States of Jersey

SOLID WASTE STRATEGY

Changing the way we look at waste

10th May 2005

Environment and Public Services Committee

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Foreword

This Strategy aims to change the way we look at waste in Jersey. A change in attitude towards waste production is needed, so that every individual recognises his or her own personal responsibilities and aims to produce less. Although my Committee must manage Jersey's waste, it is all of us who produce it. The less waste produced, the less waste there is to deal with, and the less impact there is on the environment.

Each year we are producing more waste. That presents a small island like ours with a big challenge, which we have to face up to now. The longer we leave things, the bigger the problem we will be building up for the future, and that is why this Strategy is calling for immediate action.

The Island has a record of slow-but-steady improvement in terms of recycling and composting. The recent pilot schemes have been well supported but there is scope for considerable expansion and this Strategy sets targets for improvement and outlines the actions we must take to achieve challenging and realistic goals. My Committee wants to set tougher targets to support and deliver new and improved reuse and recycling initiatives.

During the consultation period, prior to finalising this Strategy, we were encouraged by the comments indicating that we should be more ambitious with our recycling proposals. This, together with the success of the current initiatives, shows that the Island community is ready to embrace a more environmentally-aware approach. We want to harness this enthusiasm and we have incorporated proposals to promote and encourage alternatives to simply throwing things in the dustbin which currently end up being incinerated.

An ideal situation would be where all sectors of society work towards a target of zero-waste. However, in the foreseeable future, we will be left with some waste as happens in even the most advanced countries. It is accepted practice to recover energy from this waste rather than simply burying it. The situation facing the Island with respect to the current Energy from Waste plant is an urgent one, the technical problem is here now and a decision cannot be dodged or deferred. The plant is now old and inefficient and falls well short of current, let alone future, emission standards. There is nothing to be gained and an enormous amount to be lost. Therefore, we have to develop a new plant as soon as possible.

The Waste Strategy Steering Group has received submissions from companies wanting to be considered as suppliers offering different technologies. These suppliers' solutions have been initially reviewed against the following criteria: they must be environmentally sound, currently available with reference plants of similar size that have been in operation for several years and be reliable - the consequences of a breakdown would be unacceptable, in terms of potential pollution and impact on public

health. The Group can go no further than this, in deciding upon a technology and a supplier, until the States has approved this Strategy and funding approval is gained. Only then can the tendering process start.

Since the publication of the draft Strategy last year and the subsequent consultation period and the input from the Shadow Scrutiny Panel, we have done much more than just revise the Strategy. We have reviewed, in depth, issues and suggestions that have been raised and the Strategy is now much stronger from this consultation. However, this Strategy can only succeed if it receives the support of the States, and – more importantly – the whole Island community.

Senator Philip Ozouf

Executive Summary

1.0 Vision

'My vision for Jersey is that we become a less wasteful community, working hard together to reduce, reuse and recycle. To achieve this, wasteful lifestyle habits must change so we produce only the minimum amount of rubbish. The States will lead this culture change by example. We must efficiently and effectively manage the waste we can't avoid, so there is minimum impact on the environment and the health of our community'.

Senator Philip Ozouf
President of the Environment and Public Services Committee

2.0 The scope

While providing an overarching framework of policy until 2030, many of the proposals in this strategy focus on the period until 2009, since this is when the Committee will be laying the foundations to meet the longer term challenges. The strategy will remain under review and be flexible to allow for future changes.

3.0 Waste: A growing problem

Waste is a misuse of resources. The materials and energy that went into the production and transport of the goods in the first place are lost when in many cases they might be used again and the costs of waste collection, management and disposal systems are high.

Unless Jersey's waste is managed responsibly and to the highest standards, it will impact on the quality of our lives and the state of our environment - for example, through unpleasant smells, emissions, land reclamation and contamination.

Yet, like many wealthy communities around the world, Jersey produces too much waste and it is growing year on year. It is accepted that the growth in the number of households, rather than the growth in population, is a more accurate indicator of the growth in waste. The number of Jersey households has risen by about 10,000 in the last 20 years and this trend is set to continue. At the same time, our habits are changing, we have more money to spend, we buy more packaged goods and we tend to use more disposable products or throw things away before they have worn out. This trend must be stopped and then reversed. To do so requires collective action by both government and, more significantly, all of us.

4.0 The problem for Jersey

Jersey currently generates around 100,000 tonnes per year of biodegradable and combustible solid waste (termed 'non-inert' waste). A further 230,000 tonnes of 'inert' waste is produced each year, largely from the construction industry in the form of rubble and subsoil, for example.

Of the non-inert waste in 2004, approximately 79,000 tonnes were burnt in the Bellozanne incinerator, which is old, unreliable and requires increasing maintenance. The levels of emissions significantly exceed European limits, and, although Jersey does not have to comply with EU legislation, the States have made various commitments to comply with best international

environmental standards (detailed in Sections 1.2 and 1.3). If left unresolved, this has the potential to cause Jersey international embarrassment, by preventing us from complying with key Multilateral Environmental Agreements. Furthermore, the levels of emissions raise public health concerns. This situation is unacceptable and the Committee has set a deadline of 2009 to reduce emissions to below the new European limits.

In 2005, Jersey will implement its Waste Management Law. This will introduce a regulatory system for waste handling and disposal facilities, an important step in bringing Jersey into line with best European practice. Facilities will be licensed and monitored by the regulator, the Environment and Public Services Committee.

Jersey must be responsible for its own waste; only exceptionally should export be seen as a solution to deal with certain waste types, such as hazardous chemicals that the Island is unable to handle locally. This does not preclude, however, exporting materials for recycling, like scrap metal and paper, as has been done for a number of years, or in the future packaging such as polyethylene terephthalate (PET) plastics.

In 2004, Jersey recycled about 10% and composted a further 12% of its non-inert waste. (This excludes agricultural waste, which is currently dealt with by individual farmers.) The UK has introduced targets to achieve combined composting and recycling of 30% by 2010, from about 15% today.

5.0 The basis of the strategy

1. Origin of waste

Construction | Household | Commercial | Agricultural

2. Collection

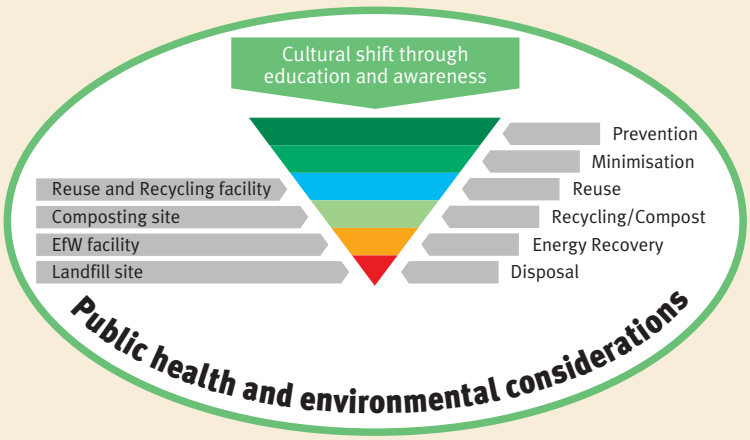
Bring banks | Kerbside collection | Direct delivery

3. Waste streams

Inert waste and non-inert waste e.g. household waste, green waste, scrap metal, sewage treatment works arisings, clinical and hazardous waste.

330,000 tonnes

4. The Internationally agreed Waste Hierarchy and the facilities needed



An internationally agreed Waste Hierarchy sets out a model for managing waste. At the most desirable end of the spectrum no waste would be produced at all. The least favourable option in the hierarchy is to simply take whatever waste is produced and dump it somewhere. In between are the options of reducing waste, reusing materials, recycling and recovering energy from waste. In practice, even the most advanced countries use some combination of all of these options.

The approach adopted in developing a strategy for solid waste management

The strategy considers the origins and composition of waste and its efficient collection and transportation. The treatment of waste and the new facilities proposed in this strategy have been evaluated in accordance with the Waste Hierarchy and with public health and environmental considerations as paramount. It is recognised that in order to be successful there needs to be a *culture shift* supported by programmes of education and awareness.

6.0 The aims of this strategy

COLLECTION OF WASTE

Rationale
Explore how improvements to the waste collection system can be achieved to boost recycling rates.

Aims
The Committee will work with the Comité des Connétables, who are responsible for collecting refuse in each parish, to improve the segregation of waste at source. This will include developing an enhanced bring bank system as well as a coordinated collection system for recyclables, based on the existing glass collection, including paper, aluminium cans, steel cans, glass and PET plastic.

APPLICATION OF THE INTERNATIONALLY AGREED WASTE HIERARCHY

PREVENTION & MINIMISATION

Rationale
To prevent or reduce the waste we generate. This will be achieved through incentives/disincentives alongside education programmes to encourage the public to change their lifestyle habits with respect to waste.

Aims
The Committee will develop proposals for financial mechanisms that will aim to change behaviour and meet environmental objectives – these will be submitted for States approval. These could include initiatives such as the introduction of environmental taxes, for example weight/volume related collection/disposal taxes for municipal waste, individual taxes on items such as newspapers or plastic bags, imposed at the point of sale, or incentive schemes such as support for the purchase of washable nappies or home composting kits.

REUSE & RECYCLING

Rationale

To reduce the quantity of waste produced by encouraging reuse and recycling. The challenge of creating less waste will be met by increasing awareness of the need to reuse more and recycle more types of materials and by making it easier for the public to do so.

Aims

By the end of **2009**, the Committee will aim to increase recycling and composting to **at least 32%**.

Before the end of 2006, the Committee will develop a Reuse and Recycling Centre for paper, glass, steel and aluminium cans and PET plastic. There will also be reuse initiatives and opportunities for the salvaging of construction 'waste'.

The Committee will develop improved aggregate recycling facilities.

The Committee will explore the possibility of introducing further incentive schemes to encourage reuse and recycling.

COMPOSTING

Rationale

To remove green waste from the overall waste stream and process it so that it becomes a valuable commodity in the form of compost, thus helping to maintain the integrity of the land.

Aims

The Committee will establish a modern composting facility for the recycling of green waste by 2007.

ENERGY RECOVERY

Rationale

Having reduced the residual waste as much as possible, efficient, economic and reliable ways of dealing with what remains need to be found; one solution is to recover heat and electricity for the Island. As public health and environmental obligations are vital and Jersey's waste storage and disposal options are so limited, the chosen method of recovery must demonstrate that it can be successfully and reliably operated to the highest standards. The current plant is old, unreliable and fails to meet modern emissions standards and it must be replaced as soon as possible.

Aims

The Committee will replace the current Bellozanne Energy from Waste plant with a modern, appropriately sized facility of a technology still to be decided, by 2009.

The Committee will continue to keep under review the option of a Channel Islands waste facility, located at La Collette, in conjunction with the States of Guernsey and will bring any such proposal for States approval.

DISPOSAL

Rationale

While accepting that this is the least desirable method of waste management, it is acknowledged that the Island must have a secure disposal site for inert waste that takes account of environmental and health impacts as paramount. At present, this can be met by the La Collette reclamation site until around 2015. The Committee must plan to maximise the life of the existing site, then develop a new site to follow on after La Collette is filled.

Aims

The Committee will bring forward a proposal for a future secure inert waste disposal site.

7.0 Finances

One way of paying for these improved facilities and processes would be for those who produce the waste to make a contribution to its disposal. Another choice would be to fund the Solid Waste Strategy from the existing capital programme from 2006 onwards. Alongside funding from the capital programme, the Committee proposes to look further at environmental taxes. If these are approved by the States, they could reduce the burden on the capital fund in the longer term. Some of the capital costs are substantial:

- Reuse and Recycling Centre - £1.4m (operational 2006)
- Energy from Waste plant (including enabling works) - £75.5m (operational 2009)
- Composting Centre - £3.9m (operational 2007)

Additional annual revenue (operating) funds of £450,000 will also be required to implement recycling initiatives.

Waste is an all-Island problem. This Strategy proposes the sustainable, long-term solutions for dealing with it in the most appropriate way for Jersey.

Recommendations

1.0 Collection

The Committee will work principally with the Comité des Connétables to develop the collection system for recyclables including: paper, aluminium cans, steel cans, glass and PET plastic. This will include enhancing the bring bank system and further developing the existing kerbside collection.

1.1 Recommendations

1. By 2006, expand the existing bring bank system to a wider geographical coverage, and include multiple materials collection on each site.

2. By 2007, have completed a pilot kerbside recyclables collection, based on the existing glass collection. This will be developed by a partnership between the Parishes and the Committee. Depending on the results, this approach will be developed and tailored, ensuring that the most efficient integrated service is implemented between the collection and processing of recyclables to achieve recycling targets by 2009.

3. Work with administrators of sites frequently used by the public, such as community centres and supermarkets, to install extra collection points for materials to augment the network described above.

4. Monitor the success of the recycling initiatives and the deliveries of residual waste to Bellozanne.

5. Where appropriate, apply Planning controls to ensure that suitable infrastructure for the collection of waste, including recyclables, forms part of proposals for new development projects.

2.0 Prevention and minimisation

Whilst it is recommended that the capital costs are funded from the capital programme, the Committee believes that financial incentives and disincentives have a role to play in changing behaviour.

In parallel with the above, the Committee will resolve the existing Covenant on the Bellozanne site.

2.1 Recommendations

1. Investigate the introduction of environmental taxes, for States approval. These could include initiatives such as weight/volume related collection/disposal taxes for municipal waste, or individual taxes on items such as newspapers or plastic bags, imposed at the point of sale.
2. Resolve the issue of the Bellozanne covenant.

3.0 Reuse and recycling

By the end of 2009, the Committee will aim to increase the local composting and recycling rate to at least 32%.

By the end of 2006, the Committee will develop a Reuse and Recycling Centre (like a Civic Amenity Site) for the reception of a range of materials including paper, glass, steel and aluminium cans and PET plastic. There will also be timber reuse initiatives and opportunities for the salvaging of construction 'waste'.

The Committee will develop improved aggregate recycling facilities.

The Committee will explore the possibility of introducing further incentive schemes to encourage reuse and recycling.

3.1 Recommendations

1. Develop a Reuse and Recycling Centre for domestic users, including an integrated bulking and baling facility to manage source segregated materials to be exported for recycling. La Collette may provide a suitable location for this facility, subject to the consideration and amelioration of any health, safety, environmental and traffic implications and planning consents being granted.

2. Recycle 50% of available paper and card in the waste stream through the following actions:

    - Continue and expand the existing programme promoting opportunities in all sectors to avoid unnecessary paper waste and make maximum use of recycling infrastructure available. For the commercial sector initiate a Waste Action Group programme to raise awareness and co-ordinate change in attitudes;
    - Continue and expand the newspaper and magazine recycling scheme as an integral part of the Island-wide improvements of the collection systems;
    - Provide a central cardboard recycling facility for householders at the proposed Reuse and Recycling Centre;
    - Encourage further segregation of commercial paper and cardboard using financial incentives;
    - Develop a bulking and baling recycling centre near to the port, to improve the long term efficiency of the export process for paper and card.

3. Recycle 90% of available glass through processing for recycled aggregate by the following actions:

    - Improve the existing glass processing equipment to allow higher quality uses to be found as recycled aggregate. Before any decision or investment is made on this, further investigations are required on potential markets in a small island.

- Continue to promote the benefits of the segregation of clean household glass, which is not suitable for treatment in an Energy from Waste plant, and improve its potential for use as recycled aggregate.
- Work with the Parish to explore the options for increasing glass segregation in St Helier.

4. Increase current levels of metals recycling through the following actions:

   - Extend the collection system to include household clean food cans in addition to aluminium;
   - Appliance reuse should be facilitated by providing a reuse shed at the Reuse and Recycling Centre;
   - The bulky material handling plant should be fitted with ferrous separation downstream of the shredding facility.

5. Recycle 10% of available plastics in the waste stream through the following actions:

   - Continue and expand the existing programme promoting and facilitating opportunities in all sectors to avoid unnecessary plastics waste. Include the promotion of high grade plastic recycling scheme, once introduced;
   - Continue the existing recycling scheme for agricultural polythene film;
   - Introduce a high grade PET plastic collection scheme within the enhanced Island-wide collection system. The materials collected will be densified, baled and exported for reprocessing;
   - Monitor the markets for waste plastics and introduce other plastic grades to the recycling collection if reasonable economic viability can be demonstrated.

6. Reuse and recycle 50% of timber available in the waste stream through the following actions:

   - Continue and expand the communication and promotion of best practice in sustainable building design to include resource management;
   - Complete the implementation of construction and demolition waste timber sorting and resale scheme. Encourage local consumers to buy recycled where possible;
   - Include timber recycling segregation and a furniture reuse shed at proposed Recycling Centre.

7. Achieve 60% reuse and recycling of Waste Electronic and Electrical Equipment (WEEE) through the following actions:

    - Encourage, through education and communication programmes, local businesses and householders to avoid the generation of unnecessary waste of this type by upgrading and repairing if possible rather than simply buying new;
    - Provide an opportunity to extend the life of some electrical and electronic goods at the proposed Reuse and Recycling Centre;
    - Provide a separate facility for end-of-life electrical and electronic goods at the proposed Reuse and Recycling Centre to facilitate segregation for export and materials recycling;
    - Deal with the remaining electronic goods and refrigeration equipment as a specialist waste.

8. Improve textiles recycling by expanding the existing collection system for textiles as part of the proposed enhanced Island-wide bring bank system and in addition:

    - Promote the use of modern washable nappies as a waste prevention measure. Investigate the feasibility of a grant scheme as offered by many UK local authorities to provide an incentive for more parents to choose washables.

9. Monitor opportunities to reuse or recycle miscellaneous items in the municipal waste stream, such as tyres, and assess viability on a case by case basis.

4.0 Composting

The Committee will establish a modern composting facility for the recycling of green waste by 2007.

4.1 Recommendations

1. Develop a Composting Facility for green waste. The facility will be sized for anticipated volumes of waste, with room for expansion to accommodate agricultural waste, should this become necessary. It will also be capable of expansion to accommodate kitchen waste, if this is considered appropriate and if this is permitted by Health requirements. La Collette may provide a suitable location for this facility, subject to the consideration and amelioration of any health, safety, environmental and traffic implications and planning consents being granted.

2. Encourage home composting through suitable initiatives. The Committee aims to have distributed 4000 home composting kits by 2009.

3. Improve bring collection system for domestic green waste.

4. Kitchen waste should not be collected for central composting at present; this will be kept under review, and could be implemented at a future stage.

5.0 Energy from waste plant

The Committee will replace the current Bellozanne Energy from Waste plant (EfW) with a modern appropriately sized facility of a technology still to be decided, by 2009.

In parallel with exploring the options for a new Energy from Waste plant, the Committee will continue to keep under review the option of a Channel Islands waste facility, located in Jersey, in conjunction with the States of Guernsey and bring any such proposal for States approval.

5.1 Recommendations

1. Commission an Environmental Impact Assessment and a Health Impact Assessment on the preferred site which, as identified in the Island Plan, is Bellozanne. Studies will also be carried out on La Collette as an alternative site and these studies will inform the decision of the best site location and identify any additional requirements on the plant, to ensure that any negative impacts of the proposal on the environment or health of the population can be eliminated or mitigated, and any positive impacts enhanced.

2. Continue investigations with the States of Guernsey to identify cost advantages in a joint facility for EfW.

3. Seek formal tenders for a new energy recovery plant to dispose of the residual waste, after recycling and composting. This facility should be capable of disposing of the forecast residual waste throughout its anticipated life and must include sufficient standby capacity to ensure that the plant provides a safe and secure disposal route.

6.0 Disposal

The Committee will bring forward a proposal for a future secure inert waste disposal site.

6.1 Recommendations

1 The Waste Hierarchy will be strictly applied through planning policies and also through recycling and reuse opportunities to minimise waste needing disposal. This should be reinforced by fiscal measures. This will extend the life span of La Collette to beyond the currently predicted completion date of 2015.

2. Identify a new landfill site before La Collette is full. Capital investment will be required for this and a full Environmental and Health Impact Assessment will be fundamental to

identifying a new site. The date will be kept under review, and proposals will be brought forward at an appropriate time, taking account of other Strategies such as the Mineral Strategy.

3. The Committee will ensure removal of the electronic/electrical waste components from the material delivered to the Energy from Waste plant, thus reducing the amount of hazardous constituents appearing in ash. This will allow the bottom ash to be recycled as construction aggregate.

4. The Committee will ensure that fly ash and flue gas treatment residues are disposed of safely in managed landfill in accordance with best practice.

5. Clinical waste - Efforts should continue to ensure that non-clinical materials are not unnecessarily added to this waste stream and there are clear procedural guidelines for healthcare professionals and good information at the point of disposal.

6. Ensure that provision is made for a replacement clinical waste plant in sufficient time.

7. Hazardous waste – Implement the Waste Management (Jersey) Law 2005, which has been approved by the Privy Council.

8. Construct an animal by-product incinerator to UK best standards, in order to serve the Island's requirements for animal by-product disposal for the next 20 years.

