005-2010
Bristol City Council draft Household Waste Management Strategy 2000
North Somerset Council Municipal Waste Management Strategy 2005-2008
South Gloucestershire Local Waste Strategy 2008 - 2014

Figure 2-3 provides guidance on the foreseeable waste legislation and guidance in England as well as emerging European legislation that may impact on England. A more detailed breakdown of the requirements of each item is provided in Appendix C – Future Waste Legislation.

Figure 2-3 Foreseeable Future legislation, guidance and strategies

EU

Batteries Directive
Thematic Strategy for Soil Protection
Waste Framework Directive Revisions
Waste Framework Directive and Thematic Strategy on Waste and Recycling
European Commission survey on environmental law
EU Thematic Strategies on Waste and Resource Use
update Revision of Hazardous Waste Directive Revision of Waste Oils Directive Integrated Product Policy

UK/ENGLAND
Climate Change Bill Site Waste Management Plans (SWMP) for the construction industry Review of Integrated Pollution Prevention and Control regulations - Environmental Permitting Regulations

This Joint Waste Strategy cannot expect to cater for all future legislation but with the review mechanism established and the frameworks the Joint Waste Strategy puts in place, the impact of any relevant new and emerging legislation/guidance will be considered by the partnership.

2.3.1 The Waste Hierarchy

The waste hierarchy was originally described in the Waste Framework Directive[15] and stresses that waste prevention and reduction should take priority over other methods of waste management with disposal being the last option (Figure 2-4).

Waste reduction is the number one priority for the public and for the Partnership, quite simply because if waste is not produced in the first place it does not have to be managed.

The Waste Strategy for England 2007 focuses on the importance of driving waste management up the waste hierarchy. It looks at more effective incentives for individuals and businesses to recycle waste and puts a strong emphasis on waste prevention. It places a greater responsibility on businesses for the environmental impact of their products and operations. Key targets and objectives from the Waste Strategy for England 2007 are discussed in Section 3.3.8.

[15] EEC, 1975, Waste Framework Directive (75/442/EEC, as amended by Directive 91/156/EEC)

Figure 2-4 The waste hierarchy

2.3.2 Regional Policy

A Regional Waste Strategy for the South West[16] (RWSSW) was published in October 2004 by the South West Regional Assembly. The Strategy sets out a fifteen year plan to manage all waste in a more sustainable way in the region and input was provided by each Authority of the West of England Waste Management and Planning Partnership. The RWSSW presents measures to manage waste produced by the region.

The RWSSW suggests that approximately 500-600 new waste facilities of all types will need to be in place by 2020 including:

- Facilities to process green waste to produce compost;
- Sorting facilities for the products that are being recycled;
- Facilities for mechanical, biological or thermal treatment of residual waste; and
- New landfill capacity.

The RWSSW aims to provide a framework such that by the year 2020 over 45% of municipal waste is recycled and reused and that the remaining 55% will be treated or recovered before going to landfill through thermal or biological/ mechanical treatments. In this way less than 20% of waste produced in the region will be landfilled. Further details of target capacities are shown Table 3.2.

2.3.3 Key Planning Policy and Legislation

To increase the amount of waste that is moved up the waste hierarchy and diverted from landfill will require major investment in waste management

[16] South West Regional Assembly, 2004, From Rubbish to Resource: The Regional Waste Strategy for the South West. Available at: http://www.southwest-ra.gov.uk/ngcontent.cfm?a_id=500 Last accessed on 9 December 2007.

facilities. The land use planning system therefore has a crucial role to play in the adequate and timely provision of these facilities.

There has been a revision of national planning policy for sustainable waste management in PPS10 by the ODPM (now the Department for Communities and Local Government- DCLG) alongside Defra's new policy framework for Municipal Waste Management Strategies (MWMS). Provision for the delivery of waste management infrastructure will require policies that reflect the needs of the relevant MWMS developed in accordance with Defra guidance, and policies that shape non-waste related development in relation to spatial planning concerns such as transport, housing, economic growth, natural resources and regeneration. The two policy frameworks are therefore closely aligned and this is expected to be re-produced on the ground through joint working of planning and waste management departments.

2.3.4 Planning Policy Statement 10 (PPS10)

This document sets out the key planning objectives and decision making principles that should be adhered to in developing Regional Spatial Strategies and Local Development Documents (LDD). It also sets out policies for identifying land for waste management facilities, for identifying suitable sites and areas that fulfil the location criteria outlined in the Waste Framework Directive. PPS10 requires that the planning strategies developed by regional and local planning bodies should help deliver sustainable development. A key tool for helping to ensure the sustainability of strategies and plans is Sustainability Appraisal (SA).This is identified in PPS10 as one of the decision-making principles to shape waste planning strategies such that they support the Government's planning objectives for waste management. As many Authorities are in a transitional period between old and new systems, PPS10 may supersede any current planning policies where this is deemed appropriate by that Authority.

The principles set out in PPS10 require the following:

- Regional Planning Bodies (RPB) should prepare Regional Spatial Strategies (RSS), which aim to provide sufficient opportunity to meet the identified needs of the area for waste management for all waste streams. Planning Authorities should develop Local Development Documents (LDD) which reflects their contribution to delivering the RSS;
- Waste management should be considered alongside other spatial planning concerns such as housing and economic growth. Recognition of the contribution of waste management in the development of sustainable communities should be noted. This should be integrated with other strategies including Municipal Waste Management Strategies;
- Clear policy objectives should be the basis for planned provision of new capacity and its spatial distribution. Policy objectives should be in line with the planning policies set out in the PPS and be linked to measurable indicators of change; and,
- Planning strategies should be shaped by Sustainability Appraisals (incorporating Strategic Environmental Assessment). SEA is a key component of sustainable development establishing important methods for protecting the environment and extending opportunities for participation in public policy decision making.

2.3.5 The Development Plan

In 2004 the Government introduced changes to the development planning system. Councils are required to prepare a Local Development Framework, which will replace their existing Local Plans. The statutory documents in the Local Development Framework are referred to as Development Plan Documents. Because the collection and management of waste takes place across local Authority boundaries within the West of England, it was decided that the four Unitary Authorities of Bath and North East Somerset, Bristol City, North Somerset and South Gloucestershire should work together to prepare The Development Plan.

Whereas this Joint Waste Strategy sets out **how** municipal solid waste should be managed, The Development Plan will direct **where** all controlled wastes, including municipal solid waste, should be managed.

The Development Plan will apportion the quantity of controlled wastes (including municipal solid waste and other controlled wastes like C&I wastes) to be managed within each of the four Unitary Authority areas.

Importantly, the Development Plan will establish the spatial strategy for the distribution of strategic waste management facilities needed in the West of England to enable waste to be diverted from landfill. It will establish the sustainable waste management principles that will guide waste-related development over the period to 2026.

In order to facilitate the development of new waste facilities that will be required over the next twenty years, the Development Plan will identify sites suitable for strategic waste management purposes, and where it is not appropriate or possible to identify sites, areas of search and/or criteria will be identified.

The process of preparing a development plan is set out in the Planning and Compulsory Purchase Act, 2004 and associated regulations and Government guidance. The key stages in the preparation of the Development Plan are outlined in Table 2.2.

Table 2.2 Key stages in the development of the Development Plan (subject to confirmation as at March 2008)

Timeline	Action
Ongoing	Evidence gathering.
January/March 2007	Consultation on Issues and Options for the Development Plan - completed
Spring/Summer 2007	Consideration of representations received on the Issues and Options - completed
September to December 2007	Preparation of the Preferred Options for the Development Plan
March to May 2008	West of England Councils agree to publish Preferred Options document for consultation

Timeline	Action
Before Christmas 2008	Consultation on the Preferred Options
August to September 2008	Consideration of representations received on the Preferred Options consultation
October 2008 to March 2009	Preparation of Submission Documents
April 2009	Submission of the Development Plan to the Secretary of State
July 2009/July 2010	Examination period of Development Plan
October 2010	Adoption of Development Plan

The Issues and Options Report was produced as a combined document to meet the statutory stage of the Development Plan and raise awareness of the Joint Waste Strategy and treatment technology options. The Issues and Options Report was heavily informed by the Technology Options Appraisal for the draft Joint Waste Strategy, with an extension to cover all controlled wastes, rather than only municipal solid waste. The Issues and Options Report was consulted upon as part of the second stage consultation.

In line with guidance a Sustainability Appraisal (incorporating the requirements of Strategic Environmental Assessment) was conducted on the Issues and Options Report. Among the salient outcomes from this report was that:

- The vision and aims of the Joint Waste Plan were broadly compatible with sustainable development objectives;
- Eliminating exports of waste will reduce waste transport distances in comparison with a continuation of exports;
- Allowing waste imports may encourage more waste transport than if imports were prohibited and may add to congestion. Waste imports may also undermine the self sufficiency;
- A more dispersed option [Subject to the type of technology and the outputs it generates] may minimise waste transport distances by siting facilities near the main urban areas. This option would spread responsibility for waste most widely but would affect more communities; and
- Creating new landraise sites instead of extending existing facilities will spread more widely the responsibility for waste and the burden of proximity to sites.

Following the consideration of responses to the Issues and Options Document, the next step will be to progress the Preferred Option(s) which is expected to be published in early 2008. This will lead to the preparation of the Development Plan, that will be submitted to the Secretary of State, and which will be the subject of an independent examination prior to its adoption around summer 2010.

2.4 Roles and Responsibilities for Waste Management

Responsibility for the control of waste management in England and Wales is split between the Environment Agency, as waste regulator, and Local Authorities in

their roles as Waste Collection Authority (WCA) and the Waste Disposal Authority (WDA). The Partnership is made up of Unitary Authorities (UAs) each of which is jointly responsible both for the collection and disposal of waste. Household waste from domestic properties is collected free of charge with the exception of certain wastes (bulky items). In addition, Unitary Authorities are responsible for investigating the potential for recycling in their area and preparing a recycling plan.

Unitary Authorities are also responsible as Waste Disposal Authorities (WDAs) for ensuring the provision of disposal facilities for controlled waste in their area. Between 1990 and 2006, these facilities had to be operated by the private sector or by a Local Authority Waste Disposal Company (LAWDC) rather than by the local Authority itself, although this requirement was repealed by the Cleaner Neighbourhood and Environment Act, 2005. WDAs must ensure provision for the disposal of all waste collected in their area by WCAs; provide facilities for householders to deposit their own waste; and arrange for the disposal of this waste.

The following documents have helped speed up the process of change and encouraged joint working between Regional Authorities:

- Government guidance and legislation on developing Joint Municipal Waste strategies;
- The Waste Strategy for England (2007); and
- Best Value in Waste Management.

To achieve the aims of the Waste Strategy for England 2007 and to meet the respective targets for recycling, recovery and diversion, closer working between the Partner Authorities is vital. This will extend to matters contained within future waste management contracts.

2.5 Current Waste Contracts

Existing contracts that the Partnership Authorities have agreed for the management and disposal of residual waste may to some extent restrict the options available to them to manage this residual waste in the future. The contract end dates have to be planned well in advance as alternative arrangements will take time to organise. It is therefore important that existing contract considerations are integrated into the decision making process. Table 2.3 below identifies the current contracts held by the Partnership Authorities for residual waste disposal. It should be noted that for each Authority the contracts are for residual waste disposal to landfill.

Table 2.3 Current residual municipal waste disposal contracts (landfill)

UA	Contract length (yrs)	Start date	End date	Contractor	Type of contract	Changes planned to contracts
B&NES	7	2001	2008	WRG	Private. Rail to landfill.	Current tender

UA	Contract length (yrs)	Start date	End date	Contractor	Type of contract	Changes planned to contracts
		2001	2008	Viridor (ex Wyvern Waste)	Private. Road to landfill.	exercise for landfill/disposal contracts
BCC	7	2001	2011	WRG	Private. Rail to landfill.	The contract has been extended to 2011'
	7	2001	2011	Cory Environmental	Private. Road to landfill.	The contract has been extended to 2011'
NS	7	2003	Feb 2010	Viridor	Private. Road to landfill.	Review programmed for 2008
SG	25	2000	2025	SITA	Integrated waste management PFI.	Contract provides a procedure for addressing changes during the contract.

All present disposal contracts among the four authorities will end between 2008 and 2011, except for South Gloucestershire's. South Gloucestershire already has a Private Finance Initiative (PFI) contract in place for the delivery of waste management services, but the disposal element of the contract can be adjusted.

For the Partnership to meet its LATS allowances, residual MSW will have to be treated so as to divert BMW from landfill. The timing of Phase 2 will have to incorporate appropriate transition arrangements to reflect the current disposal contract arrangements.

2.6 Waste Disposal Infrastructure

As discussed, the four Partner Authorities at present all rely very heavily on landfill to dispose of residual waste. Waste is first bulked up in local transfer stations and is then taken by rail or road to a network of landfill sites.

2.6.1 Residual Waste Disposal

The transfer stations and landfills used by the Authorities are shown in Table 2.4. Each Authority also has a network of household waste recycling centres (HWRCs) and bring banks where residual waste and recyclables are deposited by the public. Table 2.4 also identifies that the majority of residual waste is presently being exported outside the area for disposal, which is neither sustainable nor aligned with the guiding principle of self sufficiency.

Table 2.4 The destination of residual waste from the area (landfill).

UA	Transfer stations	Destination landfill sites	Transport	Approx.

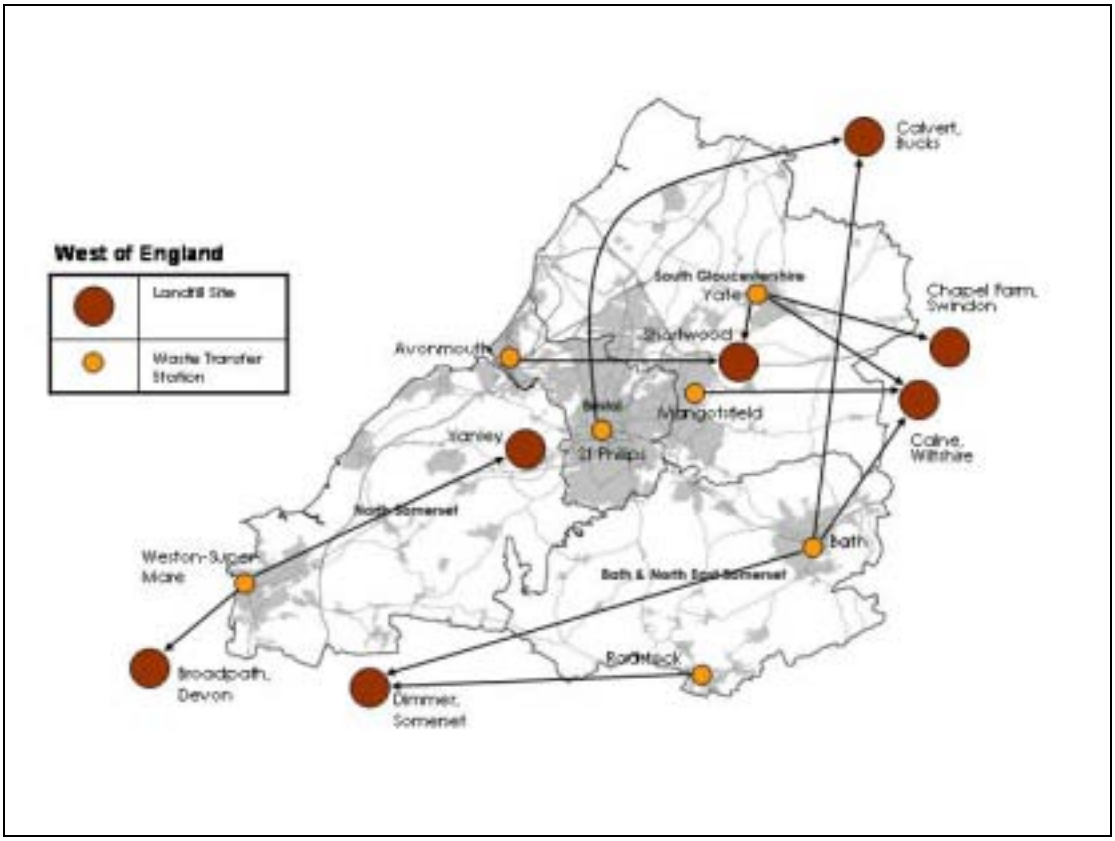
			mode	date landfill at full capacity
B&NES	• Bath (with railhead) • Norton Radstock	• *Calvert, Buckinghamshire* • *Dimmer, Somerset* • *Calne, Wiltshire (Contingency)*	• Rail • Road • Road	• 2046 • 2021 • 2031
BCC	• St Philips (with railhead) • Avonmouth	• *Calvert, Buckinghamshire* • Shortwood, South Gloucestershire [17]	• Rail • Road	• 2046 • 2017
NS	• Weston-Super-Mare	• Yanley, North Somerset • *Broadpath, Devon*	• Road • Road	• 2008 • 2010
SG	• Yate • Mangotsfield	• *Calne, Wiltshire* • *Chapel Farm, Swindon* • Shortwood, South Gloucestershire	• Road • Road • Road	• 2031 • 2013 • 2017

Note that Landfill sites outside the area are shown in italics.

The geographical location of the infrastructure utilised by the Partnership for residual waste management is shown in Figure 2-5. Please note that the locations of the landfill sites out side of the area are for illustrative purposes only, for example Calvert is located in Buckinghamshire.

[17] Updated from BCC Cabinet Meeting Note 26/10/07 http://www.bristol.gov.uk/committee/2007/ua/ua000/1025_7.pdf Last accessed on 9 December 2007.

Figure 2-5 The location of the partnership's transfer stations and landfill sites



2.6.2 Household Waste Recycling Centres

Household Waste Recycling Centres (HWRC), previously referred to as Civic Amenity Sites, are provided for the public to deposit residual wastes, and reusable, recyclable and compostable materials. Bulky wastes that are not collected from kerbside can also be received. The HWRCs within the partnership area are shown below in Table 2.5.

Table 2.5 Household Waste Recycling Centres

Bath & NE Somerset	Bristol	North Somerset	South Gloucestershire
• Keynsham • Bath • Midsomer Norton	• St Philips • Avonmouth	• Portishead • Weston-Super-Mare • Backwell	• Yate • Little Stoke • Mangotsfield • Thornbury

2.6.3 Planned Waste Treatment Facilities

BCC is working with Defra and with a waste management company called Ethos Recycling Limited (previously Compact Power) to develop a small scale waste treatment facility to manage approximately 34,000 tonnes of residual

MSW. This facility has support from Defra's Waste Implementation Programme (WIP) through the New Technologies Demonstrator Programme (NTDP). The proposed project will generate in excess of 2.5MW of electricity for export to the National Grid and 2MW of dissipated heat which can be sold locally.

BCC currently transports its kerbside collected garden waste, cardboard and kitchen waste to Dorset for composting. They have recently awarded a contract to develop a local in-vessel composting facility, requiring a processing capacity of between 25,000 and 30,000 tonnes per annum.

2.7 Analysis of Waste Data

2.7.1 Current Waste Arisings and Management

Figure 1-1 depicts the destination of MSW in terms of percentage composting, recycling and landfilling for each authority and the partnership as a whole for the year 2006/07. The corresponding data is presented in Table 2.6 below. It can be seen that SG composts the largest proportion of its waste at 18%, B&NES recycles the largest proportion at 28%, and NS landfills the largest proportion of MSW at 66%. It can be seen that the partnership as a whole landfills over 60% of its MSW.

Table 2.6 MSW recycling and composting data 2006/07. Shown in tonnes (rounded)

	B&NES	BCC	NS	SG	WoE
Recycled	28,000 (28%)	43,000 (23%)	23,000 (21%)	39,000 (26%)	133,000 (25%)
Composted	12,000 (12%)	18,000 (10%)	13,000 (12%)	26,000 (18%)	69,000 (13%)
Landfilled	60,000 (60%)	123,000 (67%)	72,000 (67%)	84,000 (56%)	339,000 (62%)
Total	**99,000**	**184,000**	**109,000**	**148,000**	**541,000**

Assuming that each person produces on average the same account of waste per year across each Authority, Figure 2-6 shows the MSW arisings produced by each of the wards. This clearly shows that BCC produces larger quantities of MSW than the other authorities in the Partnership; this is due to the greater population in BCC than the other Authorities.

Figure 2-7 shows the quantity of material segregated for recycling and composting, across each ward in the Partnership area (again assuming that each person produces on average the same amount of waste per year across each Authority). This information is useful in monitoring the quantity of recycling and composting per head of population, for example, in designing and locating infrastructure to manage source segregated wastes.

It can be seen from Figure 2-7 that densely populated wards around central BCC segregate a large quantity of MSW for recycling and composting. Wards in SG that border BCC also have large arisings. Elsewhere in the Partnership, Weston-super-Mare and its surrounding wards have some of the largest recycling and composting arisings. The sparsely populated rural areas in central and western B&NES produce the least MSW for recycling and composting in the Partnership.

Figure 2-8 shows the recycling and composting arisings that are produced per head of population in each authority. This compares the overall performance between the four authorities. Interestingly, whilst Bristol segregates a greater tonnage of materials, per head of population, it is the poorest performer at 109 kg per head of population, compared to SG which produces approximately 160kg per head of population. The low figure for BCC is a reflection of the fact that 2006/7 was a part year for the newly introduced kerbside organic waste collection scheme.

In addition Table 2.7 below shows the amount of waste produced per person in each district.

Table 2.7: Tonnages of MSW per head of population per Authority.

Tonnages of MSW per head of population	B&NES	BCC	NS	SG
Total MSW	0.57	0.46	0.55	0.58
Recycling/composting	0.18	0.14	0.16	0.21
Residual	0.39	0.32	0.39	0.37

Figure 2-6 MSW arising densities by ward, based on 2006/07 data

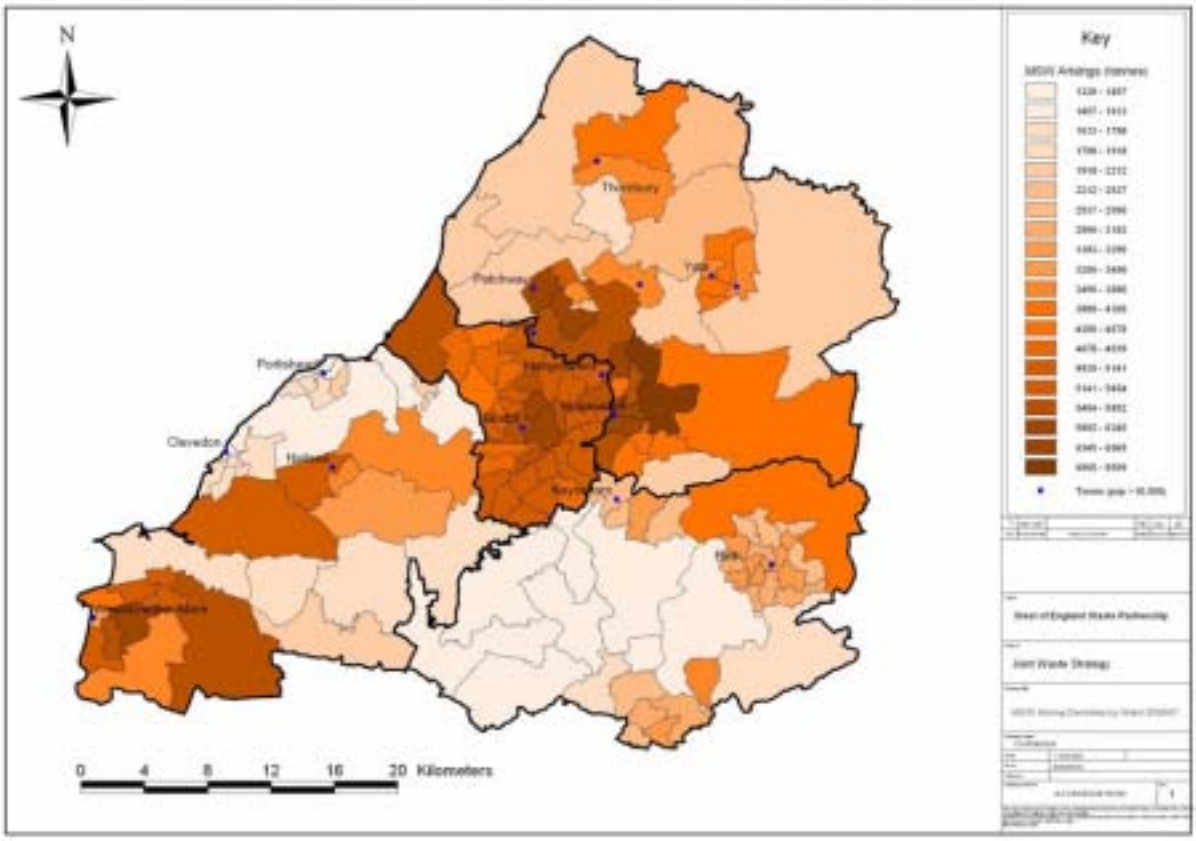


Figure 2-7 Recycling and composting densities per ward, based on 2006/07 data

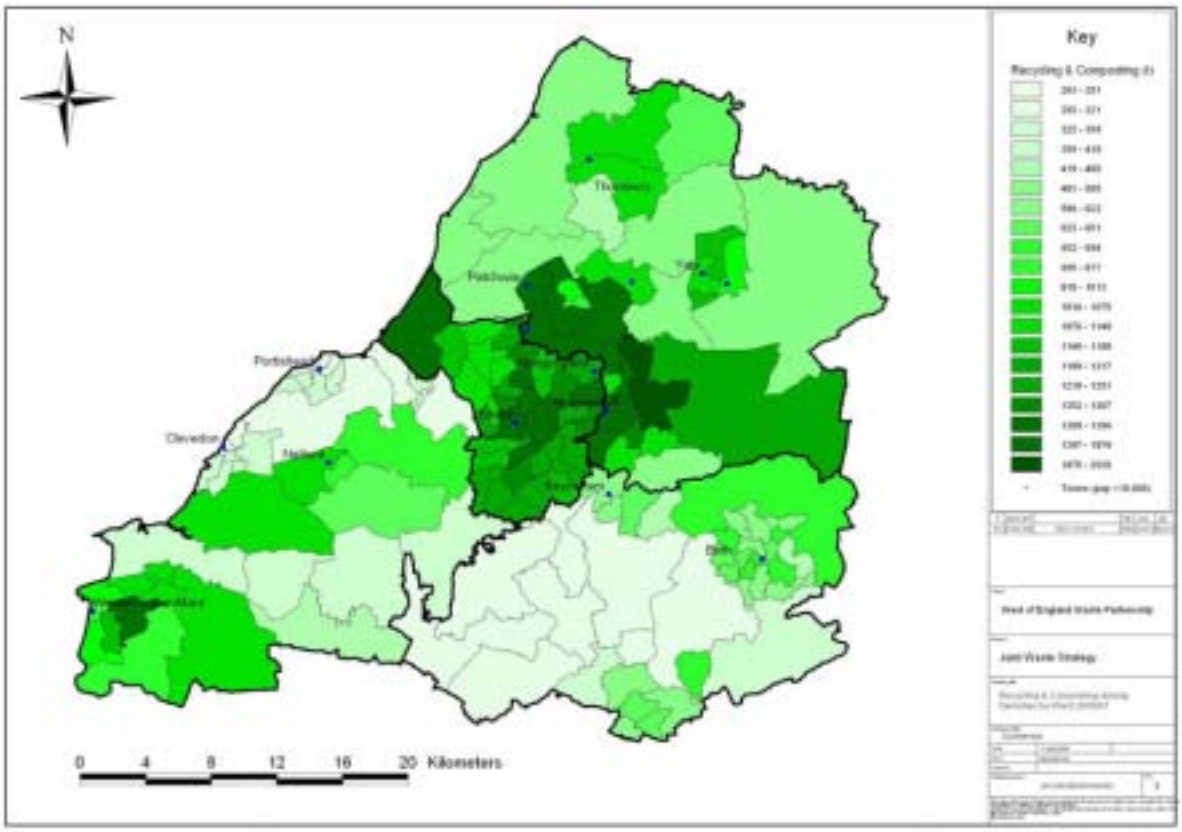
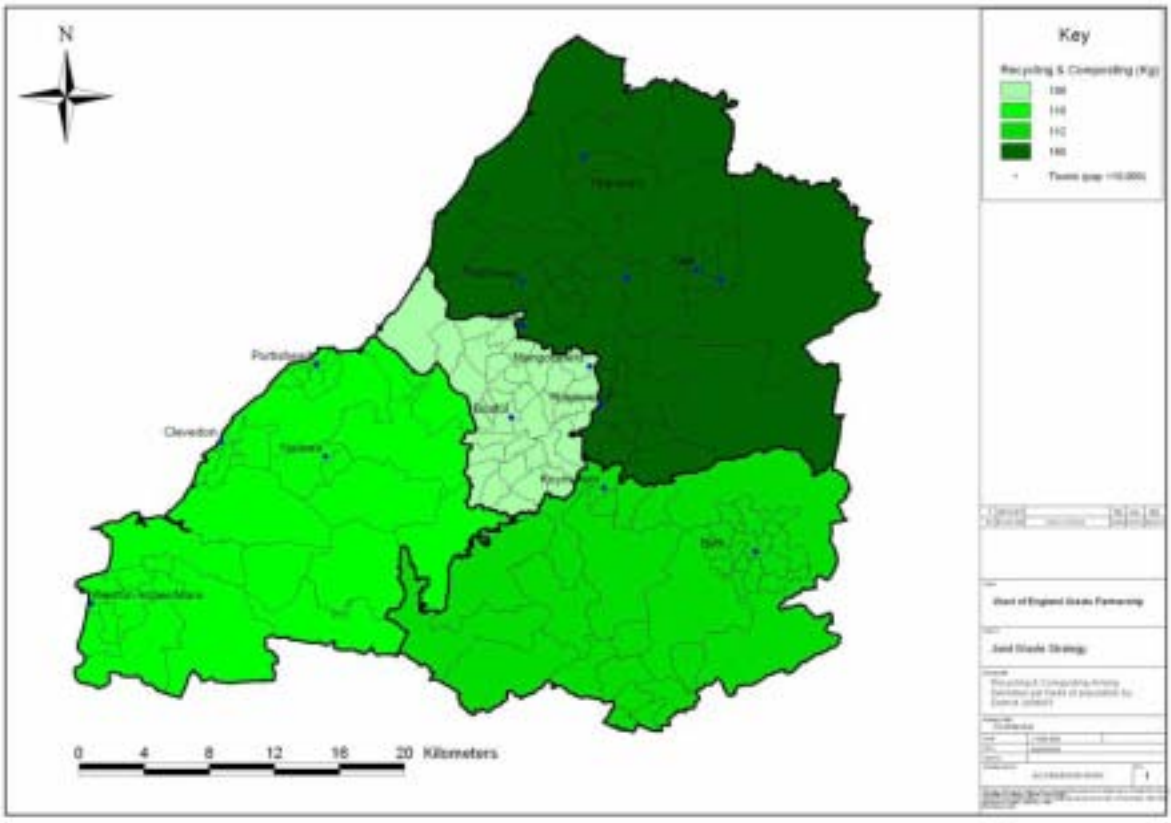


Figure 2-8 Recycling and composting per head, based on 2006/07 data



2.7.2 Waste Arisings Projections

As part of the early preparations for this Joint Waste Strategy the Partnership undertook a detailed review of the historic pattern of waste arisings. This review analysed past trends in MSW arisings with a view to projecting the quantity of waste arisings over the next 20 to 30 years.