7.0 Funding

Funding solutions lie with other States committees. The appropriate measures will be requested through the Proposition which will be voted on in the Chamber.

7.1 Recommendations

1. The States should request the Policy and Resources committee to propose the inclusion of a funding strategy for the capital projects, identified in the Solid Waste Strategy, within the States Business Plan 2006-2010 by, if necessary, re-prioritising or deleting existing projects, or by identifying additional sources of funding.

2. The States should request the Finance and Economics Committee to take States decisions on the Solid Waste Strategy implementation into consideration, when proposing the allocation of revenue funds in the resource allocation and budget processes 2006-2010.

1.0 Introduction

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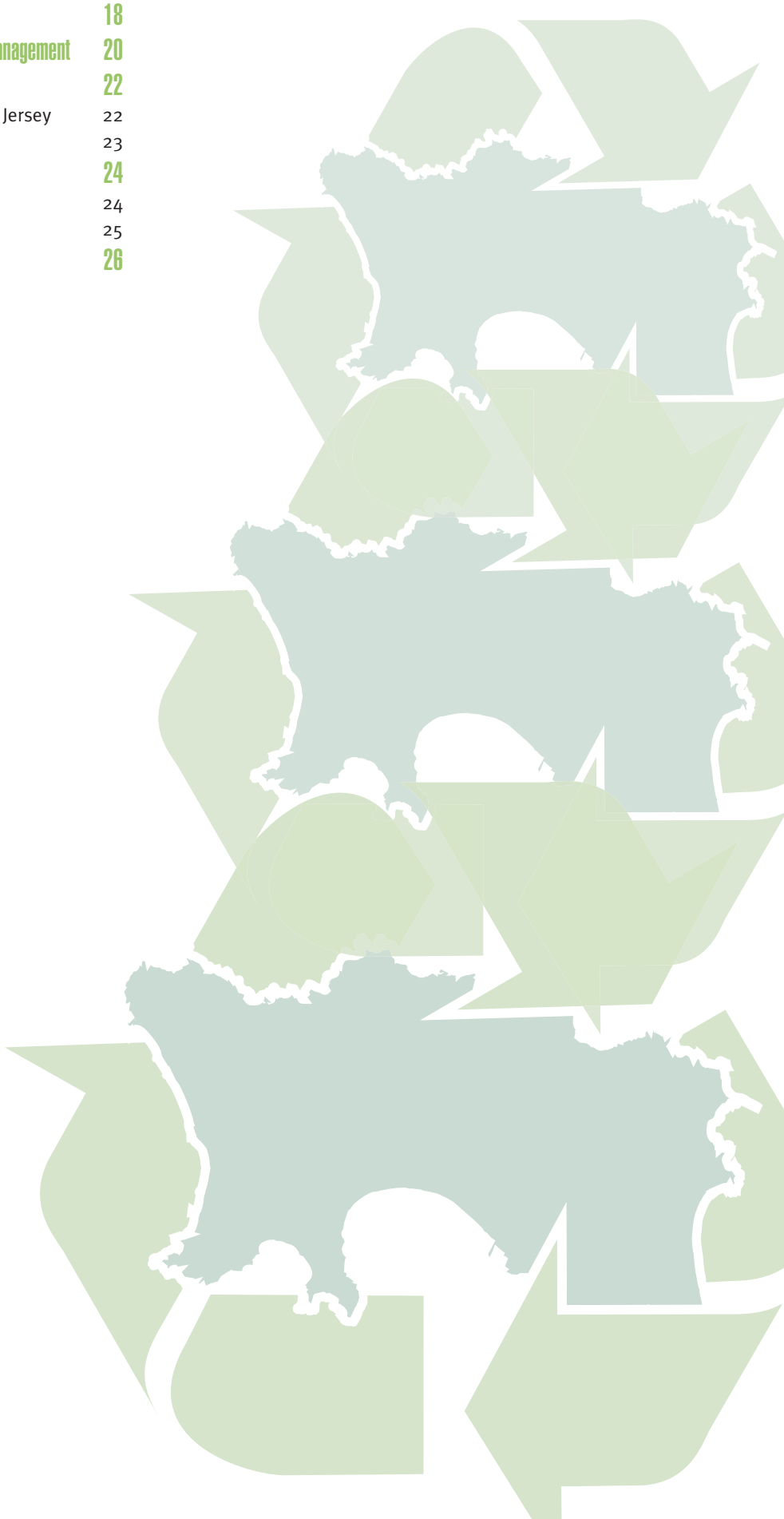


1.0 Introduction

This Solid Waste Strategy describes, at a high level and in broad terms, how the Environment and Public Services Committee (hereafter referred to as the Committee) intends to fulfil its obligations to Islanders in the management of solid waste, how it will bring solid waste management back to the standards of international best practice and manage the solid waste that is likely to be produced in the Island for the next 25 years.

Solid waste arises from households and commercial and industrial premises - for example packaging, cardboard, timber, paper and food waste – and it also includes bulky items (e.g. appliances and cars) and material from building construction and demolition. In 2004, Jersey produced approximately 330,000 tonnes of solid waste in the Island and is currently producing about 2.5% more each year. Waste is increasing principally because there are a growing number of households, the amount of packaging with goods is ever-growing and many more goods are disposable or treated as such.

This Strategy describes initiatives which the Committee will undertake to change everybody's perceptions of waste and our society's attitude to creating it. If we do not move from a 'throwaway' culture, we will ultimately submerge in the resultant rubbish. Good citizenship implies increased cooperation from Islanders to reduce the amount of waste that is created, by making informed purchasing decisions, reducing packaging, reusing wherever possible and recycling at every opportunity. The States will lead by example in culture change.

This Strategy describes how the Committee intends to:

- change Islanders' perceptions and lifestyle habits to reduce waste;
- provide the appropriate facilities to deal with the waste created;
- fulfil its environmental and legal responsibilities;
- maximise the amount of value recovered from waste, through increased recycling, composting and energy recovery;
- ensure that the remaining waste is disposed of effectively and reliably using processes that are sustainable and flexible over the 25-year period;
- propose appropriate options and recommendations that make best use of funds;
- provide a framework which is proactive and aims for continual improvement by allowing flexibility and opportunities for expansion and development;

- provide the basis for a robust and comprehensive plan for waste management.

To produce this document the Committee has called upon the experience and knowledge of its environmental and engineering staff, the expertise of consultants, research into the waste management industry, and feedback from consultation with the public, relevant organisations and the Shadow Scrutiny Panel (see Appendix A).

Waste management is a complex subject. This strategy document starts by providing some background and context for waste management in Jersey and this Strategy in particular. It goes on to describe industry best practice, and how this will be re-established in the Island.

The main part of the document looks at the specific issues regarding the management of Jersey's solid waste, starting with collection and leading on to the specific approaches for the different types of waste, exploring options and proposing measures. The following sections outline the options for energy recovery and disposal and the possible locations for facilities. Finally, there is a financial appraisal and a programme for action.

1.1 The Island context: Jersey's waste - Jersey's responsibility

Jersey is responsible for dealing with its own waste. However, our options are more limited than those of a larger country, and are governed by:

- what is environmental best practice;
- what is available in the Island;
- what is affordable and realistic;
- what is reliable.

There are some critical factors to recognise when considering the challenges ahead:

- the potential health and environmental impacts of waste handling and disposal are very important and a major consideration in selecting new facilities;
- Jersey has no landfill capacity for non-inert waste and in any case best practice is not to dispose of this waste to landfill;
- Jersey has limited landfill facilities for inert waste - the current site is likely to be full in around 2015;
- the Basel Convention, to which the Island will be bound, provides, in general terms, that jurisdictions should deal with their own waste within their own boundaries, unless it is not possible for them to do so;

- Jersey has limited land and workforce resources, which imposes some limitations on potential waste disposal options;
- reliability of disposal is extremely important, as breakdown or capacity overload will result in unacceptable and potentially hazardous backlogs of rubbish;
- the existing Energy from Waste plant at Bellozanne will be almost 30 years old by 2009 and to operate beyond then would require major modification. Its emissions of pollutants are many times greater than from a modern plant. The plant does not conform to accepted or planned European limits.

1.2 A strategy in support of States Policies

THE POLICIES

Although Jersey has particular constraints that limit the options for waste management, the States has made strong commitments to dealing with waste in the most environmentally responsible manner. The States of Jersey's Strategic Plan 2005-2010 provides the blueprint for Jersey's future and was adopted by the States in 2004. Strategic Aim Four is **'to protect the natural and built environment'** and under this aim is the initiative **'to introduce a comprehensive liquid and solid waste policy'**. Success indicators include:

- the successful commissioning of new waste disposal plant;
- a measurable decrease in waste per household.

The States endorsed an Environmental Charter in 1996, which highlighted key environmental objectives and gave a clear mission statement:

'The States will promote the conservation and sustainable use of resources, and will minimise environmental pollution in all its own activities. It will seek, through its influence, the achievement of the same objectives by other sectors of the community. The States will review all of its policies, programmes and services, and undertakes to act wherever necessary to meet globally accepted environmental standards.'

In 2003, the States approved the Jersey Island Plan 2002, which has evolved from the first Island Plan of 1987. As stated in the Island Plan 2002, the Vision for Jersey is for an Island: **'which has a visually pleasing environment, protected from undue danger and pollution, and where the wildlife, landscape and physical resources are sustained – not compromised'**. One of the objectives of the new Island Plan states that there is a need to:

'minimise the impact of Island activities on the local and global environment, including the minimisation of production of waste, greenhouse gases and pollutants.'

The current Plan sets out a number of policies relevant to this Strategy, with the overall aim of controlling waste arisings as a result of development:

'In order to conserve natural resources, it is important that waste minimisation and the recycling and reuse of resources are encouraged. Proposals for new developments should, where appropriate, include the details of the means of waste collection and proposals for waste minimisation and recycling'.

THE IMPLICATIONS

It is incumbent upon this Solid Waste Strategy to ensure that internationally accepted environmental standards are met. Currently this is not the case. The existing plant is at the end of its design life and is polluting to a level that is unacceptable locally and internationally. The plant has very limited flue gas cleaning and does not comply with current EU emission regulations; even more stringent emission legislation will be enforced throughout Europe by the end of 2005. The Committee is strongly committed to complying with the newest European standards and international agreements as soon as possible.

The effective, efficient and economic management of the Island's waste processes is an important part of ensuring an appropriate quality of life. An underlying expectation (and a measure of performance) is that the Committee will ensure that the health of the public is not put at unacceptable risk through a deficiency or shortfall. At the same time, there is a further expectation that the community's environment and its amenities will not be compromised by pollution or any other form of avoidable harm.

The Committee has considered the policy framework for all aspects of the management and disposal of the Island's solid waste for the next 25 years, and has produced this Solid Waste Strategy, which covers the whole area of the management, treatment and disposal of Solid Waste from all sources. This Strategy identifies further actions that will improve waste minimisation and recycling, building on current policies and initiatives.

This Strategy refers to the Waste Management Hierarchy. This internationally agreed approach to waste management is explained fully later on in Section 2.1, but in brief it provides a framework for dealing with the waste streams and sets out the ideal model for managing waste in an order of merit from the top priority of avoiding waste production to the least desirable option of disposal.

1.3 International obligations for successful waste management

The Environmental Charter of 1996 outlines Jersey's commitment to meet internationally accepted environmental standards and this Strategy provides a solution that follows the best European waste management practices and complies with key European legislation.

Legislation provides significant drivers for waste management in other jurisdictions, sets benchmarks and influences us in the Island. This is summarised here, and discussed in greater detail in Appendix B.

EU Packaging Directive – This requires EU Member States to minimise the amount of packaging produced as well as to recover and recycle an increasing proportion of packaging waste.

EU Landfill Directive – This requires that the amount of non-inert waste that goes to landfill is progressively and significantly reduced. It is a key legislative driver in European waste management strategy.

EU Directives on specific products – Many Directives seek to minimise environmental impact at source and make manufacturers more responsible for the wastes they produce. Examples include the Waste Electrical and Electronic Equipment Directive (WEEE) and the End of Life Vehicles Directive[i]. Under such directives, manufacturers will have to include a percentage of recycled material when producing new equipment and the goods must be easy to dismantle, with different components identified for recycling. Therefore, there should be a reduction of residual hazardous components in the municipal waste stream, as well as a market for the components themselves.

EU Waste Incineration Directive - This has a significant impact on European Waste Management practice by significantly reducing emission limits for all waste thermal recovery plants. This requires greater flue gas cleaning and better monitoring. The provisions of this Directive will be extended to all existing plants from 28th December 2005 and will cover most incineration processes, including those for municipal and clinical waste.

EU Integrated Pollution Prevention and Control Directive – This is intended to strengthen pollution prevention throughout Europe. In the UK, this has been implemented by the PPC Regulations[ii] which introduced PPC permits across industry in tranches, with the intention that all significant facilities will be regulated by 2008. Any potential releases to air, land or water must be considered. The PPC permit imposes allowable levels of releases and a monitoring system, to ensure that any potential releases are measured. The main impact of this is to impose stricter control and regulation for main waste disposal facilities, such as energy recovery plants, composting facilities, landfill and sewage works.

UK Animal By-products Regulations 2003, proposed EU Bio-waste Directive, Composting Standards - These set requirements for the treatment of material by composting and set standards for the quality of compost, depending on its end use.

UK Waste Strategy 2000 – The UK published this strategy with the aim of setting targets for recycling and composting, among others, in order to comply with the Landfill Directive. These targets provide benchmark levels to which Jersey can strive.

Aim Seven of the States Strategic Plan 2005-2010 is **'to Develop Jersey's International Personality'** and, in the spirit of international recognition and co-operation, the States pledges to **'demonstrate responsible and cooperative behaviour with regard to global issues'**. This implies active compliance with the international Multi-lateral Environmental Agreements to which Jersey is a signatory, essential to maintain Jersey's reputation and credibility:

United Nations Geneva Convention on long range transboundary air pollution (1979) - Article 2 of the Convention is: **'to protect man and his environment against air pollution and endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range trans-boundary air pollution'**. The Convention lays down general principles of international co-operation for air pollution abatement and a framework linking science and policy (see also Appendix B).

The Convention has been extended by eight protocols, which identify specific obligations and measures to be taken by the Parties and two of these have been extended to Jersey. The Sofia Protocol (1988) and the Geneva Protocol (1991) concern the control of nitrogen oxides and volatile organic compounds respectively.

Jersey has declared an in-principle decision to work towards extension of the ratification of two more protocols – the 1999 Gothenburg Protocol and the 1998 Aarhus Protocol. The first sets emission ceilings for 2010 for four pollutants: sulphur, oxides of nitrogen, volatile organic compounds and ammonia while the second targets three particularly harmful metals: cadmium, lead and mercury. Given the current emission levels from the Bellozanne incinerator, Jersey is unable to comply with these protocols.

The Basel Convention – This Convention requires signatories to handle and dispose of their waste in an 'environmentally sound manner'. In general terms this provides that jurisdictions should deal with their own wastes within their own boundaries, unless it is **'not possible for them to do so'**. It seems unlikely that Jersey could argue that this exemption applies, as Jersey has successfully dealt with the bulk of its waste for decades. However,

the Waste Management (Jersey) Law 2005 has just received approval from the Privy Council, and will allow the Convention to be extended to the Island. In turn, this will permit the export of certain forms of hazardous waste that Jersey does not have the capacity to deal with. In the meantime, this waste is stored safely at Bellozanne. The export of materials for recycling is not covered by the Convention.

If Jersey did wish to export its residual municipal waste for disposal (whether by energy recovery or landfill), the Island would need to make a case for exemption from the Convention, to be judged by the recipient country. The Island has been advised that the UK is unlikely to grant such a request (except in an emergency), because the UK Management Plan for the Imports and Exports of Waste contains a legally binding presumption against the import of waste into the UK for disposal. A request made to another potential recipient country that is a signatory to the Convention would be assessed by that country.

Movements of waste between Jersey and Guernsey would not be covered by the Basel Convention and a joint solution for waste management between the Islands could be developed.

Taken together, these commitments underline that as an Island Jersey should not export its waste, nor landfill non-inert waste, but should continue to recover what energy it can from the residual waste (after recyclables have been taken out), but with efficient flue gas cleaning. Improved control over the risk of potential hazardous releases from final disposal sites is required.

1.4 The past - Chronology of events

1.4.1 History of Solid Waste Management in Jersey

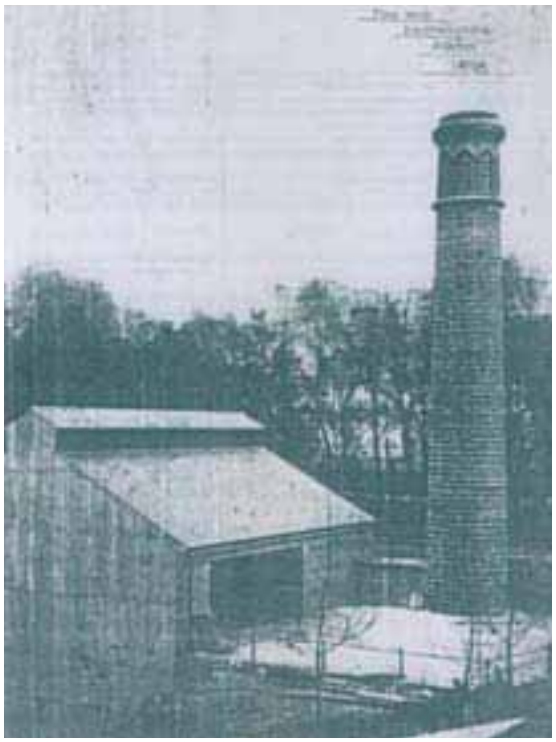
Until the mid 1950s solid waste in Jersey was deposited in tips – usually in disused quarries or worked-out sandpits. The 12 parish authorities were responsible for the collection and disposal of waste arising within each parish.

The Parish of St Helier, dealing with the most rubbish, had operated a simple static cell incinerator without gas cleaning or effluent controls since 1898. Other Parishes operated tips, some of which ignited spontaneously from time to time. These methods jeopardised groundwater supplies and generally resulted in pollution unacceptable to a community increasingly dependent upon tourism as a source of income.

At the same time as the decision was taken to treat the Island's sewage centrally, a number of parishes in addition to St Helier were experiencing problems with disposing of their waste. The Bellozanne site offered a solution in addition to the remaining landfill sites that were still in operation. It was proposed to pulverise the organic fraction of the solid waste, mix it with the sludge by-product of the sewage treatment process, ferment the

mixture to eliminate pathogens and weed seeds and apply the resulting compost to Jersey's intensively cultivated soil.

A pilot plant was built at Bellozanne and a full scale plant was commissioned by the side of the sewage treatment works at Bellozanne in 1958. The non-compostible residues from this plant were incinerated in a modified simple static cell incinerator, thus significantly reducing the volume of waste.



Significant changes in social and commercial ways of life occurred over the next few years. Agriculture, once the major source of income for the Island, was superseded by tourism and by banking activities. A rising standard of living brought about changes in the nature of refuse delivered to Bellozanne – the material becoming dramatically less dense with significant increases in plastic and non-biodegradable fractions.

The decline in the demand for the compost, laced as it was with fragmented plastics, coupled with a substantial increase in the general loading on the plant, brought about a review of disposal methods and general policy in 1973. Various alternative methods were investigated. In 1976, the States accepted the recommendation that solid waste disposal should be by incineration and that the by-product heat should be used for the production of electricity – an idea that was best practice at the time.

The two-stream incinerator was commissioned in 1979, based on handling 50,000 tonnes of refuse a year. It was designed with provision to add another stream and, due to rising demand, the third stream was commissioned in 1992. Currently, the plant is dealing with about 80,000 tonnes of waste per annum and is requiring increasing maintenance as it gets older. The backlog of material that occurs when the plant is not fully operational is both costly and problematic to handle.

1.4.2 How the Strategy evolved

REVIEW OF PREVIOUS REPORTS AND STRATEGIES

The Committee authorised the Public Services Department (PSD) to commission a report analysing the potential waste strategies for the Island. This report, undertaken for PSD by Carl Bro Group in April 2000 and entitled the Solid Waste Management Strategy Review, was reviewed by Babtie Fichtner in 2001[iii].

WASTE STRATEGY STEERING GROUP

To develop a visionary and sustainable Strategy that is realistic, achievable, and affordable, in 2003 the Committee formed a Waste Strategy Steering Group (WSSG), chaired by the President of the Committee, and comprised of representatives of the Committee, the Finance and Economics Committee and the Health and Social Services Committee, with officers from their respective

1.5 The present - Why action must be taken now

departments and the Committee's Waste Management Consultants (Babtie Fichtner).

DRAFT SOLID WASTE STRATEGY

This consultation document was published in September 2004 and intended to outline the main recommendations of the Solid Waste Strategy and how they could be achieved. It provided a summary of the work carried out to investigate waste management strategies for Jersey, and to provide the background to the recommendations for Jersey's Solid Waste Strategy. The data from the older reports was updated to reflect changes in waste flows and practices since these reports were written.

FEEDBACK

After the publication of the consultation document, public presentations were given, allowing the public an opportunity to find out more about the draft proposals and allowing them the opportunity to feed back to the Committee any issues they might have. The Waste Management Shadow Scrutiny Panel has also reviewed the draft Strategy and has produced an interim and a final report with its findings; the Committee will respond to these in detail in a separate report.

REVIEW OF FEEDBACK AND REDRAFT OF STRATEGY

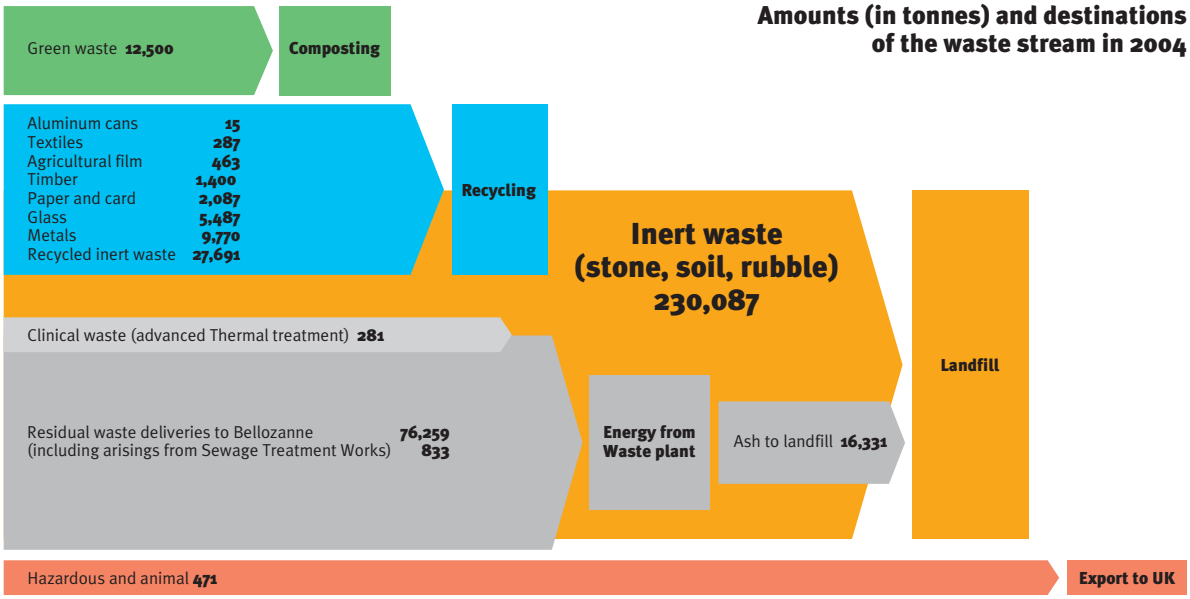
This Strategy has taken account of the feedback received and is the stronger for it. Using the draft Strategy as the basis, the review team has worked to update the document and incorporate and develop those areas that were of interest or concern. Appendix C shows the process pictorially.

1.5.1 Current waste management practices

AMOUNTS AND DESTINATIONS OF TOTAL SOLID WASTE

Of the 330,000 tonnes per year of solid waste, about 230,000 tonnes is inert waste produced from the construction and

Figure 1 **Amounts (in tonnes) and destinations of the waste stream in 2004**



demolition industry, most of which is landfilled at La Collette. The remaining waste of about 100,000 tonnes comes from household, commercial and industrial premises. In this document, the biodegradable and combustible waste has been termed 'non-inert' waste (Figure 1). The approximate sources of Jersey's non-inert waste are roughly equal (Figure 2). 'Municipal solid waste' (MSW) is a term often used to describe the waste collected from households, street cleaning and commercial premises served by the public waste collection service, and in Jersey's case equates to roughly two-thirds of the non-inert waste.

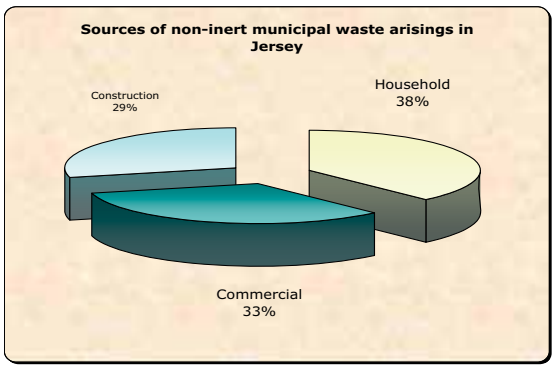


Figure 2

Composting is an important form of recycling and is a fast-growing practice in the management of municipal wastes across Europe. Jersey has a successful record in composting, currently recycling 12-13,000 tonnes of green waste each year, approximately 12% of the total non-inert waste arising and which compares well with European countries. This has achieved two main objectives: it has provided sustainability, by returning organic matter to the soil, and has also reduced the quantity of biodegradable waste that has to be disposed of by incineration.

The present disposal route for non-inert waste from households and commercial premises is the Bellozanne Incineration and Energy from Waste (EfW) Plant. In addition to disposing of around 80,000 tonnes of waste per annum, this facility recovers energy in the form of electricity, worth £898,500 in 2004.

1.5.2 Trends in solid waste arisings

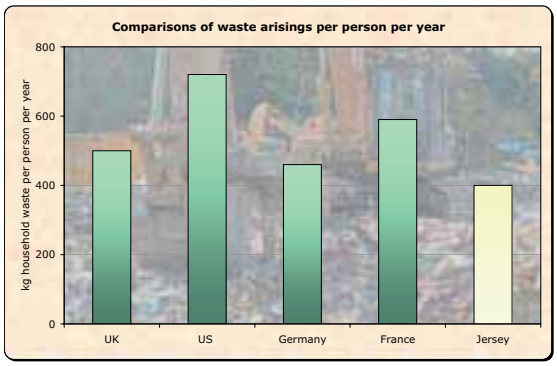


Figure 3

Non-inert waste arisings have risen on average by 2.5% per year from 1998 to 2004, similar to the rise in UK waste arisings and those of the wider EU. Jersey compares reasonably with other countries in terms of MSW arisings (Figure 3), although methods of calculating MSW arisings per person are often different, which can cause large discrepancies when comparing countries. Despite aggressive minimisation measures, the European trend in waste arisings is still increasing, even though many of these countries are significantly advanced in waste regulation practices.

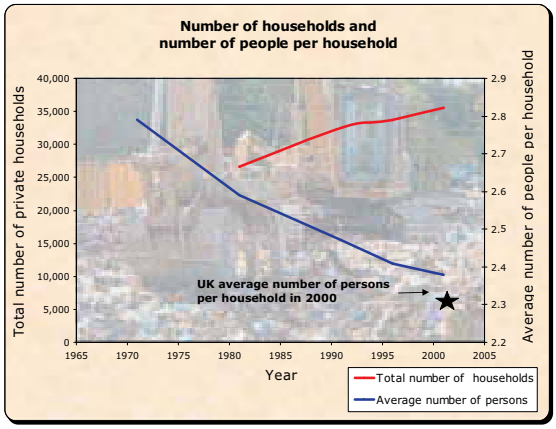


Figure 4

While the reasons for the growth in waste arisings are complex, it is normally accepted that the increase in MSW arisings follows the increase in the number of households as society lives in smaller family groups. The census information shows that the total number of households had risen to roughly 35,500 in 2001, while the number of people per household had fallen over the period of the graph (Figure 4). It should be noted that a reduction of the average household size in Jersey from that of 2001 to the current level of Great Britain (2.30) would require some 1,200 additional dwelling units to accommodate the resident population alone.

In the short term, the Committee's objective is to reduce the current rate of increase in waste arisings of about 2.5% per annum, with the longer-term objective of stabilising and then

1.6 The future

reducing the amount of waste. It is assumed that the number of households in Jersey will rise at about 1.7% per year until 2006 and from then, at about 1.2% per year until 2011 in line with projections in the Jersey Island Plan (2002). Beyond 2011, the annual increase in the number of households is assumed to be 1%. In addition to the rise in the number of households, the combination of an increase in packaging (for reasons of health and convenience), more ready-prepared meals and higher disposable incomes leads to predictions of a 2-3% increase per annum in household waste arisings for the foreseeable future. European experience in achieving waste minimisation is generally poor, but a combination of public awareness campaigns and fiscal measures is seen as the best way forward to stem waste growth. There are a number of case studies on European waste minimisation practice[iv] and relevant cases are summarised in Appendix D. It can be seen from these examples that, even when European countries have undertaken a number of initiatives to reduce waste, the main impact of these has been not to reduce the total amount of waste, but to increase recycling and composting.

This Strategy incorporates current best practice, but recognises that the management of waste is a developing area, which is receiving increased public scrutiny and which is subject to steadily evolving legislation. The Strategy has a degree of flexibility to enable a response to be made to changes in emphasis or technology. Through regular review, the Strategy can be developed to accommodate future technological advances.

A particular area in which developments are expected is recycling. It is apparent, particularly in Europe, that the drive towards better environmental solutions is accelerating. This should result in greater promotion of recycling initiatives and stimulation of markets for recyclables; this will probably result in the recycling of additional components of the waste stream becoming feasible. This could have a knock-on effect in providing better opportunities for Jersey to which the Island must be ready to respond. However, there is also a risk that, as global recycling rates improve, markets for the recycled materials become saturated, reducing the value of the material.

Available technology will also change, and, whereas some technologies are not sufficiently developed to be commercially proven and reliable now, the Island should be prepared to take advantage of them when they become robust enough. To enable this, the Committee will maintain a regular review of developments in this area.

The ‘polluter pays’ principle, while widely accepted, is an issue that many countries have yet to develop into a comprehensive approach achieving its full objectives. For example, Switzerland collects only ‘approved’ bags that are sold to householders; Ireland sells a tag to be fixed to each bin and also charges for each

emptying. Such penalties can be supplemented by incentives for specific elements of the waste stream, such as grants for the purchase of washable nappies or support for home composting kits. Whilst the polluter pays principle is supported, the opportunity to implement fiscal mechanisms will be developed to meet environmental objectives. The Committee will be monitoring other jurisdictions' experiences in this area to help develop its approach.

2.0 International perspective

2.1 The waste management hierarchy 30
2.2 Best practicable environmental option 31
2.3 The approach of other islands 32

2.0 International perspective

European countries have adopted different approaches to waste management, leading to widespread differences in methods of disposal. Figure 5 compares data from several European countries[v]. In order to develop this Strategy, international best practice has been reviewed.

2.1 The waste management hierarchy

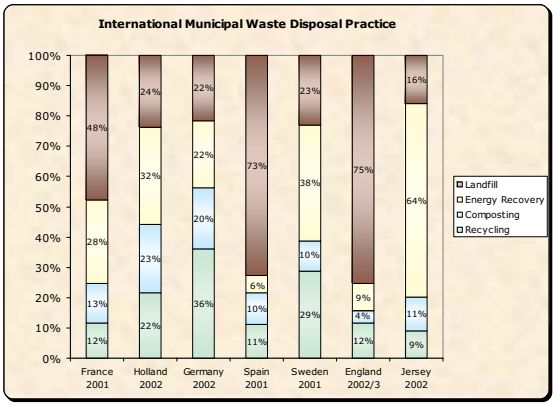


Figure 5

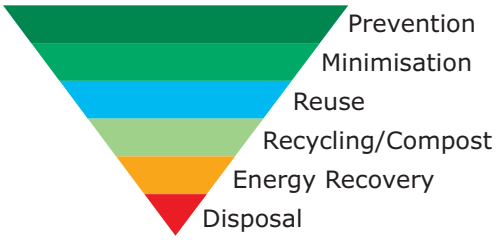


Figure 6 Internationally agreed Waste Hierarchy

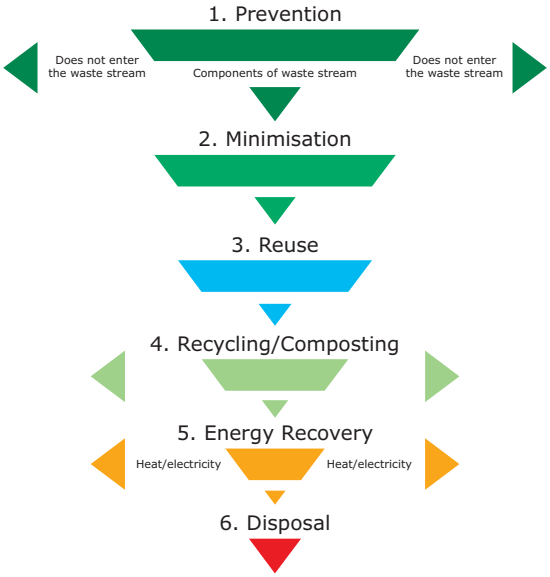


Figure 7 The Waste Hierarchy depicted as a set of sieves with the amount of waste reducing at each level

Waste management practice is based upon the Waste Hierarchy (Figure 6) which shows the preferred option of prevention at the top, working downwards to the least preferred option of disposal, i.e. landfill. It may be helpful to think of the Waste Management Hierarchy as a set of sieves whose aim is to remove as much waste as possible at each level in order to minimise the final quantity that must be disposed of (Figure 7) . These sieves are as follows:

1. Prevention: The prevention of waste is seen as being most beneficial, as this avoids the use of natural resources to make the waste, as well as the need to dispose of the waste. Based on the experiences of other jurisdictions, the first target must be to slow the rate of growth of waste. Actually reducing the quantity of waste must be seen as a longer-term objective. The local community generally supports the principles of waste avoidance and recycling, but schemes will only achieve high success rates if they involve minimal inconvenience for users, are well promoted, and financial incentives exist to encourage participation.

2. Minimisation: When waste production is unavoidable, it is considered best to reduce the amount of waste created, limiting the use of natural resources and waste to be disposed of. A major aim of the Solid Waste Strategy is to minimise waste generation. Whilst this is one of the most desirable solutions, it is also difficult to achieve in the short term. Experiences elsewhere show that, despite considerable efforts being made, the level of success is limited. Successful schemes in some European countries have targeted nappies, plastic bags and food packaging. New EU legislation is being introduced which may begin to change current practices, and the Island should benefit from this. Over the period from 1995 to 2000, MSW arisings grew in the EU15 countries, at an average rate of 2.5% per annum (Figure 8)[vi].

Generally, the approach taken is to use a mixture of increasing public awareness and fiscal measures to alter household or commercial practices and reduce waste. Any fiscal measures must be carefully considered to harmonise with other Island strategies. A much publicised initiative in the Republic of Ireland is a plastic bag tax, which was introduced in March 2002. A tax of 15 euro cents was imposed on each bag, which was reported after six months to have led to a reduction of 90% of the 1.2 billion plastic bags used in the Republic of Ireland.

3. Reuse: Where waste is produced, methods to reuse the waste products without further treatment are seen as attractive, as these avoid the use of resources for re-processing. Examples of

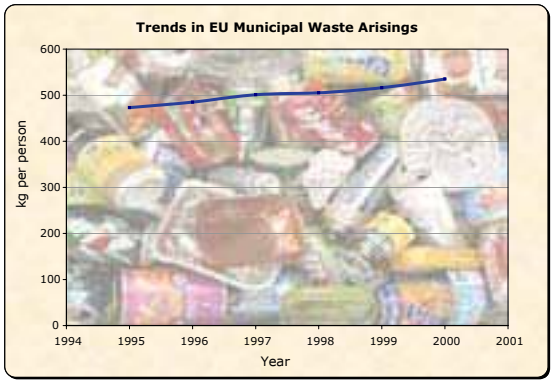


Figure 8

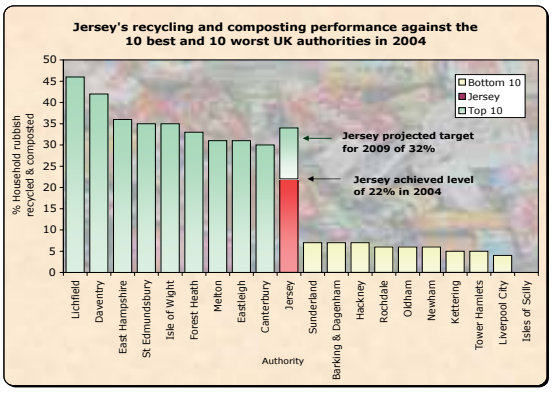


Figure 9

2.2 Best practicable environmental option

reuse are using plastic bags more than once or sending textiles and furniture to charity shops.

4. Recycling/Composting: Where possible, subject to Best Practicable Environmental Option analysis (see Section 2.2), waste should be recycled into similar or alternative products. Biodegradable waste can be composted. Although there is room for considerable expansion, the Island already has recycling options for paper, metals, timber, textiles and agricultural film (although frequently the actual recycling process occurs off-Island). Any recycling initiatives must take account of both environmental and cost factors involved in these routes.

The present level of recycling in Jersey compares reasonably with general levels in the UK, although some local authorities have had considerably more success than us (Figure 9). However, Jersey's performance is considerably lower than in some European countries, where recycling is more established (although there is some variation in what is counted as recycling). Excluding composting, approximately 10% of the combustible waste stream is recycled, but a major aim of this Strategy is to ensure increased recycling of waste office paper, newspapers and magazines, cans, glass, clothing and higher value plastics such as drinks bottles.

5. Energy Recovery: For the waste remaining after the previous activities, value can be recovered from the waste, by converting it into useful energy, such as electricity or heat. In this manner, waste displaces the consumption of fossil fuel energy sources.

6. Disposal: Where no other waste treatment method is considered possible, simple disposal of the waste is necessary. In practice this generally means the tipping of waste into landfills.

The decision-making procedure known as Best Practicable Environmental Option (BPEO) is commonly used in the UK and elsewhere to determine the strategy for managing waste streams.

While recycling is generally perceived to be beneficial in both environmental and health terms, this is not always the case. Long transport distances to the recyclers and poor recycling efficiency may outweigh the benefits of recycling. The common use of 'hand-pickers' in many Material Recycling Facilities to separate waste manually is also an area for health concerns. Each solution must be considered individually, and a local health and environmental impact assessment carried out to determine whether such practices are suitable. The decision on whether to recycle materials or not depends on a number of factors, including the availability of raw materials, energy consumption in collection and processing and any environmental implications. It can be counter-productive to recycle if doing so has a greater impact upon the environment than disposing of the waste in other ways. Furthermore, a recycling scheme that is cost-effective in the UK might be too expensive in Jersey, when shipping costs are

included. The local market for recycled goods is another important consideration – for certain materials the economics of recycling become marginal and other waste management options further down the Waste Hierarchy may be more appropriate.

The **proximity principle** implies that waste should generally be managed as near as possible to its place of production, mainly because transporting waste has a significant environmental impact. The proximity principle can make the link between the Waste Hierarchy and BPEO. Where the BPEO for a particular waste stream is an option towards the lower end of the hierarchy, such as energy recovery or landfill, this can often be because the environmental impact or cost of transport to a distant reprocessing facility outweighs the benefit of recovering value from the waste.

The proximity principle encourages the producers of waste to take responsibility for the waste produced. This is because the waste should preferably be dealt with 'on the doorstep', as opposed to exporting the problem somewhere else. While exporting the Island's residual waste may appear to be the easy way out, this is environmentally irresponsible and weakens incentives to reduce waste, by transferring the problem to someone else.

Sustainability is a critical underpinning principle for the Island, and it is vital that the waste management systems adopted provide a secure and long-term solution to ensure that where recyclables, compost or residues are produced, there is an environmentally acceptable and economic method of disposal. However, as a responsible community, the Committee believes that the Island is morally bound to deal with its own waste whenever it is possible – an approach that has been followed for many years.

Getting the involvement of the public is vital to success. Together we must accept ownership of the problems, issues, strategies and solutions that are put forward, in order to achieve success. Public consultation and feedback, public participation, support and co-operation are essential. Education of the public to appreciate the benefits to be gained from waste minimisation and recycling will be extended. This will produce some immediate gains, but the real success will come from achieving a lasting change of attitude to these issues. It is accepted that this will not happen overnight, and will require a continuing campaign.

2.3 The approach of other islands

It is also relevant for us to note how other European island communities deal with their non-inert solid waste (Figure 10). The high arisings in the Shetlands are due to importation of waste from other islands, such as the Orkneys. It should also be noted that large differences in waste arisings per capita can be due to the method of collecting waste statistics (Jersey's figures include most commercial waste) and the impact of visitors swelling waste arisings.

The majority of islands use landfill as the main method for disposal of waste. Islands such as Crete, Sicily and the Greek Islands use landfill almost solely as their waste disposal route. Other islands have adopted more sustainable approaches. For example, Mallorca, the Isle of Wight, Gotland and the Shetlands have integrated waste management strategies, incorporating recycling, composting and energy recovery from incineration, with limited landfill[vii]. As an example, Mallorca achieves about 15% recycling, 3% composting and 57% energy recovery, with the remainder landfilled. The Isle of Man has recently installed a new Energy from Waste plant.