This forward projection assessed the expected allocations of new housing in the area as well as the impacts of waste reduction initiatives and education, and forecasting improvements in recycling and composting. A prediction scenario was developed based on these technical modelling assessments whereby future arisings of MSW would rise from approximately 550,000 tonnes in 2005 up to nearly 720,000 tonnes in 2040. The main influencing factor on this rise is the 126,950 new homes expected to be built to 2026 [18].

The Partnership has seen a significant positive difference in the pattern of waste arisings predicted. The overall tonnage of MSW actually reduced between 2005/06 and 2006/07, by nearly 12,000 tonnes. The quantity of material that was segregated for recycling and composting increased by over 39,000 tonnes and the tonnage sent to landfill reduced by 51,000 tonnes.

After observing such dramatic changes in the pattern of waste arisings in just one year, the Partnership set out to review the future waste arisings prediction exercise. The rerun of the technical modelling revealed that over the period from 2007 to 2040, the Partnership estimates much lower year-on-year overall municipal solid waste arisings, an increasing quantity of material segregated for recycling and composting and a reducing quantity of residual MSW.

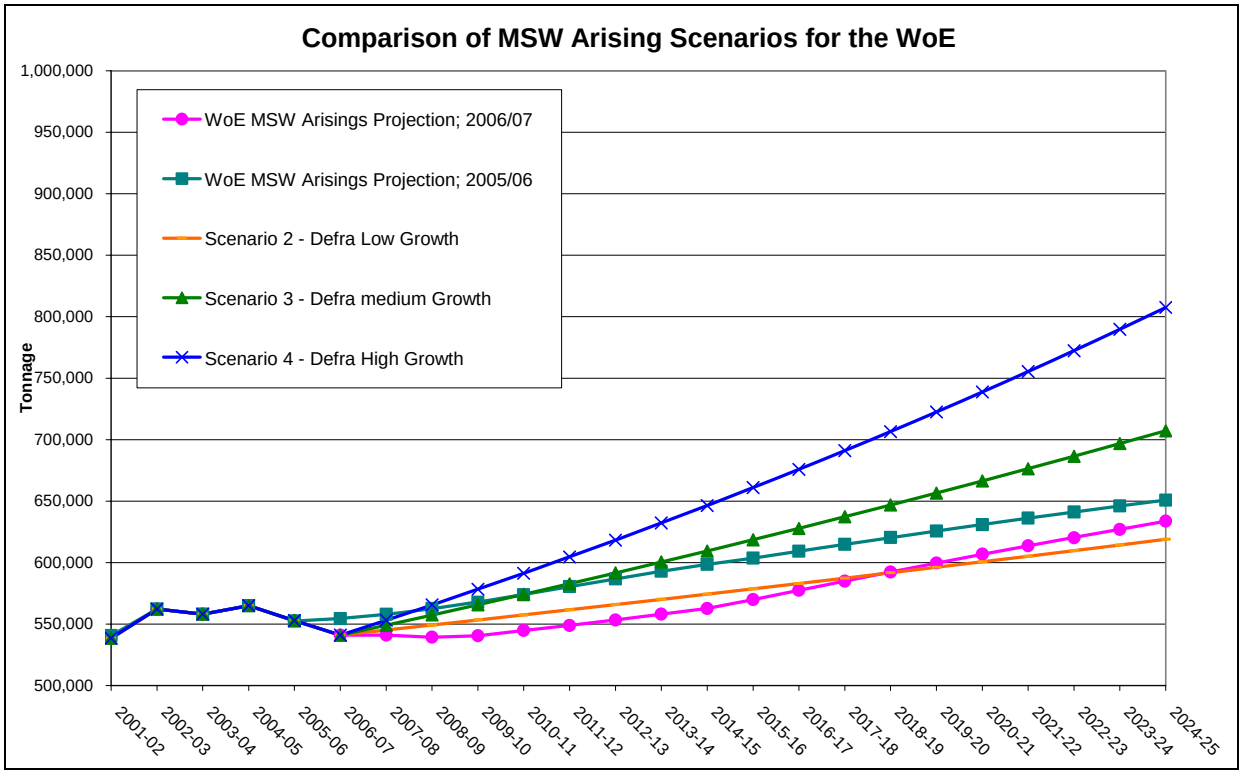
Figure 2.9 compares projections of future overall MSW arisings made in 2006, with those made in 2007. The 2007 projections take into account waste arisings data for the year 2006/07 and updated Programmed Service Improvements (PSI) from the waste partnership. These projections are also compared against Defra scenarios for low, medium and high growth.

The assumptions used in the capture rate and waste arisings modelling for each of the Authorities is provided in the supporting document 'Capture Rate and Waste Arisings Assumptions Reports for Bristol City Council, Bath & North East Somerset Council, North Somerset Council and South Gloucestershire Council' (see Section 13).

[18] South West Regional Assembly, *The Draft Regional Spatial Strategy for the South West 2006 – 2026 Examination in Public Panel Report* . Available at: http://www.southwesteip.co.uk/downloads/FinalSouthwestEiP.pdf Last accessed on 10 January 2008

Figure 2-9 shows that the 2005/06 projection surpassed the Defra low growth scenario. The 2006/07 projection represents lower MSW growth and is slightly less than the Defra low growth scenario up to 2018/19.

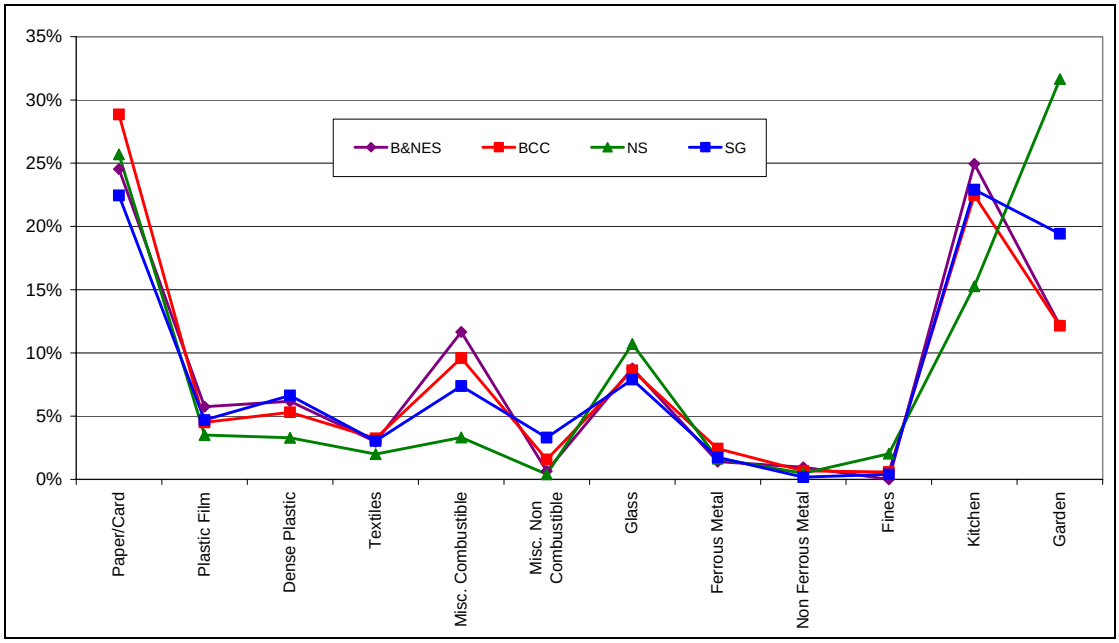
Figure 2-9 Comparison of 2006/07 Projected MSW Arising Scenario for the WoE



2.7.3 Household Waste Composition

Figure 2-10 shows how the composition of household waste varies across the partnership Authorities. This is based on composition data supplied by each authority from analyses carried out on their behalf.

Figure 2-10 Comparison of total household waste arising compositions



B&NES household waste consists of a higher proportion of kitchen waste and miscellaneous combustibles than the other Authorities. The composition of other waste types appears fairly consistent with that of the other Authorities.

BCC household waste contains the highest proportion of paper and card but has a relatively small amount of garden waste. Its composition of other dry recyclables and kitchen waste is fairly consistent with the other Authorities.

NS has a relatively high proportion of glass in its household waste and also a high proportion of garden waste. This means that the composition of dry recyclables in the waste stream is relatively low in comparison.

The waste composition of SG is relatively average when compared to the other Authorities. However it appears that SG household waste consists of slightly less paper and card and glass but slightly more dense plastic and miscellaneous non-combustible material.

The proportion of material is not only a reflection of the socio demographic profile of the authority but also a reflection of the collection and recovery infrastructure available.

3 Where Does The Partnership Want To Go And When?

This section describes the aims of the Partnership in relation to the waste hierarchy and the targets which are to be met.

3.1 Aims

The principal aim of the Joint Waste Strategy is to develop a sustainable plan for residual municipal waste management in the West of England. This will enable the Partnership Authorities to meet the landfill diversion targets for biodegradable municipal waste (BMW), set down by Government.

This aim will be achieved:

- In consultation with local residents and special interest groups;
- In a timely fashion, so as to avoid unnecessary financial penalties and landfill tax costs; and
- So as comply with all environmental legislation and regulation.

3.2 Objectives

The strategic objectives of this Joint Waste Strategy are as follows:

OBJECTIVE 1: WASTE TREATMENT

To deliver actual municipal residual waste treatment facility capacity, on the ground, this will result in:

- Meeting the financial and environmental objectives of the four Waste Disposal Authorities in the area, including landfill diversion targets;
- Meeting tonnage/treatment requirements of the Regional Waste Strategy;
- Minimising waste disposal costs in the area; and
- Moving waste management up the waste hierarchy and developing more sustainable practices.

OBJECTIVE 2: FUNDING

To secure sufficient funding to implement this Joint Waste Strategy.

OBJECTIVE 3: CONSULTATION

To provide the opportunity for local residents and community & special interest groups to inform the delivery of the strategic objectives through consultation;

OBJECTIVE 4: COMMUNICATION/INFORMATION DISSEMINATION

To develop and implement an external communications campaign which will:-

- Raise awareness of the waste management challenges facing the Partnership;

- Raise awareness about the requirement to provide treatment capacity in the West of England region and initiate discussion on treatment technology options; and
- Provide opportunities for participation in the process by all residents in the area.

3.3 Targets

The Partnership has a number of statutory and voluntary targets set down at a national, regional and local level. The Partnership will seek to achieve the following targets:

3.3.1 Landfill Directive: Diversion

The Partnership will seek to meet or exceed Landfill Directive[19] targets for the landfilling of biodegradable municipal waste. This will mean reducing the quantity of Biodegradable Municipal Waste (BMW) sent to landfill in line with the following targets:

- By 2010 to reduce BMW landfilled to 75% of that landfilled in 1995;
- By 2013 to reduce BMW landfilled to 50% of that landfilled in 1995; and
- By 2020 to reduce BMW landfilled to 35% of that landfilled in 1995.

3.3.2 Landfill Allowance Trading Scheme (LATS)

Reflecting the intention of the Landfill Directive, the Landfill Allowance Trading Scheme (LATS) sees progressively tighter restrictions on the amount of BMW that WDA's can landfill. Local Authorities have been allocated allowances for the amount of BMW they can landfill for every year of the scheme until 2020. These allowances are tradable, so that high landfilling authorities can buy more allowances if they expect to landfill more than the allowances they hold. Similarly, authorities with low landfill rates can sell their surplus allowances. The relevant LATS permits for the local authorities in the Partnership are shown in Table 3.1 and Figure 3-1. Figure 3-1 illustrates that all Partnership Authorities will need to significantly decrease the quantity of BMW sent for disposal to landfill to meet their LATS allowances.

BCC, NS and SG's jointly procured waste treatment facility for Phase 3 is unlikely to be operational until 2015 after the 2013 Landfill Directive target year. B&NES long term residual waste solution may also be beyond this date. Therefore, the four authorities have agreed to jointly procure an interim treatment solution (Phase 2). As a contingency each of the authorities will need to develop internal strategies to avoid or manage any LATS shortfalls through:

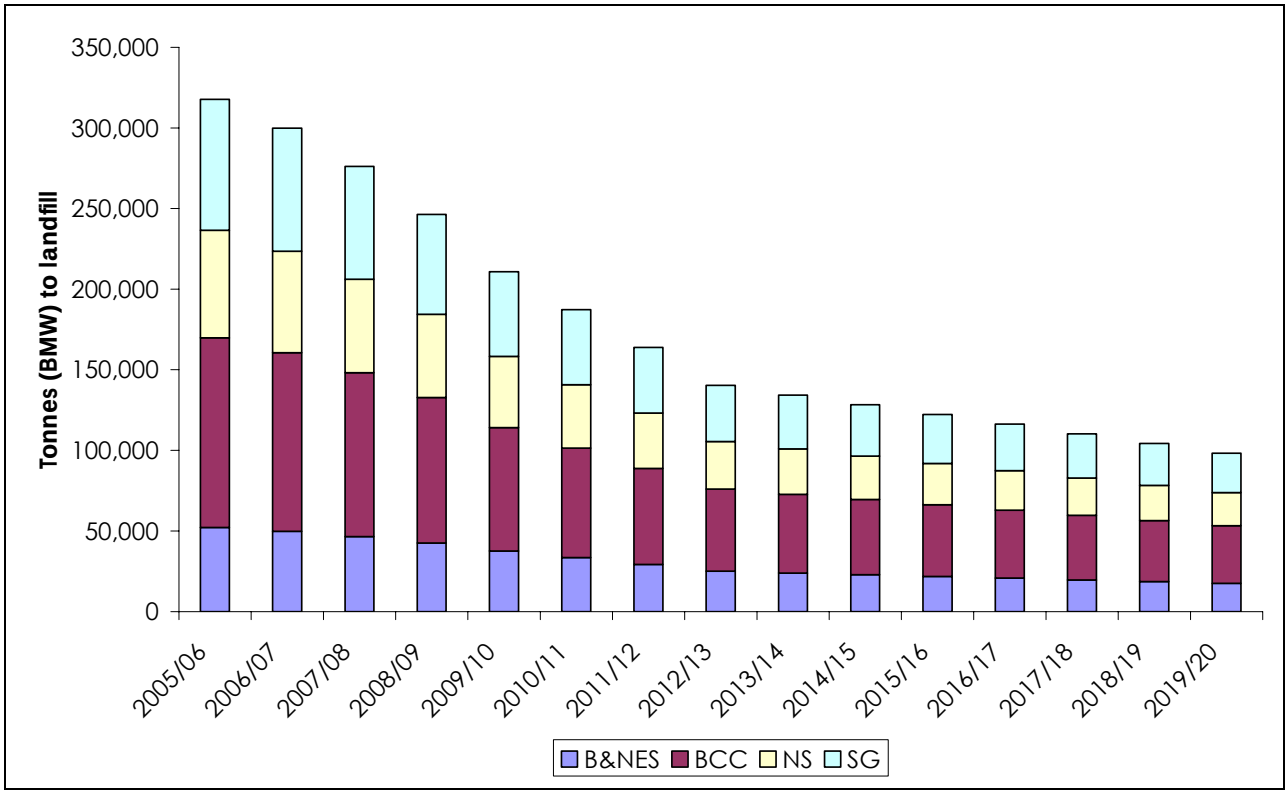
- Waste reduction;
- Increased recycling and composting;
- Banking, borrowing or trading LATS permits; and
- Looking for an interim treatment technology to divert BMW from landfill.

[19] Landfill Directive (Council Directive 1999/31/EC)

Table 3.1 LATS permits available to the Partnership Authorities in 2007-2008 and the target years

Unitary Authority	Base year figure	2007-2008 allocation	Target year 2010	Target year 2013	Target year 2020
B&NES	53,806	46,515	37,604	25,047	17,526
BCC	122,194	101,660	76,563	50,996	35,684
NS	69,195	57,954	44,214	29,450	20,607
SG	84,421	69,996	52,366	34,879	24,406
WoE	329,616	276,125	210,747	140,372	98,223

Figure 3-1 The decreasing LATS permits available to the Partnership Authorities



3.3.3 The Position of the Partnership in Relation to the LATS

Programmed (source-segregation) Service Improvements (PSI) that each of the four Authorities intends to make over the period to 2020 has been collated and entered into the technical waste flow and mass balance modelling to determine how source segregation performance will change over the next 25 to 30 years. This capture rate modelling analysis determines the impacts of, for example, additional services being rolled out, more materials being targeted for collection and participation increases etc. This establishes the projected future performance and enables the calculation of what quantity of MSW is

source segregated and hence the quantity of residual MSW that will need to be managed.

The Programmed Service Improvements, (PSI) scenario represents the future improved source segregation performance.

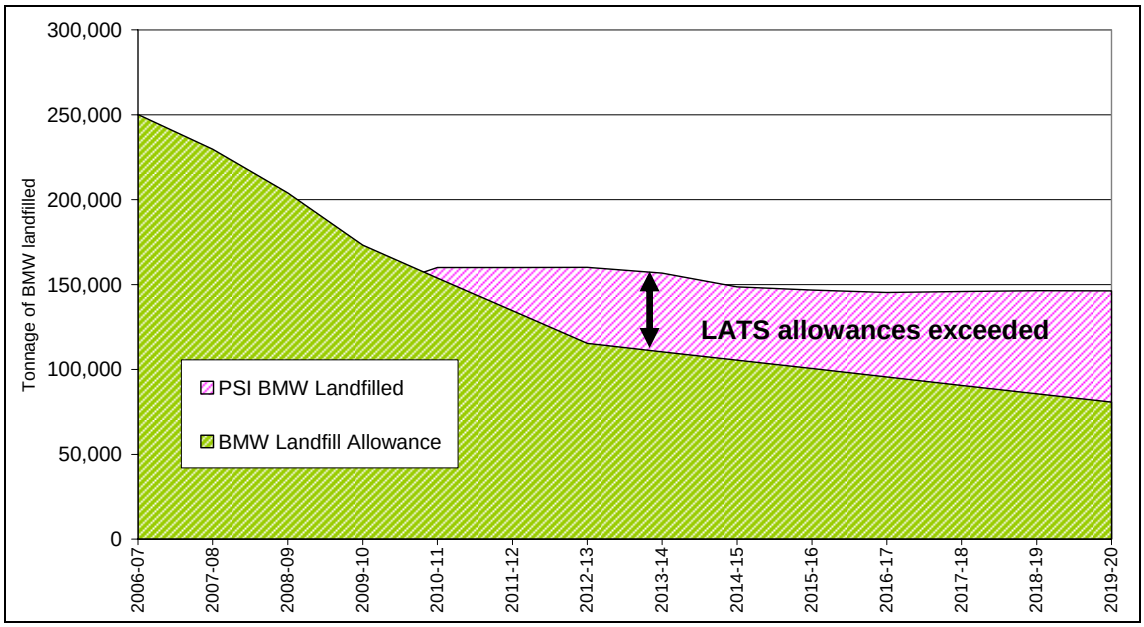
The quantity of residual MSW is then used to determine the size and performance of various technology options against the landfill diversion targets i.e. the quantity of BMW allowed to be landfilled under the LATS. This also includes an assessment of each technology's performance against recycling/composting targets

The following analysis assesses the state of the Partnership in meeting its LATS allowances under the PSI scenario.

3.3.4 The Partnership's Projected LATS Performance

Figure 3-2 is a representation of the Partnership's performance against its LATS allowances solely with the PSI scenario. It can be seen that between 2005/06 and 2009/10 the Partnership meets its LATS allowances i.e. outperforms the LATS requirements to divert BMW from landfill. In subsequent years the Partnership expects to continue to decrease the quantity of BMW sent to landfill, but will still fail to achieve sufficient diversion of BMW from landfill required to meet the LATS allowances and to avoid fines. In 2010/11 the Partnership predicts it will exceed the landfill allowances by over 10,000 tonnes BMW.

Figure 3-2 Projected LATS performance under PSI



3.3.5 The Financial Implications of Missing LATS Allowances

The financial implication of not meeting the LATS allowances could be severe and even buying permits being traded on the market is likely to prove very expensive by the 2009/10 target year. In 2006/07 the permits were trading at an

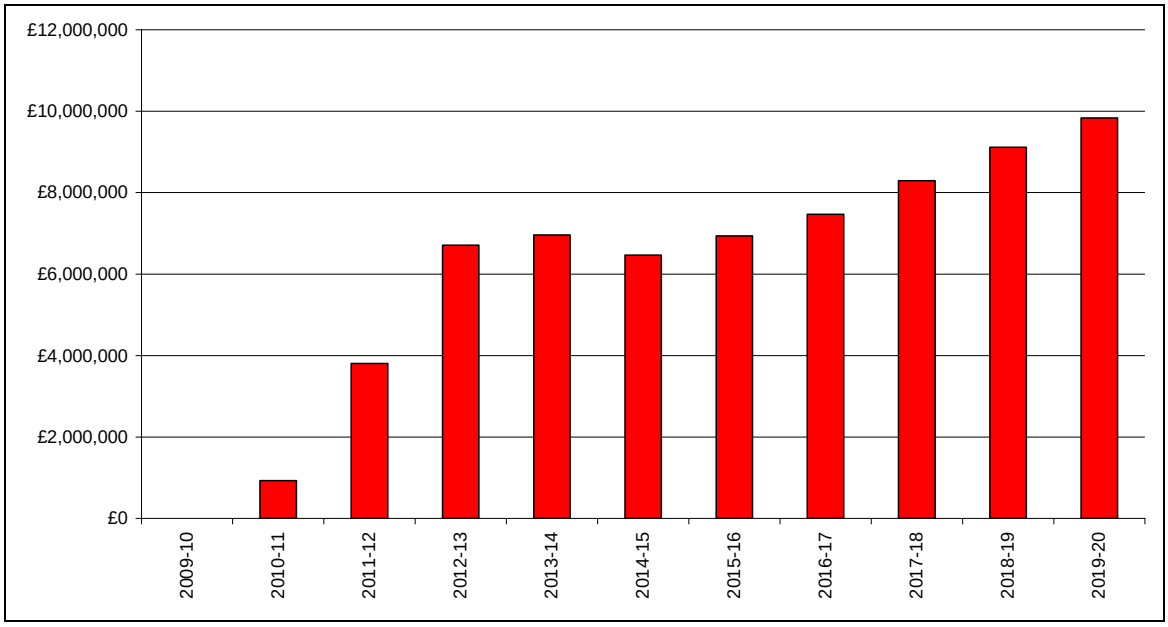
average price of £17.34 per permit i.e. per tonne of BMW [20], but by 2009/10, it is likely that the price of buying permits could increase significantly.

If the UK, as a whole, fails to meet its Landfill Directive BMW diversion targets, it has been reported that a share of the EU fine imposed upon the UK of £½ million per day would be passed down to local authorities contributing to that failure; the exact mechanism of how this would be apportioned has not been agreed by Defra at this time.

It should also be noted that if the correct number of allowances are not available to the Authorities each will be liable for a cash penalty from Defra of up to £150 per tonne of excess landfill usage. An example of the estimated financial implications for the Partnership of not meeting the LATS allowances is set out in Figure 3-3. The first fines are likely to be in the year 2010/11 at around £1.7m and could increase to £12.7m by 2019/20.

Figure 3-2 and Figure 3-3 illustrate the need for the Partnership to invest in new facilities to treat residual waste in the long term. However, any new facilities or waste solution for B&NES, BCC, NS and SG is unlikely to be available until at least 2015 which creates the need for contingency arrangements to divert excess tonnage from approximately 2009.

Figure 3-3 The estimated financial implications for the Partnership for not meeting the LATS allowances (possible annual fines at £150 per tonne)



3.3.6 Short-Term Options to Manage LATS Risk

The Partnership has the following short-term options available:

[20] Environment Agency (2007), Report on the Landfill Allowances and Trading Scheme 2006/7. Available at: www.environment-agency.gov.uk/commondata/acrobat/lats_report_1896047.pdf Last accessed on 9 December 2007

1. Bank as many spare LATS allowances as possible - this will help only in non-target years (i.e. it will not help in 2009/10, 2012/13 and 2019/20);
2. Trade allowances when possible to meet the LATS allowance and ring-fence the income to help fund deficit years;
3. Accept all LATS fines (£150 per tonne of biodegradable waste landfilled above allowance); and/or ideally; and
4. Until longer term treatment capacity is secured, work with the market to find an option that is a suitable waste treatment solution that will divert sufficient quantities of BMW from landfill. The Partnership is actively investigating with the market what this option could be. This will lead to a procurement exercise (Phase 2), where possible technology options might include mechanical and biological 'biostabilisation' and autoclaving (with or without thermal treatment). More detail on this is provided in Sections 3.6.5 to 3.6.7 on the phase 2 soft market testing.