Guernsey currently disposes of its waste by landfill, but had been proposing to build an Energy from Waste plant in the Island. The report of their Panel of Inquiry has suggested that Guernsey should not proceed with the present plans for an Energy from Waste plant. Instead, much more should be done to encourage the reduction, reuse and recycling of waste, in order to alleviate (but not solve) the disposal problem. The Panel highlights that a joint solution with Jersey for an Energy from Waste facility is possible. It also refers to alternative technologies, but notes that none is yet proven for Guernsey's waste. The recommendation is to maintain a minimum of five years' landfill locally and to take immediate steps to ensure that the Island is able to export waste, as a short-term measure, should the landfill become full.

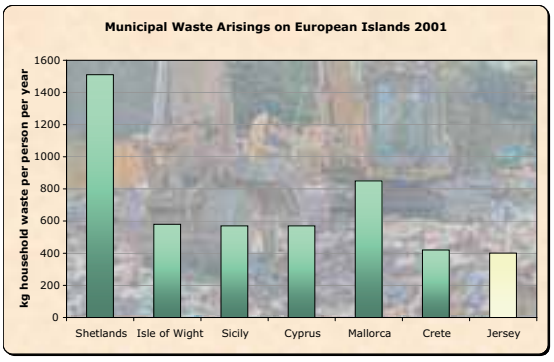


Figure 10

Ongoing discussions with the Guernsey Authorities are exploring the options of a joint solution. While a combined plant would be more economical, because of economies of scale, it is not yet clear that the savings would be sufficient to cover the additional costs of transporting the waste.

3.0 The collection system

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3.2 Recycling Bring System 36
3.3 Kerbside Collection 37
3.4 Reuse and Recycling Centre 37
3.5 Recommendations 38

3.0 The collection system

The detail of the report begins with the collection system, since this underpins the success of other initiatives that are detailed further on. In this context, collection means the entire process of bringing waste materials from the user to a central point for treatment, and includes bring banks (containers for the public to deposit materials – usually recyclable).

3.1 Household Collection

Jersey's 12 parish authorities are responsible for operating their own collection services for municipal waste. This service has provided the parishes with a robust, reliable and efficient collection from households and businesses for many years. The service is made up of a weekly household collection and a weekly or monthly glass collection (with the exception of St Helier, which recently reverted to a network of bring banks for glass).

3.2 Recycling Bring System

To maximise the value of recyclable materials, it is necessary to segregate them at source. The simplest and most cost effective way of achieving this is through collection points at which the public can deposit their materials.

Jersey's current bring systems deal with the following products:

- aluminium drinks cans (private company) – exported to the UK;
- clothes and shoes (Salvation Army) – exported to the UK;
- newspapers and magazines (pilot study on five sites) – exported to the UK;
- green waste at La Collette;
- glass in St Helier and on marina sites;
- bulky household waste (not recycled), batteries, gas bottles, and miscellaneous waste at Bellozanne;
- bulky metals at the scrap yard – exported to Spain;
- packaging timber – majority exported to the UK.

As the existing collection banks are operated by a number of organisations, there are a large number of different sites, very few of which offer facilities for more than one material. This is inconvenient for users, requiring travel to different sites to deposit materials. Despite this, the existing system enjoys good support, which suggests that a more developed bring system would achieve better capture rates.

Finding suitable sites for an extended bring system for recyclables will always be a challenge in an Island where land is a valuable resource. The logical location for these facilities is well frequented sites, such as car parks, which would allow users to bring their

materials for recycling while on another journey, such as for shopping. However, the businesses operating on these sites seek to provide ease of parking for their customers and relinquishing space for other facilities will be a difficult decision.

To help solve this in the future, the Environment and Public Services Committee will, where appropriate and in accordance with the policies set out in the Jersey Island Plan 2002, require proposals for new developments to include the provision of suitable waste collection infrastructure. This will be especially important where major new building projects, such as supermarkets, are proposed.

The Committee intends to monitor the success of the bring bank system in achieving the targets set for recycling of materials. In addition, the quantities of residual waste delivered to Bellozanne by the parishes and commercial enterprises will be monitored, and the Committee will publish this information on a regular basis. If the recycling targets are not being achieved, and the Committee considers that particular groups or bodies are not participating in working towards these targets, then the Committee will actively seek ways of making further improvements to the collection systems, working in conjunction with the parishes and commerce.

3.3 Kerbside Collection

It is generally accepted that convenience is the key to public participation in recycling schemes. Collection direct from the household, the kerbside system, requires little effort on the part of the householder. Every property in the Island is served by a kerbside collection for residual waste and most, outside St Helier, are also served by a kerbside collection for glass.

In the UK, kerbside collections for dry recyclables are becoming commonplace. Most require the householder to put their dry recyclables, such as paper, plastics, glass and cans into a separate container. These are either sorted directly into the collection vehicle, ‘kerbside sort’, or collected ‘co-mingled’, and sorted at a materials recycling facility.

To achieve the levels of recycling proposed for the strategy period, it is anticipated that a kerbside system for selected recyclables will be required. It should be noted that the costs of this type of collection are generally relatively high, especially where complex specialist multi-compartment vehicles are used. However, a simple but effective bespoke collection system, initially targeting newspaper and magazines, food and drink cans and high grade plastic, needs to be developed.

3.4 Reuse And Recycling Centre

A new Reuse and Recycling Facility needs to be developed, to allow additional recycling materials to be accepted and segregated. A beneficial additional feature would be a reuse shed, which would allow the public to deposit goods, which, while still serviceable, are not wanted. The centre would also provide an

obvious location for receiving materials from the other recycling collections, to allow bulking and baling before transhipment.

3.5 Recommendations

By 2006, expand the existing bring bank system to a wider geographical coverage, and include multiple materials collection on each site, coordinating between different operators as necessary.

Work with administrators of sites frequently used by the public, such as community centres and supermarkets, to install extra collection points for materials to augment the network described above.

Monitor the success of the recycling initiatives and the deliveries of residual waste to Bellozanne.

Where appropriate, apply Planning controls to ensure that suitable infrastructure for the collection of waste, including recyclables, forms part of proposals for new development projects.

By 2007, have completed a pilot kerbside recyclables collection, based on the existing glass collection. This will be developed by a partnership between the Parishes and the Committee. Depending on the results, this approach will be developed and tailored, ensuring that the most efficient integrated service is implemented between the collection and processing of recyclables to achieve recycling targets by 2009.

Establish a new Reuse and Recycling Centre.

4.0 Waste materials

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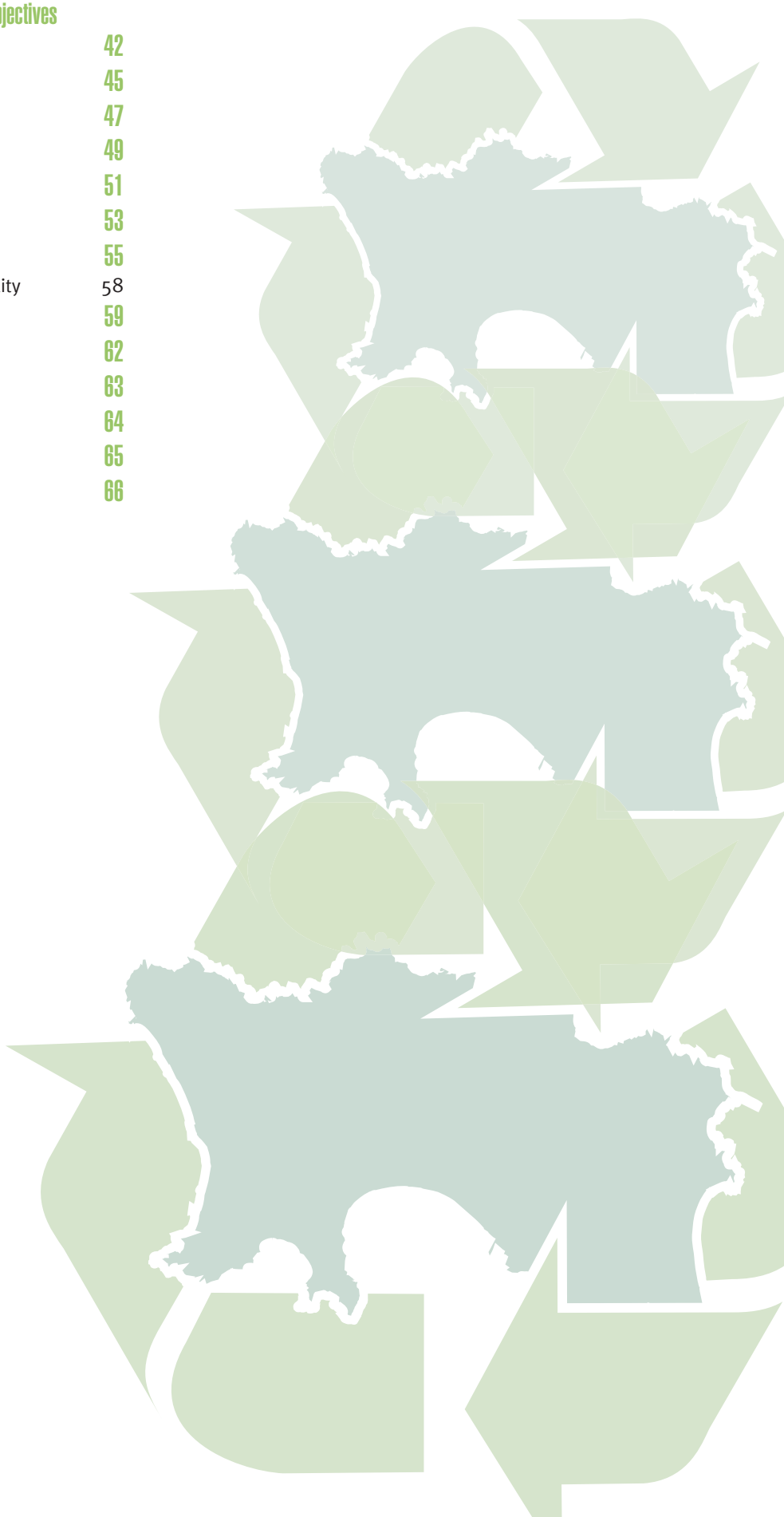

4.0 Waste materials

The Strategy now addresses the critical issue of how to deal with the waste arisings, in the light of best practice and the Island's international and local obligations. The current and projected trends in the components of the waste stream are detailed individually, after the current position is outlined.

4.1 Current position

It is necessary to assess the composition of the waste stream to explore the options for waste management. The total non-inert waste dealt with in 2004 was:

Breakdown of Non-inert Waste 2004[viii]	
Source	**tonnes**
Parish deliveries to Bellozanne	44,406
Miscellaneous deliveries to Bellozanne (mostly commercial premises, delivered independently)	10,141
Grit and rags from sewage treatment plant	451
Dried sewage sludge	382
Bulky waste received at Bellozanne	22,124
Metal from bulky waste to scrapyard Glass from bulky waste to recycling	-842 -403
Total at Bellozanne	**76,259**
Recycling and Composting	
Recycled glass - total commercial and domestic	5,487
Recycled aluminium	15
Recycled paper and card	2,087
Recycled plastic (agricultural film)	463
Recycled timber	1,400
Reused textiles	287
Green waste delivered to La Collette Household Commercial	12,500 41% 59%
Total Recycled and Composted	**22, 239**
Total Non-inert Waste	**98,498**

To break this down further, it is useful to refer to the typical UK waste stream composition, derived from various UK data sources[ix]. However, it must be noted that waste composition can vary significantly, depending on the area served and whether commercial collections are included or not.

Typical Analysis of Unsorted UK Municipal Solid Waste			
Paper/card	**Total paper and card**		**29.2%**
	Newspapers/magazines	15.8%	
	Other paper	3.9%	
	Liquid cartons	0.3%	
	Card packaging	4.0%	
	Non-recyclable paper	3.5%	
	Other card	1.7%	
Plastic	**Total plastic**		**9.4%**
	Plastic film	4.6%	
	Dense plastic	4.8%	
Textiles	**Textiles**		**2.1%**
Misc. combustibles	(Includes disposable nappies)		**5.6%**
Misc. non-combustibles			**3.6%**
Glass	**Total glass**		**6.2%**
	Brown glass bottles	0.9%	
	Green glass bottles	2.0%	
	Clear glass bottles/jars	3.2%	
	Broken glass	0.1%	
Putrescible	**Total Putrescibles**		**38.6%**
	Kitchen waste	28.3%	
	Garden waste	10.3%	
Ferrous metal	**Total**		**3.0%**
Non-ferrous metals	**Total**		**1.7%**
	Beverage cans	1.6%	
	Foil	0.1%	
Other	**Total**		**0.3%**
Fine particles	**10 mm fines**		**0.3%**
Total			**100.0%**

In addition to the municipal waste generated, there are a number of other sources of wastes:-

Construction industry – The non-inert waste arising from construction, demolition and renovation activities comprises mostly timber and board materials, textiles (e.g. mattresses and carpets), metals and packaging.

Agriculture – The agricultural sector is currently dealing with the green waste produced as part of the cropping cycle, by returning this to the land. The sector also discards a quantity of packaging materials, and up to 600 tonnes of plastic film that is exported for recycling.

Sewage sludge – Approximately 70% of the residue sewage sludge from the sewage treatment works in Bellozanne Valley is dried after the completion of the digestion process and sewage pellets are produced. In line with the Waste Hierarchy, the

advanced thermally treated pellets are being recycled as an agricultural fertilizer. If the land bank is unavailable due to adverse weather conditions or crop constraints, the pellets will be diverted to the Energy from Waste plant.

Clinical waste – 281 tonnes of 'health care' waste (arising primarily from hospital and doctors', dentists' and veterinary surgeries) were disposed of in 2004 at the special clinical waste incinerator, operating at higher temperatures than the main EfW plant at Bellozanne. This facility has an operational capacity of a further 15 years and operates to post-2005 European standards.

Animal by-products – By special agreement with the UK Government, animal by-products are exported and incinerated off-Island (471 tonnes in 2004). However, plans are being developed for an animal by-product incinerator to be constructed in the Island.

Hazardous waste – This category comprises materials that pose a threat to health or the environment, such as CFC gases from refrigeration equipment, surplus chemicals (e.g. weed-killer) and paint. Some, such as asbestos, are suitable for disposal in special lined pits at La Collette. The remainder must be disposed of by special incineration; with relatively little such waste, it would be inefficient for the Committee to construct and operate these specialised facilities, so previously this waste was exported to the UK. As discussed in Section 1.3, due to the Basel Convention, the Island is currently unable to export hazardous waste (solid or liquid) until appropriate Waste Management legislation is introduced. Therefore, considerable quantities of such waste are being stored until this legislation is in force.

Inert solid waste - Construction and demolition activities account for around 70% by weight of Jersey's solid waste; in 2004, 230,000 tonnes of inert materials were delivered for disposal to the La Collette Reclamation site. A proportion of this waste is recycled as secondary aggregates, but the infill site has a limited life span so the production of inert waste must be minimised, wherever possible.

4.2 Prevention, minimisation, reuse and recycling objectives for Jersey

To reduce the quantity of residual waste that has to be dealt with, every effort must be made to reuse, recycle or compost, whenever possible. The optimal solution is to avoid producing the waste in the first place, but experience in other countries demonstrates that this is not easy to achieve. Often, the result of encouraging householders and businesses to avoid residual waste is an increase in recycling rather than genuine avoidance, but there are examples of successful waste prevention schemes such as washable nappy initiatives.

Perhaps the most important opportunity to influence community behaviour on waste production is through education programmes. Waste Action Groups have been successfully used

in other authorities, as a way of drawing together individuals representing local household and business communities, to discuss waste management issues and drive changes in consumer behaviour. Such groups are usually set up and supported by local government, but eventually may be led by the members of the group. There is no reason why such an initiative would not be successful in Jersey.

Some supermarkets are beginning to promote the reuse of articles, such as egg boxes and carrier bags, in response to consumer demand. Such reuse initiatives are to be encouraged, and may be expected to spread to other packaging and other retail outlets.

Theoretically, around 85% of the materials in the municipal solid waste stream could be recycled or composted. However, to achieve this would require total public participation to segregate every single recyclable or compostable material every week. In practice, of course, this cannot be achieved and the highest rate currently attained in the UK is 46%. Jersey's recycling and composting rate is currently 22%.

Not all recycling is environmentally beneficial, especially where materials need to be transported long distances. This is a particular issue in an island setting, where the majority of materials will need to be exported. Decisions on which materials will be targeted for recycling need to take this into account. The economics of recycling is also a fundamental issue, as the cost of collecting, bulking and exporting most recyclables will considerably outweigh any income generated. However, the Committee will support recycling schemes for some materials on environmental grounds and for others until the collected quantity reaches viable levels.

The main objectives for Jersey are:

- To promote a community-wide change in attitude towards waste management;
- To improve rates of reuse of materials and goods;
- To set challenging but realistic targets for waste recycling rates;
- To segregate and recycle materials from the waste stream, in accordance with the Best Practicable Environmental Option approach, using economic instruments and regulatory structures as appropriate;
- To make use of recyclable materials in the Island, whenever possible.

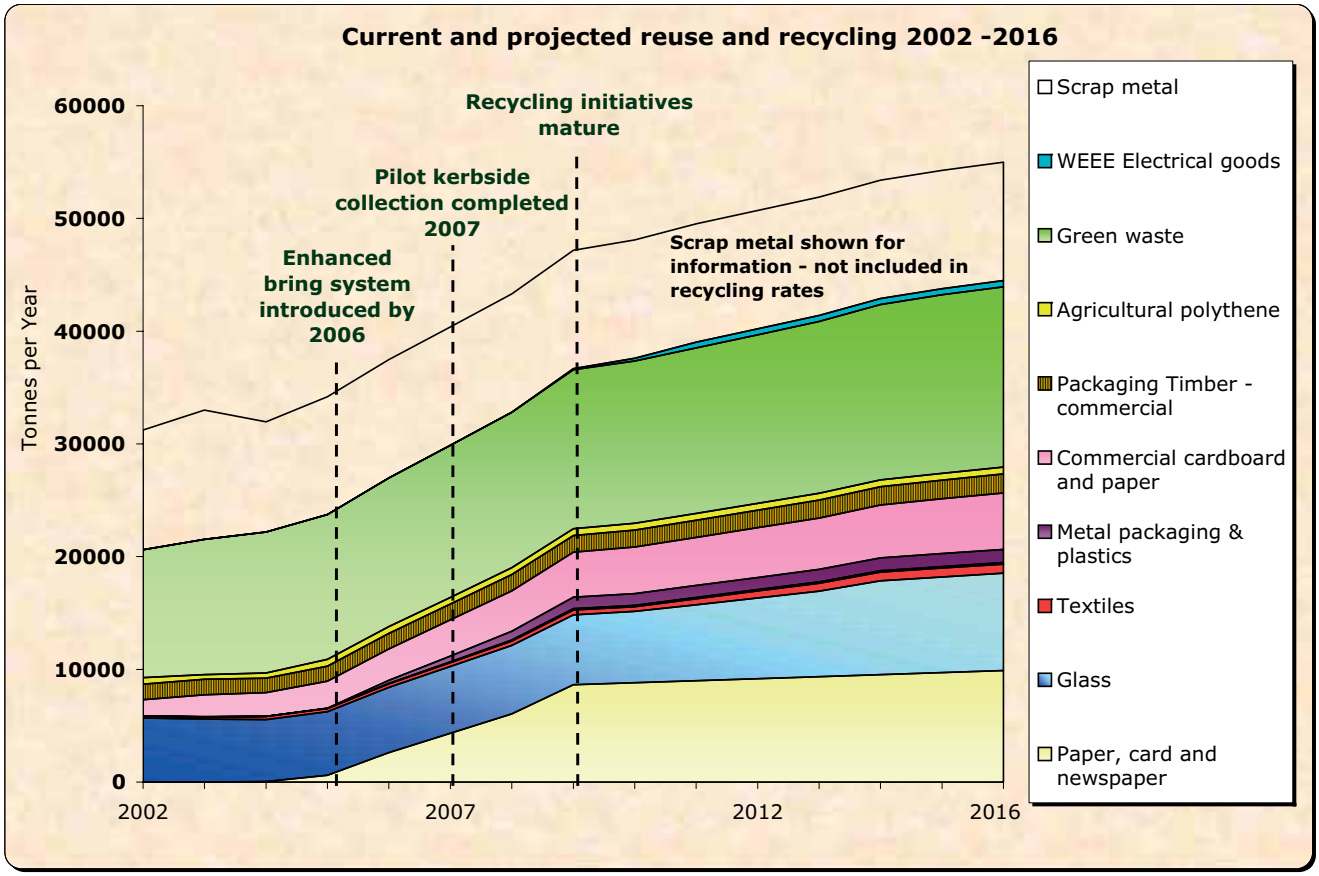

Figure 11

Figure 11 shows a breakdown of current and projected recycling activities for different key materials and illustrates the expected growth in recycling. Total waste arisings are expected to increase at an initial rate of 2.6%, reducing to 1.8% by 2024; once recycling initiatives have realised their potential, increases in recycling follow the overall increase in waste. This forecast will only be achieved by maintaining public awareness of the need to recycle.

To complement recycling initiatives, economic instruments can be used to influence behaviour. This can include taxes on specific materials (e.g. plastic bag tax) or other fiscal mechanisms intended to reduce non-recyclable waste. However, before many of these measures can be considered, it will be necessary to resolve the issue of the Bellozanne covenant (see Section 8.1.4).

RECOMMENDATIONS

Investigate the introduction of environmental taxes, for States approval. These could include initiatives such as weight/volume related collection/disposal taxes for municipal waste, or individual taxes on items such as newspapers or plastic bags, imposed at the point of sale.

Resolve the issue of the Bellozanne covenant.

The following sections consider the issues surrounding particular materials in the waste stream and proposals for action. Recycling

targets have been developed using a model to predict the future amount of different components of the waste stream. This model uses predictions of the number of households in the Island and the waste they will generate, and allows different waste management scenarios to be investigated. The Committee believes that the recycling targets which have been derived are challenging yet achievable.

4.3 Paper and card

CURRENT SITUATION

Current total annual arising: 15,000 tonnes	
Recent recycling summary - Years	**Tonnes**
2001	733
2002	1,433
2003	1,933
2004	2,087

The large quantity of paper and cardboard in the municipal solid waste provides a significant target for segregation and recycling. Currently, the majority of paper and card from homes is collected mixed with other household waste and delivered to the Bellozanne EfW plant for incineration. Some high grade (office) paper is collected from commercial premises by a private firm and exported for recycling.

The Committee has subsidised a commercial cardboard recycling scheme, operated by a private firm since 1995. Recent initiatives have significantly increased the level of cardboard recycling, with many organisations such as supermarkets now ensuring that the majority of their cardboard is recycled.

A trial public newspaper and magazine bring scheme was introduced at the end of 2004. This is already popular with the public and expansion of the number of collection points and further promotion would significantly increase the amount of paper recycled.

Some paper waste, such as over-issue newsprint, is shredded locally for secondary use as animal bedding. There are other low volume schemes, such as Christmas card and telephone directory recycling. The majority of paper and card segregated is exported and recycled at UK paper mills.

CHALLENGES

The environmental case for transporting paper for reprocessing off-Island, when compared to local incineration with energy recovery, is not clear cut.

Low grade paper and card, such as newsprint, magazines and corrugated cardboard, has a generally low and unstable market value. To maintain at least some value, the paper must be

segregated at source to minimise contamination. The collection, bulking and export of these materials are relatively simple, but costs considerably outweigh any sales value. Significant and sustained expenditure is required if paper recycling is to be maintained and expanded.

Household paper and card waste is not easy to avoid; over half of the paper in household waste is newsprint and magazines, which are an established and important part of everyday life.

There is currently no incentive for local organisations generating waste office paper to use a recycling service, apart from the feel good factor. This will need to change if targets for high grade paper are to be achieved.

OPPORTUNITIES

There are clearly opportunities to reduce the quantities of paper being generated as waste. Work is already underway to raise levels of awareness of the benefits of avoiding unnecessary waste in the office environment. Simple good practice, such as use of double-sided printing and copying equipment and the avoidance of non-essential printing, will need to become common culture in the workplace. Government-led initiatives, such as the development of Waste Action Groups with representatives from local commerce, could provide a useful vehicle to accelerate this process.

The current trial public bring system is relatively well supported. There is scope for improvement of geographical coverage, providing more convenience to users. A targeted and sustained awareness programme would increase participation and capture rates.

Some reductions in waste arising from paper and card used in the packaging of goods imported to the Island, are likely during the strategy period as a result of the UK Packaging Regulations.

Recycling rates for paper and card could be increased substantially through a kerbside collection, targeting all paper including from office premises and newsprint, paper and card associated with packaging from homes. New bulking and baling facilities, ideally near the port, would be needed to process efficiently and export the extra materials collected through this system.

RECOMMENDATIONS

Target: Recycle 50% of available paper and card in the waste stream through the following actions:

- Continue and expand the existing programme, promoting opportunities in all sectors to avoid

unnecessary paper waste and make maximum use of recycling infrastructure available. For the commercial sector, initiate a Waste Action Group programme to raise awareness and co-ordinate change in attitudes;

- Continue and expand the newspaper and magazine recycling scheme as an integral part of the Island-wide improvements to the collection system;
- Provide a central cardboard recycling receptacle for householders at the proposed Reuse and Recycling Centre;
- Encourage further segregation of commercial paper and cardboard using financial incentives;
- Develop a bulking and baling recycling centre near to the port, to improve the long term efficiency of the export process for paper and card.

Successful implementation of these recommendations is shown in Figure 12 and would result in approximately:

- **7,000 tonnes being recycled in 2008**
- **9,000 tonnes being recycled in 2015**

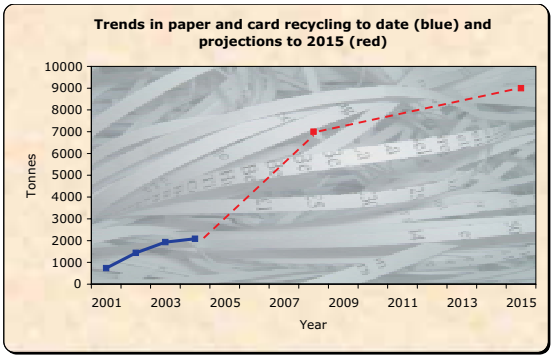

Figure 12

4.4 Glass

CURRENT SITUATION

Current total annual arising: 6,500 tonnes	
Recent recycling summary - Years	**Tonnes**
2001	5,470
2002	5,679
2003	5,599
2004	5,487

The parishes have for many years provided a kerbside glass collection system. However, St Helier has recently reverted to bring banks, which could have led to a reduction in glass segregated. The existing system appears to be reasonably efficient, as the level of glass separation from the remaining municipal solid waste compares well to performance in other authorities.

Waste glass is currently delivered to an aggregates recycling contractor for crushing. The majority of the product is stockpiled and subsequently used in the process of lining the La Collette marine reclamation site, displacing a stone aggregate.

CHALLENGES

The raw materials for glass manufacture are generally abundant. The main benefits of recycling glass are from reduced energy

consumption compared to manufacture from virgin materials. Environmental benefits in the Jersey context would be diminished by a requirement to export the glass for reprocessing.

If waste glass is to be reprocessed it needs to be separated into different colours, and contaminants removed, such as metals, ceramics and food waste, which increases the complications and cost of collection and reprocessing.

OPPORTUNITIES

There are few apparent opportunities to minimise glass waste. It could be argued that glass is a preferable form of packaging, as its manufacture does not deplete a scarce or non-renewable raw material. It also provides good potential for local reuse as a recycled aggregate.

Existing waste glass processing for recycled aggregate could be significantly improved. With better equipment, glass could be crushed and have contaminants removed allowing a higher grade of reuse in construction applications, such as concrete and road surface asphalt.

Historically, glass bottles were often collected, washed and reused. Advances in technology have made manufacture a cheaper option, or led to a switch to alternative packaging materials, resulting in the demise of most bottle-washing facilities. With few packaging operations occurring locally, there is unlikely to be much scope for the re-introduction of glass packaging reuse, apart from where secondary uses can be found in the home.

RECOMMENDATIONS

Target: recycle 90% of available glass through processing for recycled aggregate by the following actions:

- Improve existing glass processing equipment to allow higher quality uses to be found as recycled aggregate. Before any decision or investment is made on this, further investigations are required into potential markets in a small Island.
- Continue to promote the benefits of the segregation of clean household glass, which is not suitable for treatment in an Energy from Waste plant, and improve its potential for use as recycled aggregate.
- Work with the Parish to explore the options for increasing glass segregation in St Helier.

Successful implementation of these recommendations is shown in Figure 13 and would result in approximately:

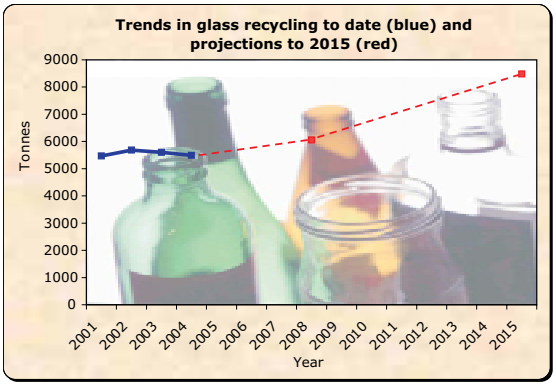

Figure 13

- **6,000 tonnes being recycled in 2008**
- **8,000 tonnes being recycled in 2015**

4.5 Metals

CURRENT POSITION

Current total annual arising:
Municipal Solid Waste (MSW) 1, 800 tonnes
Scrap metal from scrap yard 10,000 tonnes

Recent recycling summary - Years	Scrap Metal Tonnes	Vehicles Scrapped (number)
2001	9,912	3,213
2002	10,335	3,698
2003	11,470	2,721
2004	9,770	2,602

For many years, the Committee has worked in partnership with the scrap yard and other metal recycling companies in the Island. The safe disposal of scrap metal, particularly vehicles, is an important service to the Island. Jersey's current recycling position for metals is good, with over 80% being recycled (Figure 14).

The scrap yard deals with the majority of white goods, fridges and household bulky metal items. Refrigeration equipment is degassed at the scrap yard. In addition, they process industrial scrap metals and cars. Approximately 10,000 tonnes of metal each year is processed and exported to Spain for recycling.

Following the installation of a fragmentising plant (to cut large metal items into smaller pieces), with ferrous and non-ferrous separation, the scrap yard can produce different grades of scrap and this allows better recycling and a corresponding increase in value. Currently the residue from the fragmentising plant, which is a mixture of plastics, rubber, insulation and some embedded metals, is returned to the Energy from Waste plant for incineration.

Two private companies recycle particular scrap metals. One operates an aluminium can bring system and currently recycles approximately 15 tonnes of aluminium per annum. This company is responsible for emptying the banks, bulking and baling the material and then sells it to Alcan in the UK.

The bottom ash from the Energy from Waste plant contains a proportion of metals, mostly household items (food cans, etc), but bulkier items are common. This metal passes through the plant without treatment and adds nothing to the energy output. It is important to note that inappropriate metal objects can cause severe problems within the plant and hazardous components (e.g. cadmium and lead) from electrical and electronic goods contaminate the ash. A metal separator removes large ferrous and non-ferrous materials from the bottom ash.

CHALLENGES

Successful metal recycling requires that metal in the waste stream is separated from other materials which are often attached to it, such as plastics or other metals, and which can significantly reduce its value, or mean that it is not attractive to recyclers.

The current trend is towards a consumer-driven shorter lifespan for household appliances which can contain significant amounts of metal. In addition, designs and the relative costs of labour and appliances discourage repair and reuse.

Many products must be appropriately handled in order to separate them into components which can be recycled, e.g. refrigeration equipment, cars and IT equipment.

Best practice and overseas legislation will affect our ability to export for recycling in the future, particularly the End of Life Vehicle (ELV) regulations and Waste Electrical and Electronic Equipment regulations (WEEE).

OPPORTUNITIES

Reuse of domestic appliances could be substantially improved within the proposed Reuse and Recycling facility, where discarded, but functional, appliances could be made available to other potential users.

Household metals can be recycled, if separated at source.

Bulky waste would yield more metals if processed by a ferrous separator after shredding.

Electronic Goods could be recycled in a more sophisticated manner – see Section 4.9.
Refrigeration equipment could be recycled in a way that deals with the insulation, as well as the gases.

RECOMMENDATIONS

Target: recycle 85% of metal packaging in the municipal waste stream through the following actions:

- Extend the collection system to include household clean food cans in addition to aluminium.
- Appliance reuse should be facilitated by providing a reuse shed at the Reuse and Recycling Centre.
- Bulky material handling plant should be fitted with ferrous separation, downstream of the shredding facility.

- The current metal recycling operation at the scrap yard should be maintained.

Successful implementation of these recommendations would result in approximately:

- **500 tonnes of household metal packaging (drink and food cans) being recycled in 2008**
- **1000 tonnes of household metal packaging (drink and food cans) being recycled in 2015**

4.6 Plastics

CURRENT SITUATION

Current total annual arising: 5,600 tonnes	
Recent recycling summary - Years	**Agricultural Film Tonnes**
2001	600
2002	570
2003	400
2004	463

There is a range of different plastic types in the MSW stream, for example, high grade PET (polyethylene terephthalate) plastic used in most fizzy drinks bottles, polythene plastic bags and polystyrene food packaging. Most of these are collected as part of household and commercial waste that goes to the Bellozanne EfW plant. There is currently no service provision for householders to segregate and recycle plastics.

The Committee provides a recycling service for waste agricultural polythene film used by local growers as crop cover in the spring. A gate fee is charged for this facility which is currently set at £158 per tonne. The fee covers the shredding and baling process carried out at Bellozanne and the transport to a plastics reprocessor in the UK.

CHALLENGES

Mixed household plastic waste is worth very little to reprocessors and experience elsewhere has shown that it is often difficult for members of the public to differentiate between different types of plastic in the waste stream.

Source segregation of household plastics is essential, as cleanliness is important to allow recycling to occur. In addition, plastics are generally bulky, so collection and transport costs are likely to be high.

Efficient and economic collection of plastic is made difficult by its very low density, and the forms in which the materials are used exacerbate this. With no capacity for reprocessing in the Island,

all plastics collected will have to be exported for recycling. Grinding or compacting the plastics to reduce volume could reduce potential export costs, but this has an additional processing cost.

Agricultural film plastics are a particular issue in Jersey. The plastic used is of a high quality, but is heavily contaminated with soil at the end of its useful life. Very few plastics reprocessors are capable of pre-washing this material which increases the cost of recycling.

OPPORTUNITIES

Increased levels of community awareness to the issues associated with managing waste in Jersey may help to reduce slightly the growth of waste plastics in the waste stream. There is also evidence of alternatives to plastic appearing in the product packaging industry, such as the use of corn starch for emulating plastic film and expanded polystyrene. Our best opportunity to support these initiatives is through the wider introduction of environmentally conscious procurement in local businesses and the public sector.

Some local retailers have already initiated the process of offering robust re-usable carrier bags to encourage their customers not to take disposable polythene bags on each visit. There is considerable scope to introduce this policy to all major food retailers, perhaps through a tax levied on disposable bags, or through a voluntary agreement to charge for disposable bags.

Recycling of plastics is generally considered to be a desirable objective in environmental terms, as the fossil fuel oil is the primary raw material used in plastic manufacture. Higher value plastics, such as PET, the material used primarily for fizzy drinks bottles, have a reasonable value when segregated at source as a clean product free from other plastics. This is successfully collected and recycled in other jurisdictions through kerbside and bring bank collections. A similar system could be implemented in Jersey.

Other plastics in the waste stream may become more valuable during the strategy period, as off-Island reprocessing capacity increases, and technology for sorting improves, but a local waste management solution, such as energy recovery, capable of dealing with the majority of plastics, will be an important part of the overall solution for this material.

RECOMMENDATIONS

Target: Recycle 10% of available plastics in the waste stream through the following actions:

- Continue and expand the existing programme, promoting and facilitating opportunities in all sectors to avoid unnecessary plastics waste. Include promotion of high grade plastic recycling scheme, once introduced.
- Continue existing recycling scheme for agricultural polythene film.
- Introduce a high grade PET plastic collection scheme within the enhanced Island-wide collection system. The materials collected will be densified, baled and exported for reprocessing.
- Monitor markets for waste plastics and introduce other plastic grades to the recycling collection, if reasonable economic viability can be demonstrated.

Successful implementation of these recommendations would result in a minimum of:

- **600 tonnes being recycled in 2008**
- **700 tonnes being recycled in 2015**

4.7 Timber

CURRENT SITUATION

Current total annual arising: 4,000 tonnes	
Recent recycling summary - Years	**Tonnes**
2001	-
2002	-
2003	1,400
2004	1,400

The majority of timber currently arising in the waste stream comes from the building construction and demolition industry. In recent years, disposal rates for this material have been high due to high levels of building activity.

Some larger, more valuable items of timber are already salvaged by demolition contractors. A recent trial to recover more timber from waste arriving at Bellozanne, in partnership with the Jersey Employment Trust, was successful. Premises for the sale of reclaimed timber are currently being fitted out and should be operational later this year.

A second, significant source of timber waste is from the packaging and transportation of goods arriving in the Island. Although the majority of freight loads arrive on reusable pallet boards, Jersey receives a high number of single-trip pallets, which end their life here and become waste. Scrap pallets are currently segregated from other wastes and received at the La Collette facility. In 2003 6,445 loads, an estimated 40,000 pallet boards were delivered to

the site, which were shredded and exported for recycling in the panel-board industry. A trial is currently running with a local kindling wood manufacturer to use these scrap pallets to make a packaged kindling wood product.

CHALLENGES

Preservatives in many timber products restrict local recovery options, such as composting. However, less harmful chemicals are being used in modern processes to pressure treat timber.

Some timber waste is too decomposed to recover.

Markets for reclaimed wood may be limited, but the appeal of seasoned timber features in modern construction and renovation will assist in the further development of low volume salvage outlets.

Waste timber is often burnt on-site or broken up for easier transportation rendering it less salvageable.

OPPORTUNITIES

Waste awareness work within local industry, including the construction and demolition sector, is vital. Provision of information on opportunities to design out unnecessary waste, using examples of successful good practice elsewhere could be helpful to the industry. Initiatives, such as the sustainable design awards, will assist in promoting examples of low waste construction methods and the maximisation of recovery.

Probably the most significant opportunity to reduce the amount of timber arising as waste is through planning controls. The principle of sustainable development was introduced as part of the Jersey Island Plan 2002, which includes specific policies to ensure that development is only permitted where measures to avoid waste and recycle and reuse materials are employed. For large scale development or where there is potential to generate significant quantities of waste, a Waste Management Plan must be submitted, requiring the developer to identify how the principles of the Waste Hierarchy will be applied to that project. Where development proposals do not seek to re-use, recycle and recover as much of the generated waste materials as possible, the Committee may resist the development proposals.

Sorting of good timber arriving at Bellozanne could be achieved to allow a proportion of this material to be reused. Further work is required to establish the size of the potential market for salvaged timber.

A Reuse and Recycling Centre could provide a collection point for waste timber from households. Similar sites in other countries

often provide a reuse shed for unwanted items of furniture. A similar scheme would be beneficial in Jersey.

The majority of packaging timber in the waste stream is already segregated for export and recycling but there would be economic and environmental benefits in finding a locally viable outlet for this material. Packaging timber is likely to be mostly untreated. If this could be reliably proven, it could be shredded and used as a bulking agent and carbon source in the composting system proposed in this strategy.

RECOMMENDATIONS

Target: Reuse and recycle 50% of timber available in the waste stream through the following actions:

- Continue and expand communication and promotion of best practice in sustainable building design to include resource management.
- Complete implementation of construction and demolition waste timber sorting and resale scheme. Encourage local consumers to buy-recycled where possible.
- Include timber recycling segregation and furniture reuse shed at proposed Recycling Centre.

Successful implementation of these recommendations would result in a minimum of:

- **2,000 tonnes being recycled in 2008**
- **2,300 tonnes being recycled in 2015**

4.8 Organic waste

CURRENT SITUATION

Current total annual arising:
Municipal Solid Waste 32,500 tonnes of which:
Green waste 15,500 tonnes
Kitchen waste 17,000 tonnes

Agricultural waste previously dealt with approximately 22,000 tonnes

Recent composting summary - Years	Tonnes
2001	11,610
2002	11,345
2003	11,000
2004	12,500

The majority of garden waste, such as lawn cuttings, prunings, leaves and bedding plants are received at the La Collette Green Waste site. Here, the materials are shredded and composted by an open windrow system. At the end of the process the compost product is used on local agricultural land as soil improver. A

recent initiative to produce a fine 10mm compost product for sale to local gardeners and for use on amenity land has been successful.

A significant proportion of household waste is kitchen food waste, such as plate scrapings and vegetable peelings. The majority of this type of waste is collected with other black bag waste in the Parish collection system for incineration at Bellozanne.

A growing number of householders with gardens compost their own kitchen waste. This is seen as a very sustainable waste management solution as it avoids the need for collection and processing and provides a useful source of compost. The Committee currently makes home composting kits available at promotional prices and these have proved very popular. Since the launch of this initiative in 2004, 1200 kits have been distributed through local retail outlets.

Until 2002, agricultural waste was managed at the Crabbé composting facility. Since its closure, farmers have dealt with this waste themselves, by ploughing it back to the land.