3.3.7 The Need for Residual Waste Treatment

From the data above it is clear that the Partnership needs to pursue the procurement of residual waste treatment technologies. High recycling and composting rates alone will not meet long term targets for diverting biodegradable municipal waste from landfill. Further treatment of the residual fraction will still be required. Longer term sustainability objectives require that new waste treatment technologies should be developed in the area at one or more sites.

The sizing and role of any treatment technology has to be carefully considered, so that it does not present a barrier to increased recycling and composting aspirations. Section 4.3 examines different residual waste management technologies that were considered by the partnership.

3.3.8 The Waste Strategy for England 2007

The targets and objectives as set out in the Waste Strategy for England 2007 are shown in Figure 1-2.

a) Climate Change

The Waste Strategy for England 2007 emphasises the impacts of climate change and the cost of not tackling this threat now. The management of waste plays a significant role in climate change. Reducing natural resource use, recycling materials and recovering energy from materials used is a vital part of moving towards more sustainable consumption and production.

Disposal of biodegradable waste to landfill results in emissions of methane, a powerful greenhouse gas which contributes to climate change. However, recycling and energy recovery can preserve virgin materials and reduce fossil fuels usage. By further reducing landfill by increasing the quantity of waste that is recycled, composted or has energy recovered, there is considerable scope for reducing greenhouse gas emissions.

The Partnership aims to reduce its impact on climate change by reducing waste arisings and landfill disposal. Action will be focused on priority waste materials, with greatest scope for improving environmental and economic outcomes, as identified in the Waste Strategy for England 2007:

- Paper;
- Food waste;
- Garden waste;
- Aluminium;
- Glass;
- Plastics;
- Wood; and
- Textiles.

The Partnership is targeting improved performance in source segregating their priority waste materials. Carbon emissions were considered in the technology options appraisal, however with the increased emphasis on climate change and carbon footprinting the Partnership took the opportunity to use the Environment Agency's WRATE (Waste and Resources Assessment Tool for the Environment) tool to provide a more thorough assessment of the technology options against global warming potential (see section 4.3.2 for discussion and results). Any new facilities for managing waste will be evaluated for their impacts on climate change.

b) Recycling and Recovery

It is clear looking at the targets set out in Figure 1-2 that the four Partnership Authorities will need to continue to improve recycling and composting performance to meet the strategy targets of 40% recycling and composting by 2010, 45% by 2015 and 50% by 2020. Phase 1 of This Strategy addresses waste reduction, and also reuse, recycling and composting. All four Authorities are working towards meeting these targets as a minimum. Critically, the subsequent phases of the Strategy establish a flexible framework that seeks to avoid presenting a barrier to future improvements in source segregation.

Under proposed reforms to the performance framework for Local Government, a new series of waste indicators will be developed. It is anticipated that these will take the form detailed below[21]:

- National Indicator 191 - Residual household waste per head - Household waste not reused, recycled or composted per head (kg/head);
- National Indicator 192 - Household waste recycled and composted - Percentage of household waste reused, recycled and composted; and
- National Indicator 193 - Municipal waste land filled - Percentage of Municipal Waste landfilled.

The partnership will need to update its data management systems to address the revised indicators as well as reviewing programmed service improvements for recycling to address the revised targets.

[21] HM Government National Indicators for Local Authorities and Local Authority Partnerships: Handbook of Definitions. Draft for Consultation http://www.communities.gov.uk/publications/localgovernment/indicatorsdefinitions Last accessed on 9 December 2007.

c) Non-Municipal Wastes – Commercial and Industrial Wastes

The focus of This Strategy is on residual MSW. Nevertheless the Partnership recognises the challenges and opportunities that C&I waste arisings present. There is a good degree of synergy in the development and implementation programmes of The Development Plan and the Joint Waste Strategy. The Development Plan provides for managing all controlled wastes, including C&I waste. This aligns with the emphasis in the Waste Strategy for England 2007 to realise the synergies between municipal and commercial waste. The potential for integration of commercial waste with the implementation of this Strategy is detailed in Sections 4.5 and 5.4.

d) Hazardous Municipal Solid Wastes

The Waste Strategy for England 2007 encourages local Authorities to increase the segregation of hazardous waste. As the amount of residual waste decreases through waste reduction and recycling schemes the concentration of hazardous waste may proportionately increase which could be potentially harmful to the environment.

The partnership will make every reasonable effort to keep hazardous items out of the mixed domestic waste stream. This will include the provision of appropriate facilities at HWRCs combined with the use of site signs, leaflets and websites, as well as explanations given by HWRC staff to guide site users and to intervene where necessary to ensure that hazardous household waste is deposited in the correct container.

All HWRCs will have facilities for the more common types of household hazardous waste, including:

- Hazardous Waste Electrical Electronic Equipment – WEEE - (including cathode ray tube televisions and/or computer monitors, fridges and fluorescent tubes);
- Gas bottles;
- Automotive batteries;
- Engine oil; and
- Household batteries.

At least one HWRC in each Authority area will provide facilities for asbestos and for household and garden chemicals.

3.3.9 Regional Waste Strategy for the South West: Capacity Targets

The Partnership will seek to contribute to meeting capacity targets set down in the Regional Waste Strategy for the South-West [22]. The overall target for the regional strategy is to ensure that by the year 2020 over 45% of waste is recycled and reused and that less than 20% of waste produced in the South-West is landfilled.

[22] From Rubbish to Resource. The Regional Waste Strategy for the South West 2004 – 2020 http://www.southwest-ra.gov.uk/ngcontent.cfm?a_id=500 Last accessed 9 December 2007

The Regional Waste Strategy also incorporates indicative annual municipal waste management capacities for each county in the south-west including the West of England area. These capacities or targets are shown below in Table 3.2.

Table 3.2 Municipal waste capacities set down by the Regional Waste Strategy[23]

	2010 (tonnes)	2013 (tonnes)	2020 (tonnes)
Recycled	230,000	280,000	310,000
Secondary Treatment	150,000	220,000	370,000
Landfill	300,000	240,000	120,000

The Partnership will consider these targets for secondary treatment facility capacity and the landfill disposal reductions. However, the Partnership has also conducted detailed modelling work presented in section 4.3 which highlights waste treatment requirements based on the size of waste treatment facilities. This data will also be considered before setting specific targets for waste treatment capacity in the West of England.

3.4 Policies

The Authorities have been working in Partnership towards the shared vision, with regard for the following guiding policies on residual waste:

POLICY 1: LANDFILL DIRECTIVE TARGETS

- The Partnership will use the waste hierarchy as a guiding principle to waste management and landfill will be used as the last option after residual waste treatment;
- Recovery and disposal facilities will be delivered to ensure compliance with the Waste and Emissions Trading Act/Landfill Allowance trading Scheme; and
- Achieve or better landfill diversion targets.

POLICY 2: PARTNERSHIP WORKING

- Committed to pursuing and assessing the options for working together as an area; and
- The Authorities will work in partnership with each other, the community and the private sector to maximise the sustainable and efficient recovery of resources from residual MSW.

POLICY 3: DELIVER BEST VALUE

[23] Based on data given in Appendix 2 -Table 1 Municipal Waste - Annual Municipal Waste Management Capacities for Landfill Directive Target Years – data in the Former Avon Sub Region

- The Partnership will ensure the delivery of services to a high standard, consistent with the principles of best value whilst considering the evaluation of the economic, social and environmental impacts.

POLICY 4: LOCAL SUSTAINABILITY

- Local sustainability issues will be considered, including opportunities to enhance the local economy and employment and minimise environmental and traffic impacts;
- Recognise the benefits of energy efficiency in waste management and the importance of minimising greenhouse gas emissions;
- Aim to minimise waste through prevention, recycling and composting;
- Support sustainable and efficient recovery of resources;
- Support home and community composting schemes; and
- Support and encourage kerbside recycling.

POLICY 5: NATIONAL STRATEGIC OBJECTIVE

- The Partnership will work to ensure waste is managed in ways that protect human health and the environment, and in particular:
  - Without risk to water, air, soil and plants and animals;
  - Without causing a nuisance through noise or odours;
  - Without adversely affecting the countryside or places of special interest; and
  - Disposing of waste at the nearest appropriate installation, by means of the most appropriate methods and technologies.
- Where economically viable, consider accepting waste from surrounding Authorities; and
- Reduce environmental impact of transporting waste.

POLICY 6: COMMUNICATION

- The Partnership will work to promote public awareness and information on waste management issues.

3.5 Communications Strategy and Stakeholder Engagement Plan

The Partnership understands that communications are a vital and integral part of the successful implementation of their waste solution. This ensures that all those involved, from the waste industry, statutory stakeholders and decision makers to local residents and community groups, all receive clear and concise information at a level and an amount appropriate to their needs.

In order to improve communications both internally and externally a Communications Strategy and Stakeholder Engagement Plan has been prepared by the Partnership's Joint Communications Officer. Its objectives include the following:

- To pro-actively influence stakeholders over the long term including internal stakeholders, external stakeholders and statutory organisations;

- To create awareness of the joint waste strategy via a detailed information plan which proposes specific communication activities to enhance awareness and understanding of the Strategy and Waste Technologies;
- To create public awareness within Phase 1 of the Waste Strategy a programme of waste minimisation, along with publicity/promotion is planned and a business case is to be developed;
- To engage in a public consultation exercise in relation to the Preferred Options Consultation. This is a third stage of consultation and is required to meet statutory planning requirements set out in Regulation 26 of the Town and Country Planning (Local Development) (England) Regulations 2004;
- To assist in clarifying and responding to objections by environmental pressure groups. Communications alone cannot diminish all negative attitudes, but it can help to redress the balance and ensure that a rational case is put forward;
- To ensure councillors are regularly briefed and updated;
- To continue to liaise with Defra - a key stakeholder for positive communications, and in particular those involved with the Waste Infrastructure Delivery Programme (WIDP), 4ps, Partnership UK and GOSW; and
- To increase the potential for Industry 'bid-ability' by reassuring the waste industry that the Partnership is committed to the procurement of new waste facilities.

To meet these objectives a tool kit of modern communication methods is outlined in the Communications Strategy and Stakeholder Engagement Plan. These are a means of informing the variety of groups and individuals classed as 'stakeholders'. There is no one means by which to communicate the waste strategy and Development Plan document, therefore the following will be used to engage with stakeholders;

- Meetings and/ or briefings;
- Minutes from meetings;
- Video conferencing;
- Intranet;
- E- bulletins or E-newsletters;
- Council newsletters and websites;
- 'Rubbish or Resource' website;
- Posters and Leaflets;
- Direct mail; and
- Press articles/ broadcast media.

The methods and timings of communication will also be monitored and reviewed regularly to assess the suitability of activities in light of changing circumstances. These methods have been organised into a communications plan and timetable which identifies when they are to be implemented and to which particular stakeholder.

A full copy of the Communications Strategy and Stakeholder Engagement Plan is provided in Section 13.

3.6 Consultation

Two public consultation programmes were carried out in June/ July 2006 and February/ March 2007. Both were extensive and raised awareness of the emerging waste strategy and the Development Plan, as well as generating responses from the public. The purpose of the Stage 1 consultation was to identify public perception of waste and its potential as a resource and to improve public perception/ knowledge of waste issues and the treatment options that are available. These views were then considered when setting the objectives for the Joint Waste Strategy, which could be tested and reviewed during Stage 2 of the consultation process.

Stage 2 of the consultation focused more on the amount and type of waste generated in the West of England, the outcomes of the Options Appraisal, the combinations of technologies being considered and the site selection criteria proposed for waste facilities, building on the consultation exercise of Phase One.

3.6.1 Stage 1 of the Public Consultation – Rubbish or Resource Campaign

A Strategic Consultation Forum (SCF) was formed from a wide group of interested parties and stakeholder groups from each Partner Authority to help design and deliver the consultation programme and to ensure that all aspects of the community were fully engaged and involved.

The public consultation exercise was launched at The Council House in Bristol on 10 July 2006. Titled 'Rubbish or Resource?' the campaign invited the public to provide feedback and views on the subject of residual waste. During July 2006 the 'Rubbish or Resource' road show toured shopping centres and other venues, together with five public meetings throughout the region to canvass public opinion on how residual waste could be managed.

A survey was designed to quantify feedback from the public and this was distributed at all organised events and through a specially designed website (www.rubbishorresource.co.uk). The questionnaire survey section of the leaflet is reproduced in an associated report [24], which details Stage 1 of the consultation process and its results.

a) Summary of Issues Highlighted by Stage 1 of the Consultation

The main points highlighted by the public were:

- All areas could recycle more;
- Investment in alternatives to landfill is required;
- The Partnership should look at examples of best practice from Europe;
- Respondents "care" what happens to waste and a large proportion believe further value should be obtained;
- Respondents are aware of alternatives to landfill but feel they do not have enough information to make an informed judgement;
- Environmental considerations are more important than financial considerations when deciding on an alternative to landfill;

[24] Hyder, 2006. Rubbish or Resource? Public Consultation – Phase 1 Summer 2006

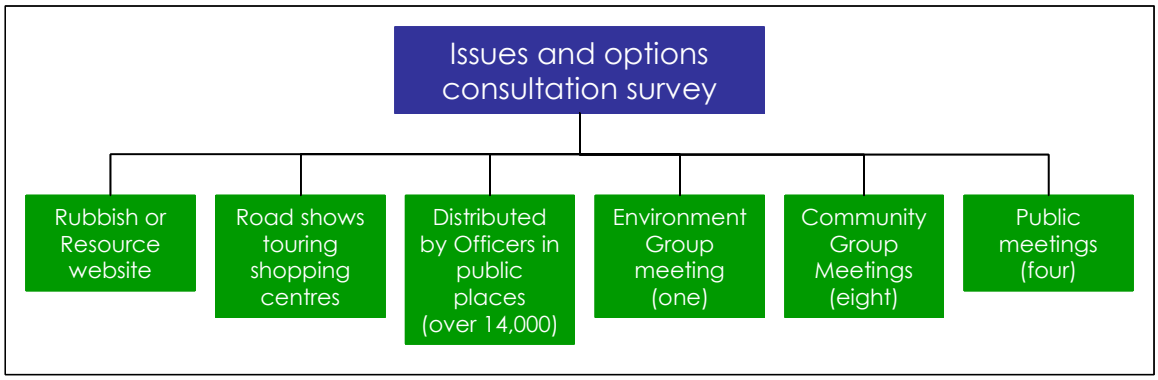
- The preference expressed for the location of facilities was on brownfield sites, and a larger number of small facilities;
- Odour and air quality were the most important issues with regards to site location; although visual impact, traffic and noise all ranked highly; and
- A large percentage of respondents indicate a need to reduce their waste.

3.6.2 Stage 2 of the Public Consultation – Issues and Options Consultation

Events for the second stage of the consultation were chosen with guidance from the Strategic Consultation Forum (SCF) formed during Stage 1 of the Public Consultation. The same range of waste treatment technology options were subject to consultation with the public, as part of the Stage 2 Consultation.

The public consultation took place between February and March 2007 when an issues and options survey was distributed via a number of means (see Figure 3-4). The Consultation document was physically distributed to Council offices, libraries, sports centres, community and citizens groups, local businesses, schools and colleges.

Figure 3-4 Means by which the Issues and Options Consultation was distributed



a) Summary of Issues Highlighted by Stage 2 of the Consultation

The main points highlighted by the public were [25]:

- There is a need for residual waste treatment facilities, but more emphasis is still required on reduction and recycling;
- Wastes should be treated locally;
- MSW and C&I wastes should be treated together (if possible);
- Waste should not be exported but some imports from neighbouring authorities should be considered if economically advantageous;
- Residual waste facilities should not be too big and thus inhibit expansion of recycling programmes, nor should they have long contracts which will inhibit the adoption of new technologies;

[25] Hyder, 2007. West of England Waste Management and Planning Strategy Consultation – Phase 2 www.rubbishorresource.co.uk Last accessed 9 December 2007

- Energy efficient and carbon neutral facilities were favoured, as were those that were proven and had sufficient track record to give comfort that they would work;
- The elected members were trusted to make decisions on appropriate facilities and technologies, but more transparency was required in terms of the decision-making process;
- The technology options appraisal process was questioned as the emphasis on carbon neutral facilities and global warming was considered insufficient;
- The planning framework which was presented and the land-use criteria which were discussed were appropriate;
- People still wanted more information to help them express their opinion. They wanted definitive answers to questions about size, cost, health and environmental impacts of all the technologies;
- Plastics, packaging and supermarkets were frequently cited as problem areas for waste; and
- Some expressed views that combined heat and power facilities should be located near to where such energy can be used.

Please see Appendix D – Stage 2 Consultation Responses for more details regarding the issues raised.

3.6.3 Stage 3 Preferred Options Consultation (2008)

A public consultation will take place in 2008 on Preferred Options as part of delivering the Development Plan. This third and final stage of the consultation will be the 'statutory' consultation linked to the identification of sites in the waste core strategy.

3.6.4 Waste Industry Consultation

a) Local Business/Waste Industry - Stage 1

An Industry Day was held on 20 July 2006 to inform and receive input/comment from the waste management industry. Representatives from all aspects of the waste industry were invited to attend.

Firstly, the representatives were given an overview of the project and the consultation process. Breakout sessions were then held on the following subjects:
- Finance;
- Planning;
- Political sensitivities/engagement with community; and
- Technologies.

The Technology Options Appraisal process was explained to the representatives and a short questionnaire was distributed to gather the views of the industry on a number of potential criteria to evaluate technology options. A total of 14 responses were received, which were mainly in line with those already discussed. These opinions and any additional criteria were used to help develop potential criteria to evaluate technology options and also to verify criteria already put forward by the Partnership. Further explanation of the Technology Options Appraisal is provided in Section 4.3.

b) Local Business/Waste Industry – Stage 2

A second Industry Day was held on 29 May 2007, aimed particularly at local businesses and employers, where a series of four presentations were given on the Development Plan process. These presentations set the scene for the delegates regarding the latest developments in the progress of the project and current situations generally in the West of England regarding the choice of facilities, siting and other important planning issues. Following this a series of interactive workshops were used to facilitate an open debate and discussion around three key themes:

- Data on waste arisings (MSW and C&I wastes);
- Implications for the planning process; and
- Integration of facilities (MSW and C&I wastes).

Each stakeholder spent time in each of the three workshops ensuring that a full spectrum of opinion and input was captured.

3.6.5 Soft Market Testing

The Partnership has developed this Strategy in line with best practice guidance, in consultation with the public, with engagement of key stakeholders, with feedback from Defra and with the early views and thoughts of industry.

The Partnership wanted to test the emerging phased Strategy with industry to discuss whether it could be successfully implemented. Two soft market testing exercises were undertaken in October and November 2007. One to specifically test and discuss Phase 2, the second to discuss Phase 3 in more detail but also on the Strategy and its implementation more generally.

3.6.6 Soft Market Testing for Phase 2

The LATS is scheduled to run until 2019/20 and landfill allowances for each authority have been allocated to that date. The procurement arrangements to manage the early LATS risk are a key phase (Phase 2) in the necessary arrangements needed for the Partnership to meet its medium term LATS risk to approximately 2014/15.

The Partnership engaged the industry through a soft market testing (SMT) exercise to understand what Phase 2 interim treatment capacity they may be able to provide. The purpose of the soft-market testing exercise was to:

- Gain an understanding of the options and availability of treatment capacity for Phase 2;
- Inform a tender process leading to potential procurement of a contract of at least five years in length; and,
- To minimise or eliminate risk of financial penalties or unbudgeted additional costs arising from LATS.

The Partnership recognises that a Phase 2 solution may need to be delivered over a longer timescale in order to achieve best value, i.e. it may overlap and complement Phase 3.

The first stage of this Interim SMT was a questionnaire issued in August 2007; 18 responses were received. Of these, four industry respondents were invited to meet with Partnership officers to discuss proposed Phase 2 technology solutions. These meetings were held confidentially, on a one-to-one basis. The salient outcomes from these meetings included:

- The only treatment capacity that was guaranteed to be available during the period required was at an existing facility. This could only meet around 20% of the Authorities' requirements and was approximately 100 miles outside of the West of England area;
- There is, a genuine market interest in developing new facilities in the West of England to process MSW and C&I waste;
- A number of different technology solutions were put forward, which could align themselves with phase 2. These included mechanical, biological, advanced thermal and autoclave treatment processes;
- Companies would be prepared to offer capacity on the basis of gate-fee payment;
- If site(s) acquisition and planning application(s) are expedited, these technologies could be delivered in time to meet the Partnership's LATS allowance targets in 2012/13;
- Companies expressed a preference to extend the contract period beyond the five year LATS allowance shortfall period to the introduction of Phase 3; to encourage better value for money; and
- A number of the companies are investigating sites and considering their approach to planning.

The feedback from these detailed discussions was positive. They indicate that a flexible approach to Phase 2 must be adopted. It was recognised that Phase 2 may well benefit from a longer contractual period then originally anticipated. A viable and deliverable technology option is likely to be offered by the market if and when a Phase 2 contract is presented.

3.6.7 Soft Market Testing for Phase 3

The Partnership's requirement to divert significant quantities of BMW from landfill is clear. This phased Strategy framework has been developed to help deliver that requirement. The purpose of the Phase 3 soft-market testing exercise was:

- To gain an understanding of the interest of the market in the Partnership project;
- To inform the Partnership's governance and structural arrangements; and
- To inform the Joint Waste Strategy and help shape any future procurement exercise.

Eight industry representatives met with Partnership officers, again in one-to-one meetings and in confidence. The discussions focussed on:

- The phased Strategy framework;
- Planning and sites;
- Their technology preferences and how they fitted with the Partnership's preferences;
- Procurement matters;
- Project risks; and
- Governance and structural arrangements.

The key findings from the exercise were as follows:

- The emerging phased Strategy received strong support from all industry representatives;
- There is significant interest within the waste industry for the longer term procurement of a contract(s) to manage residual MSW in the Partnership area;
- The choice of Energy from Waste technology received strong support and should be put forward as the preferred option;
- Combined Heat and Power is desirable and a possibility where sites permit;
- A number of the companies are investigating sites and considering their approach to planning.
- All the representatives indicated that they would be seeking to include C&I waste in their facility and would be expecting to size the facility to provide the excess capacity required;
- The Partnership should be governed as a single entity with effective and efficient delegated decision making powers;
- Political support needs to be united across the Partnership. Political will to deliver the project and the technology is crucial to attracting and retaining market interest;
- The Joint Waste Strategy and Development Plan need to be aligned in terms of site locations;
- If the Partnership offers a site to the market, baseline surveys should be conducted to provide a level playing field to all bidders;
- The Official Journal of the European Union (OJEU) notice should be kept flexible. This provides industry with the ability to put forward, what they consider to be the best solution for the Partnership;
- The Partnership should consider including Waste Transfer Stations within the contract;
- The Partnership should separately contract landfill capacity for wastes that are inappropriate to be processed by the selected contractor;
- The Partnership needs to be appropriately resourced to deliver an efficient competitive dialogue process. The procurement process could be expedited if the Partnership lead had experience of delivering [waste] PFI projects.

It should be noted that the soft market testing exercise was undertaken on a Partnership basis and does not reflect the three authority approach of Phase 3. The Partnership intends to conduct further market testing in the lead up to procurement.

The industry representatives were clear in their support for this Strategy and the phased framework it presented. They agreed that the choice of EfW as a reference project for Phase 3 was a rational, deliverable, and low risk choice that offers value for money. There was obvious support for delivering the Strategy with proactive engagement from the industry already.

4 What Does The Partnership Need To Do To Get There?

This section evaluates the Partnership's options for achieving the objectives of the project set out in the previous chapter. It includes two sections:

1. A brief overview of what the Authorities are doing to promote waste reduction and reuse, the recycling services they currently manage and those planned for the future; and
2. A summary of the residual waste Technology Options Appraisal process used to assess and evaluate options for residual waste management.

This Strategy is principally focused on the treatment and disposal of residual waste; however, this cannot be assessed without examining other factors that may influence waste arisings and composition. Therefore other methods employed by the partner Authorities to divert waste from landfill are discussed briefly. More details on the approaches employed by each Authority are available in the 3Rs Statement.

The Partnership is participating in the Government's 4ps Gateway Review Process. In the summer of 2007 a 4ps Gateway Review (Gate 0) was completed. One of the key themes highlighted is to place greater emphasis on waste reduction and recycling and consideration of joint Authority campaign work. This theme was also raised through the consultation process and has been taken on board by the Partnership; it was a key driver in producing the 3Rs Statement. The following summary of activities highlights this change towards partnership working and increased waste reduction and recycling schemes.

4.1 Waste Reduction and Reuse

Growth in waste arisings is a considerable problem. It is a difficult issue to tackle because the underlying reasons appear to be closely associated with lifestyle, culture and market forces. This issue is not local to the Partnership but is driven by national and international influences. Excluding the impact of housing growth, growth in waste arisings per household, or per head in population, appears to have arisen through two principal sources:

- Excessive consumption; and,
- Excess packaging.

Local authorities have relatively little power to influence these factors, but the Partnership will work to encourage all parties to 'behave' in a more sustainable way, through promotion, education and the provision of services. The Waste Strategy for England 2007 highlights that new markets for recycled materials should be established, local authorities should strive to reduce the quantity of waste they collect and that more efficient collection, treatment and disposal methods should be adopted; these will ultimately encourage waste reduction indirectly.

The Waste Strategy for England 2007 sets out plans for waste reduction through a combination of legislation, education and incentives. These include:

- Consultation to enable local authorities to offer financial incentives for waste reduction (estimated to reduce the amount of waste landfilled per household by up to 130kg);
- Increased promotion of waste reduction practices;
- Reducing the impact of waste plastic bags by 25% by the end of 2008; and
- Targeting waste producers to reduce waste streams such as packaging.

The Authorities will continue to actively promote waste reduction, working to reduce the quantity of waste produced by encouraging the reuse of many materials that would otherwise have been disposed of to landfill.

4.1.1 The Partnership's Existing Waste Reduction Initiatives

The Partnership uses numerous methods of promoting waste reduction and recycling as shown in Table 4.1 below. Many of these are detailed in the individual Partners' strategies.

Reduction schemes that target specific waste streams, such as SOFA (large items such as furniture and white goods) can have an immediate and quantifiable effect on waste diversion and often provide good examples of community involvement. They require a sustained effort and establishment of good joint working processes.

Other schemes (such as Real Nappy campaigns and school education sessions) are intended to increase awareness of waste-related issues. The benefits are not easy to quantify though they are very important in the longer term in changing public behaviour towards more sustainable waste management practices. Home composting initiatives will also contribute to meeting Waste Strategy for England 2007 reduction targets.

Table 4.1 Methods of promoting waste reduction and reuse employed by all Partnership Authorities

B&NES [26]	BCC [27]	NS [28]	SG [29]
• Rethink Rubbish waste awareness and education campaign. • Waste Minimisation and Reduction advice and activity including zero waste Weeks. • Schools recycling and litter education including zero waste Lunch projects. • Reuse of furniture and white goods through SOFA Project and also Genesis. • WRAP Home composting and bin promotion. • Waste min/reduction website information • Reuse and recycling initiatives and disposal controls at Recycling Centres. • Real Nappy Campaign promoted on website.	• Reuse of furniture & white goods (with SOFA). • WRAP funded project with 'hard to reach' groups to improve participation. • Junk mail campaign. • Computer reuse/ recycling. • Paint reuse. • Freecycle. • Children's scrap-store. • Real Nappy Campaign and voucher scheme. • Subsidised Home Compost Bins. • Schools and public education campaigns. • Christmas tree recycling. • Controls on trade abuse at HWRCs. • Encourage home composting.	• Christmas tree recycling. • Schools Education Officer. • Real Nappy network. • Junk Mail campaign. • Schools and public recycling campaign. • Subsidised home composting. • Third party recycling. • Controls on trade abuse at HWRCs. • Publicity for new services, recycling initiatives and disposal controls at HWRCs. • Encourage home composting.	• SORT IT newsletter to all residents. • Junk mail campaign. • Yellow pages with schools. • Real Nappy network. • Subsidised home composting (joining WRAP home composting scheme in 2008). • Christmas tree recycling. • Junk mail campaign. • Mobile phone recycling. • Schools recycling awareness raising. • Slim Your Bin. • Publicity for new services. • Reuse of selected electrical goods through SOFA project

[26] B&NES Recycling, Rubbish and Waste website is available at: http://www.bathnes.gov.uk/BathNES/environmentandplanning/recyclingandwaste/default.htm Last accessed on 9 December 2007

[27] BCC Recycling, Rubbish and Waste website is available at: http://www.bristol.gov.uk/ccm/navigation/environment-and-planning/recycling--rubbish-and-waste/ Last accessed on 9 December 2007.