CHALLENGES

Kitchen waste may include meat residues. There are risks of it containing animal pathogens and protein prions which could be returned to the food chain through compost applied to agricultural land or vegetable plots. In consequence, compost derived from kitchen waste is generally classified as low-grade and typically is reserved for top-dressing non-agricultural areas such as landfill sites, although some composting technologies solve this problem. The Health and Social Services Department has expressed concerns over the potential risks of transmission of animal diseases, particularly in the Jersey context, and the composting of kitchen waste in a municipal composting facility is not recommended at present, as the risk to the Island's agricultural land is seen as too great.

Jersey's 'land bank' for the disposal of organic products is not unlimited and the pressures on it are severe. The farming industry has maximised the land use over many years and land is intensively farmed. To recycle the existing levels of municipal and agricultural compost, sewage sludge and cattle slurry in a safe and controlled manner, is a very challenging process. Any substantial increase in volumes or lowering of quality of municipal compost may prevent the safe disposal of these products. International policies for recycling of these materials are to safeguard food products and the environment from any long-term problems caused by over-application of a particular product.

Collection directly from households of kitchen waste in other jurisdictions is often introduced as one of the final phases of a

kerbside collection scheme. It can be more successful at this point, because public participation in the separation of waste is better established.

Municipal scale composting can be a source of nuisance from vehicle movements, odours and dust, and health concerns from the transmission of potentially harmful aerosols.

Home composting can only be achieved on a significant level in households with a garden and space to install a composting system.

Offering a kerbside collection for household green and kitchen waste would be a disincentive to home composting.

Under current agricultural regimes, the practice of ploughing agricultural waste back into the soil cannot be continued indefinitely, due to potential risks from disease communication. The composting facility must be capable of being expanded to handle agricultural green waste if this can no longer be ploughed back.

Composting must be managed to ensure that pathogens, seeds and pests in the green waste are killed. Any compost produced must comply with relevant EU and UK standards[x] and with best environmental practice.

The amount of green waste handled varies with season and weather conditions.

OPPORTUNITIES

The existing composting facility could be improved, with enhanced environmental controls leading to higher quality compost.

Home composting could become more widespread in homes with a suitable garden and available space. Initiatives to make home composters available at an attractive price to householders have already been successful. There is considerable scope for a cultural shift in this area, which would reduce levels of organic waste requiring collection and disposal. Domestic composting is the most environmentally-friendly option, as it reduces transport.

Collection of green waste could be developed through an improved bring system, such as weekend collection sites. A well-designed, conveniently-sited central facility would be more attractive to users; distributed collection would probably increase take-up further.

Increasing take-up of composting (whether domestic or centralised) has the benefit of reducing waste taken to the Energy from Waste plant (green waste is relatively low in energy content).

The current fashion for garden makeovers is likely to increase the amount of domestic green waste handled.

Sales of compost could offset some of the costs of the operation.

Whilst not considered appropriate at present, opportunities to expand composting to include kitchen waste will be monitored.

4.8.1 Options for a modern composting facility

The main techniques in current use are:

- **Open Windrow** – a basic process, where the material is spread in the open and left to rot down
- **Tunnel or In-vessel** – the decomposition process takes place in a controlled tunnel enclosure to contain odours and facilitate the collection of effluent
- **In-hall** – the entire process takes place in a closed hall with controlled air flows, allowing control of liquid effluent and odours

Proposal – The Committee intends to install a two-stage facility, in which received green waste is shredded and then undergoes a primary decomposition phase in a tunnel facility, before being transferred to an open windrow area for maturation. This is a facility that can be expanded fairly easily, should the supply of green waste increase (for example if agricultural waste is no longer returned to land).

Minimising the Impact - Composting gives rise to a number of impacts on neighbouring premises. These will be controlled by careful design:

- **Bio-Aerosols** - The raw material is shredded first, to accelerate the decomposition process, which causes the release of potentially harmful bio-aerosols. These will be controlled by housing the process in a purpose-built building.
- **Pathogen Destruction** - The raw waste may contain pathogens that are potentially harmful to humans, animals or plants. It is important that any composting facility does not spread these pathogens, either to the general environment or to land, in the compost produced. The proposed facility combines the more effective pathogen destruction capabilities of tunnel composting at the start of the process, with the lower cost of windrow composting near the end of the process, where large areas and longer residence times are more important for maturation.
- **Odours** - Most of the odour generation would take place in the composting tunnels. All waste air from the pre-treatment and tunnel composting stages would be

treated in biofilters to remove odours and particulates, prior to release to atmosphere.

- **Effluent** - Effluent would be collected and used for wetting dry composting material. Excess effluent would be treated to remove pathogens, suspended solids and chemical and biological oxygen demand, prior to discharge to a local watercourse or to a soakaway. Rainwater and clean condensate would be collected in an open lagoon and either be used for wetting dry composting material, be lost via evaporation or be allowed to overflow to a local watercourse, particularly in times of heavy rainfall. Measures would be employed to prevent sludge decomposing under anaerobic conditions at the bottom of the lagoon and producing unpleasant odours.

RECOMMENDATIONS

Target: Compost 90% of the available green waste through the following actions:

- Develop a Composting Facility for green waste. The facility will be sized for anticipated volumes of waste, with room for expansion to accommodate agricultural waste, should this become necessary. It will also be capable of expansion to accommodate kitchen waste if this is considered appropriate and if this is permitted by Health requirements.
- Encourage home composting through suitable initiatives. The Committee aims to have distributed 4000 home composting kits by 2009.
- Improve bring collection system for domestic green waste.
- Kitchen waste should not be collected for central composting at present; this will be kept under review, and could be implemented at a future stage.

Successful implementation of these recommendations is shown in Figure 15 and would result in composting:

- **13,800 tonnes in 2008**
- **15,800 tonnes in 2015**

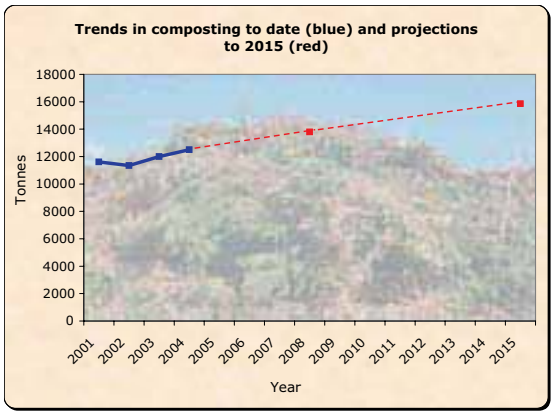

Figure 15

4.9 Electrical and electronic equipment

CURRENT SITUATION

Current total annual arising: 500 tonnes
Recent recycling summary- A few low-volume schemes exist

A proportion of the metal components of the Waste Electrical and Electronic Equipment (WEEE) waste stream are recycled, after

processing at the scrap yard. There is also likely to be an amount of reuse of electrical and electronic goods through car boot sales and charity shops. A few low volume recycling schemes exist, such as for mobile phone handsets.

The majority of electrical and electronic goods, such as IT equipment and home appliances, are received at the Bellozanne Refuse Handling Plant for shredding and incineration. Equipment of a primarily metal construction, such as washing machines and cookers, is received at the scrap yard for shredding and separation of the metals for recycling. End-of-life refrigeration equipment is received at the scrap yard, where refrigerant gases are removed before disposal. This method of disposal is not totally compliant with current best practice, which requires ozone depleting agents in the insulation foam of fridges to be collected for specialist disposal as well. Batteries are collected at the Bellozanne site and rechargeable batteries are separated for export and recovery.

CHALLENGES

This is a generally complex waste stream containing a large range of materials, some of which are hazardous. Electrical and electronic equipment is a major contributor of heavy metals in the waste stream, which currently end up in the ash of the EfW plant. Many appliances are large, bulky and difficult to transport, making export for recycling more expensive.

In a generally affluent society, there are likely to be limited markets for second hand electrical and electronic equipment, exacerbated by frequent replacement of consumer goods, such as computers, televisions and home appliances. Over 2,000 refrigerators are disposed of each year in the Island.

The most reliable route for the recovery of the materials in electrical and electronic goods is through modern reprocessing equipment, which shred and separate constituent materials for recycling. These plants are growing in availability but are unlikely to be viable locally, so export is the most robust option to recycle this type of waste in the short term.

OPPORTUNITIES

A high level of electrical and electronic goods in waste is a result of rapidly advancing technology and a society keen and sufficiently affluent to be able to replace appliances regularly. It is difficult to foresee an end to this trend, although a move toward more upgradeable rather than disposable products may occur as the financial burden of this waste is placed back on manufacturers by new EU legislation.

The EU WEEE Directive, which aims to increase the collection, recovery and recycling of electro-scrap should be transposed into

UK law in 2005. This will provide collection and recycling infrastructure free to consumers, financed by manufacturers, based on market share. Although outside of the EU, it is possible that Jersey could negotiate into this system, as most products are imported from the UK.

Separation of electrical and electronic goods from the waste stream is relatively straightforward. A collection facility could be provided at the proposed Reuse and Recycling Centre for this category of waste; the aim is to export collected items for reuse or recycling. Refrigeration equipment will be a high priority target for this process, as the current waste management process falls a long way short of environmental best practice.

Working items of electrical and electronic goods could be deposited in a reuse shed at the proposed Centre, to provide an opportunity of extending the life of these appliances.

Removal of electrical and electronic goods from the waste stream not only increases recycling rates but also removes many of the hazardous contaminants from the residual waste stream, allowing bottom ash from the Energy from Waste plant to be recycled as an aggregate.

RECOMMENDATIONS

Target: 60% reuse and recycling through the following actions:

- Encourage, through education and communication programmes, local businesses and householders to avoid the generation of unnecessary waste of this type by upgrading and repairing, if possible, rather than simply buying new.
- Provide an opportunity to extend the life of some electrical and electronic goods at the proposed Reuse and Recycling Centre.
- Deal with the remaining electronic goods and refrigeration equipment as specialist waste.
- Provide a separate facility for end-of-life electrical and electronic goods at the proposed Reuse and Recycling Centre, to facilitate segregation for export and materials recycling.

Successful implementation of these recommendations would result in approximately:

- **300 tonnes being recycled in 2008**
- **500 tonnes being recycled in 2015**

4.10 Other waste materials

As well as the main materials in the waste stream, there are other less significant ones, such as textiles (clothing, shoes and household linen etc), disposable nappies and finer residues, such as dust collected in vacuum cleaners and cigarette ash.

There is already a significant amount of textile reuse and recycling occurring in the Island, through charity shops and through a public bring bank system operated by the Salvation Army, which collects over 200 tonnes of material each year for export to the UK. Scope exists to improve the bring bank system to increase the recycling capture rate.

Encouraging the use of modern washable nappies can help reduce the number of disposables discarded, which can make up to 4% of the household waste stream by weight. Many UK authorities offer a grant scheme to encourage parents to choose washables. This is currently thought to be one of the most successful waste prevention activities in the UK.

There are various other bulky waste items in the waste stream, such as vehicle tyres, carpets and mattresses. These are currently shredded and incinerated. Opportunities may exist to divert such materials into alternative uses, such as shredding tyres for use in equestrian arenas. These opportunities will be monitored and viability assessed on a case by case basis.

No real opportunities exist to avoid or recycle the fine residues collected in municipal solid waste, so these will continue to be managed as part of the residual waste stream going to an Energy from Waste facility.

Until now, a proportion of the sewage sludge from the sewage treatment works has been returned to the land by deep injection. Work is currently in hand to increase the amount recycled by adopting different application methods. Any residues that are not returned to the land would be sent to the EfW plant.

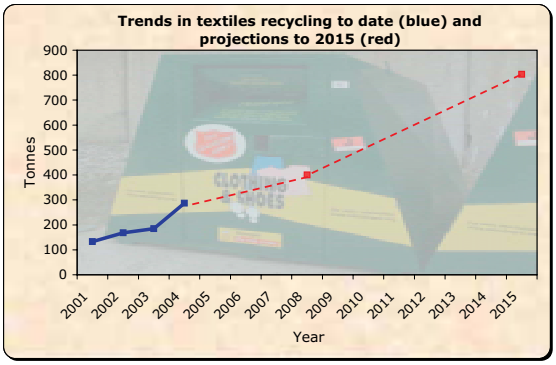

Figure 16

RECOMMENDATIONS

- Expand the existing collection system for textiles, as part of the proposed enhanced Island-wide bring bank system (Figure 16), which will achieve an estimated recycling rate of 32% of the total textiles waste stream.
- Promote the use of modern washable nappies as a waste prevention measure. Investigate the feasibility of a grant scheme, as offered by many UK local authorities, to provide an incentive for more parents to choose washables.
- Monitor opportunities to reuse or recycle miscellaneous items in the municipal waste stream, such as tyres, and assess viability on a case by case basis.

4.11 Inert waste

CURRENT SITUATION

Current total annual arising: 230,000 tonnes		
Recent summary - Years	**Total inert waste received at La Collette (tonnes)**	**Total recycled material from La Collette (tonnes)**
2001	375,000	37,000
2002	273,000	34,000
2003	238,000	30,000
2004	230,000	28,000

Inert waste arises from construction and demolition activities. Jersey produced 375,000 tonnes of inert waste in 2001 and 230,000 tonnes in 2004. Much has been done to encourage recycling and to discourage the end-of-use production of inert waste, by planning policies and other means, and the quantity of material has reduced. Other factors leading to the reduction in material arriving at La Collette are increased tipping charges and fluctuations in the rate of construction. A sustainable disposal route for this inert waste must be provided, while recovering any potential value from it and, in particular, displacing the use of fresh stone from quarries wherever possible.

For this to be successful, consideration of how to avoid unnecessary waste needs to begin at the earliest stages of planning and design. The Environment and Public Services Department is working with the construction industry, to develop guidance on how to meet the obligations set by policies WM1 and WM2 in the Jersey Island Plan, concerned with sustainable solid waste management and resource conservation and ways to reduce solid waste arising during the lifecycle of a development scheme. A Waste Management/Resource Efficiency Plan is now required, as an integral part of the planning process, for all developments likely to produce a significant amount of construction waste. Supplementary Planning Guidance is being developed, to ensure that these Plans demonstrate that positive and imaginative consideration has been given to reducing excavation, demolition and construction waste in the design and build of development schemes.

REUSE AND RECYCLING

Construction and demolition waste, including excavation waste, represents the largest constituent of material being deposited in the reclamation site. Inert waste arriving at La Collette is separated and graded for reuse as secondary aggregates. In 2004, about 28,000 tonnes were recycled in this manner (12%). The remaining inert waste was used in the filling of the site. Part of the area being filled at La Collette is intended for use as a light industrial area, and it is essential that the fill is constructed with sufficient loading strength to support future buildings, otherwise the land will not be suitable.

However, while there is a limit to the amount of construction and demolition waste that can be diverted if the land is to be sufficiently stable for eventual redevelopment, an overall reduction of this waste deposited in the site will result in the extension of its useful life.

The requirement for Waste Management/Resource Efficiency Plans, as part of the planning process, will improve two processes: the procurement of material in the new build and the methodology used to demolish the existing building. The result will be a stimulation of demand for recycled materials and an increase in the supply to meet this demand. The ability of the construction industry to strengthen the link between demolition and new build is dependent on a reprocessing industry, which is able to support the provision of recovered/reprocessed demolition material to required standards. One of the main barriers cited as preventing increased use of recycled materials in general, and recycled aggregate in particular, relates to quality.

RECOMMENDATIONS

Target: 30% recycling through the following actions:

- Continue to use the Planning process to require developers to utilise recycled inert materials in projects.
- Achieve proper control of the inert waste through waste regulation, to ensure that chemical and physical contamination is minimised, in order to provide recycled materials that meet construction industry standards.
- Establish a new inert landfill site in the longer term, when required. Capital investment will be required for this and a full Environmental and Health Impact Assessment will be fundamental to identifying a new site.

Successful implementation of these recommendations would result in approximately:

- **60,000 tonnes being recycled in 2008**

4.12 Clinical waste

CURRENT SITUATION

Current total annual arising: 281 tonnes

Clinical waste is a special category of waste because it may include pathogens and cytotoxic compounds. As a result, it must be kept totally separate from other waste streams and be burnt in a special incinerator at higher temperatures than those achieved in the Energy from Waste plant. Local hospitals are the primary source of this type of waste but materials are also received from doctors', dentists' and veterinary practices.

The current clinical waste incinerator was installed at Bellozanne in 1998, and complies with the present and anticipated UK regulations[xi]. The incinerator has the capacity to process up to 200 kg per hour of clinical waste.

OPPORTUNITIES

The rate of production of this waste stream is governed by clinical needs, which are increasing as the population ages and new treatments are developed. However spot checks of clinical waste often identify quantities of materials that do not need to undergo such specialist incineration and could have been better segregated at source.

Due to the special nature of this type of waste, there are currently no recycling opportunities.

RECOMMENDATIONS

Efforts should continue to ensure that non-clinical materials are not unnecessarily added to this waste stream and there are clear procedural guidelines for healthcare professionals and good information at the point of disposal.

The existing facility operates at the best European standards, no modifications are required and it is proposed that the plant will continue to be used to dispose of clinical waste for a further 15 years, which is the expected lifetime of the incinerator. The performance of the plant will be monitored to ensure that proposals for a replacement facility are brought forward in sufficient time for decisions to be made.

4.13 Hazardous waste

There are a number of hazardous waste materials, such as asbestos, redundant chemicals and used oil. The bulk of these are stored at Bellozanne, in a secure compound, before shipping to the UK for safe disposal. The intention is to continue with this practice, as a hazardous waste disposal unit would not be viable for the relatively small amount of hazardous waste produced. However, to continue to ship hazardous waste off the Island, waste management regulations must be adopted in line with best European practice. This requires the introduction of the Waste Management (Jersey) Law 2005, which received Privy Council approval in March 2005.

The EU Hazardous Waste Directive[xii] has been upgraded by various Council decisions[xiii] and now provides a new integrated list, containing a much larger number of wastes considered to be hazardous than the 1994 list. A number of the new categories may occur in the municipal waste stream, such as fluorescent tubes and asbestos cement.

Some solid hazardous waste, such as asbestos, will continue to be put into sealed pits at La Collette, see Section 6.

4.14 Animal by-products

Jersey currently exports animal waste to the UK for incineration, by special agreement with the UK Government. A new animal by-product incinerator, for which funding is available, is planned to be installed in the Island. This incinerator will safely dispose of animal by-products, even if they were BSE infected. This facility will be constructed to UK best standards, and is intended to serve the Island's requirements for animal by-product disposal for the next 20 years.

RECOMMENDATIONS

Construct an animal by-product incinerator to UK best standards, in order to serve the Island's requirements for animal by-product disposal for the next 20 years.