[28] NS Waste and Recycling website is available at: http://www.n-somerset.gov.uk/Environment/Waste+and+recycling/ Last accessed on 9 December 2007

[29] SG Rubbish, Waste and Recycling website is available at: http://www.southglos.gov.uk/Environment/RubbishWasteandRecycling/ Last accessed on 9 December 2007

4.2 Recycling and Composting

Various recycling schemes have been implemented by the Partnership and are discussed in more detail in the following sections. It should be noted that there are other individual recycling and composting initiatives as detailed in the 3Rs Statement and individual waste or recycling strategies.

4.2.1 Household Waste Recycling Centres

The Partnership Authorities will continue to collect a range of recyclable and compostable materials at HWRCs. The location of these centres and the range of materials accepted there are shown in Table 4.2.

These facilities will be regularly reviewed and improvements to the layout and signage will be adopted as required. This will help to maximise recycling rates, particularly for the bulky household items commonly deposited at such sites. It should be noted that additional materials are collected at individual HWRCs as detailed in the 3Rs Statement and individual recycling strategies.

To assist producers to comply with the Waste Electrical and Electronic Equipment Regulations 2006, the Partnership provides householders with a designated area at HWRCs to deposit their waste electronic and electrical goods.

Increased segregation of household hazardous waste was identified as an objective within the Waste Strategy for England 2007. To meet these objectives all HWRCs provide facilities for the more common types of household hazardous waste, including:

- Hazardous waste electrical equipment (including cathode ray tube televisions and/or computer monitors, fridges and fluorescent tubes);
- Gas bottles;
- Automotive batteries;
- Engine oil; and
- Household batteries.

Batteries will be collected, not only to meet the Batteries Directive and anticipated UK legislation, but also to improve segregation of household hazardous waste.

At least one HWRC in each Authority area will provide facilities for asbestos and for household and garden chemicals.

4.2.2 Bring Sites

The Partnership has a network of Bring Sites where the public are able to deposit a range of materials for recycling. These tend to be located in car parks or supermarkets and accept a narrower range of materials than HWRCs due to the lack of space available. These facilities will be regularly reviewed and improvements to the layout and signage will be adopted as required, to facilitate maximising recycling rates. The range of materials accepted at Bring Sites is shown in Table 4.2. It should be noted that additional materials are

collected at individual bring sites as detailed in the 3Rs Statement and individual recycling strategies.

Table 4.2 The materials accepted for reuse, recycling, and composting at the Partnership's HWRCs and Bring Sites in 2006/07

Unitary Authority	Location of HWRCs	Materials Accepted for Recycling/ Reuse at HWRCs	Materials Accepted for Recycling/ Reuse at Bring Sites [µ]
B&NES *3 HWRCs* *158 Mini Recycling Centres (at blocks of flats, schools and other selected locations)* *12 Bring Sites*	• Keynsham • Radstock • Bath	Plastic bottles Paper Glass bottles and jars Cans Textiles and shoes Books Cardboard Timber Green garden waste Rubble and soil Engine oil Cooking oil Bric-a-Brac Bicycles Furniture Domestic Appliances Car batteries Tyres Scrap metal Fridges & freezers CDs, DVDs, videos Televisions/ monitors Fluorescent tubes & lamps Mobile phones Ink and toner cartridges Foil Spectacles	Paper Textiles Mixed cans Glass Tetrapaks (to be introduced at selected locations)
BCC *2 HWRCs* *52 Bring sites*	• St Philips • Avonmouth	Plastic bottles Paper Glass bottles and jars Cans Textiles and shoes Cardboard Fridges and freezers Tyres Scrap metal domestic appliances Used engine oil Rubble and soil	Paper Textiles Mixed cans Glass Plastic bottles (33)

Unitary Authority	Location of HWRCs	Materials Accepted for Recycling/ Reuse at HWRCs	Materials Accepted for Recycling/ Reuse at Bring Sites μ
		Green waste from gardens Wood waste Car batteries and other batteries Televisions/ monitors	
NS *3 HWRCs* *41 Bring Sites*	• Weston-Super-Mare • Backwell • Portishead	Plastic bottles Paper Glass bottles and jars Cans Textiles Green garden waste Metals Cardboard Oil Car batteries	Paper Textiles Mixed cans Glass
SG *4 HWRCs* *67 Bring Sites*	• Yate • Little Stoke • Mangotsfield • Thornbury	Plastic bottles Paper and Cardboard Glass bottles and jars Cans Textiles and shoes Paper and Cardboard Car batteries Used engine oil Scrap metal Green waste from gardens Hardcore (rubble) and soil Wood Vehicle tyres Fridges and freezers Televisions/ monitors	Paper Textiles Mixed cans Glass Plastic bottles Tetrapaks WEEE λ Fluorescent tubes λ

μ *Materials accepted at HWRCs and bring sites may vary between locations.*

λ *At selected supermarkets*

4.2.3 Materials Segregated by Households through Kerbside Collection

The Partnership provides kerbside collection of the recyclables shown in Table 4.3. It should be noted that additional materials are collected on some kerbside routes as detailed in the 3Rs Statement and individual recycling strategies.

Table 4.3 The recycling collections managed by each Authority

		B&NES	BCC	NS	SG
Frequency & Type of Collection		Weekly recyclables collection - Green box. Fortnightly Garden Waste & Cardboard Composting Collection.	Weekly recyclables collection - Black box Weekly kitchen waste and cardboard collection. Weekly optional chargeable garden waste collections.	Fortnightly kerbside recycling collection - Green box. Fortnightly collection of corrugated cardboard and garden waste.	Fortnightly collection of recyclables - Green box. Fortnightly collection of cardboard and garden waste from a green wheelie bin.
Materials Collected at Kerbside	Paper	✓	✓	✓	✓
	Cardboard	✓ **With green waste**	✓	✓ **Corrugated, with green waste**	✓ **With green waste**
	Glass bottles and jars	✓	✓	✓	✓
	Food and drinks cans	✓	✓	✓	✓
	Aluminium foil and containers	✓	✓	✓	✓
	Clothes, material, & shoes	✓	✓	✓	✓
	Batteries	✓	✓	×	✓
	Engine Oil	✓	✓	×	✓
	Plastic bottles	✓	×	×	×
	Mobile Phones	✓	×	×	×
	Ink cartridges	✓	×	×	×
	Spectacles	✓	✓	×	×
	Aerosol cans	✓	✓	×	✓
	Car batteries	✓	✓	×	✓
	Garden green waste	✓ **Opt in chargeable inc. Christmas trees**	✓ **Optional**	✓	✓
	Kitchen waste (food)	× **Introduction 2008/09**	✓	×	× **From winter 2008**

4.2.4 Addressing the Waste Strategy for England 2007

The Partnership will focus on the priority waste streams highlighted in the Waste Strategy for England 2007. The waste streams and the preferred treatment methods are shown in Table 4.4.

Table 4.4 Priority materials highlighted in the Waste Strategy for England 2007

Waste stream	Recovery options
Paper and card.	Both recycling and energy recovery show significant greenhouse gas and energy benefits over landfill. However, the relative benefits of recycling versus energy recovery are sensitive to the quality of the paper or card available (with higher quality tending to favour recycling), and the efficiency of energy recovery (with higher efficiency and, especially, the availability of CHP, tending to favour energy recovery).
Food and garden wastes	All degradable wastes have a significant greenhouse gas potential when landfilled. For rapidly degrading wastes, such as food/kitchen wastes, anaerobic digestion offers climate change and energy benefits over landfilling/land spreading, while composting has the potential to sequester carbon in soils and to improve soil fertility, which may confer additional climate change benefits.
Aluminium	The recycling of all metals yields significant greenhouse gas benefits because large amounts of energy are needed to extract and process them. Each tonne of aluminium recycled saves 11 tonnes of CO_2. Therefore small increases in recycling tonnages would yield extensive greenhouse gas benefits.
Glass	Recycling of glass can yield significant greenhouse gas benefits dependent on the processing route, with closed loop recycling (for example, container glass recycled as containers) offering significantly greater benefits than lower grade uses (such as in aggregate substitutes), which may yield only marginal benefits.
Plastics	Recycling shows significant potential for carbon and energy savings through displacing virgin materials, although the scale of this varies widely with the processing route.
Wood	Wood has relatively low embodied energy (energy consumed in extraction) but high calorific value. Though for some kinds of wood waste reuse or recycling are better options, use as a fuel generally conveys a greater greenhouse gas benefit than recovering the material as a resource (and avoiding primary production).
Textiles	Reuse and recycling of all textiles provides environmental benefits, partly due to the high resource requirements of

Waste stream	Recovery options
	primary material production. As regards clothes, current levels of reuse and recycling of clothes are low despite the excellent work of charity shops and the availability of textile banks and the economics of reuse and recycling are deteriorating.

All of these waste streams are currently collected at all of the Partnership's HWRCs. In addition, a kerbside collection is provided for all of the materials, with the exception of wood and plastic (except B&NES who currently collect plastic at kerbside), in all of the Partnership Authorities. Awareness raising activities will be undertaken to promote the use of these collections schemes, with particular reference to the waste streams identified in Table 4.4.

The Partnership supports WRAP's mission to accelerate resource efficiency by creating stable and efficient markets for recycled materials and products, while removing barriers to waste reduction, reuse and recycling. The Waste Strategy for England 2007 particularly highlighted WRAP's work to increase the recycling of plastics.

4.2.5 Carbon Emissions and Energy Balance

One of the most crucial elements of environmental degradation is the effects on climate change through the release of greenhouse gas emissions to the atmosphere.

By further reducing landfill and increasing the amount of waste that is recycled, reused, composted or recovered for energy there is scope for limiting greenhouse gas emissions from waste management activities in the UK and stabilising the energy balance.

Carbon is one particular emission that could be reduced through improved practice of waste management activities. Each waste management activity has a consequence for the flow of carbon and is associated with greenhouse gas emissions and an energy burden, be it the result of a release from degrading waste (such as in a landfill) or through the generation of electricity or waste fuel.

The Waste Strategy for England 2007 [30] identifies a number of environmental benefits of good waste management practice. Among these is the statement that better management of waste can contribute to reducing greenhouse gases such as carbon dioxide (CO_2) and improve the energy balance that the demands of modern living in the UK are de-stabilising.

Within the strategy a number of preferable waste management activities are identified for typical MSW materials that local authorities can adopt to limit the

[30] Defra (May 2007) Waste Strategy for England 2007.

amount of carbon emissions and provide an energy benefit [31]. These activities include:

- Recycling paper and card, textiles, plastics, metals and glass;
- Incineration of wood (or other materials with a high carbon content) with energy recovery;
- Anaerobic Digestion of food waste; and
- Composting of garden, plant waste.

The energy benefits can vary from material to material depending on their properties. For example, the recycling of aluminium provides significant greenhouse gas benefits. This is because of the large amounts of energy needed to extract and process the material into a final product; each tonne of aluminium recycled saves on 11 tonnes of CO_2 emissions.

Elements of these activities that are being adopted into the WoE Waste Strategy will help ensure carbon emissions are limited, for example:

- Increase paper recycling through developing existing initiatives on collection of newspapers and magazines and reducing direct mail;
- Increase metal, glass and textile recycling by targeting these materials at kerbside collection from households thus reducing the energy needed to extract these materials from primary natural resources;
- Recycling plastics to displace virgin materials;
- Encourage grocery organisations within the West of England to sign up to WRAP's Courtauld Commitment;
- Composting organic waste to capture carbon in soils and therefore improving soil fertility and indirectly encouraging the practice of less energy intensive farming;
- Despite extraction and processing of wood generally being a low energy process, its use as a fuel conveys a greater carbon benefit than recovering the material as a resource since high levels of energy can be produced in the form of electricity or heat. Other materials with high carbon contents could also be considered for use as a fuel;
- Some materials are transported long distances before they are recycled. Using these materials as a fuel close to their points of origin can achieve a greater carbon benefit than recovering them as a resource, particularly in the case of light weight materials;
- Combined Heat and Power (CHP) can deliver substantial carbon emission savings by recovering waste heat, displacing the need for additional fuel processing for district heating; and
- Three quarters of the bottom ash produced by EfW facilities is inert and can be recycled and used for road building and land reclamation. This reduces the energy required to extract virgin materials for these processes.

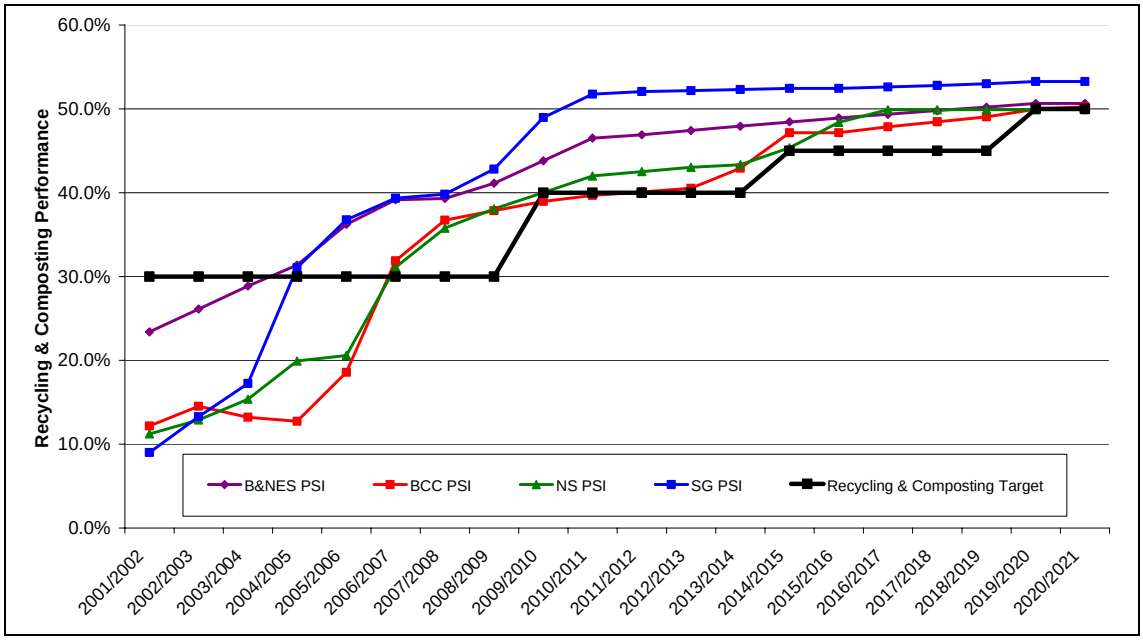
4.2.6 Predicted Future Recycling and Composting performance

Figure 4-1 compares the recycling and composting performances of the four Partnership Authorities against recycling and composting targets in Waste

[31] Defra (March 2007) Carbon Balances and Energy Impacts of the Management of UK wastes

Strategy for England 2007 (shown as the black line) under the Programmed Services Improvements scenario.

Figure 4-1 Future predicted recycling and composting performance [32]



The ways in which the Partnership authorities intend to improve their source segregation performance has been carefully considered through detailed capture rate analysis modelling. The PSI scenario reflects the predicted assumptions over:

- The further roll out of current schemes to those not currently receiving them;
- The roll out of new collection schemes that target the capture of new materials, for example, kitchen waste; and
- Increased participation in, and recognition of, source segregation schemes by householders.

It can be seen from Figure 4-1 that with one exception, all Authorities comply with and exceed the recycling and composting targets between 2001/02 and 2020/21. BCC can be seen to fall slightly short of the target between 2009/10 and 2011/12. They are looking at ways in which they can address this predicted shortfall which partially reflects the diversity of its community.

This position only reflects the recycling and composting of household waste, since this is the measure adopted by Defra on which to assess local authority performance. The Partnership will continue to encourage greater source segregation of all MSW, for example, inert/ rubble material at HWRCs and trade waste recycling.

[32] This performance is measured according to the definition of recycling and composting according to the Audit Commission's (2007) Best Value Performance Indicators Guidance 2007/08. Available at: http://www.audit-commission.gov.uk/performance/downloads/0708_AC_Best_Value_Guidance_2007_08.pdf Last accessed on 9 December 2007

The performance is based on technical waste flow and mass balance modelling based on 2006/07 arisings data. This projection will be regularly reviewed with new waste arisings data.

4.3 Residual Waste Management Options

4.3.1 Technology Options Appraisal

As a critical stage in the process of developing a Joint Waste Strategy and a Development Plan the Partnership conducted a Technology Options Appraisal (TOA) at the end of 2006. A range of residual waste treatment technology options were considered [33].

The Partnership used the best available data, techniques, guidance and best practice in the TOA process to make the process:

- Robust; and
- Transparent.

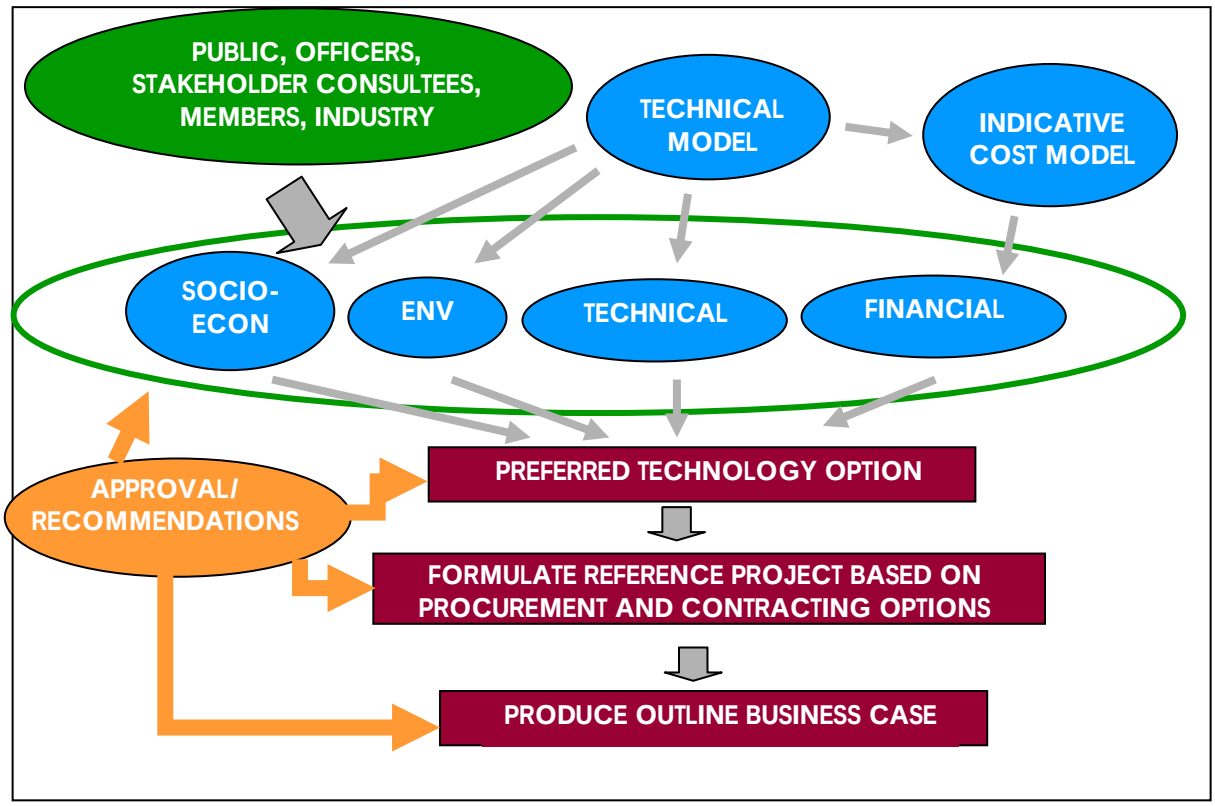
The TOA process was broken down into a number of key stages, namely:

1. The selection of technology options to evaluate;
2. The modelling of waste flows to estimate the total quantity of waste to be managed;
3. The selection of criteria to evaluate the technology options;
4. The weighting of evaluation criteria;
5. The evaluation of technology options against the criteria selected; and
6. The selection of a preferred technology option from those evaluated to go forward to this Joint Waste Strategy.

A schematic of the TOA process and its constituent stages is illustrated in Figure 4-2. The socio-economic, environmental, technical and financial evaluation criteria are circled blue. These criteria are applied to outcomes from the technical and indicative cost models to assist with the decision on the preferred technology option.

[33] A full supporting Options Appraisal Report (Jacobs UK Ltd, January 2007) to this Strategy, as well as summary reports, on the Technology Options Appraisal process can be viewed through the download section of www.rubbishorresource.co.uk

Figure 4-2 A schematic of the TOA process



As illustrated in Figure 4-2, and in line with 4ps guidance and best practice experience from other Authorities, a wide range of stakeholders were consulted at various stages of the TOA process, and their input has been considered by the Partnership over key factors including:

- The selection and weighting of criteria to evaluate technology options against; and
- Scoring of the technology options against criteria.

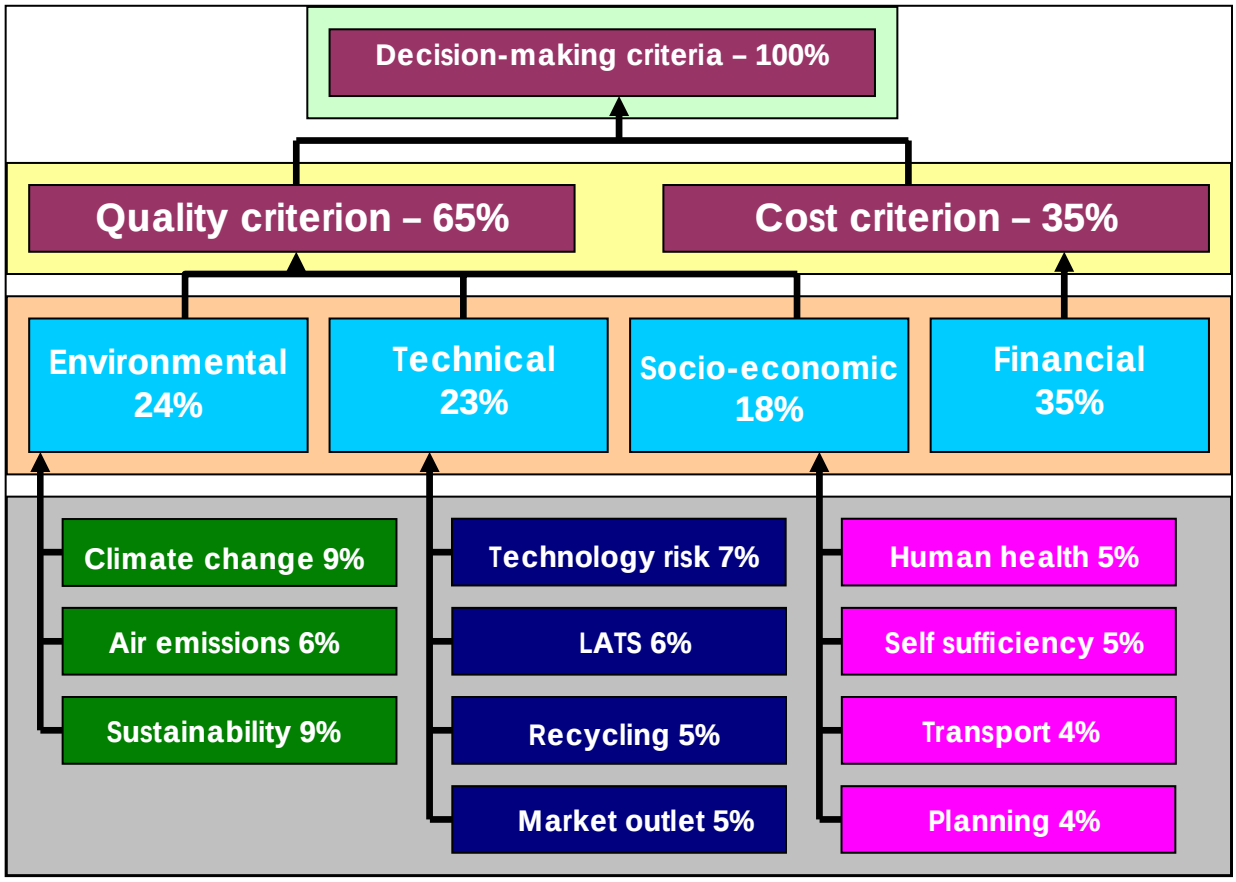
In addition to the seven UA Executive Members on the Partnership's Member Project Board at that time, appropriate Scrutiny Panel Councillors also took part. Representatives from umbrella organisations in the West of England were also invited for consultation, including environmental interest groups, waste industry, regional government and agencies, health trusts and parish councils. Stakeholder groups from each UA's local area were invited for consultation, including housing associations, pensioners' forums, waste management forums, residents' groups, citizens' panels and local strategic partnerships.

In line with 4ps guidance and best practice experience from other Authorities, it was recommended, by the Member Project Board, that the technology options should be evaluated initially against Cost and Quality. In the TOA, cost and quality were the Level Zero criteria. The issue of cost was considered by the Board exclusively, but quality issues were considered by the Member Project Board and a TOA Stakeholder Group.

The Quality criterion was further considered by the Member Project Board and divided firstly into three Level One criteria, and subsequently into 11 Level Two

sub-criteria. These Level Two sub-criteria were the basis of the technology evaluation. Each Level of criteria was assigned weightings by stakeholders, through a Criteria Consultation Day, based on their views on the importance of each particular criterion. The criteria selected, the weightings they were assigned, and how each Level is informed by the Level below it is illustrated in Figure 4-3.

Figure 4-3 Decision-making criteria used in TOA (note – yellow filled box shows level zero criteria, orange shows level one criteria, and grey shows level two sub-criteria)



These weightings are shown in Figure 4-3 Decision-making criteria used in TOA (note – yellow filled box shows level zero criteria, orange shows level one criteria, and grey shows level two sub-criteria)

The percentages shown identify the weighting given to each of the criteria as part of a 100% total. For example, climate change has 9% of the weighting in the overall scoring or in other words 9% of the influence over the ranking of technology options against each other.

The TOA assessed eight potential technology options for the management of residual MSW generated within the Partnership area, which included the Status Quo option i.e. do nothing more than is currently done today and continue to landfill. The technology options modelled are shown in Table 4.5.

Table 4.5. Technology options modelled

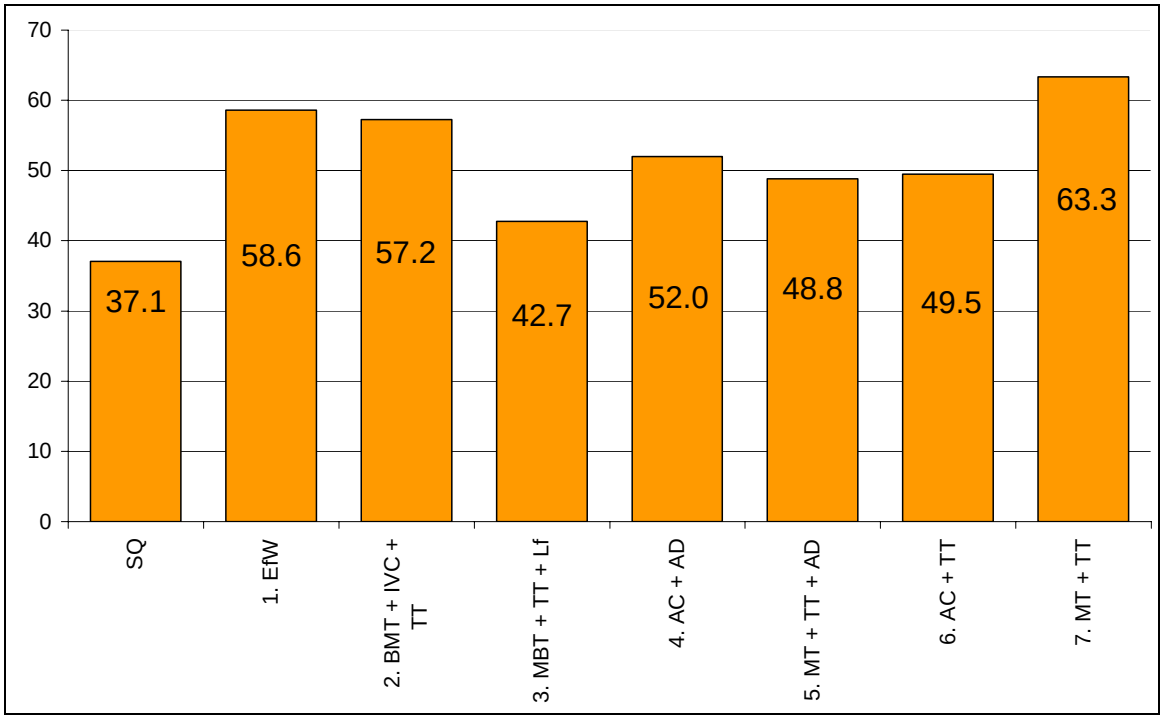
Option	Description	Acronyms
SQ	The Status Quo [β]	SQ
PSI	Programmed Service Improvements [α]	PSI
1	Energy from Waste (EfW)	EfW
2	Biological Mechanical Treatment + 3rd Party Thermal Treatment of solid recovered fuel (SRF) + In-Vessel Composting of waste derived compost	BMT + IVC + TT (3rd)
3	Mechanical Biological Treatment + 3rd Party Thermal Treatment of SRF + Landfill of stabilised output	MBT + TT (3rd) + Lf
4	Autoclave + Anaerobic Digestion of Fibres	AC + AD
5	Mechanical Treatment + 3rd Party Thermal Treatment of SRF + Anaerobic Digestion of waste derived compost + maturation of digested compost product	MT + TT (3rd) + AD + Mtn
6	Autoclave + Thermal Treatment of Fibre	AC + TT (gas)
7	Pyrolysis / Gasification (with mechanical fuel preparation)	MT + TT (pyrolysis/ gas)

[β] The Status Quo option is modelled into the future as the 2005/06 baseline performance in source segregation and the sustained reliance on landfill only as a disposal option.

[α] In Summer 2006 the Partnership undertook detailed assessments of their short to medium-term Programmed Service Improvements (PSI) i.e. assessing how their source segregation initiatives and services would change into the future, for example, additional roll out of a scheme, improving participation of a scheme, targeting the recovery of extra materials. This PSI was not scored, as it provided the baseline source segregation performance upon which the technology options (1 to 7) were founded.

The agreed qualitative and quantitative evaluation criteria are shown in Figure 4-3 i.e. environmental, socio-economic, technical and financial, were used to evaluate each of the technology options presented in Table 4.5 (excluding the PSI, which underpinned each technology option). This process was conducted at a stakeholder workshop, Scoring Consultation Day, on 12 October 2006, where participants scored each technology option against each of the Level Two sub-criteria under the Level Zero Quality criterion in order to provide a relative ranking of the technology options against each other. The outcomes from the process are shown in Figure 4-4.

Figure 4-4 Results of the consultation scoring day against the level zero quality criterion



An indicative Net Present Value for each of the technology options was determined in an indicative cost model, the outputs of which were considered by the Member Project Board and factored into the Cost/Quality weighting.

After consideration of both cost and quality criteria, the three technology options that emerged with the highest scores were:

1. Option 7: Pyrolysis/Gasification (with fuel preparation);
2. Option 1: Energy from Waste; and
3. Option 2: Biological Mechanical Treatment + Thermal Treatment of SRF + In-vessel Composting to stabilise organic material + Landfill of residues.

The Status Quo i.e. landfill option, was evaluated as the poorest against the Quality and Cost criteria, and therefore ranked last.

There was no significant difference between the ranking of the three top technology options against quality and cost criteria from the TOA. The TOA demonstrated that performance against LATS is a key consideration for any option.

At this point in time, technology Option 7, pyrolysis/gasification, is not yet proven (deliverable on UK residual MSW) on the scale required by the Partnership. There are also costing uncertainties with the solution. The Partnership was subsequently advised both financially and technically that only the EfW and BMT options should be considered as part of any further assessment work.

The performance of the pyrolysis/gasification New Technologies Demonstrator Programme pilot plant to be built and operated at Avonmouth, Bristol is

awaited. Although this technology may not be ready in time to meet the short term LATS risks of Phase 2, the Partnership appreciate that this technology option may form part of a longer-term waste strategy and procurement process, for example, as part of Phase 4. The phasing of this Strategy is designed to be flexible to future changes in technology risk, i.e. should currently emerging technologies prove themselves capable of treating residual MSW they may form part of Phase 4.

The proven deliverability of EfW as a technology leads BCC, NS and SG to consider this option as its Reference Project for a PFI funded procurement strategy. B&NES are considering an alternative procurement approach which does not preclude some form of Thermal Treatment. The objective of recovering energy from waste was further tested with the public in the consultation that followed the TOA.

The BMT option in third place usefully demonstrated that all technologies could be considered as part of the Joint Waste Strategy. The one element of this technology option that could present a degree of risk relates to securing third party thermal treatment of the solid recovered fuel (SRF) produced and achieving any further stabilisation of organic rich fines. The Partnership understands that this is a rapidly emerging market, which it anticipates will develop substantially in the short to medium term, not least through the current number of PFI projects recently signed and now in procurement. The Partnership is well placed in terms of its programme to review the emerging risk profile of BMT/SRF projects in order to consider these more fully for the longer term.

The TOA explicitly considered a single site, large scale facility, however, each of the top three ranking options can be configured on a modular/multi-site scale, albeit it is likely to cost more. The Planning Level Two sub-criterion also considered modularity within its evaluation. This may present opportunities to the Partnership to align technologies with the sites emerging from the Development Plan process. Moreover, modularity can be accommodated through the four phased approach of this Strategy.

The TOA process and its outcomes were subject to further consultation in the second stage public consultation. With output from this consultation, the Partnership was able to take decisions on a preferred technology option to form the basis of the Reference Project for Phase 3 of this Joint Waste Strategy.

4.3.2 Climate Change – WRATE Modelling

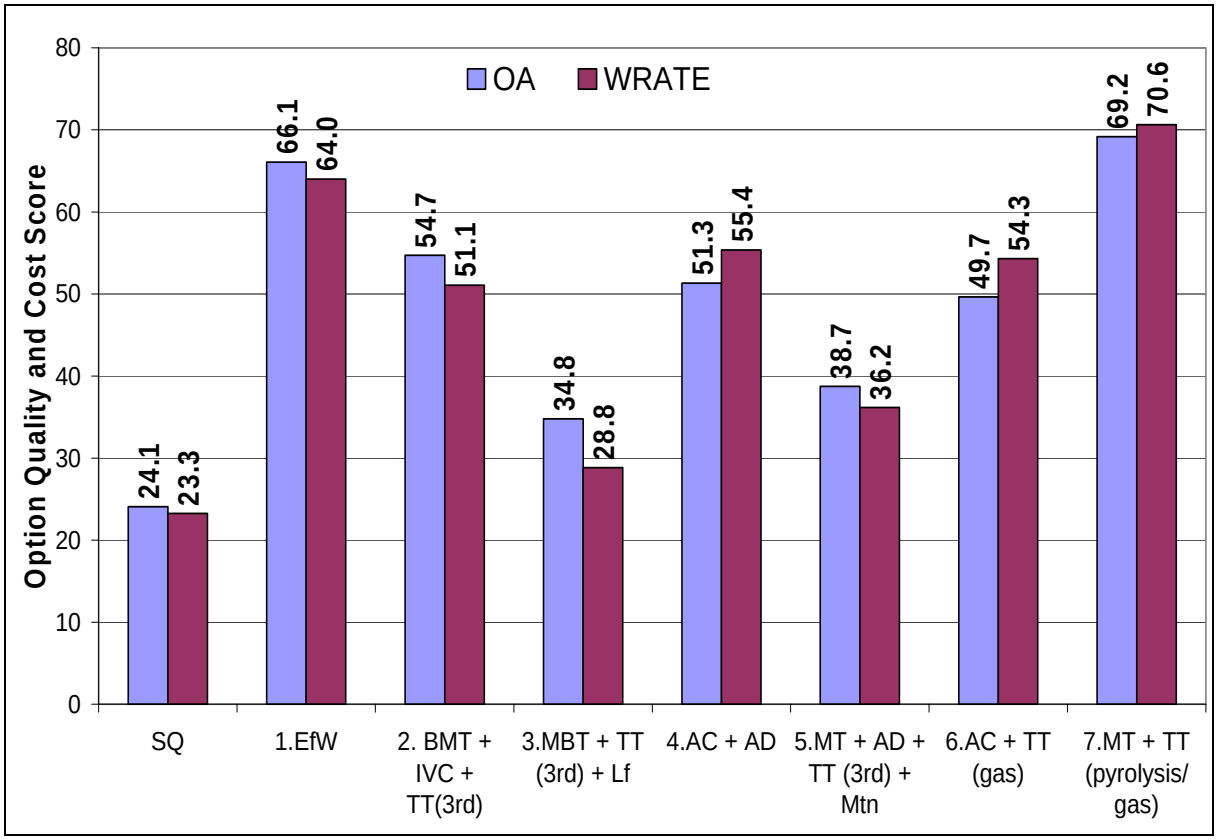
Carbon emissions were considered in the original TOA, however, with the increased emphasis on climate change and carbon footprints (noted in the consultation feedback) the Partnership took the opportunity to test a pilot version of the Environment Agency's WRATE (Waste and Resources Assessment Tool for the Environment) tool to provide a more thorough assessment of the technology options.

The Waste Strategy for England 2007 emphasises the potential impacts of climate change and the cost of not tackling this threat now. The management of waste could play a significant role in addressing climate change. Reducing

natural resource use, recycling materials and recovering energy from materials used is a vital part of moving towards more sustainable consumption and production.

A comparison was made between the TOA and using WRATE to inform the Climate Change and Air Emissions Level Two sub-criteria. The outputs from WRATE were input to the Scoring Consultation Day scoring model to assess whether it would have adjusted the ranking of technology options. The option scores for the level zero quality and cost criterion is shown in Figure 4-5.

Figure 4-5 Final option scores generated by the TOA and WRATE outputs for the cost and the quality criterion



Option 7 (advanced thermal treatment) was confirmed as the most preferential option, followed closely by Option 1 (Energy from waste). This confirmed the validity of the ranking of EfW, after applying WRATE's more sophisticated analysis. The Status Quo i.e. continue disposal to landfill, was confirmed as the least preferential option.

The third, fourth, and fifth most preferential options were more ambiguous as the WRATE model produced results that differed slightly from those of the initial technical options appraisal. This was due to these options having a similar performance; hence, a slight change in the score for a particular option may have a significant effect on how preferential that option may be perceived. It is therefore considered that Option 2 (biological-mechanical treatment/ in-vessel composting/ third party thermal treatment of the solid recovery fuel), Option 4 (autoclave technology/ anaerobic digestion), and 6 (autoclave

technology/ thermal treatment) have a similar performance and no one option stands out as the third most preferential option.

4.4 Landfill

The four phased Strategy approach will still require non-hazardous landfill capacity between 2007/8 and 2019/20.

Not all waste is suitable for treatment through technology options, for example, an Energy from Waste facility is less likely to accept certain bulky wastes, fly-tipped materials and gully wastes without pre-treatment. These wastes are called 'inappropriate' wastes. These waste streams are typically sent directly to landfill.

Moreover, there may be residues and rejects from a technology option which are also likely to be landfilled. For example, incoming waste to an EfW will be screened for anything that should not typically be in that waste stream and may impact upon the operation of the facility.

The residues and by-products from a typical Energy from Waste process are[34]:

- Metals (approximately 2% by input weight);
- Bottom ash (approximately 20% to 25% by input weight); and
- Air Pollution Control (APC) fly ash (approximately 5% by input weight).

The metals can be recycled. The bottom ash can be reprocessed for use as an aggregate, for example in road building, although a small, unsuitable, proportion may be required to be landfilled. At present the predominant route for APC fly ash is to a designated hazardous waste landfill.

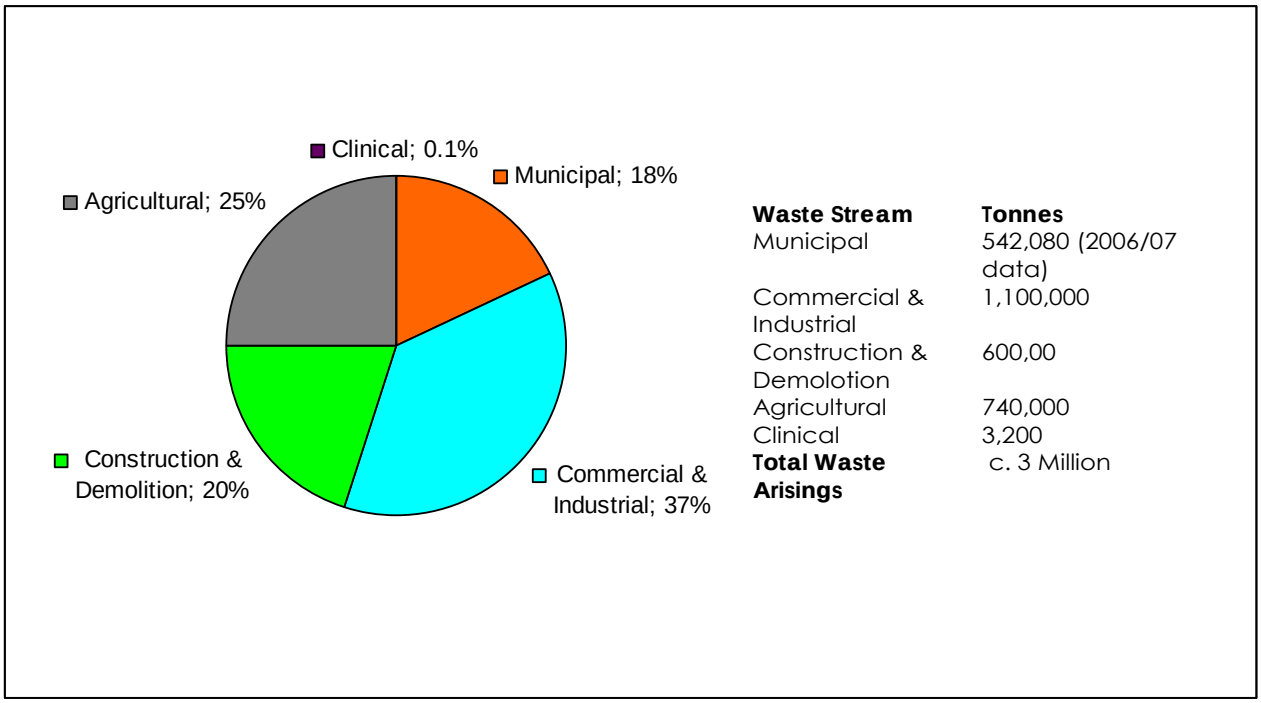
The Partnership is producing their Development Plan which will address the issue of landfill capacity in further detail. Early analysis reveals that available landfill void space in the West of England is reducing significantly each year. The estimated capacity in 2005/06 was 393,000 tonnes of MSW, reducing to around 50,000 tonnes in 2020. The four authority's existing landfill contracts, which end between 2008 and 2011, will be reviewed and updated with consideration of the availability of landfill in the context of this Strategy and the Development Plan.

4.5 Suitability of Facilities for Other Controlled Waste Streams

Treatment of residual MSW is the focus of this Joint Waste Strategy; however, the Partnership recognises the potential for synergies in treating both MSW and other appropriate selected controlled waste streams. MSW in the Partnership region accounts for only 18% of the total waste arisings (see Figure 4-6 below). Over 80% of the waste arisings in the Partnership area come from C&I, construction and agricultural sources.

[34] Chartered Institution of Wastes Management, 2005, Energy from Waste Good Practice Guide.

Figure 4-6 Waste arisings in the West of England 2002/03



Waste Stream	Tonnes
Municipal	542,080 (2006/07 data)
Commercial & Industrial	1,100,000
Construction & Demolotion	600,00
Agricultural	740,000
Clinical	3,200
Total Waste Arisings	c. 3 Million

Source: Municipal Waste Statistics - Local Authority data
http://www.defra.gov.uk/environment/statistics/wastats/index.htm Last accessed 26 February 2008

C&I waste has a similar composition to MSW, but significantly more tonnage is produced. C&I waste therefore offers the most likely opportunities to integrate residual municipal waste management with other waste streams. C&I waste is discussed further in Section 5.4

Defra set up the Waste Infrastructure Delivery Programme (WIDP) at the end of 2006 to help meet the UK's Landfill Directive targets. One of the main objectives of this programme is that opportunities are taken to achieve synergies between the treatment of municipal and other waste. In order to achieve diversion targets the WIDP will seek to encourage the synergies of merchant facility development with treating MSW where appropriate. The Partnership will take into consideration any benefits arising from this when procuring residual treatment facilities.

The Partnership supports the aims and objectives of the BREW (Business Resource Efficiency & Waste) Programme which works with businesses to help improve their efficient use of resources, in particular by encouraging waste reduction and diversion from landfill. Projects funded by the BREW programme are being delivered through a number of established programmes and organisations [35] and will help:

- To deliver more sustainable business processes and products;
- To shift the UK towards a low-carbon, low-waste economy; and

[35] Draft strategy for the future of the BREW programme
http://www.defra.gov.uk/environment/waste/brew/index.htm Last accessed 9 December 2007

- Businesses to realise the financial benefits of using resources more efficiently.

The Partnership will seek to assist local businesses by looking at developing schemes such as:

- Online guidance and advice;
- A helpline number ;
- Contact details and support for local waste reduction/resource efficiency clubs; and
- Support to local and national waste exchange and industrial symbiosis projects.

B&NES currently provides a collection of paper, cardboard and confidential waste. Businesses can take green waste, timber, hardcore/rubble & soil, ferrous and non-ferrous metals and cardboard to B&NES transfer stations. There are increasing recycling services offered by commercial waste collection services in B&NES such as glass, cans, toners and ink cartridges, fluorescent lighting tubes and confidential waste.

Businesses within BCC area can recycle cardboard, metal, fridges and freezers, green waste, soil and rubble and wood at their Avonmouth transfer station.

Provision of C&I treatment capacity is considered further in Section 5.4.

5 How Will The Partnership Implement Actions?

5.1 Delivering a Phased Strategy

The delivery of this Joint Waste Strategy has been developed on a phased and flexible implementation framework. The approach is structured around an ongoing desire to reduce the quantity of waste to be managed and the need to address the LATS risk faced by the Partnership. The Phasing is described in detail below.

Phase 1 – Waste reduction and source segregation
Immediate and ongoing

- ***Phase 1*** of this Strategy focuses on waste reduction and source segregation in the immediate future and ongoing. Each authority retains individual responsibility for waste minimisation activities, recycling and residual waste collection services as these areas are deemed best designed and delivered on a local basis, responding to local residents' views and wishes. However, the Partnership has produced a Joint Position Statement on Reduce, Reuse and Recycle which summarises past and future planned activity in those areas.
- The Joint Position Statement serves to illustrate the history of how each council has progressed to its current position. The agreed programmed service improvements and future action plans to achieve or surpass the new national targets. An overarching aim is to reduce the residual waste that remains to be disposed of through treatment and/or the recovery of energy and/or materials.
- Foremost in importance in dealing with waste is the Partnership's commitment to adhere to the Waste Hierarchy. This principle firstly requires maximum emphasis be placed on reducing the amount of waste produced, followed by policies to encourage reuse wherever possible and to offer recycling or composting opportunities for materials that cannot immediately be reused.
- A proposal for an enhanced programme of joint waste reduction and recycling activity has been drafted and a business case is to be produced in the first quarter of 2008. There is considered to be significant scope for joint publicity campaigning to assist in further raising awareness of reduction, reuse and recycling initiatives. The Partnership is committed, as a minimum, to meeting the national household waste recycling targets of 40% by 2010, 45% by 2015 and 50% by 2020.
- The Partnership will explore and deliver further opportunities to improve source segregation performance through their Programmed Service Improvements (PSI).

Phase 2 –Interim treatment to meet short-term LATS allowances
Seek to commence contract process in 2008

- ***Phase 2*** focuses on the Landfill Allowances from now until at least 2015. The required landfill diversion will be achieved by implementation of a suitable contract in 2010/11.
- Modelling has been undertaken to project future waste arisings and source segregation performance to meet the requirements of the LATS. This has shown that without some form of secondary waste treatment facility the Partnership will fail to meet the targets from 2010/11 onwards. This could potentially lead to the Authorities having to purchase permits or face fines which would have a major financial implication for the Authorities.
- The Partnership is planning a contingency LATS trading scheme for the period to 2015, but recognises that securing diversion through treatment is preferable.
- Soft market testing has been conducted to explore available treatment technology solution(s) to meet their short-term shortfall against their LATS allowances. The soft market testing revealed that at present, there is no existing facility in the area. The Partnership is therefore progressing detailed discussions with industry to explore in more detail available treatment technology solution(s) to this meet short-term shortfall against LATS allowances.
- The treatment technology is not yet determined. Through soft market testing the Partnership has established that the market is likely to offer innovative technologies including biostabilisation (Mechanical Biological Treatment (MBT)/ Biological Mechanical Treatment (BMT) type technology), or autoclaving processes. Whilst the deliverability risks of these technology options would be considered through a competitive tendering exercise, these technologies were appraised in the Technology Options Appraisal.
- The Partnership cannot yet establish a specific contract duration, but realises the short term LATS risk is from 2010 to 2015. It is however likely that a contract will be between five and ten years duration to realise best value. Therefore this option may overlap with Phase 3 described below.
- B&NES may seek to extend Phase 2 beyond 2015 whilst also pursuing a long term residual waste solution that is outside of a PFI contract (see B&NES Phase 3)
- The Partnership members BCC, NS and SG will pursue Phase 2 with the intention of subsequently procuring a long term residual waste solution supported by Defra PFI credits (see BCC, NS and SG Phase 3).

Phase 3 – Meeting 2020 LATS diversion
Commence procurement, to implement a contract in 2011

- ***Phase 3*** of this Strategy recommends that BCC, NS and SG adopt as its Reference Project, EfW in order to meet 2020's landfill allowances (with a risk buffer). This Reference Project will be used as a yard stick against which tenders will be evaluated.

- The requisite capacity is likely to be around 160,000 tonnes, which is deliberately sized so as not to present a barrier to future improvements in waste reduction, reuse, recycling and composting. This facility is sized to meet the estimated shortfall against LATS allowances to 2020 when BCC, NS and SG have known and definite obligations to divert BMW from landfill. Modelling currently indicates that a 160,000tpa capacity EfW facility would enable BCC, NS and SG to landfill BMW within its LATS Allowances (allowing for a risk buffer).
- Where sites and market opportunities are favourable, BCC, NS and SG would actively wish to investigate the potential for Combined Heat and Power output from an EfW facility
- BCC, NS and SG recognise there is no shortcut to getting a major contract procured, a facility planned, consented constructed and commissioned. Current programming was confirmed during the soft market testing that a facility may be operational by 2015.
- The TOA, the consultation, the funding options appraisal and industry representatives at the soft market testing have suggested that EfW is a preferable and deliverable technology option.
- BCC, NS and SG have considered its LATS risk to 2020, it has considered the deliverability of a facility, and it has considered the sites being shortlisted through the planning process. Findings show that not over-sizing a facility i.e. building to a capacity that meets LATS allowances to 2020 (with a risk buffer), allows flexibility for changes in waste arisings, and critically does not prevent increased source segregation performance i.e. does not present a future barrier to waste reduction, reuse and recycling. Phase 3 encapsulates this flexibility and would complement a longer running technology option contract under Phase 2 [36].
- Phase 3 will form the basis of an Expression of Interest to Defra for PFI credits

B&NES Phase 3 – 2020 LATS diversion through best technology treatment option

- B&NES Cabinet have considered proposals for the four Phase approach and is fully supportive of working in partnership with BCC, NS and SG for Phases 1, 2 and 4, however, B&NES does not wish to participate in Phase 3.
- B&NES intend to work in partnership to procure Phase 2 facilities to treat its residual waste stream for a 10 year period (2010-2020) whilst during this time developing further zero waste initiatives and source segregation of recyclables.
- B&NES will then consider with the partnership whether an extension to the Phase 2 contract is appropriate, assess any viable alternatives that may exist at that time, and work jointly to determine if the Partnership will move into a Phase 4 procurement at around 2025.

[36] This size is based on the technical mass balance and waste flow modelling updated from the TOA. This takes account of the 2006/07 revised PSI, housing allocations in the draft Regional Spatial Strategy and LATS allowances to 2020.

Phase 4 – Longer-term treatment contract
Commence procurement once Phase Three is implemented

- Beyond 2020, ***Phase 4*** of the Strategy involves building and developing further waste treatment facilities/processes to continue to increase waste diversion, explore new treatment technologies and use the lessons learned from previous Phases to continue to meet targets.
- In the longer term, beyond 2020, there is great uncertainty in the waste industry about which emerging technologies will be proven; including the pyrolysis/ gasification technology being piloted as part of the Defra New technologies Demonstrator Programme. Equally, we have yet to discover how the LATS will function or what quantity of residual waste there will be. These uncertainties are inherent in Phase 4 and in effect this Phase will be determined by the outcomes of previous Phases and industry development.
- Future sensitivity modelling may indicate that additional facility(s) could be phased to track future LATS risk. The sizing and number of facilities will take account of any future waste reduction and improvement in source segregation performance. It will also take account of outcomes from Soft Market Testing, from implementing Phase 3, performance of the New Technologies Demonstrator Project pilot plant, sites and planning issues arising from the adoption of the Development Plan, and sensitivity modelling of impact of multiple sites/ multiple modules. Facility(s), if required, are anticipated to be operational by 2018/19. No treatment technology is prescribed, though there may be a link with either Phase 2 or Phase 3.

The Partnership has designed this Joint Waste Strategy to be flexible; to cater for volume and composition changes in residual MSW and to adjust to targets should they be revised. In the event that Phase's 2, 3 and 4 are not realised in the form described above, a contingency plan has been considered. This effectively caters for a worst case scenario based on increasing future waste arisings for BCC, NS and SG and a treatment solution approximately sized to 260,000 tonnes capacity.

As part of B&NES contingency plan he Council will then consider with the partnership whether an extension to the phase 2 contract is appropriate, assess any viable alternatives that may exist at that time.

The deliverability of the BCC, NS and SG contingency plan was also tested with industry representatives through soft market testing. The industry was also receptive to the contingency plan.

5.2 Phase 3 Options

5.2.1 Why Energy from Waste through PFI as the Reference Project?

BCC, NS and SG recognise that the potential for EfW within Phase 3 is a contentious issue. BCC, NS and SG recognise that there has been opposition to EfW facilities across the UK and focused effort from some stakeholders in campaigning against proposed EfW facilities. The question therefore is why are BCC, NS and SG recommending EfW?

The TOA process ranked Option 1 EfW second, closely behind another thermal treatment option. The first placed technology Option 7, pyrolysis and gasification, was not taken forward because of risks around delivery and implementation of a technology, not yet proven nor deliverable at a scale required by the Partnership. There may be an opportunity under Phase 4; should such an alternative thermal treatment technology become proven.

58% of respondents in the second public consultation ranked EfW (Option 1) as their highest preference of the seven technology options presented from Table 4.5. This option was consistently ranked the highest preference across all the tests used to evaluate public opinion.

The need to reduce LATS risk is a key driver in adopting this phased strategy. Option 1 EfW is mature, well understood and safe. Emissions are more tightly controlled today than ever before and recent Government reviews have found no convincing evidence to suggest that emissions from modern EfW facilities harm human health [37].