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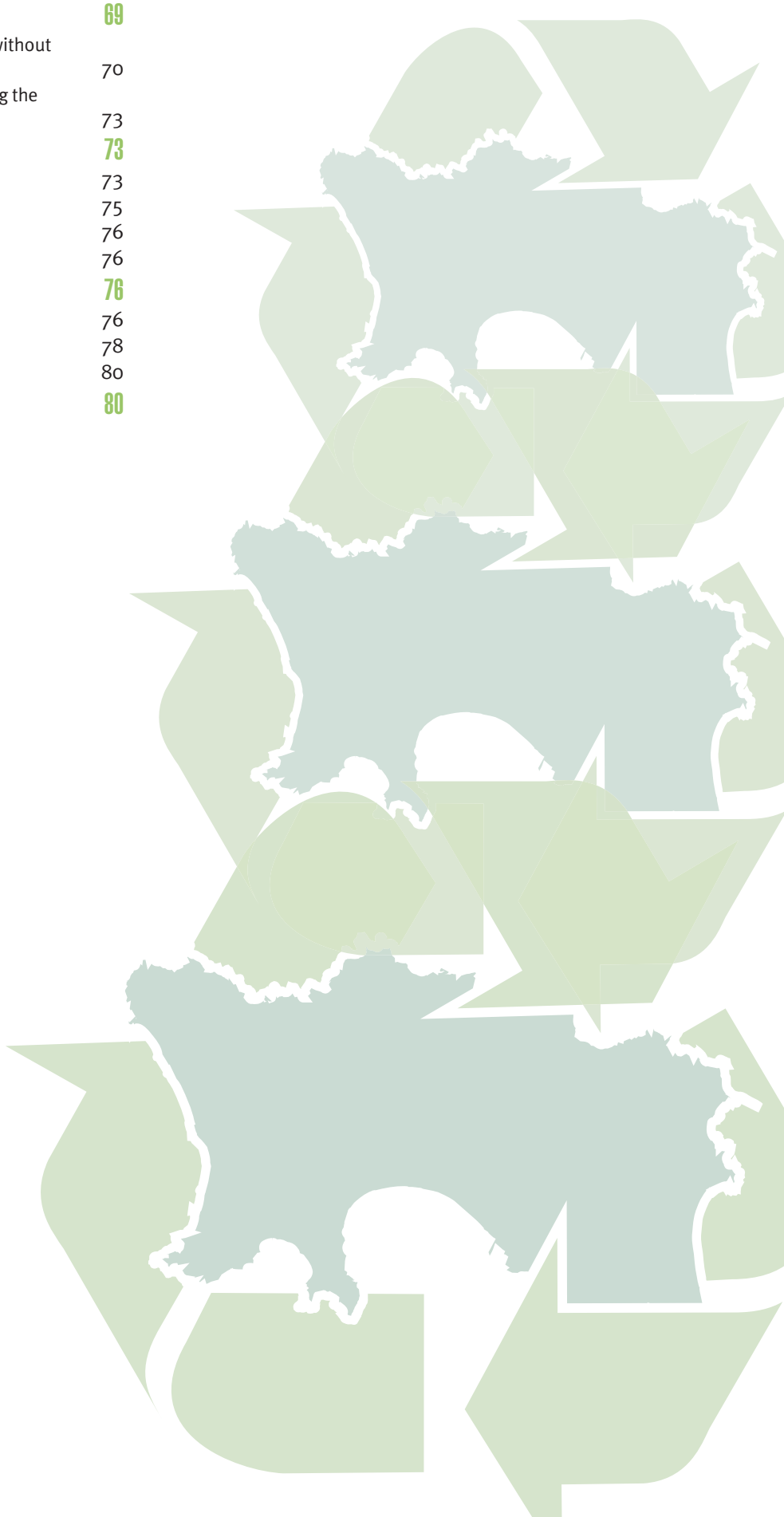


5.0 Energy recovery

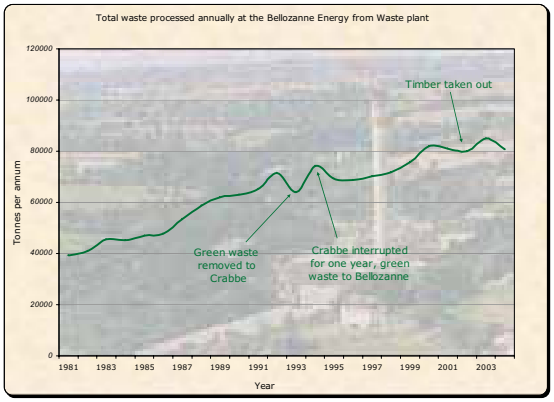


Figure 17

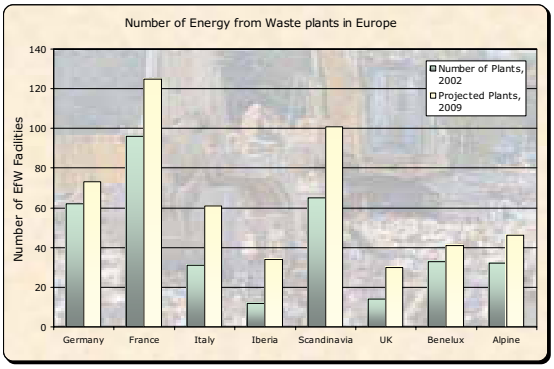


Figure 18

Continuing to follow the Waste Hierarchy, it is seen that once the preferred options of minimisation, recycling, and composting have been exhausted, any remaining value should be recovered from the residual waste, as energy for heating purposes or to generate electricity. This is considered to be better in the Waste Hierarchy than disposal, because landfill does not recover any of the remaining energy of the residual waste (barring some methane recovery if the fill site has been properly designed) and can cause significant environmental impacts at the site of disposal. In any case, Jersey has no landfill disposal opportunities for non-inert waste, so it is essential to process the residual waste by recovery of energy. The only alternative would be to export the residual waste, but as discussed in Section 1.3 the Committee does not believe this to be a viable option for the Island, except in truly exceptional circumstances such as extended plant failure, or in the case of specialised hazardous waste, which Jersey cannot deal with in isolation.

The solid waste arisings entering the Energy from Waste plant have consistently risen since it was built (Figure 17). In 1992, the third stream came on line to cope with the increased demand and has been used to reduce the reliance on the first two streams. As these have approached the end of their lives, their availability is reducing and the third stream has consequently had to take a greater share of the load than would be expected.

Energy recovery is widely practised throughout Europe. Its use is increasing as waste is diverted from landfill (Figure 18).

5.1 Outputs

Heat and Electricity - The energy contained in the residual waste is recovered in the form of heat by incineration. In some newer technologies this is achieved through an intermediate step in which the combustible components are converted to gas, which is then burnt; in others, the material is turned into an intermediate fuel by drying and shredding. The current Bellozanne incinerator is 'mass burn' – that is, municipal waste is burnt as delivered without pre-treatment, and bulky items need only coarse shredding before incineration. The different technologies are described in more detail in Section 5.3. The heat released by burning is usually used to generate electricity, although in some installations it is used for district heating.

Supplying heat to local customers increases the overall efficiency of the energy recovery process, but depends on having suitable customers nearby. The ideal customer is an industrial process, because the demand is present throughout the year; domestic demand in general is limited to the winter, which often does not justify the investment in the pipe system.

Some of the electricity thus generated is used to meet site requirements, and the remainder is available to export to the Jersey Electricity Company (JEC) system. The current generator is rated at 3MW, of which up to 2MW is used on site, supplying the

sewage treatment works and the solid waste processing plant. A new EfW plant would have a greater output, partly from improved efficiency and partly from more appropriate equipment sizes. The current value of the electricity available for export to the JEC system is very low, as it effectively replaces base load electricity bought from France at prices based on nuclear power plant operating costs. The strategic value in increasing in-Island energy sources and reducing reliance on supplies from France is difficult to value in financial terms.

Opportunities may arise in the future to sell this power to third parties, who could be interested in the electricity, as it can be classed as renewable energy.

Ash - dependent on composition, bottom ash (that is, ash that is recovered from the bottom of the furnace chamber) can be recycled as aggregate, because it is inert and contains limited amounts of hazardous components. Any ferrous metals it contains could be recovered, although these would have a lower scrap value because of ash contamination. The metal appearing in the ash could be considerably reduced if such materials were removed by the waste producer and recycled; the existing arrangements at Bellozanne do not allow sorting on delivery to the site.

Flue Gas Treatment residue/fly ash - In modern plants, the flue gas is treated chemically to remove gases that are harmful to the environment. This chemical treatment gives rise to solid or sludge wastes containing hazardous materials, which need to be disposed of safely (see Section 6). The existing incinerator at Bellozanne does not have flue gas treatment, beyond the electrostatic precipitator, which removes only the larger fraction of solid particles. This is why its environmental performance falls so far short of modern requirements – see Section 5.2.

5.2 Energy from waste - a plant for Jersey

Based on historic data and the expected level of prevention, minimisation, and recycling, the forecast of residual waste tonnages is shown in Figure 19.

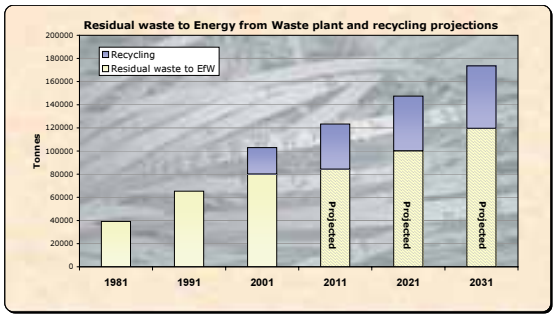
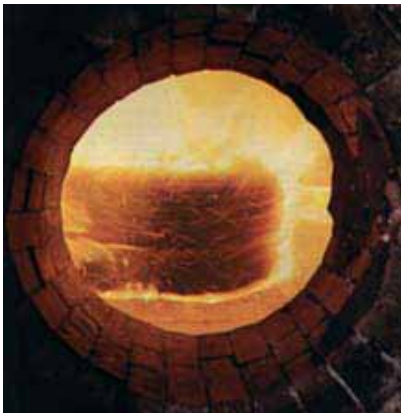


Figure 19

If the total waste continues to rise as predicted, and the Island adopts the recycling and composting measures proposed in this Strategy, residual waste arisings will reach about 95,000 tonnes per annum by 2020. If the situation were to remain as today, with only limited recycling and composting, the residual waste arisings would reach about 119,000 tonnes per annum by 2020. By the end of the design life of a new plant commissioned in 2009, the predicted residual waste arisings, after the proposed recycling and composting measures, rise to about 126,000 tonnes per annum.



5.2.1 The case for replacing the energy from waste plant without delay

The existing plant emits significant amounts of toxic substances and there are serious concerns about the possible effects that these emissions may have on public health and on the wider environment. The highest annual throughput achieved to date has been 85,000 tonnes. This has often resulted in volumes of waste being stockpiled around the Island, during periods of breakdown or maintenance. This is not acceptable, from the point of view of public health, in that such piles are unsightly, will attract rodents, cause smells and potentially create leachate. As the plant ages, its performance can only be expected to deteriorate further, without expensive refurbishment.

For us to comply with the legislation and Protocols mentioned in Section 1.3, it is imperative that the EfW plant is replaced, in order to reduce emissions to within accepted limits. Furthermore, Jersey has given a commitment to the UK Government of 2009 as a date for compliance, subject to the commissioning of a new EfW plant. Should the Island extend the timescale, it must be aware that Jersey's performance is being scrutinised internationally.

GASEOUS EMISSIONS

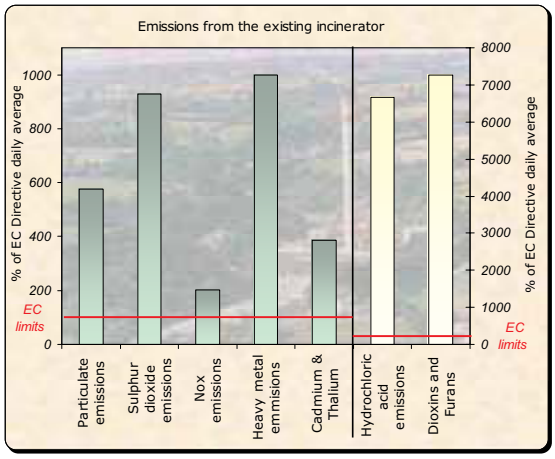


Figure 20

With current medical knowledge and the complexities of real situations, it is very difficult to estimate the effects on health of any given level of pollutants in the environment. However, a comparison can be made between predicted levels and those set as 'safe' by expert groups. In the EU, these levels are taken to be those in Directive 89/369 EEC: Prevention of air pollution from waste incinerators and Directive 2000/76/EC: The Incineration of Waste. The UK has implemented these from 2002 for new plants and from December 2005 for existing plants; the States has determined that, in general, it will comply with EU standards and introduce compatible legislation. Section 1.3 has shown that Jersey does not comply fully with protocols on air pollution, under United Nations Geneva Convention on long range transboundary air pollution (1979).

An investigation of emissions from the EfW plant was undertaken by Warren Spring Laboratory in 1992 (Figure 20). While this data was collected some years ago, and although the mix of emissions may have varied with the variation in the type of waste, the quality is unlikely to have improved in the intervening years. It can be clearly seen that, in all parameters, the plant operates well outside EC Directive emission limits. The plant does not have a system for reducing gaseous pollutants, nor does it have emission monitoring equipment. If the Bellozanne incinerator was located elsewhere in the European Community, it would have had to shut down in 1996.

The dioxins (and related compounds such as furans) are of particular concern, since they are toxic at extremely low levels, persistent in the environment and can accumulate in humans and animals. Dioxins are formed in tiny quantities when organic materials such as oil, grease and plastic are burnt, especially when chlorine and metals are present. However, they are also found naturally in the environment and as much as 95% of total intake of dioxins can be from food. Recognising this, a survey was carried out in 1994[xiv], and this showed that dioxin levels in Jersey soil are significantly below UK urban levels and slightly lower than UK rural levels. Further monitoring,[xv] in 1998, also showed that dioxin levels in vegetation and milk were extremely low. However, in both cases it was shown that the dioxin footprint closely resembled the emission footprint close to the chimney stack.

Sulphur dioxide and particulates do not have a lower threshold below which they have no health effect, and so it is not possible to say that emissions of these compounds will have no effect on health. Nitrogen oxides (NOx) and particulates are respiratory irritants that may exacerbate asthma and possibly increase susceptibility to infections. Small particulates are comprised mainly of carbon resulting from local primary combustion processes, such as car engines, the crematorium and the power station stack, as well as the Energy from Waste plant.

It is important to assess Energy from Waste plant emissions in the context of the total ambient concentration of pollutants in the area; where the ambient concentrations are already close to or above environmental guidelines or standards, even relatively small increments can be important. There is also a need to recognise the additional potential health risks from the greater emissions that may occur during start up, shut down, maintenance problems or accidents of the plant.

Studies worldwide have not been able to link emissions of known pollutants with health impacts and there is no direct evidence of harm being caused to the population. However, the continued emissions of increased levels of toxic substances are a serious cause for concern, and it is critical that the replacement of the existing Energy from Waste plant is addressed urgently, if the precautionary principle is to be adhered to.

Comparing the emissions from the existing plant with those from a modern, compliant EfW plant (based upon conventional Energy from Waste plants in the UK), it is clear that, for every day the old plant is running, pollutants are being produced in quantities that would be produced over the course of months, if not years, from a new plant. In recognition of this problem, the Waste Strategy Steering Group has requested a study on the impact of the emissions and the results of this study will be used in the Environmental Impact Assessment and Health Impact Assessment for the new plant.

Pollutant	Existing Plant	New Plant	Days of new plant operation equivalent to ONE day of old plant
Hydrochloric Acid, mg/Nm^3	700	5	140
Sulphur Dioxide, mg/Nm^3	600	10	60
Oxides of Nitrogen, mg/Nm^3	400	180	2.2
Dust, mg/Nm^3	60	5	12
Dioxin, ng/Nm^3	10	0.02	500

All emissions are at reference conditions
(dry, Normal Temperature and Pressure, 11% oxygen).

Even the best facilities, with advanced flue gas scrubbing technology, will emit very small quantities of toxic materials such as dioxins, furans, heavy metals, oxides of nitrogen and oxides of sulphur, along with fine particulate matter; but these will be well within the planned EU limits. This is sometimes referred to as the residual pollution burden. Currently, the levels of many of these materials vary with the make-up of the waste stream that is burnt.

SOLID RESIDUES

The waste burnt at the Bellozanne incinerator is different from that at most UK municipal plants because shredded industrial and bulky waste (such as electrical goods, tyres, and carpets) is added to the municipal solid waste in Jersey. An investigation into the composition of the bottom ash from the Energy from Waste plant, carried out in 2002[xvi], suggested that, although total concentrations of constituents were generally within the range of values of other UK MSW bottom ashes, the variability of the waste is the main factor affecting ash quality. Electronic goods and commercial waste contribute to high levels of lead, copper, zinc, mercury, nickel, zinc and antimony, so that they exceed the landfill waste acceptance criteria for hazardous wastes, under certain pH conditions. Currently the ash is disposed of in secure lined pits.

This supports the case for responsible and careful segregation of wastes containing high levels of toxic materials. The reuse and recycling of electrical and electronic goods (see Section 4.9) will reduce the amount of heavy metals appearing in ash, allowing the bottom ash to be recycled as a secondary aggregate.

5.2.2 The case for replacing not refurbishing the existing energy from waste plant

If the existing plant is to comply with the current EU standards and the Protocols under the 1979 UN Geneva Convention (see Section 1.3), substantial investment would be required. Arguments have been put forward that a programme of refurbishment might make it possible to continue to use the existing plant beyond 2009. This option was examined by the Committee and their consultants, Babtie Fichtner, in 2001[xvii]. In order to make the existing plant suitable for long-term operation, Babtie Fichtner identified that:-

- an additional waste stream would need to be installed;
- a Flue Gas Treatment plant would need to be installed;
- there would need to be considerable refurbishment of the existing boilers and infrastructure, most of which are 25 years old.

The estimated cost for this in 2001 was £41m (see Appendix E). Although feasible, the result would be a plant that was not easy to operate or maintain, due to the mixture of old and new components, requiring an increased level of staffing and an increased operating budget. Also, the life expectancy of the oldest two streams is limited, no matter how much refurbishment (short of full replacement) is carried out. Disruption to the existing facilities during construction would be significant and it is likely that waste would need to be diverted to storage or other disposal routes for several weeks, while common parts were refurbished.

In summary, refurbishment does not provide value for money for Jersey.

5.3 Available technologies

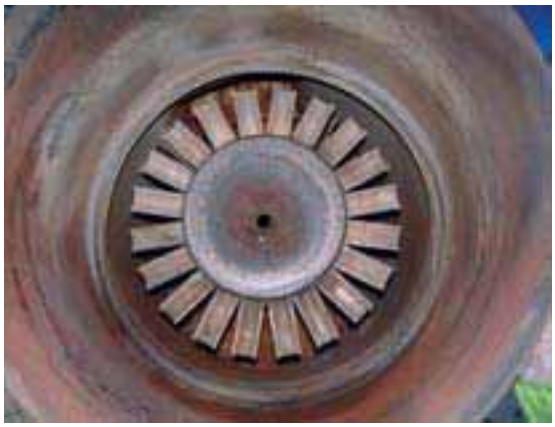
There are a number of technologies to recover the energy contained in the residual waste - the main features of these are discussed below.

5.3.1 Refuse derived fuel technologies

Mechanical Biological Treatment (MBT). The raw waste is processed by a combination of mechanical and biological treatments. Different facilities can either separate mechanically first, or treat the whole waste stream by composting it (biological treatment), prior to mechanical separation, but the end results are similar. As an example, the waste is typically shredded, then allowed to putresce under controlled air conditions. The putrescing process creates heat and dries the waste. The resulting product is quite dry and quite stable, making it easier to process into:

- an energy rich Refuse Derived Fuel (RDF);
- extracted metals (normally separated ferrous and non-ferrous);
- a fine fraction containing organic and inert material.

Typically, one tonne of waste would produce about 450 kg of RDF, 250 kg of vapour, 30 kg of metals and 270 kg of residue. The residue can be further composted and used as low quality compost for landfill cap (but it still contains heavy metals). Examples of such systems are common in Germany and Austria. In the UK there are several purpose-built operating facilities linked to Energy from Waste plants (e.g. Slough Heat and Power and Neath Port Talbot) and some in construction using the Ecodeco technology.



Mechanical Treatment. The raw waste is processed by screening, normally in a large drum, and often shredded or crushed in a ball mill. The coarser fraction can then be further divided into a light fraction and a heavy fraction. The coarse light fraction is a form of RDF, containing mainly paper and plastic. The remaining fractions can be mixed with water to produce a slurry for anaerobic digestion (AD, see below) and rejects, which are normally landfilled. An example of such a system is the hammer mill installed at Leicester by Biffa, producing RDF and slurry for AD.

Steam Autoclaving. A process that has been heavily marketed in the UK is the steam autoclave. Residual waste is fed into a large drum, which is closed and pressurised with steam. The drum rotates for a period, while steam is injected. This results in the paper and other biodegradable material being broken down into a type of fibre, while the plastics, textiles and metals remain in a similar form. Metals are effectively polished while there are difficulties with rags, which bind into other materials preventing effective separation. After a couple of hours, the material can then be screened to separate it into various components, such as metals, plastics and rejects. The biggest stream, perhaps 60% of the incoming total, is the 'fibre' which is a mixture of biodegradable organic material, fine grit and glass. Various uses for this fibre have been proposed, such as RDF, composting to produce a low-quality compost or use in plasterboard, but none of these uses has been demonstrated commercially to date. Examples of such a system are marketed by Brightstar, Estech and Thermsave.

These processes are likely to be expensive for the Island because the RDF would need either to be burnt in a new facility in the Island, whose costs would be comparable to a conventional EfW plant, or to be exported overseas. Markets for this fuel stream are uncertain, and off-takers require a gate fee, as there are relatively few facilities able to burn it and the volume produced is increasing. Shipping would also be a significant additional cost. In

addition, because no landfill exists for non-inert waste, a disposal route would still need to be found for the approximately 27% of residue, which is a mixture of grit, fine organic material and glass.

5.3.2 Energy from waste technologies

Conventional Energy from Waste plant (i.e. Incineration). Modern Energy from Waste plants are built to process all waste and recover energy, usually as electricity, in an efficient manner. They are robust and have been shown to be reliable and effective. The flue gases produced are scrubbed to remove the majority of pollutants of concern. This means that the plants are not considered to create a health risk to the public[xviii]. Such plants are generally based upon conventional grates or rotating kilns, and have high availability. There are about 400 such plants operating in Europe today. The residues are coarse bottom ash, suitable for reuse as aggregates, fine fly ash and flue gas treatment residue (solid or a sludge), which is deemed hazardous.

Fluidised Bed systems. Fluidised beds have been developed as a more efficient method of burning fuel, by adding it to a bed of sand, which is fluidised by blowing air through it. This promotes more complete and efficient combustion. However, it is necessary to pre-treat the waste and remove bulky items prior to burning it. There are a number of fluidised beds operating in Europe. As these would be unable to process all of the waste, and another facility or a landfill would be needed for bulky or dense items, fluidised beds are not considered to be a practical option for dealing with Jersey's entire waste stream. The residues are similar to those from a conventional grate system.