Health Risk Assessment (HRA) studies on the potential health impacts of Energy from Waste carried out in BCC and B&NES between 2002 and 2005 concluded that, for all locations, the risk to public health would be very small indeed, even having made a series of pessimistic assumptions regarding emission levels from the plants and the health of those who might live their whole life with a maximum theoretical exposure. The HRA found that the increases in pollution levels associated with the EfW plants would be within the recommended acceptable limits set by the World Health Organisation, Environment Agency and US Environment Protection Agency [38].

There is a sound track record of banking EfW projects in the UK. EfW is a proven, deliverable technology, there are currently 22 EfW facilities operating in the UK on residual MSW, and at least another ten currently in the pipeline [39]. EfW is supported by a number of European countries, including Germany, the Netherlands, France, Italy, and Denmark among others. These countries also have higher levels of recycling and composting than the UK. The public expressed support for best European practice through the consultation.

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[37] Review of Environmental and Health Effects of Waste Management, Enviros and the University of Birmingham for Defra, 2004; Position Statement on Municipal Solid Waste Incineration, Health Protection Agency, 2005.

[38] Atkins Environment (2007) Bristol City Council and Bath & North East Somerset Council: Energy from Waste Study. Summary report available to download from www.rubbishorresource.co.uk.

[39] Mass burn begins its big breakthrough, Article in ENDS Report 394, November 2007, pp 28-31

The need for BCC, NS and SG to demonstrate Value for Money is critical. In the financial analysis conducted, EfW was favourably assessed against the Programmed Service Improvements position, where the need to trade allowances, or even face LATS penalties was required.

The TOA was based on a traditional mass burn incineration moving grate process with energy recovery. The specific choice of thermal technology process has not been decided at this stage, and would be left to the market to bring forward optimal solutions. As such BCC, NS and SG will not preclude other technology processes which are proven and which are competitive.

Amongst the consultation feedback was support for a treatment technology which produces energy. This was seen as being viable and effective for the treating residual waste. There was recognition of the efficiencies of a facility that provides heat and power. Defra's (October 2006) consultation on the Proposal for a Directive of the European Parliament and the Council on waste; Waste Framework Directive [40], highlights that in order for the UK's MSW incinerators to be classified as recovery installations according to the methods prescribed in Annex II of the proposed Directive, all installations would need to either:

- Increase electrical recovery performance; and/or
- Supply heat.

BCC, NS and SG have taken these issues into consideration and if sites permit would ideally like to deliver a high efficiency combined heat and power facility, in order to maximise energy recovery, improve energy off-setting and thus reduce the carbon footprint impact.

5.2.2 Why has B&NES Adopted an Alternative Phase 3 Approach?

B&NES is committed to working within the West of England Partnership to procure appropriate treatment processes to divert waste from landfill, however, B&NES is also committed to its own goal of zero waste, and within this context is opposed to committing themselves to a 25 year PFI contract. Although B&NES has made its own position clear with regards to PFI procurement, it in no way seeks to jeopardise the 3 remaining partner authorities continuing to submit an Expression of Interest for PFI funding.

Having taken full account of the soft market testing and results of the public consultations, B&NES Cabinet have considered proposals for the four phase approach, and is fully supportive of working in partnership for phases 1, 2 and 4, however, B&NES does not wish to participate in Phase 3. Phase 3 is a long term 25 year commitment, seeking PFI funding for a proven technology which may bring forward EfW Waste.

B&NES intend to work in partnership with BCC, NS, and SG to procure Phase 2 facilities to treat its residual waste stream for a 10 year period, (2010-2020) whilst

[40] http://www.defra.gov.uk/corporate/consult/waste-directive/consultation.pdf Last accessed on 9 December 2007

during this time developing further zero waste initiatives and source segregation of recyclables. B&NES will then consider with the partnership whether an extension to the Phase 2 contract is appropriate, assess any viable alternatives that may exist at that time, and work jointly to determine if the partnership will move into a Phase 4 procurement at around 2025.

B&NES' rationale for this decision is as follows:

- The concept of zero waste encourages reducing, reusing & recycling throughout the entire life cycle of products. B&NES does not believe that a 25 year PFI procurement encourages the behavioural change required to achieve zero waste;
- Over a 25-30 year period, behavioural and market trends will inevitably shift to enable their long term strategy of zero waste to be more fully realised, making any large-scale, long term commitment to one specific treatment technology inappropriate for B&NES;
- B&NES believes that within a shorter time-frame the market for new residual waste treatment technologies will develop, so that alternative treatments which may have a greater contribution to their zero waste aspirations may be considered; and
- B&NES has concluded that a long-term contract and funding mechanism carries an unacceptable financial risk for B&NES in relation to the potential scale of change in residual waste tonnages requiring treatment.

5.3 Facility Sizing

The technical waste flow and mass balance modelling conducted to date [41], estimates that in 2009/10 the Partnership will marginally meet its LATS allowances. There is clearly a risk around this performance and the sensitivity of the theoretical modelling that estimates it. By 2010/11 there is a predicted shortfall of 10,000 tonnes, increasing to over 57,000 tonnes by the 2012/13 target year and to over 83,000 tonnes in the final target year of 2019/20 i.e. the Partnership predicts it will landfill 83,000 tonnes more BMW than its allowance of 98,223 tonnes; approximately 181,000 tonnes in total in 2019/20.

In Table 5.1 the approximate tonnages of BMW that need to be diverted in the short term to comply with the LATS is presented; this is drawn from modelling under a 'meeting LATS allowances' scenario. These figures are the starting point for Phase 2, which may continue beyond 2015. The figures shown are tonnes of BMW needing to be diverted.

[41] Technical modelling is based on 2006/07 waste arisings data, with revised waste arising scenario projections and PSI assumptions.

Table 5.1 Estimated required tonnage of BMW that needs to be diverted to 2015 from landfill) through a Phase 2 option treatment contract (figures rounded)

Contract year	2010-11	2011-12	2012-13	2013-14	2014-15
Phase 2 – tonnes of BMW to divert to meet LATS allowances	10,000	34,000	57,000	59,000	57,000

Figure 5-1 illustrates the required diversion of BMW from landfill over the period to 2020. The green block represents the Partnership's pooled landfill allowances. The red and blue shaded blocks above that line represent the anticipated quantity of additional BMW that needs to be diverted from landfill in order to meet those allowances. This is assuming a level of diversion of BMW achieved through Programmed Service Improvements.

To be clear, Figure 5-1 does not demonstrate the actual capacity required for a Phase 2 technology option or a Phase 3 EfW or other facility i.e. the quantity of MSW needed to be processed to achieve that BMW diversion. The quantity of MSW that needs to be processed to achieve the BMW diversion under Phase 2 will depend upon what technology option is adopted. This is because different technology options will divert different percentages of BMW. An indication of the estimated total quantity of residual MSW is also shown.

Figure 5-1 An illustration of the requirements to divert BMW under Phase 2 and Phase 3

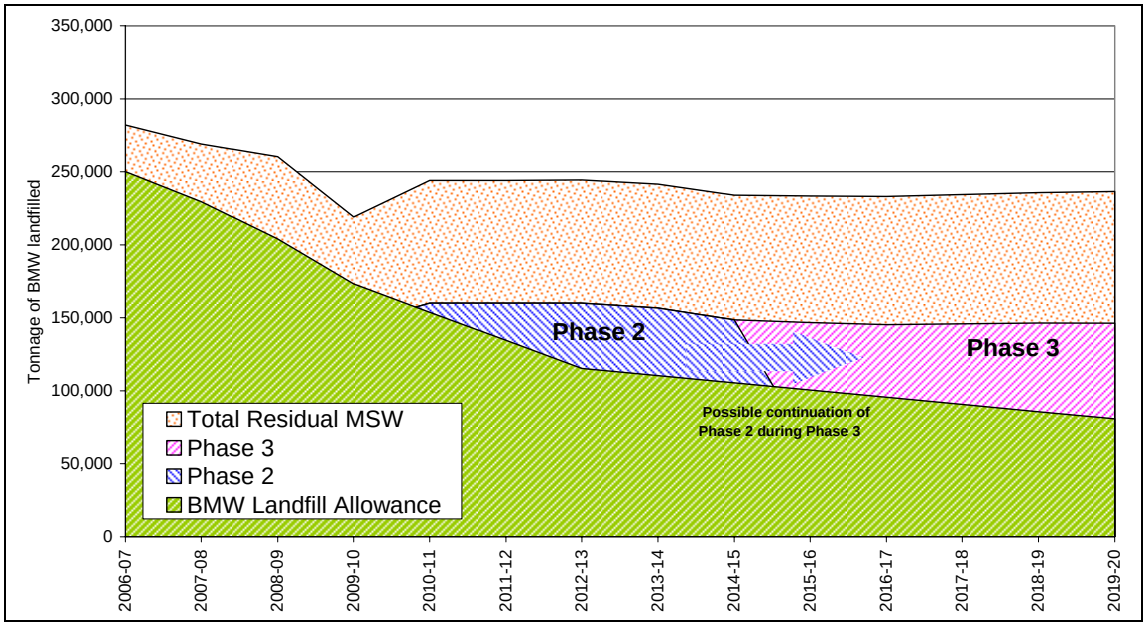


Figure 5-1 illustrates how Phase 2 and Phase 3 treatment solutions could fit with meeting BCC, B&NES, NS and SG's LATS allowances. This illustrates the contribution that is required above and beyond the contribution to LATS

allowances made by the PSI, for example, in diverting paper, green garden and kitchen waste from landfill through source segregation.

The Partnership has considered its LATS risk to 2020, BCC, NS and SG have considered the deliverability of a PFI funded EfW facility under Phase 3, B&NES has considered the deliverability of an alternative arrangement under Phase 3 and it has considered the sites being shortlisted through the planning process. Findings show that not over-sizing a facility i.e. building to a capacity that meets LATS allowances to 2020 (with a risk buffer), allows flexibility for changes in waste arisings, and does not present a future barrier to waste reduction, reuse and recycling. Phase 3 for BCC, NS and SG encapsulates this flexibility, based on a 160,000tpa EfW facility. This sizing is deliberate in that it should not present a barrier to future reduction, reuse and recycling and should complement any extension of Phase 2 contract[42] but by doing so all three authorities should incur no LATS penalties in the period 2015 to 2020.

The contingency option of developing a large single facility (up to 260,000 tpa) has also been considered by BCC, NS and SG. At this stage, whilst it remains an option for BCC, NS and SG, it is not being recommended as the way forward as, not only may it prove to be a disincentive to further waste reduction, reuse and recycling, it would remove the opportunity for new technologies to be adopted at an appropriate scale and location in the longer term when they become proven.

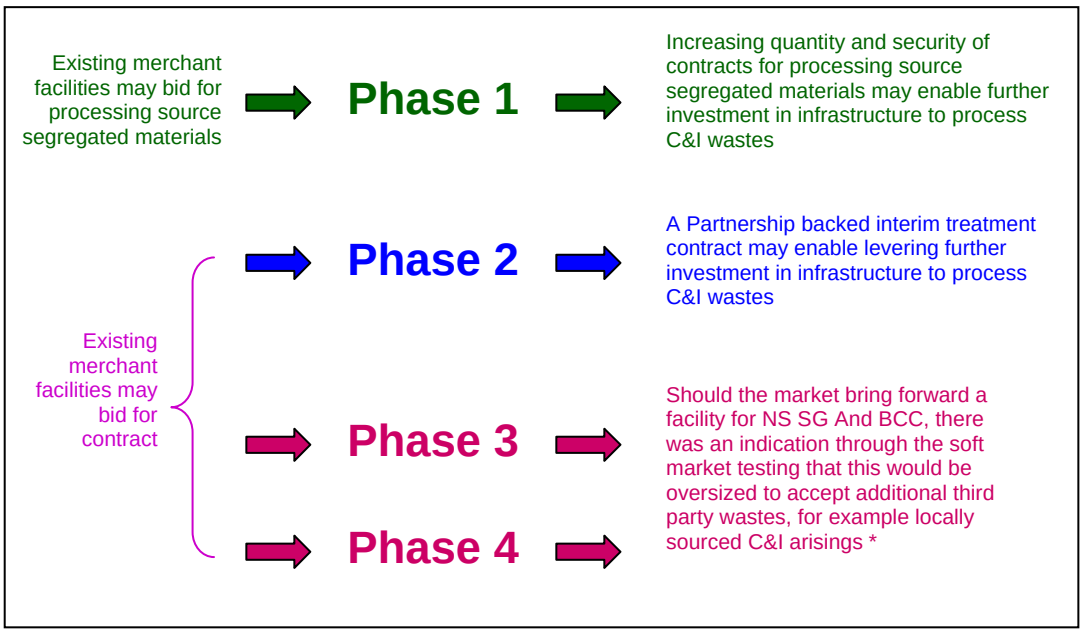
5.4 Commercial and Industrial (C&I) Waste

As discussed in section 4.5, there is synergy in the development and implementation programmes of the Development Plan and this Joint Waste Strategy. The Development Plan provides for managing all controlled wastes, including C&I. This aligns with the emphasis in the Waste Strategy for England 2007 to realise the synergies between MSW and C&I.

Where practicable and where there is Value for Money, this Joint Waste Strategy intends to reflect the national stance towards C&I wastes. The framework of this Strategy can facilitate management and treatment of C&I wastes and/ or other third party wastes throughout each of the phases as described in Figure 5-2.

[42] This size is based on the technical mass balance and waste flow modelling undertaken for the Technology Options Appraisal. These models have been revised in line with updated 2006/07 waste arisings data.

Figure 5-2 The Strategy's potential integration with C&I wastes



* It is not clear at present whether C&I waste can be accommodated into B&NES's solution for Phase 3.

In Phase 3 for BCC, NS and SG, as Figure 5-2, indicates, should the market come forward with an oversized facility i.e. greater than 160,000 tonnes capacity, which was indicated as a possibility through the soft market testing, there may be opportunities for a facility to process additional waste streams, for example C&I wastes. The spare capacity could, however, also be utilised by BCC, NS and SG for processing its own residual MSW to divert more BMW from landfill should it be required.

5.5 Data Reporting

A common methodology and approach to monitoring and performance review is essential. The detailed methodology for determining the primary performance indicators for municipal waste management are to be further developed by Defra in 2008. The aim will be to ensure that data collection and collation conform to Defra and EU requirements.

Reporting the information under WasteDataFlow allows for greater integration with data reporting in other parts of the UK. WasteDataFlow is designed for local authorities:

- To allow faster and more accurate data collection of MSW statistics, more regularly and efficiently;
- To enhance their local data management for reporting and strategic planning purposes; and
- To offer them streamlined access to performance benchmarking with other authorities.

Data reports from the Partnership will be published annually, including information on performance indicators.

WasteDataFlow does not record, as standard, all of the data that would be generated if the Partnership proceeds with waste reduction, reuse and recycling actions in the 3Rs Statement, such as increasing home composting, a junk mail initiative or the real nappies initiatives. The recording of this data will require the Partners working together to ensure there is specific monitoring and recording of any actions or initiatives they introduce.

5.6 Procurement Timetable

In headline (simplistic) terms the timescales involved in implementing this phased Strategy, as at March 2008, are illustrated in Table 5.2 below.

Table 5.2 Timetable illustrating the indicative timelines for implementing this Strategy as at March 2008

Timeline	Implementation Plan
Ongoing	Phase 1 – waste reduction, reuse and source segregation strategy development and implementation. Joint waste reduction campaign and publicity proposal and business case in development
March 2008	BCC, NS and SG Phase 3 – Expression of Interest for PFI credits submitted to Defra
March to May 2008	Joint Waste Strategy approved by each UA.
Summer 2008	Phase 2 – Commence procurement of treatment technology contract
October 2008	BCC, NS and SG Phase 3 – Outline Business Case for PFI credits submitted to Defra (assuming Expression of Interest is accepted)
Before Christmas 2008	Consultation on the Preferred Options (Development Plan)
January 2009	BCC, NS and SG Phase 3 – OJEU notice for procurement
January 2009 to March 2011	BCC, NS and SG Phase 3 – competitive dialogue procurement
April 2009	Submission of the Joint Waste Development Plan Document to the Secretary of State
Between April 2009 and April 2010	Phase 2 – expected period of planning, consenting, construction and commissioning of technology
October 2010	Adoption of the Joint Waste Development Plan Document
October 2010	Phase 2 Predicted start of delivery to Phase 2 facility

Timeline	Implementation Plan
April 2011 to March 2015	BCC, NS and SG Phase 3 – Planning, consenting, construction and commissioning of facility
April 2015	Phase 4 – Commence procurement
April 2015	BCC, NS and SG Phase 3 – commence facility operations
April 2015	B&NES's Phase 3 contract commences
From April 2020	Phase 4 – facility/facilities operational (if required), which may align with Phase 2, or be an extension of Phase 3

BCC, NS and SG anticipate submitting an Expression of Interest for PFI credits to Defra in March 2008 and thereafter an Outline Business Case by October 2008.

The procurement of Phase 2 treatment technology capacity to address short to medium term LATS risk, is in its early stages of preparation. It is anticipated that a tendering process for Phase 2 will commence in summer 2008.

The timetable for The Development Plan is included in Table 5.2 to illustrate how the timing of planning under the Phase 3 contracts for BCC, NS and SG fits with the adoption of the Development Plan. This should facilitate a more efficient planning process in terms of site locations.

5.7 Strategic Environmental Assessment (SEA)[43]

The revised Environmental Report for the Strategic Environmental Assessment of this Joint Waste Strategy (April 2008) was drafted in February and further revisions carried out during March/April 2008 to cover this final version of the Joint Waste Strategy.

It highlights the need to maintain monitoring procedures associated with the Joint Waste Strategy implementation and places emphasis on the appropriate review mechanism to ensure that the objectives of sustainable development are maintained particularly with respect to the technology options considered as part of the Joint Waste Strategy's development. The key points that arose from the SEA that are addressed in this Joint Waste Strategy are:

- The commitment to sustainable as well as efficient recovery of resources;
- Adhering to self-sufficiency by disposing of waste at the nearest appropriate installation;
- The recognition of the benefits of energy efficiency in waste management and stating the importance of minimising greenhouse gas emissions;
- The commitment to promote development of local enterprises and to support innovation, creating investment in the waste sector and strengthening its contribution to the regional economy; and

[43] ERM, April 2008. Environmental Report for the Strategic Environmental Assessment of the Joint Residual Municipal Waste Management Strategy for the West of England

- The inclusion of a policy to promote public awareness and information on waste management issues.

For each of the four phases of the Joint Waste Strategy (see section 5.1), the SEA identified the following key points;

Phase 1

- Clearly seeks to improve access to services and to raise public awareness of waste management; thereby promoting greater responsibility for waste and helping to promote waste reduction, recycling and composting;
- Likely to have a positive impact on air emissions, including greenhouse gas emissions; and
- Increased recycling will require multiple handling of materials which may increase emissions from waste transport.

Phase 2

- Enables more waste to be managed closer to its source and reduce the impacts of waste transport;
- However, this benefit will be offset to some extent by the need for multiple handling of waste which will be required with treatment of residuals from the treatment process;
- Likely to minimise costs compared to landfilling or purchasing LATS allowances or paying fines; and
- An uncertain effect on greenhouse gas emissions compared to continuing to landfill waste, as the effect is strongly dependent on the type of technology employed which is not specified.

Phase 3

- The preferred technology of EfW performs well in terms of amenity impacts (noise, light, dust) and estimated costs;
- Minimises the number of vehicle movements and associated impacts;
- Promotes aspects of communities taking responsibility for their own waste;
- Helps to promote the waste hierarchy;
- Produces a relatively good energy balance;
- Comparable performance to other technologies on air emissions;
- Generates hazardous waste (as do all technologies except Option 4); and
- Performs better than MBT but not other options on global warming potential.

Phase 4

- Will further promote the waste hierarchy and recovery of resources;
- Enables future additional waste arisings to be managed close to their source; however
- The number of vehicle movements will increase with the additional quantities of waste to be treated.

In comparison with a single larger treatment facility covering phases 3 and 4, the phased approach has favourable benefits overall, such as allowing increased innovation, improved waste hierarchy performance, less potential transport through waste imports, increased potential for locating facilities close to the source of wastes, less air emissions and hazardous waste generation. The reduction in the capacity requirement for phase 3 is predicted to have limited effect on the appraisal of technologies relative to each other, although the effects reduce in absolute terms.

The revised SEA also contains a list of recommendations for mitigation and enhancement for the implementation of the Waste Strategy including:

- Decisions on the procurement of residual treatment capacity should require contractors to demonstrate that negative effects will be avoided or minimised to an acceptable level;
- The provision of residual treatment capacity should not restrict the achievement of targets for reduction, recycling and composting;
- Facilities should treat waste from the sub-region in preference to waste from outside, and treat only those wastes which cannot otherwise be reused, recycled or composted; and
- Policy should be included to promote the recovery of energy and in particular the generation of CHP wherever practicable.

5.8 Joint Waste Strategy Review

As a matter of protocol the Joint Waste Strategy will be fully reviewed at a minimum of every five years by the Partnership, or unless there is a significant change in government policy, regulation or legislation, for example:

- 2009 –Waste Framework Directive revisions;
- 2010 – Adoption of the Development Plan; and
- 2012 – Expected updated Waste Strategy for England.

5.9 Risk Assessment

A basic technical risk assessment has been undertaken on the implementation approach to identify key risks early in the process. The headline issues have been identified as:

- Change in legislation;
- Change in National Waste Strategy targets;
- Changes in growth rates or waste composition;
- Under performance of recycling initiatives;
- Changes to LATS;
- Site selection/ availability;
- Planning;
- Options Appraisal;
- Waste management licences/PPC permits;
- Changes in waste collection strategies;
- Chosen technology and performance;
- Delays in obtaining approvals;

- Insurances; and
- Partnership does not agree on Preferred Options.

The risk register is provided in Appendix E – Technical Risk Assessment and illustrates the numerous risks associated with this complex project and the methods the Partnership will put in place to manage these risks throughout the process.

6 Appendix A – Memorandum of Understanding and Terms of Reference

WEST OF ENGLAND WASTE PARTNERSHIP

MEMORANDUM OF UNDERSTANDING

BETWEEN

BATH & NORTH EAST SOMERSET COUNCIL
BRISTOL CITY COUNCIL
NORTH SOMERSET COUNCIL
SOUTH GLOUCESTERSHIRE COUNCIL

Background

The UK Government is committed to managing the nation's waste more sustainably as outlined in its policy document 'Waste Strategy 2000' and in regulations arising from the European Landfill Directive.

In pursuit of this objective the Government sees the management of household waste by local Authorities as an area for significant improvement. Through the Best Value regime, Government has set challenging statutory performance standards, requiring all local Authorities to significantly increase the proportion of waste recycled and composted. Waste Disposal Authorities (WDAs) are also under a statutory obligation to reduce the amount of biodegradable waste, which is disposed of to landfill.

The Government is encouraging joint working between local Authorities where it can be demonstrated that enhanced service provision can be secured alongside value for money.

Each of the four councils is a unitary authority and is the statutory Waste Disposal Authority for its administrative area, each having the statutory responsibility for making arrangements for the disposal of household waste collected within their areas under the Environmental Protection Act 1990.

The four councils have powers and responsibilities under the Environmental Protection Act 1990 as Waste Disposal Authorities and wish to work together to secure the proper exercise of these powers and duties by establishing and supporting joint working for this purpose.

The four councils also have powers and responsibilities under the Planning and Compulsory Purchase Act 2004 and wish to work together on strategic waste planning and to share good practice and guidance on planning for waste.

Joint working is expected to produce economic, environmental and social benefits as well as overall efficiency savings.

Purpose and Status

The purpose of this Memorandum of Understanding is to clarify the relationship between the four Councils in relation to the development by each and all of the Councils of a West of England Waste Management and Planning Strategy, a Reference Project and corresponding Project Plans. This is likely to include the determination of sub-regional planning policies, preferred waste management technologies and Outline Business Plan (for municipal waste) appropriate for the sub-region.

It is anticipated that this Memorandum of Understanding will subsist until such time as a properly constituted joint agreement or such other appropriate relationship between the Councils is in place to facilitate the procurement of joint facilities and services.

The four Councils acknowledge that this Memorandum of Understanding is not a formal contract and is not legally binding or enforceable. However, the parties will treat it as an operational document and will use their best endeavours to comply with its terms. No Council will be obliged to undertake expenditure, which it would not have otherwise undertaken in compliance with its duties as a Waste Management Authority.

Guiding Principles

In formulating and administering this Memorandum of Understanding the councils acknowledge that the West of England Waste Management and Planning Strategy will be developed as a result of a close working relationship between the parties and a commitment to transparency in their dealings. Mutual support and co-operation is the key to the process and the success of the strategy is dependant upon the continuation of this approach.

In particular and with effect from the signing of this Document, the parties agree that:

i. The parties will give consideration to this Memorandum of Understanding before entering into any contractual arrangements which could adversely affect the development of a joint waste management strategy;

ii. New initiatives and/or working practices relating to overall management of waste being considered or developed by any of the parties shall if appropriate be openly discussed at meetings of the Officers Project Team and Member Project Board at the earliest practical opportunity; provided that no party to the Memorandum of Understanding shall be required to provide information which it considers is either exempt information in accordance with the LGA 1972 or which in the view of the authority would be the subject of an absolute or non-absolute exemption in accordance with the Freedom of Information Act 2000. The Officers Project Team and the Member Project Board shall give due consideration to the implications of new initiatives and working practices on the development of the West of England Waste Management and Planning Strategy. Mechanisms should be considered whereby these can be incorporated into any long-term waste management arrangements;

iii. Each party will endeavour, when entering into contracts, to give consideration if practicable and appropriate to the requirements of the sub-regional arrangements;
iv. The Member Project Board will use its best endeavours to make recommendations on the development of a West of England Waste Management and Planning Strategy that embodies the wishes and aspirations of all the parties to achieve sustainable waste management solutions;
v. As existing waste management related contracts expire and where the Constituent Authorities enter into new ones, they will endeavour, where practicable and appropriate to give consideration to the West of England Waste Management and Planning Strategy arrangements so as to facilitate the development of integrated waste management systems;
vi. The four Councils will use reasonable endeavours to develop and maintain an effective joint process to ensure the satisfactory development of the West of England Waste Management and Planning Strategy. The four Councils will use their combined skills and experience to understand key issues and commit to work together to ensure continuous improvement throughout the life of this Memorandum of Understanding;
vii. In determining the viability of any activity or process, consideration should be given to the long-term effects and impact of that decision upon finance and upon an integrated waste management approach;
viii. Matters relating to future joint arrangements which require decisions to be taken will be referred by the Member Project Board to the constituent Authorities for determination. It will be for each of the four Councils to determine within its own constitutional arrangements how the decisions reserved to the four Councils should be taken;
ix. The four Councils will use all reasonable endeavours to work together to ensure the timely completion of the project in accordance with the agreed Project Plan;
x. In preparing development plan documents relating to waste as respects their area, each Council will keep each other informed as to progress and will use their best endeavours to co-ordinate the implementation of their planning strategies, including the release of sites for strategic waste-related development in the interests of implementing the agreed waste planning strategy; and
xi. The four Councils respect the collective need to exercise commercial confidentiality in matters which come to their attention.

As soon as practicable following the signing of this Memorandum of Agreement the Member Project Board agree to recommend to the four Councils that the project costs associated with the development of a West of England Waste Management and Planning Strategy will be met in equal shares by the four Councils.

WEST OF ENGLAND WASTE PARTNERSHIP

West of England Waste Management and Planning Strategy

TERMS OF REFERENCE OF THE OFFICER PROJECT TEAM AND THE MEMBER PROJECT BOARD

Overview

The four Unitary Authorities, comprising the West of England Waste Partnership - Bristol City Council, Bath & North East Somerset Council, North Somerset Council and South Gloucestershire Council are working together to develop and deliver a Joint Waste Management and Planning Strategy for Municipal and other controlled wastes. The four Authorities have established a Member Project Board (MPB) with a supporting Officers Project Team (OPD), which includes both waste and planning representation.

It is now proposed to enter into a Memorandum of Understanding, which sets out the principles of the joint working arrangement as part of the West of England Waste Partnership. As an integral part of this is also the need to have an agreed set of Terms of Reference for both the Member Project Board and the Officers Project Team follows:

OFFICER PROJECT TEAM (OPT) - TERMS OF REFERENCE

Purpose

To develop and deliver a Joint Waste Management and Planning Strategy in accordance with an agreed Project Implementation Document (PID).

Functions

- To review progress against the PID and update the PID as required;
- To prepare reports for the Member Project Board;
- To identify resources and funding to carry out tasks, and if necessary to consider the preparation of bids by the Unitary Authorities for external funding; see below;
- To identify specific projects and tasks within the PID and agree resources, processes and timescales; see below;
- To undertake procurement of external advisors and recommend appointments to the Member Project Board, although it is recognised that as with all functions which involve use of resources, expenditure and procurement, officers would only be able to carry out these in relation to their own Unitary Authorities under their Constitutions and in accordance with their delegated powers. Officers will work together in connection with the appointment of any consultants in order to achieve efficiency and consistency;
- To identify issues which require a Member perspective and to refer them to the Member Project Board;
- To identify and refer matters which require decisions to be taken by individual Unitary Authority Members in pursuit of developing the West of England Waste Management and Planning Strategy; and

- To prepare and disseminate briefing updates for the West of England Planning Transport and Environment Group (PTEG).

Meeting Arrangements

- Meetings to be held each calendar month, dates to be agreed at the start of each year;
- Additional ad-hoc meetings to be arranged as and when required;
- The location of meetings to rotate between each unitary authority;
- The host authority will chair the meeting and arrange for notes to be taken; and
- Representatives from external organisations/appointed consultants to be invited to attend and give presentations at meetings as appropriate.

Membership

- Chief/Senior Officers responsible for strategic waste management and planning from each Unitary Authority;
- Strategic waste management and planning officers from each Unitary Authority; and
- Representation from the Joint Strategic Planning and Transport Unit.

MEMBER PROJECT BOARD (MPB) - TERMS OF REFERENCE

Purpose

i) To provide an opportunity to consider recommendations and views from individual Unitary Authorities on common waste and planning issues;

ii) To receive and consider reports and issues presented by the Officers Project Team;

iii) To make recommendations to the Officers Project Team and to individual Unitary Authorities; and

iv) To keep the West of England Partnership Planning, Transport and Environment Group (PTEG) informed of progress and developments.

Functions

- To review progress on the development and delivery of a Joint Waste Management and Planning Strategy for the West of England;
- To review progress on and against the Project Implementation Document (PID) and individual projects within the scope of the PID;
- To consider reports and issues presented by the Officers Project Team and external advisors and consultees;
- To recommend to the Officer Project Team that external advisors are appointed, where appropriate;
- To provide a political steer on issues raised by the Officers Project Team;
- To make recommendations to the constituent Authorities concerning strategic waste management and planning; and

- To consult with and refer key decisions to constituent Authorities for determination where appropriate and provide guidance to the Member Project Board members and the Officers Project Team.

Membership

- Executive Members for Strategic Planning (one from each Unitary Authority);
- Executive Members for Waste Management (one from each Unitary Authority); and
- Chief/Senior Officers responsible for Strategic Planning and Waste Management.

Meeting Arrangements

- Meetings to be held at least four times per year, the dates of which are to be arranged at the start of each year;
- Additional ad-hoc meetings to be arranged when key decisions required;
- The location of meetings will rotate between each unitary authority;
- The host authority will chair the meeting and arrange for notes of the meeting to be taken; and
- Project advisors, external consultants or representatives from external organisations such as the Environment Agency, the Regional Development Agency, South West Regional Assembly, Government Office for the South West and the 4ps etc. will be invited to attend or give presentations and their advice at meetings as and when appropriate.

7 Appendix B – Current Waste Legislation, guidance & strategies

The table below details the current legislation, guidance and strategies that will have a direct bearing on waste management development for the partnership. The list is by no means exhaustive, but seeks to capture the salient items that affect the Partnership. It details the European legislation, Acts, Regulations, Policy & Strategy, and Guidance for England. This list will be continually reviewed in line with the review of this Joint Waste Strategy.

European Legislation Current waste Legislation, guidance & strategies	**What it means for the Partnership**
Waste Framework Directive 1975	Known as the Waste Framework Directive, the Directive establishes a framework for the management of waste across the European Community. It also defines certain terms, such as 'waste', 'recovery' and 'disposal', to ensure that a uniform approach is taken across the EU. It requires Member States to: • Give priority to waste prevention and encourage reuse and recovery of waste; • Ensure that waste is recovered or disposed of without endangering human health and without using processes which could harm the environment; • Prohibit the uncontrolled disposal of waste, ensure that waste management activities are permitted (unless specifically exempt); • Establish an integrated and adequate network of disposal installations; • Prepare waste management plans; • Ensure that the cost of disposal is borne by the waste holder in accordance with the polluter pays principle; and • Ensure that waste carriers are registered.
Landfill Directive 1999	The Landfill Directive contains far-reaching legislation that impacts both on the management of waste and on specific waste streams. The Landfill Directive aims to improve standards of landfilling across Europe, by setting specific requirements for the design, operation and aftercare of landfills, and for the types of waste that can be accepted at landfill sites. The Directive: • Requires a substantial reduction in the amount of biodegradable municipal waste (BMW) being landfilled: o By 2010 to reduce BMW landfilled to 75% (by weight) of that produced in 1995; o By 2013 to reduce BMW landfilled to 50% (by weight) of that produced in 1995; o By 2020 to reduce BMW landfilled to 35% (by weight) of that produced in 1995. • Requires a plan for the reduction of all biodegradable wastes in landfill to be produced by 2003; • Bans the landfilling of: o Waste which is corrosive, oxidising, highly

	flammable, flammable or explosive; o Liquid hazardous waste, infectious hospital and other clinical wastes; o Whole used tyres (from 2003); and o Shredded tyres (from 2006). The Directive classifies landfills as hazardous, non hazardous, or inert waste and prevents the co-disposal of hazardous and non-hazardous waste after July 2004. It also requires that waste must be pre-treated before being landfilled and that landfill gas must be collected, treated and used to produce energy. This means that if the gas cannot be used it must be flared. The Directive applies to all sites that were accepting waste on 16 July 2001. Larger landfill sites taking wastes other than inert wastes are also subject to the Integrated Pollution Prevention and Control Directive.
Directive on Hazardous Waste 1991	The Directive on Hazardous waste lists a number of properties of waste which render it hazardous (such as explosive, flammable, carcinogenic, or corrosive). Although the Directive does not substantially augment the requirements of the waste framework directive as regards permitting and registration of waste management facilities, it contains additional requirements concerning the mixing of hazardous waste, record keeping and international shipments of waste. The Directive requires: • A record of every site where tipping of hazardous waste takes place; • The prevention of the mixing of non-hazardous and hazardous waste; • The separation of hazardous waste from other waste where technically and economically feasible; • Hazardous waste to be transported, packaged and labelled in accordance with international and European Union standards; • Waste to be transferred with an identification form; • Producers and disposal sites to be inspected; and, • Permitted sites to keep records for three years. Hazardous wastes are listed in the amended European Waste Catalogue (EWC), established by Commission Decision 2000/532/EC which was brought into effect in the UK in 2002. Changes to the EWC have brought many wastes not previously categorised as hazardous within the scope of the wider definitions, including computer monitors, fluorescent tubes, fridges and end of life vehicles that have not been drained of liquid or other hazardous components.
Groundwater Directive 2006	The Groundwater Directive aims to protect groundwater from pollution by controlling discharges and disposals of certain dangerous substances to groundwater, including from waste management operations and facilities.
Directive on packaging and packaging waste 1996	The Packaging and Packaging Waste Directive aims to harmonise measures concerning the management

	of packaging and packaging waste and in particular, obligates the UK to meet targets for the recovery and recycling of packaging waste. The Directive covers all packaging placed on the Community market. Targets are set as a percentage of packaging flowing into the waste stream. The Directive: • Sets targets for recovery and recycling; • Requires the encouragement of the use of recycled packaging materials in the manufacturing of packaging and other products; • Requires packaging to comply with 'essential requirements' which include the minimisation of packaging volume and weight, and the design of packaging to permit its reuse or recovery; and • Requires the implementation of measures to prevent packaging waste in addition to preventative measures under the 'essential requirements', which may include measures to encourage the re-use of packaging. Targets were originally introduced by the UK Government in 1997, to be met by 2001. More recent targets have been agreed by the European Union, to be met by the 31st December 2008. The overall recovery target is set at 60%, with a recycling target of between 55% and 80%. Material specific targets for each packaging material have also been set: 60% for glass, 60% for paper, 50% for metals, 22.5% for plastics and 15% for wood.
Directive on Batteries and Accumulators 2006	The Directive concerns batteries and accumulators containing certain dangerous substances. From January 1993, the original Directive: • Prohibits the placing on the market of manganese alkaline batteries designed from prolonged use in extreme conditions and containing more than 0.05% by weight of mercury; • Prohibits the placing on the market of any other alkaline battery with a mercury content of more than 0.025% by weight; • Requires appropriate steps to be taken to ensure that spent batteries and accumulators are collected separately with a view to their recovery or disposal; • Requires batteries to be marked to indicate separate collection, recycling and heavy metal content; • Requires Member States to draw up programmes to reduce the heavy metal content of batteries and accumulators. Later amendments tightened up the standards from January 2000. Batteries of the button type or those composed of elements of the button type are excluded from the scope of the Directive. The Commission is currently drafting proposals to replace the 1991 Batteries Directive - consultation with stakeholders commenced in July 2003. Following an

	initial agreement in 2004, and two readings during 2005, the current targets are now: collection rates of 25% within 6 years, and 45% within ten years, of sales volume of portable batteries. The recycling target is set at 50%. Batteries containing nickel cadmium will be phased out; however this does not include those used in power tools, medical equipment and alarm systems. The battery producers will also be responsible for funding battery information campaigns and the collection and recycling of batteries.
Environmental Liability Directive 2004	The Directive is likely to be transposed into UK law by December 2008 and seeks to achieve the prevention and remedying of environmental damage - specifically, damage to habitats and species protected by EC law, and to species or habitat on a site of special scientific interest for which the site has been notified, damage to water resources, and land contamination which presents a threat to human health. It reinforces the "polluter pays" principle - making operators financially liable for threats of or actual damage.
International Shipments of wastes 2006	The Council legislation on the supervision and control of shipments within, into and out of the European Community requires Member States to ratify all transfrontier shipments of waste. The waste may only be moved when consent has been given by the competent authorities using a system of consignment notes, which are prescribed in detail. Waste must also be properly packed and labelled. The Regulation also restricts the countries from which or to which waste can be transported. These countries must have suitable arrangements for the control of waste. Green, amber and red lists of wastes are provided in the Regulation, each requiring different standards of control during movement. These lists only apply to wastes destined for recovery.
Ozone Depleting Substances Regulation 2000	Over 170 countries have now ratified the Montreal Protocol on substances that deplete the ozone layer, an international treaty for the protection of the stratospheric ozone layer. The new EC Regulation will affect users, producers, suppliers, maintenance and servicing engineers, and those involved in the disposal of all ODS. These substances are mainly used in refrigeration, air-conditioning, foam blowing, as solvents and in fire fighting.
WEEE Directive 2006	The Waste Electrical and Electronic Equipment (WEEE) Directive was published on 13th February 2003 and has significant implications for importers, producers and retailers of electrical and electronic equipment. It aims to reduce the amount of electrical waste, increase recovery and recycling, and improve the environmental performance of all operators involved in the lifecycle of electrical and electronic equipment. Examples of equipment that will be covered by the Directive are household appliances, IT and telecommunications equipment, audiovisual equipment (TV, video, hi-fi), lighting, electrical and electronic tools, toys, leisure and sports equipment. The Directive requires: • Member states to encourage the design and production of EEE which take into account

	and facilitate dismantling and recovery, in particular the reuse and recycling of waste equipment; • Separate collection systems to be set up; • Final holders to be able to return waste free of charge; • Producers to meet most of the costs of collecting, treating, recycling and disposing of their products once they become consumer waste - applies to products placed on the market after August 2005; • In the case of 'historical' WEEE (arising from products placed on the market before August 2005) producers to share costs proportionate to market share; • Distributors of electronic goods (mostly retailers) to take back old equipment free of charge when supplying new (equivalent) products to customers - this might be in-store or by third parties; • A collection target on average of 4 kg per inhabitant per year to be achieved by 31st December 2006; and • Recovery and recycling targets to be met according to product category - targets apply to the separately collected fraction only, targets range from 50% - 80%. Householders must be encouraged to separate WEEE but there is no mandatory requirement. The Directive does not require Local Authorities to take on any additional burdens such as separation of household WEEE or kerbside collection provision for WEEE.
End of Life Vehicles (ELV) Directive 2000	The purpose of the End of Life Vehicles (ELV) Directive is to prevent waste from end of life vehicles and promote the collection, reuse and recycling of their components. It sets recycling targets and will require producers, dismantlers and shredders to establish collection systems for ELVs. The Directive: • Aims to improve the environmental performance of all of the economic operators involved in the lifecycle of vehicles and especially the operators directly involved in the treatment of ELVs; • Restricts the use of certain heavy metals including mercury, hexavalent chromium, cadmium and lead, in vehicles placed on the market after 1st July 2003; • Requires that ELVs can only be scrapped ('treated') by authorised treatment facilities, which must meet tightened environmental standards; • Introduces a "certificate of destruction", which must be issued to the final owner when the vehicle is scrapped; • Requires producers to design vehicles to facilitate dismantling, reuse, recovery and recycling; • Requires producers to make available dismantling information in respect of new

	vehicles and to mark certain vehicle components to aid recycling; • Requires that, for vehicles put on the market after 1st July 2003 which have a negative value when scrapped, owners are able to have their complete ELVs accepted free of charge and producers must bear all or a significant part of these costs; • Requires that owners are able to have their complete ELVs accepted free of charge after 1st July 2007, irrespective of the date they were first put on the market, if such vehicles have a negative value when scrapped; • sets targets for economic operators - by 1st January 2006 reuse and recovery to increase to a minimum of 85% (by wt) and re-use and recycling to 80% (by wt), by 1st January 2015, reuse and recovery to increase to 95% and reuse and recycling to 85%; • Further targets will be set for the years beyond 2015.
Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment 2002	This Directive bans the placing on the EU market of new electrical and electronic equipment containing more than agreed levels of lead, cadmium, mercury, hexavalent chromium, polybrominated biphenyl (PBB) and polybrominated diphenyl ether (PBDE) flame retardants. Manufacturers need to understand the requirements of the RoHS Directive to ensure that their products, and their components, comply.
Registration, Evaluation and Authorisation of Chemicals (REACH) (2006)	Businesses have to consider their REACH responsibilities as part of registration with the Health & Safety Executive.
Ozone Depleting Substances Regulation 2000	Management of the disposal and recycling of fridges and freezers.
Thematic Strategy on the prevention and recycling of waste (2005)	This long-term strategy aims to help Europe become a recycling society that seeks to avoid waste and uses waste as a resource. As a first step, the Commission proposes revising the 1975 Waste Framework Directive to set recycling standards and to include an obligation for EU Member States to develop national waste prevention programmes.
UK/England Acts Current waste Legislation, guidance & strategies	**What it means for the Partnership**
Clean Neighbourhoods and Environment Act 2005	Repeals the requirement to transfer waste disposal functions to companies and amends the payments of recycling credits. Extends the powers of WCAs in relation to illegal waste activities.
Control of Pollution (Amendment) Act 1989 and The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1998 (as amended)	Sets out rules regarding waste carriers, and the powers of WCAs to investigate and take enforcement action against offenders.
Environmental Protection Act 1990	Sets out duties & responsibilities of WCAs and WDAs. Sets out duty of care, waste licensing and fly tipping legislation.
Household Waste Recycling Act 2003	All WCAs should collect at least two types of recyclable waste from all households in their area, which could

	include batteries, garden waste, glass, hazardous household liquids (i.e. paint and varnish), kitchen waste, metals, paper, plastics, textiles and shoes, electrical or electronic waste (e-waste) and wood.
Local Government and Public Involvement in Health Act 2007:	Introduces new powers to allow the creation of Joint Waste Authorities (JWAs). This measure aims to help those authorities that wish to put joint working on waste on a statutory footing. Groups of authorities will be able to voluntarily request creation of a JWA in order to enable stronger partnership working on waste. Government will work with authorities to determine the structure, constitution and funding of their partnerships.
Waste & Emissions Trading Act 2003 Landfill (Scheme Year and Maximum Landfill Amount) Regulations 2004 The Landfill Allowances and Trading Scheme (England) Regulations 2004 The Landfill Allowances and Trading Scheme (England) (Amendment) Regulations 2005	WDAs need to know: • Whether they are required to produce a MWMS under the Act; • Their schedule of landfill allowances; • The way in which the balance of allowances will be calculated, including the way in which the performance of treatments will be assessed under the Landfill Allowances Trading Scheme (LATS); • The rules regarding trading, banking and borrowing of landfill allowances; • The powers of direction which the Act gives to WDAs vis-à-vis WCAs; and • The amount of the financial penalty under the Scheme.
Waste Minimisation Act 1998	Allowing Local Authorities to provide funding for waste reduction initiatives.
UK/England Regulations	**What it means for the Partnership**
Animal By Products Regulations 2005 (as amended)	Authorities collecting biowastes including food wastes can no longer deal with materials through open-air treatments. If the collected biowaste includes meat the material must be treated through a two-barrier process. If collected waste includes kitchen waste, but attempts are made to exclude meat, the material must be treated using a single barrier process. The fact that the State Veterinary Service needs to approve facilities may add to lead-times for in-vessel facilities. There are restrictions and reporting requirements for the spreading on land of compost derived from kitchen wastes.
Controlled Waste Regulations 1993 (as amended)	Defines in more detail what waste types can be classed as household, C&I and which waste categories Local Authorities may make a charge for collecting.
End of Life Vehicles Regulations 2003 End-of-Life Vehicles (Producer Responsibility) Regulations 2005	Requirements regarding how vehicles (including abandoned vehicles from Local Authorities) are managed.
Environmental Protection (Duty of Care) Regulations 1993	Sets out the requirements of the transfer note system and powers of the Environment Agency and WCAs to enforce them.
Hazardous Waste Regulations 2005 The List of Wastes (England) (Amendment) Regulations 2005	Sets out new regime for dealing with hazardous waste, and includes requirements for producers of hazardous waste to register with the Environment Agency, and sets out documentation requirements.
Landfill (England and Wales) (Amendment) Regulations 2005 Landfill Tax Regulations 1996 (and relevant Budget announcements)	Local Authorities should know which wastes are classified as 'active' and 'inert' for the purposes of the tax. For 'active wastes', landfill tax is due to increase to £32 per tonne by April 2008. The tax will continue to rise by £8 per tonne each following year to 2010/11. For 'inert wastes', the rate of landfill tax is £2 per tonne currently and will increase to £2.50 per tonne in April 2008.
Landfill (England & Wales) Regulations 2005 Revisions	All waste destined for disposal in landfill must first undergo treatment (October 2007).

Landfill (England and Wales) Regulations 2002	Bans certain wastes being disposed of to landfill, and sets limits on the amount of biodegradable municipal waste allowed to be deposited at landfill. Sets requirements for specific landfills for hazardous, non hazardous and inert waste. Is likely to reduce the number of landfills permitted to accept hazardous waste.
Pollution Prevention and Control (England and Wales) Regulations 2000 (as amended)	Require Local Authorities to regulate Part A(ii) and Part B processes under the Regulations. Note – most waste management facilities are regulated by the Environment Agency as they fall under the Waste Management Licensing Regulations or are classified as Part A(i) processes under the PPC Regulations
Producer Responsibility Obligations (Packaging Waste) Regulations 2007	Though this imposes no obligations upon Local Authorities, the role of Local Authorities in meeting targets set in the European Packaging Waste Directive will be extremely important. Some Authorities already receive some money from obligated packaging producers, however, further funding opportunities may become available in the future, depending upon the approach taken by compliance schemes to meet the next Packaging Directive targets in 2008.
Renewables Obligation Order 2006 (currently under review and to be superseded as amended)	Sets out which forms of energy generation qualify for Renewables Obligation Certificates (ROCs). Sets out the proportion of electricity to be supplied through renewable energy sources in future years. Effectively establishes the parameters affecting the value of ROCs and the waste treatments for which these are available.
The Transfrontier Shipment of Waste Regulations 2007	These set out offences and penalties, and designate the responsible enforcement Authorities.
The Waste Electrical and Electronic Equipment (Waste Management Licensing) (England and Wales) (Amendment) Regulations 2007 WEEE Directive 2006	The aim of the regulations is to reduce the quantity of waste from electrical and electronic equipment and increase it's reuse, recovery and recycling.
Waste Management Licensing Regulations 1994	Sets out specific requirements of the waste management licensing and exemptions regime.
UK/England Policy & Strategy	**What it means for the Partnership**
Planning Policy Statement 10 (PPS10) (2005)	Sets out how sustainable waste management will be delivered through spatial planning. Authorities should involve senior planners in the Municipal Waste Management Strategies (MWMS) development, and MWMS developers should be involved in preparing Local Development Documents (LDD). MWMS should be the source of data for municipal waste in the RSS and the LDD, with revisions being reported as appropriate.
Regional Waste Strategies	Waste strategies are set out at a local level and then adopted at regional level. Local waste strategies must have regard to the strategies produced at a regional level.
The Waste Strategy for England 2007	Authorities should know their statutory recycling and composting targets, both current and future. It should be noted, there are *no recovery targets* for individual Local Authorities (only national ones).
UK/England Guidance	**What it means for the Partnership**
Guidance on the Household Waste Recycling Act 2005	This was published to help Waste Collection Authorities take any necessary steps to comply with the Act, whilst acknowledging their freedom to choose the best way of doing so. The new guidance, which followed a consultation held in 2004, highlights good practice and other sources of information and support that Waste Collection Authorities may find helpful when formulating

	waste management strategies whilst addressing other statutory requirements such as health and safety.
Guidance on monitoring mechanical biological treatment (MBT) and other pre-treatment processes for the landfill allowances schemes (England and Wales) (2005)	This sets out how the contribution of mechanical biological treatment systems to the achievement of LATS targets should be measured.
A Practice Guide for the Development of Municipal Waste Management Strategies (MWMS) (2005) (as amended)	This Guidance sets out what the government expects from English and Welsh Waste Disposal Authorities and Waste Collection Authorities when preparing and updating Municipal Waste Management Strategies (MWMS).

8 Appendix C – Future Waste Legislation, Regulation and Guidance

The table below highlights future guidance and legislation for both Europe and England that will have a bearing on future strategies developed by the partnership. There is a significant quantity of legislation, regulation and guidance being revised all the time. The Partnership will continue to review forthcoming and foreseeable legislation, regulation and guidance in line with the review of this Joint Waste Strategy.

European Legislation	What it means for the Partnership
Detergents Regulation (2004/648/EC)	The EC must review and, if justified, present legislative proposals to extend the biodegradability rules by April 2009. This will have implications on disposal of such materials.
Batteries Directive	Deadline for transposition of September 2008. The Directive will increase the recovery of the materials contained within batteries. An objective of this Directive is to reduce the number of batteries per head of population.
Thematic Strategy for Soil Protection	In response to concerns about the degradation of soil, the European Commission has outlined the first steps in a strategy to protect soils. This may provide a basis for establishing standards regarding composted/digested materials affecting which products can be used in which contexts.
Waste Framework Directive Revisions	Proposed changes are: • Minimum quality standards for all waste facilities; • Best Available Techniques – the use of BAT for disposal facilities and introduce BAT for exempt sites; • Recovery for all waste – requirement for all waste to undergo recovery; and • Incinerators – new energy efficiency thresholds for incinerators would reclassify most UK municipal incinerators as disposal rather than recovery facilities.
UK/England Legislation	**What it means for the Partnership**
Climate Change Bill	This is the first of its kind in any country and sets targets to address climate change. The Bill will present a series of clear targets for reducing carbon dioxide emissions. This will link with the Waste Strategy which has an overall impact of an annual net reduction in global greenhouse gas emissions from waste management.
Site Waste Management Plans (SWMP) for the construction industry	Site Waste Management Plans (SWMP) aim to reduce the amount of waste produced on construction sites and prevent fly-tipping; by April 2008 the new regulations should be in force and SWMPs must be in place after this time.

Review of Integrated Pollution Prevention and Control regulations - Environmental Permitting Regulations	A review of the waste permitting process has been conducted over the past five years. The emerging Environmental Permitting Regulations will amalgamate the current elements of waste permitting (PPC, Waste Management Regulations etc) to provide a more streamlined and effective permitting process. Any changes must be noted and integrated with the policy of the partnership. This should control regimes from April 2008.
Reform of the Renewables Obligation	A Statutory Consultation on the Renewables Obligation Order 2007 was completed and responses published in early 2008. This is likely to lead to changes in the Renewables Obligation, clarifying what waste management technologies will qualify for support and the degree of support they can expect to achieve, for example, the degree of support for anaerobic digestion and combined heat and power.

9 Appendix D – Stage 2 Consultation Responses

The following table describes the responses to the Stage 2 consultation.

Issue	Partnership's response to issue
Issue 1 – Reduce, Reuse, Recycle (the 3Rs) Throughout this consultation many people said that more should be done to help reduce the quantity of waste produced in the first place and that more emphasis should also be placed on improving opportunities for recycling. Some people felt that higher targets should be set for recycling rates.	The Partnership is producing a 3Rs statement on their existing and planned waste reduction, recycling and composting activities and performance to date. This statement will support the Joint Waste Strategy, which is focussed on residual waste. The report will also include information on the Programmed Service Improvements the Partnership Authorities plan to introduce in order to improve their performance in the future. Targets for recycling will be reviewed and improved in line with the Government's Waste Strategy 2007 targets. The potential for joint campaign and publicity work to raise awareness of the 3Rs amongst residents is also being developed.
Issue 2 – Waste treatment technologies There is widespread understanding and acceptance that Thermal Treatment which produces energy is a viable and effective technology for treating residual waste. However some environmental organisations are opposed to thermal treatment technologies.	There are many thermal treatments plants of a variety of sizes and specific technologies operating in the UK and in Europe, and in countries with very much higher recycling rates than the UK. There are also newer advanced thermal treatment technologies in development. All such plants are subject to EU controls on management and emissions. The local Friends of the Earth (FoE) groups proposed an alternative Option X, which included waste reduction and recycling, MBT treatment with landfill of residue, and opposition to thermal treatment of any kind. The residual element of this Option X closely resembled our Option 3, which was based on MBT with stabilised output, but with the flexibility to produce a quantity of recovered SRF for thermal treatment. We are pleased at the support for greater emphasis and action on waste reduction and recycling and are keen to share and discuss ideas for achieving this with inputs from them and other local groups and regional and national organisations. We do not believe that thermal treatment can be excluded at this stage and so are not intending to pursue FoE's Option X as a viable option for Phase 3.
Issue 3 – Carbon footprint information There is now rapidly growing awareness of the danger posed to the planet by excessive carbon dioxide. The lack of emphasis on climate change and carbon emissions was thought to be a shortcoming of the consultation.	During a Technical Options Appraisal process both climate change and air emissions impact were set as evaluation criteria. The weightings of these criteria were agreed by representatives of a wide range of organisations and groups from the West of England area, in a transparent process. It is acknowledged that the profile of global warming has been raised considerably over the last year. Therefore we have taken advantage of the new Environment Agency life cycle model, WRATE, to assess these types of impacts more closely. Details on

Issue	Partnership's response to issue
	the outcomes of the WRATE modelling are contained in Section 4.3.2. Nevertheless we are aware of the concerns expressed about carbon footprint and will take them into account when selecting treatment technologies
Issue 4 – Reduce transportation In order to improve self-sufficiency	The need to reduce 'waste miles' i.e. the distance that waste is transported was strongly heard from all quarters of the consultation response. This is welcomed in terms of recognising the need for the West of England area to take responsibility for and deal with its own waste.
Issue 5 – Small and local facilities A considerable majority voiced an opinion in favour of a large network of smaller localised facilities dispersed across the area.	We acknowledge this desire and will endeavour to take it into account if it is technically and operationally viable. The pros and cons of such a strategy need to be reviewed thoroughly alongside the strategy of a small number of larger-scale facilities. This would refer to a range of considerations such as site availability and ownership; planning application costs (including Environmental Impact Assessments); design and build costs; ongoing operations costs and implications.
Issue 6 – Complex and questionable data A substantial number of people felt they could not express a clear preference because they thought the information supplied was too complex. For those with technical knowledge and who used the longer technical document, the reliability of the data and evaluation processes were questioned.	This is an understandable and fair comment about a technically complex subject area. Much effort was put into producing a range of consultation documents to allow people with differing degrees of knowledge to be engaged. At the public meetings a number of waste officers and advisors were present to address any queries. The Technical Options Appraisal was considered a robust, accountable and transparent methodology, used previously by the project's technical advisors for other Authorities. Government, regulatory and other reputable research data was used to support the process.
Issue 7 – Plastics, packaging and supermarkets These were frequently cited as problem areas for waste	In March 2005, 13 major UK retailers signed up to the Courtauld Agreement formed by WRAP (Waste and Resources Action Program, a Government Agency) and the Environment Minister. In doing so they agreed to engage support in finding new packaging solutions and technologies, so less rubbish ends up in household bins. The main supermarkets operating in the UK namely, Tesco, Sainsburys, Asda, Waitrose, Morrisons, Marks & Spencers and the Co-op, have all signed up to the Courtauld Agreement and have therefore agreed in principle to strive to achieve the following targets: • To design out packaging waste growth by 2008; • To deliver an absolute reduction in packaging waste by 2010; and • To identify ways to tackle the problem of food waste. The recent report published by the National Consumer Council on 'Greening Supermarkets' has investigated

Issue	Partnership's response to issue
	and subsequently rated supermarkets according to their green credentials. Along with looking at food transport, sustainable sourcing and farming, the report examines what action is being taken by the stores to reduce, reuse and recycle.
Issue 8 – Long term contracts A dislike of long term contracts was expressed. Shorter, more flexible contracts were thought to be preferable in light of rapidly developing technical innovations.	Flexibility in the eventual contracts for build and operation of new facilities will be important. There will need to be a balance struck between this preference, the risk transfer between the Councils and the contractor and the cost implications for local tax-payers. The financial viability will be dependent on contractors being prepared to provide facilities on the desired contract terms and at an affordable cost.
Issue 9 – Cost More information was requested about the cost impact of the technologies. Some respondents felt unable to express an opinion until this information was known.	Cost is obviously a very important factor and we understand it is of great concern to local tax-payers. The Authorities were keen to give residents an early opportunity to get involved and comment on the technology and site identification work, prior to the detailed financial and cost modelling that will be necessary in the preparation of the next stage which is the development of the Outline Business Case.
Issue 10 – Commercial and Industrial Waste A majority (71%) thought that we should plan to build facilities that could handle C&I waste as well as MSW.	This is acknowledged along with comments also expressed about the implications for sizing/scaling of such facilities and potential income/cost benefits. It is also dependent on the waste industry being prepared to develop such facilities
Issue 11 – Combined heat and power Some expressed views that any facilities which generate energy should be located near to where such energy can be used.	This is an excellent point that we will endeavour to achieve by maximising the benefits of heat and power generated by such a facility and, in so doing, offset energy usage elsewhere. It has been achieved or is planned in other areas of the country. It generally needs to be viewed over the long-term as retro-fitting of the energy supply infrastructure to the users can be complex and expensive.

10 Appendix E – Technical Risk Assessment

A risk register was developed at the inception of this Strategy project. This risk register is being continuously reviewed and monitored. A Directors Programme Management Team is tasked with owning the risk register as well as reviewing and updating this risk register as the Strategy progresses. This team will develop appropriate risk management (mitigation and aversion) measures to ensure that project and programme risks are allocated to the party best able to manage it and that they are in turn managed in an appropriate and timely manner as the Strategy is implemented.

One technique that will be used to review this risk register will be to undertake interactive project planning sessions, where all appropriate officers and advisors come together to map out the project programme and identify risks in achieving that programme.

As the Strategy is implemented, specific risk registers will be developed for each phase of this Strategy. These are likely to be significantly more detailed, more comprehensive and will assign specific risk owners and risk managers.

At the options appraisal stage a technology risk assessment was performed. An outline technology risk assessment considered the risks that impact upon the deliverability of each technology option. The outcomes of that assessment were factored into the decision on the preferred technology options. The risks that each technology was assessed against were as follows:

- Proof of Technology – number of other plants operating, performance of existing plants, references from other Authorities using the technology, supplier robustness;
- Volume risk – Flexibility of technology to changes in waste volumes;
- Composition risk – Flexibility of technology to changes in waste composition;
- Operational risk – Maintenance, plant utilisation, plant failure, operating costs will vary, durability of technology; and,
- Performance risk – Ability of technology to divert biodegradable municipal waste from landfill i.e. will the technologies meet the expectations of the Landfill Allowance Trading Scheme (LATS).

These technology risks were all assessed in isolation, i.e.

- Risks are not site specific purely with the technology; and,
- Risks not specific to the region.

Each technology option was assessed and assigned a risk rating based on a simple three-by-three risk matrix that is outlined in Figure 10-1. The outcomes of that risk assessment are presented in the supporting Options Appraisal document.

Figure 10-1 Risk Matrix used to assess the risks to the project

IMPACT	High	Significant	Critical	Unacceptable
	Medium	Insignificant	Significant	Critical
	Low	Acceptable	Insignificant	Significant
		Low	Medium	High
		PROBABILITY		

This risk matrix has also been used in developing the risk register for this Strategy, which is set out in the table below. The table identifies the risk to the Strategy, the Probability of that risk occurring, the impact it would have if it occurred. The fourth column identifies any comments to explain the risk in more detail and the final column presents the Partnership's approach to managing that risk

Risk Issue	Probability	Impact	Comment	Mitigation/Controls
Legislation/ regulation	Medium	Low	Any change in legislation (planning, waste etc) could have a significant impact on the project.	The Partnership will continuously monitor possible future changes in legislation and assess its impact on this strategy.
Changes to LATS	Medium	Medium	LATS is a fundamental driver for this Strategy. The LATS is known to run until 2020, and this is the date that the Partnership is working towards and has used a key working assumption in its modelling. We understand that Defra is currently reviewing the LATS, which could affect optimal project timings.	The Phasing of this Strategy is flexible. It can be adapted to allow changes in policies following any significant review of the LATS review. The Project target dates will be regularly reviewed. By basing the sizing of facilities on how the LATS is currently shaped the Partnership is reducing is LATS risk.
Strategy targets	Low	Medium	Regional and national targets could change due to review. Therefore the chosen technologies may not be able to deliver new targets.	This Strategy has been designed to be robust enough to take account of changes in targets; the phasing and the technologies chosen will be flexible and adaptable and give required targets without utilising 100% of their capacity.
Waste growth rates	Medium	Medium	Changes in the volume/ quantity of	If there is less residual waste than predicted

Risk Issue	Probability	Impact	Comment	Mitigation/Controls
			waste that needs to be treated will be a key risk area that the industry will want to reduce.	from the partnership a facility could be oversized for the needs of treating that waste and it may have to secure additional feedstock from other authorities or third parties, for example, C&I waste. C&I waste should not be a problem to source according to feedback through the soft market testing exercise. If waste is greater than predicted, the Partnership will have to work harder at Phase 1 and devote more resource in that area. Moreover, a facility may have to be enlarged or more facilities commissioned. It will be critical to monitor arisings throughout the year using WasteDataFlow.
Waste composition	Low	Low	Changes in the composition of the waste are could have a significant impact on the performance of a technology and its ability to support the requirements of the LATS.	Technologies chosen will not be reliant on a single waste type and will adaptable enough to adjust to fluctuation in the quantities and types of wastes available. Under Phase 3, for an EfW facility, EfW can accept a broad range of composition input. Predicting future changes in composition is inherently complex and difficult. The Each UA will continue to monitor its composition through regular composition auditing.
Changes in waste collection strategies	Low	Medium	Changes to collections may change the composition of the residual waste which may mean processes are rendered	Changes will be investigated before implementation. Changes that are already being proposed will be

Risk Issue	Probability	Impact	Comment	Mitigation/Controls
			ineffective.	considered as possible. The modelling work that was conducted as part of this Joint Waste Strategy took into consideration future foreseeable changes to collection through the Programmed Service Improvements scenario. Changes above and beyond the PSI or revisions to it will be modelled to assess what impacts they would have on residual waste arisings.
Under performance of recycling initiatives	Low	Medium	If recycling collection initiatives are unsuccessful the Partnership could be left with more residual waste than was anticipated to deal with.	Chosen technologies and facility sites will be selected with the capacity to handle greater volumes of waste than would be anticipated if the collection systems were successful.
Site selection/ availability	Medium	High	Sites are a key risk to this Strategy. Sites may be removed from the Development Document because they are not considered the 'best' site. Suitable sites may not be available due to acquisition costs/ problems.	Contingency sites will be assessed for suitability. Partnerships between local Authorities will help in the acquisition of sites. A continuous liaison with the local planning authority will be maintained. Selected sites will be fully investigated in terms of cost and suitability. There is a potential that the market will bring forward their own sites in order to meet the needs of this Strategy, although the Partnership is not relying on this being the case.
Planning permission	Medium	High	Planning is a major risk for this Strategy. Planning permission will be required for all sites. Delays, refusals, or enquiries will affect the process.	Target dates will be flexible to allow for alterations due to planning processes. All parties involved will be advised of the planning process. A continuous liaison with the local

Risk Issue	Probability	Impact	Comment	Mitigation/Controls
				planning authority will be maintained.
Environmental Permitting (Consents and Authorisations)	Low	High	IF planning permission is secured, then securing the necessary Environmental Permits should not pose too significant a risk. The appropriate permits will be required at the 'right' times for all waste sites and processes. Any delays in approvals could have serious cost delays.	Permits will be applied for in advance of deadlines. It is likely that permits will be sought in parallel with planning permission. The progress of each site/process will be monitored carefully. The Partnership will consider undertaking certain aspects of the process, for example, some appropriate baseline surveys, to expedite the process for the industry. Applications for approvals will be thorough, and be budgeted to allow for possible problems
Implementation	Low	Low	This Strategy will be implemented through a series of procurements. There is a risk that the contracts being procured do not attract sufficient or robust enough market interest.	The Partnership has appointed a dedicated Communications Officer to liaise with press, public and industry and other interested parties. The Partnership has already undertaken soft market testing with industry to ascertain market interest in the project. It proposed to undertaken further soft market testing exercises in the lead up to procurement activity to help shape their approach to contracting to secure sufficient market interest to attract and stimulate competition and gain best value for money.
Chosen technology			Several of the technology options are unproven in the UK. Factors such as the diversion rate from	Technologies chosen will be proven within a similar country to the UK. They will be suitable for the desired diversion

Risk Issue	Probability	Impact	Comment	Mitigation/Controls
			landfill and markets for outputs may be critical.	rates and markets, but allow for changes in requirements.
Performance of technology	Low	Low	Technology performance is a critical risk. The Partnership has known LATS allowances requiring it to divert significant quantities of biodegradable waste from landfill. If a particular technology fails to perform to the level expected this could pose major risks to the Partnership, environmentally and financially.	A detailed technology risk assessment was conducted as part of the Options Appraisal process. The performance risk of all technologies that are proposed to help deliver this Strategy will be meticulously scrutinised to ensure that meet or improve upon the Partnership's required risk profile (also considering cost). The Partnership will ensure that adequate contingency arrangements are put in place by industry through any contract that is put in place. The Partnership has considered various technologies and through Phase 3 believes that the EfW technology has a sufficiently robust risk profile on which to deliver against LATS allowances
Insurances	Low	Low	Insurance for innovative technologies may be difficult and expensive to obtain.	Insurance will be considered when choosing the best technologies (using Best Available Technique). The cost/benefit equation will be considered for each.
Partnership working	Low	Medium	If the Partnership cannot commit to working together in the longer term this would change the quantity and composition of waste that has to be managed. If the Partnership decide to align their	Each UA in the Partnership has signed a Memorandum of Understanding and has committed to working together to manage its waste collectively. The governance, structural and decision making arrangements of the Partnership as a

Risk Issue	Probability	Impact	Comment	Mitigation/Controls
			collection activities this would widen the scope of this Strategy under Phase 1. This could present an opportunity or positive risk to the Strategy.	procuring body will be meticulously worked through to ensure that the survival of the Partnership in the event of proposed change.
Programme and resource	Low	High	A strict Strategy implementation programme must be developed by the Partnership. This programme must be managed, and continuously reviewed, as letting the programme for delivery slip represents a key risk to meeting the Partnership's requirements under the LATS and ensuring that other financial drivers are met.	To reduce the risk to the project of the programme slipping a dedicated project team must be in place to implement this strategy. A Directors Programme Management Team is already in place and is driving the process. External programme management advice has been in place since 2005 and it is likely that this will continue for the foreseeable future.
Response of Defra to Expression of Interest and subsequent Outline Business Case	Low	Medium	Defra may well refuse to allocation PFI to Phase 3 of this Strategy. This would mean a significant review of the affordability of implementing this Strategy.	A 4ps Transactor has been working on this project since 2006. With this support and the assistance of experience technical advisors, and by following the guidance issued by Defra the Partnership is limiting the risk of not been offered PFI credits.

11 Glossary of Terms

Anaerobic digestion (AD)	Biodegradable material is broken down in the absence of oxygen. Material is placed into a closed vessel and in controlled conditions it breaks down into digested material and biogas.
Advanced Thermal Treatment	See Thermal Treatment.
Autoclave (AC)	A method of sterilisation. Waste is loaded into a sealed vessel and the biodegradable fraction of this waste is then broken down by steam treatment into a homogeneous organic "fibre".
B&NES	Bath and North East Somerset Council.
BCC	Bristol City Council.
Biodegradable waste	Any waste that is capable of undergoing anaerobic or aerobic decomposition, such as; food and garden waste; and paper and cardboard. (Source: Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste).
Biological mechanical treatment (BMT)	The processes incorporate mechanical sorting and separation of the waste stream to separate the non biodegradable component parts from the biodegradable component parts, which then undergo biological decomposition of the waste.
Bring bank/sites	Deposit facilities for the recycling of clean segregated materials such as glass and aluminium cans by members of the public.
Civic amenity (CA) site	A site provided by the local authority for local residents to dispose of bulky household waste, garden waste and recyclable materials. Known as Household Waste Recycling Centres in the West of England.
Climate Change	A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (Source: Intergovernmental Panel on Climate Change Glossary 1995).
Clinical waste	Any waste which consists wholly or partly of human or animal tissue, blood or other bodily fluids, excretions, drugs or other pharmaceutical products, swabs or dressings, or syringes, needles or other sharp instruments,

	being waste which unless rendered safe may prove hazardous to any person coming in contact with it; and Any other waste arising from medical, nursing dental, veterinary, pharmaceutical or similar practice, investigation, treatment, care, teaching or research, or the collection of blood for transfusion, being waste which may cause infection to any person coming into contact with it.
Combined Heat and Power	Combined Heat and Power (CHP) is the simultaneous generation of usable heat and power (usually electricity) in a single process. CHP is a highly efficient way to use both fossil and renewable fuels and can therefore make a significant contribution to the UK's sustainable energy goals, bringing environmental, economic, social, and energy security benefits. CHP systems can be employed over a wide range of sizes, applications, fuels and technologies. In its simplest form, it employs a gas turbine, an engine or a steam turbine to drive an alternator, and the resulting electricity can be used either wholly or partially on-site. The heat produced during power generation is recovered, usually in a heat recovery boiler and can be used to raise steam for a number of industrial processes, to provide hot water for space heating, or, as mentioned above with appropriate equipment installed, cooling. Because CHP systems make extensive use of the heat produced during the electricity generation process, they can achieve overall efficiencies in excess of 70% at the point of use. In contrast, the efficiency of conventional coal-fired and gas-fired power stations, which discard this heat, is typically around 38% and 48% respectively, at the power station. Efficiency at the point of use is lower still because of the losses that occur during transmission and distribution. In contrast, CHP is a form of a decentralised energy technology. CHP systems are typically installed onsite, supplying customers with heat and power directly at the point of use, therefore helping avoid the significant losses (which occur in transmitting electricity from large centralised plant to customer.
Commercial and industrial waste (C&I)	Waste from premises used wholly, or mainly, for the purpose of a trade or business or for sport, recreation or entertainment (Source: Environmental Protection Act 1990).
Composting	The degradation of organic wastes in the presence of

	oxygen.
Construction, demolition and excavation waste (C,D&E)	Waste, generally inert, arising from the construction, maintenance or demolition of buildings or other civil engineering structures.
Defra	Department for the Environment Food and Rural Affairs. The Government department with national responsibility for sustainable waste management.
Development Plan	The Joint Waste Development Plan Document, known as the Development Plan, will identify development control policies and make provision for a network of waste management facilities. The Development Plan will identify where all waste should be managed in the four local Authorities of BCC, B&NES, SG and NS. This is due to be adopted in October 2010.
Emission	A material which is expelled or released to the environment. Usually applied to gaseous or odorous discharges to atmosphere.
Energy from waste (EfW)	Energy that is recovered by thermally treating i.e. incinerating waste. The waste is combusted to produce steam and electricity, metals are recovered for reprocessing as is bottom ash for use as a substitute aggregate. Hazardous Air Pollution Control residues are landfilled.
Environment Agency	The leading public body for protecting and improving the environment in England and Wales.
Environmental impact	The total effect of any operation on the surrounding environment.
Fly tipping	The unregulated, and hence illegal, dumping of waste.
Gasification	The thermal breakdown of material by heating in a low oxygen atmosphere to produce a gas. This is then used to produce heat/electricity.
Household waste	Waste from domestic property, that is to say, a building or self-contained part of a building which is used wholly for the purposes of living accommodation (Source: Environmental Protection Act 1990).
Household Waste Recycling Centre (HWRC)	Facilities provided by the Unitary Authorities to which the public can bring household waste, such as bottles, textiles, cans, paper, green waste and bulky household items/waste for free disposal.
Inert waste	Inactive or un-reactive waste. Contains no organic or

	biodegradable materials.
In-vessel composting (IVC)	Shredded waste is placed inside a chamber or container through which air is forced. This speeds up the composting process.
Joint Waste Strategy	The Joint Residual Municipal Waste Management Strategy or The Joint Waste Strategy. This will detail how waste will be managed and treated in the four local Authorities of BCC, B&NES, SG and NS.
Kerbside collection	A service which requires the householder to put out recyclable and/or compostable materials for collection from outside their property.
Landfill (Lf)	The engineered practice of depositing waste into or onto land which will be restored at the end of its life to provide land for alternative use.
Landfill Allowance Trading Scheme (LATS)	Process of apportionment, by local authority area, of the tonnage of biodegradable municipal waste that may be disposed of to landfill to meet EU Landfill Directive targets (The Landfill Allowances and Trading Scheme (England)(Amendment) Regulations 2005).
Landraise	The deposit of waste material above existing or original ground level.
Local Development Document (LDD)	A document that forms part of the Local Development Framework. Can either be a Development Plan or a Supplementary Planning Document.
Local Development Framework (LDF)	A portfolio of local development documents that will provide the framework for delivering the spatial planning strategy and policies for an area.
Maturation (Mtn)	Maturation of digested compost product from the AD process.
Mechanical Biological Treatment (MBT)	Mechanical Biological Treatment (MBT) plants are used to treat residual municipal waste by a combination of physical, mechanical and biological processes. Waste is separated into biological and non-biological fractions through a variety of methods. Recyclable materials are separated and in some instances energy is recovered. MBT is an intermediate treatment process.
Mechanical treatment (MT)	Residual waste is fed into a mechanised front-end to separate out metals, glass and plastics and contaminants, such as batteries, still left in the waste stream.
Municipal solid	Municipal waste includes household waste and any

waste (MSW)	other wastes collected by waste collection authorities (or their agents) such as municipal parks and gardens waste, beach cleansing waste, commercial or industrial waste and waste resulting from the clearance of fly-tipped materials (Source: Waste Strategy for England 2007).
NS	North Somerset Council.
NTDP	Defra's New Technologies Demonstrator Programme.
OA	Options Appraisal.
Odour	The (unpleasant) smell of a material or collection of materials. The characteristic odour of landfill gas is due mainly to alkyl benzenes and limonene, occasionally and additionally associated with esters and organo–sulphur compounds.
PFI	The Private Finance Initiative - a central government funding source for capital projects.
Planning Policy Statement 10 (PPS10)	Guidance documents which set out national planning policy.
IPPC	Integrated Pollution, Prevention and Control.
Programmed Service Improvements (PSI)	The planned level of improvements to in source separation of waste collections through Bring banks, HWRCs and kerbside collections.
Pyrolysis	The heating of waste in a closed environment (i.e. in the absence of oxygen) to produce a secondary fuel product.
Recovery	Recovery in Waste Strategy for England 2007 is defined as to obtain value from wastes through: • Recycling; • Composting; • Other forms of material recovery (such as anaerobic digestion); and • Energy recovery (combustion from direct or indirect use of the energy produced) or from the manufacture and use of a refuse derived fuel in gasification, pyrolysis, or other technologies.
Recyclable Waste	Means waste which is capable of being recycled or composted [Source: Household Waste Recycling Act 2003, c.29, Section 1(6)].
Recycling	Recovering re-usable materials from waste or using a waste material for a positive purpose (Source: West of England Waste Partnership Consultations – Issues and

	Options Technical Document).
Reference Project	"All major procurement projects i.e. those that involve a major investment decision, must be supported by a robust business analysis or investment appraisal. The results of such an exercise should be documented in an Outline Business Case. A critical stage in the Outline Business Case process is the identification and appraisal of a range of options that will deliver the service changes and outputs required. Best Value is achieved by a thorough and robust comparison of the various options available. An Options Appraisal typically consists of two stages. Firstly, the appraisal of project options in order to identify the project (such as number or size of assets to be included in the project) that best meets the service delivery needs – the Preferred Project Option, and secondly, the appraisal of procurement options (such as PFI) to identify the procurement route that is likely to offer Best Value. The selected project and procurement option will become the Reference Project, against which bids will subsequently be evaluated." Source: The Outline Business Case, 4ps, May 2004
Regional Spatial Strategy (RSS)	A document being prepared by the South West Regional Assembly to replace the Regional Planning guidance for the South West.
Residual municipal solid waste	Waste that is not reused, or is not source segregated for recycling or composting and therefore remains to be managed.
Reuse	Reuse of materials in the original form, either by the householder, or via the manufacturer, without reprocessing.
ROCs	The Renewables Obligation requires power suppliers to derive a specified proportion of the electricity they supply to their customers from renewables. This starts at 3% in 2003, rising gradually to 10% by 2010. The cost to consumers will be limited by a price cap and the obligation is guaranteed in law until 2027. Eligible renewable generators receive Renewables Obligation Certificates for every MWh of electricity generated. These ROCs can be sold to suppliers to fulfil their obligations.
RWSSW	Regional Waste Strategy for the South West.

	South West Regional Assembly, 2004, From Rubbish to Resource: The Regional Waste Strategy for the South West.
SCF	Strategic Consultation Forum.
Self-sufficiency	Dealing with wastes within the administrative region where they are produced.
SG	South Gloucestershire Council.
SMT	Soft market testing (with industry).
SOFA	Shift Old Furniture Around. A community group based in the West of England specialising in reuse.
SRF	Solid recovered fuel. A fuel product produced from the combustible fraction of household waste.
Status Quo (SQ)	A modelling scenario that reflects making no changes at all to current waste collections and disposal i.e. to maintain the status quo.
Strategic Environmental Assessment (SEA)	A systematic process for identifying, predicting, reporting and mitigating the environmental impacts of certain proposed plans and programmes as required by the European Directive 2001/42/EC (the SEA Directive). The SEA Directive is transposed into UK law by the Environmental Assessment of Plans and Programmes Regulations 2004.
Sustainable waste management	The management of waste is one of the key themes of 'sustainable development'. A widely-used and accepted international definition of sustainable development is: 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs' (Source: The Brundtland Report, 1987 also known as *Our Common Future)*.
Thermal treatment (TT)	Treatment by heat. For waste this includes incineration, pyrolysis and gasification.
TOA	Technical Options Appraisal.
Transfer station	Central depot where collection vehicles deliver waste where it is compacted and loaded into bulk transfer vehicles for onward transport to a recovery or disposal facility.
UA	Unitary Authority.
Value for Money	1. Value for Money (VfM) is the term used to assess

	whether or not an organisation has obtained the maximum benefit from the goods and services it acquires and/ or provides, within the resources available to it. It not only measures the cost of goods and services, but also takes account of the mix of quality, cost, resource use, fitness for purpose, timeliness and convenience to judge whether or not, when taken together, they constitute good value. Achieving VfM may be described in terms of the 'three Es' - economy, efficiency and effectiveness: a. Economy. Doing less with fewer resources, i.e. making savings; b. Efficiency. Doing the same as before, but with fewer resources (money, staff, and space); and c. Effectiveness. Doing more than before with the same resources as now (or less).
Void space	The remaining space within landfill sites available for the disposal of waste.
Waste	Unwanted materials as defined by the Environmental Protection Act 1990. Waste includes any scrap metal, effluent or unwanted surplus substance or article that requires to be disposed of because it is broken, worn out, contaminated or otherwise spoiled. Explosives and radioactive wastes are excluded.
Waste arising	The amount of waste generated in a given locality over a given period of time.
Waste Collection Authority (WCA)	Organisation responsible for collection of household waste. Authorities are defined in the Environmental Protection Act 1990, Part 11, Section 30 (3).
Waste Disposal Authority (WDA)	Organisation responsible for disposing of municipal waste. Authorities are defined in the Environmental Protection Act 1990, Part 11, Section 30 (3).
Waste hierarchy	The basis of European waste management policy. The hierarchy indicates the relative priority of different methods of managing waste and provides instruction to waste management policy and planning initiatives on how to progress towards sustainable waste management.

Waste reduction	Reduction in the quantity of waste generated.
WEPO	West of England Partnership Office.
WIDP	Waste Infrastructure Delivery Programme.
WIP	Waste Implementation Programme.
WoE	West of England.
WRATE	Waste and Resources Assessment Tool for the Environment. A lifecycle assessment tool developed by the Environment Agency for assessing the lifecycle impacts of waste management systems.
Zero Waste	A long term vision to reduce consumption of goods by ensuring that products are made to be reused, repaired or recycled, so that what is now regarded as waste should instead be regarded as a mixture of resources to be used again where possible.

12 Supplementary and Supporting Papers

There are a series of supplementary and supporting papers to this Joint Waste Strategy. These will all be available to download from the Resource or Rubbish website.

- West of England Waste Management and Planning Partnership (March 2008), *Joint Position Statement of Reduce, Reuse and Recycle (the 3Rs Statement)*

- Jacobs Engineering U.K. Ltd (January 2007), West of England Waste Management and Planning Partnership, *Options Appraisal Report*

- Jacobs Engineering U.K. Ltd (August 2007), West of England Waste Management and Planning Partnership, *A Comparison of the Emissions Determined in the Options Appraisal Modelling and the WRATE Tool Modelling*, August 2007

- ERM (April 2008), *Environmental Report for the Strategic Environmental Assessment of the Joint Residual Municipal Waste Management Strategy for the West of England*

- Atkins Environment (January 2007), *Bristol City Council and Bath & North East Somerset Council, Energy from Waste Study*.

- Jacobs Engineering U.K. Ltd (February 2008), Capture Rate and Waste Arisings Assumptions Reports for Bristol City Council, Bath &North East Somerset Council, North Somerset Council and South Gloucestershire Council.

- West of England Waste Management and Planning Partnership (January 2008) Communications and Stakeholder Engagement Plan

- Ernst & Young (September 2007), Procurement, Funding and Contract Options Appraisal. And Ernst & Young (December 2007), Procurement, Funding and Contract Options Appraisal; Addendum Report.