Advanced Thermal Technology. This term is used for gasification and pyrolysis systems (and also anaerobic digestion, see below). In gasification and pyrolysis systems, waste is first turned into a gas, and then, in the majority of these systems, the gas is burnt, either in a boiler or in a gas engine, to produce electricity. The waste is reduced to a 'char' and gas scrubbing residues. The expectation is that such a system will be more efficient than conventional energy recovery plants. There are a number of demonstration-scale plants operating in Europe, perhaps five plants of various technologies and a number of other plants using one other system. There is a lack of evidence to demonstrate that many of the proposed systems can currently be considered as commercially proven for municipal waste treatment[xix]. The Environment Services Association report on the Advanced Technologies[xx] again highlighted that few systems were commercially tested and that the claimed benefits of high efficiency and reduced emissions were in no way proven.

5.3.3 Other technologies

Anaerobic Digestion (AD). AD is not seen as a solution for the main residual waste, because AD systems only work on the organic fraction of waste streams. Any plastic or non-organic material is removed, prior to AD, and would form a residual stream for which an alternative disposal method would be needed; in addition, AD produces a sludge for which there is no appropriate end use. Currently, about 70% of the sewage sludge from the AD plant in Jersey is dried and burnt in the existing incinerator. Any new energy recovery option will need to be able to deal with the Island's sewage sludge.

5.3.4 Combined Heat and Power (CHP)

Whatever energy recovery technology is selected, the facility will produce a combination of heat and power. Therefore, there is an available source of heat in the form of hot water or steam. The existing large-scale heat consumers near Bellozanne are the hospital, schools, States Housing Estates, central offices, and hotels, but pipe infrastructure on this scale is relatively expensive and disruptive to install. The Bellozanne EfW report concluded that CHP was not an economic option for Jersey - the cost and disruption would outweigh potential benefits – and, therefore, an energy recovery plant should be expected to produce only electricity. However, with rising fuel costs, CHP may yet be an important option to limit the use of imported fuels and reduce emissions from premises connected to such a system. If a viable heat demand was identified, heat could be supplied from the plant later, and the possibility will be kept under review, especially with regard to new building developments in the vicinity.

5.4 Making the choice

5.4.1 Criteria For Choice

The new plant must be of current industry standards to meet the EC Directive on the Incineration of Waste 2000/76/EC (WID), which imposes strict emission limits on the main pollutants emitted from any thermal treatment plant. This applies equally to incineration, gasification and pyrolysis plants. No decision has yet been taken regarding the technology to be selected for the proposed new plant.

Environmental Impact and Health Impact Assessments will be undertaken. These ensure that the environmental and health consequences (including vehicle movements) of any scheme are not overlooked, and that any negative impacts of the proposal can be eliminated or mitigated and any positive impacts enhanced. The assessments will involve all relevant stakeholders, including the public, in this important part of the decision-making process.

The following criteria will be used to ensure that the selected plant is suitable for Jersey's needs:

ABILITY TO DEAL WITH ALL RESIDUAL WASTE

The plant needs to be of sufficient size to dispose of the expected residual waste stream in 2034, the end of the plant's anticipated life. Should the waste volume have grown faster, despite the measures proposed in the Strategy, additional capacity will be needed before the end of the plant's life; should the growth of waste be slower than forecast, the life of the plant could be extended. The components in the residual waste are assumed to be similar to the current mix, after allowing for the increased recycling. Sufficient extra capacity must be incorporated to ensure that waste can always be processed and seasonal variations can be accommodated, to prevent potential health problems in the Island from stored waste. Current experience is that peak summer month waste arisings are about 19% higher than the winter minimum.

It is possible to build a smaller plant, with the intention of extending it by adding extra capacity when waste tonnages have increased sufficiently to require it - this was the approach taken with the existing plant. Experience has demonstrated that the resultant mix of technologies and equipment creates a plant that is very difficult to operate. In addition, this is an expensive option - because of scale economies, a larger plant is not much more expensive to install than a smaller one. It is, therefore, proposed to install a plant with a capacity adequate for the Island's future needs.

ROBUST SOLUTION

In many operating European EfW plants, waste is diverted to landfill, when the plant is not operating. This is feasible in most cases because the EfW plant is a fairly recent substitute for landfill, and the landfill operation is close by and remains operational. In Jersey, there is no landfill for non-inert waste. The consequence of this is that the EfW plant must have high availability and standby capacity – after the new facility is commissioned, the existing incinerator will be closed down. If the new facility then fails, the only alternatives would be to store for later incineration or to export. If storage is chosen and the new solution has poor availability, the problem can only snowball. Waste exports as a stop-gap solution would be expensive, as the infrastructure (compactor, containers and loaders) would have to be purchased (and maintained) and transport and landfill capacity abroad secured through retainer payments. That is why the Committee considers that a tried and tested technology is essential for Jersey, rather than unproven designs.

VALUE FOR MONEY

To ensure value for money, consideration will be given to project, capital and operating costs anticipated through the plant's life, together with revenue from electricity or heat sales. Performance guarantees will be required, backed by a payment retention or bond.

A range of technologies is represented on the list of possible suppliers for the new plant and to ensure value for money the new energy from waste facility must be tendered in a competitive arena. To achieve this, the number of tenderers must be enough to provide competition and the select list must remain confidential. This process prevents open discussions regarding specific companies and the technologies offered within this document.

At all costs, the Island must not lose the element of competition on such a large project. If one particular technology is specified over another then all of the Island's commercial and contractual advantages will be lost.

One final point to note is that the Committee has to show to the industry that Jersey is a credible client and that this project is worth tendering for. This may appear a strange concept, but the Island is a very small player within this field, as the Island will only purchase one relatively small facility every 25 years.

5.4.2 The procurement process

Section 5.3 highlights the main residual waste disposal technologies available in the European market. To ensure that the maximum opportunity was given for technologies to be brought forward, the Waste Strategy Steering Group placed a Notice in the Official Journal of the European Communities (OJEC) in August 2003, seeking Expressions of Interest from companies with the relevant experience and ability to design and build a facility to deal with Jersey's non-inert waste. The public sector and utilities in EC member states are required to publish an OJEC invitation to tender for contracts above €200,000 in value, and so it is keenly read by suppliers of goods and services.

The following are relevant paragraphs from the OJEC notice:

'It is essential that the Contractor can offer a proven and reliable solution. The contractor is requested to provide the following information to demonstrate this capability:

- A description of the proposed solution for Jersey including proposed plant capacities and drawings showing plant footprints.

- Operating records from at least two reference plants of a similar capacity to that proposed. The reference plants should process similar types of waste. Details should be provided showing several years throughput at each reference plant, together with a contact at each plant.
- A Reference list showing similar projects using the proposal solution(s) which have been successfully completed, showing client, location, type of waste, capacity of plant and date of completion.
- Evidence that the Contractor can demonstrate compliance with UK (or equivalent) Health and Safety Regulations.
- Evidence that the Contractor's proposed solution will comply with European Environmental Regulations and Best Practice.
- Acceptance by the Contractor that the performance of the plant will be demonstrated against commercial process guarantees with consequential liquidated damages.
- The Contractor is requested to provide a budget capital cost for the proposed solution together with estimates of annual operating costs and staffing numbers. This information shall be based upon existing operating facilities.

Eleven initial responses to the OJEC Notice were received in September 2003; five companies are being given further detailed consideration, offering processes for

- mass burn,
- gasification,
- a hybrid system.

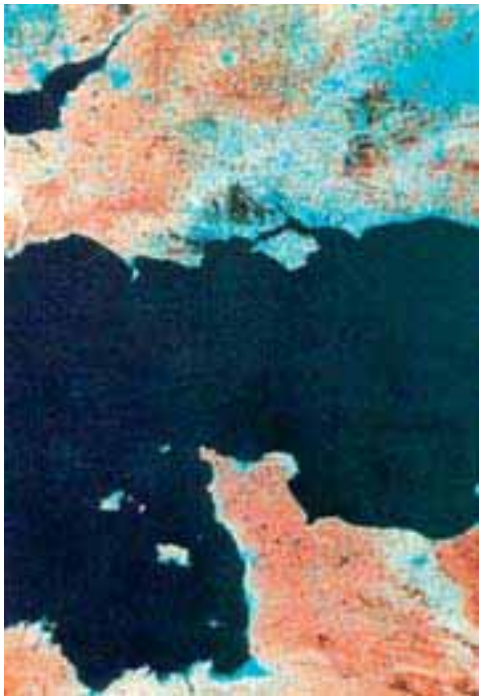
Commercial confidentiality precludes giving further detail at this stage. When States agreement has been given, the next step is the tendering phase. After the Committee has appointed technical consultants for the procurement phase, a functional specification will be drawn up as a basis for tenders.

The final decision on the detail of the technology will be made within the formal tender process. The best value tender that meets the technical requirements of the specification will be chosen. Companies that submit a formal tender will all be assessed against a set of criteria to ensure they receive equal treatment.

5.4.3 Possible joint solution with Guernsey

In parallel with the development of this Strategy, the States of Guernsey has been reviewing its waste management options, and it seems that there might be joint benefit to be gained through economies of scale from a single EfW plant meeting the needs of both Islands. Exploratory meetings have taken place and preliminary feasibility studies carried out, but it is not clear yet whether the potential savings would cover the additional transport costs.

5.5 Recommendations



It is recommended that:

- investigations continue with the States of Guernsey to identify cost advantages in a joint facility for EfW;
- The Committee will commission an Environmental Impact Assessment and a Health Impact Assessment on the preferred site, which is identified in the Island Plan as Bellozanne. Studies will also be carried out on La Collette, as an alternative site and these studies will inform the decision of the best site location and identify any additional requirements on the plant, to ensure that any negative impacts of the proposal on the environment or health of the population can be eliminated or mitigated, and any positive impacts enhanced;
- The Committee will seek formal tenders for a new energy recovery plant to dispose of the residual waste, after recycling andcomposting. This facility should be capable of disposing of the forecast residual waste throughout its anticipated life and must include sufficient standby capacity to ensure that the plant provides a safe and secure disposal route.

6.0 Disposal

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6.0 Disposal

After all options further up the Waste Hierarchy have been exhausted, final disposal is the only alternative, and the least favoured under the Hierarchy. It is inevitable that, despite all other activities at higher levels of the hierarchy, there will be some waste that has to be disposed of. The only route for disposal is to landfill, following the prohibition of dumping at sea, under the Convention on the Prevention of Marine Pollution by Dumping of Wastes (The London Convention).

Most landfilled waste is classed as inert – that is, it will not change over time following chemical or biological processes, and the only precautions needed are to ensure that the resultant land achieves the desired shape and has the strength and surface treatment necessary for its intended use. However, some wastes are classed as hazardous, and those considered for landfilling have to be treated with care. Although inert in that they are not subject to chemical or biological breakdown, they contain components that would harm the environment and/or pose health hazards, if released. These are disposed of in lined pits, which are sealed when full. Environmental monitoring ensures that these pits retain their integrity, and a full inventory of the contents is maintained.

The only landfill site in current use is at La Collette, a marine land recovery facility with an estimated capacity sufficient to last until around 2015, although this Strategy makes recommendations that will extend the site's lifetime. A decision will be needed on the location of a replacement site in sufficient time before La Collette is full. There are considerable environmental arguments against a further marine reclamation site; a worked-out quarry site has the advantage of ultimately rehabilitating the site, although it is not clear whether such a site will be available at the appropriate time. Work will continue on this subject with the objective of developing a strategy for States' approval in good time.

Any proposed site would be the subject of Environmental and Health Impact Assessments, as part of the planning process.

6.1 Inert waste

Current annual arisings: 230,000 tonnes

Virtually all the inert waste derives from construction and demolition activities. Modest quantities are recycled, but this is limited by the need to ensure sufficient stone is included in the landfill site to ensure that the resultant filled land area is stable and suitable for future uses. La Collette, when full, is intended for light industrial use, and this imposes some constraints on the mix used for fill.

It is also necessary to keep full records of the fill material to facilitate future civil engineering works for construction on the site.

6.2 Ash, asbestos and flue gas treatment residues

Current annual arisings: 45 tonnes of asbestos
2,800 tonnes of fly ash
14,100 tonnes of bottom ash

Bottom and fly ash are deposited in secure pits at La Collette, which are constructed to ensure the materials deposited cannot escape to the environment. Once filled, they are capped. Regular monitoring is being introduced to check that no escapes occur, such as by leaching from the pits.

New EfW plants have significantly improved flue gas cleaning, resulting in very low levels of emission to atmosphere; however, this is offset by the concentration of the toxic materials in the waste from the cleaning process, commonly referred to as flue gas treatment residue when in a dry state, although some cleaning systems use wet scrubbing techniques which give rise to a liquor. They require special handling and disposal to hazardous waste sites, or alternatively concentrating for recovery of elements of value or vitrification at high temperature.

Depending on the flue gas treatment system adopted, up to 4,800 tonnes of dry residue a year will have to be disposed of in lined pits.

Asbestos arises mainly from the demolition of buildings and is disposed of in special sealed containers at La Collette.

The intention is to continue with the disposal of this type of solid hazardous waste in secure pits, in the short term. If no suitable site can be identified in the Island when La Collette is full, it may be necessary to export this waste to secure sites overseas. Alternative treatment systems of fly ash will continue to be evaluated and will be adopted, if they can demonstrate environmental benefit.

6.3 The future

Waste regulation will be tightened, to give proper control of the inert waste and to ensure that all hazardous materials are separated. The adoption of a regulatory system, with a regulator and waste licences for facilities, should ensure that best operating practices are followed, and the inert waste disposal has no significant environmental or health impact. Fiscal measures will be introduced to encourage attention to minimising inert waste.

The Island is limited in its options for the disposal of inert waste and the waste outputs from any energy recovery process, after the completion of the La Collette site in around 2015. Therefore the Waste Hierarchy must be strictly applied to the Island's current waste management challenges to minimise the need for disposal sites. This will be particularly relevant to the generation of construction inert waste, which forms the bulk of the material going to disposal. Options will be explored in parallel with the policies of the Island Plan and the Mineral Strategy, which

suggests that disused quarry workings will be considered for disposal sites and which would have the advantage of rehabilitating old mineral workings.

Long-term options for the treatment of flue gas treatment residues will be considered, such as continued disposal in sealed pits, export to disposal facilities in Europe or in-Island treatment.

6.4 Recommendations

The Waste Hierarchy will be strictly applied through planning policies and also through recycling and reuse opportunities to minimise waste needing disposal. This should be reinforced by fiscal measures. This will extend the life span of La Collette to beyond the currently predicted completion date of 2015.

Identify a new landfill site before La Collette is full. Capital investment will be required for this and a full Environmental and Health Impact Assessment will be fundamental to identifying a new site. The date will be kept under review, and proposals will be brought forward at an appropriate time, taking account of other Strategies, such as the Mineral Strategy.

The Committee will ensure removal of the electronic/electrical waste components from the material delivered to the Energy from Waste plant, thus reducing the amount of hazardous constituents appearing in ash. This will allow the bottom ash to be recycled as construction aggregate.

The Committee will ensure that fly ash and flue gas treatment residues are disposed of safely, in managed landfill, in accordance with best practice.

7.0 Location

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7.2 Reuse and recycling centre (including bulking and baling facility) 87
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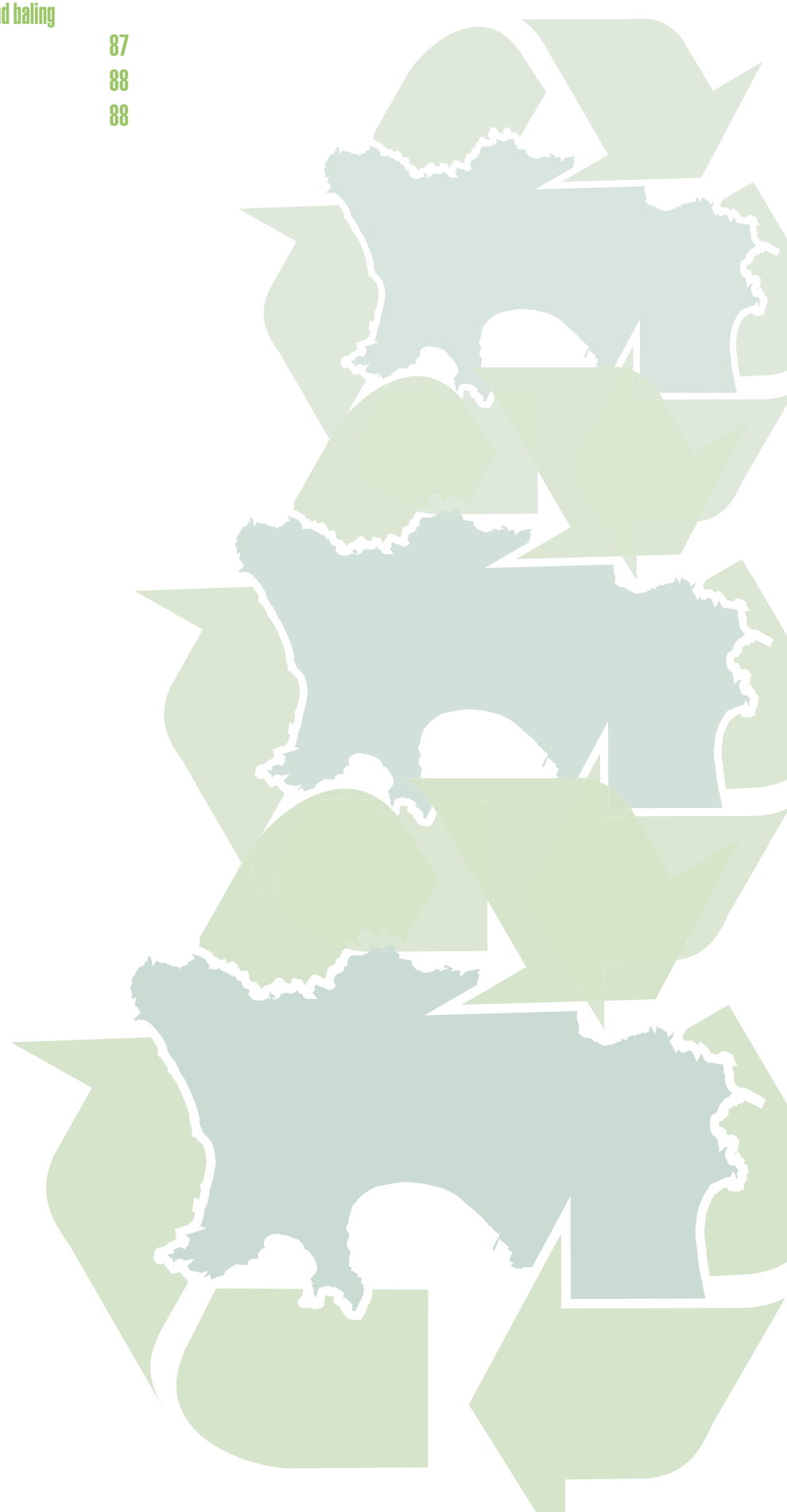

7.0 Location

Developing more sustainable levels of waste management will inevitably place different demands on land-use resources. Modern best practice has moved towards greater source separation of individual materials to minimise contamination so as to facilitate recycling. Another shift is the application of integrated solutions where a range of techniques are applied, including composting and other forms of technology. This is returning the emphasis to a greater number and variety of facilities. Finding sites and suitable space for such operations, which are often regarded as bad neighbours, will always present a challenge in a small, densely-populated island.

To achieve the enhanced levels of composting and recycling proposed in this strategy, new infrastructure is required. In a recent household survey conducted by the Jersey Consumer Council on the subject of waste management, 84% of respondents cited lack of facilities as the main reason they don't recycle more. Conveniently located, well presented and high profile facilities are required for source segregation of recyclables. Siting and design of other infrastructure such as a replacement Energy from Waste plant and composting facilities will need to account for potential bad-neighbour issues such as vehicle movements, noise, odours and visual impacts.

Environmental impact assessments will set out exactly what the development and operation of these facilities will mean for aspects such as local air quality, local traffic generation, noise and safety.

They are required as part of applications for development permission and will help the Committee decide whether the preferred (or any alternative) sites can appropriately accommodate these new facilities.

7.1 Bring banks

Currently a network of collection containers or bring banks exists for the public to deposit waste textiles, aluminium beverage cans, glass (in St Helier) and newspaper and magazines. Each of these collection systems is run by a different organisation. There is little co-ordination between the schemes and very few sites are multi-material which is less convenient for users. Despite this, the schemes are fairly well patronised, which suggests that an improved system could generate respectable recycling rates.

Although managing waste in a small island introduces a number of extra challenges, this is one area where local geography and the parochial system should assist with success. A bring site or mini recycling centre in each parish is likely to be popular. These sites could be augmented by other collection points at well-visited locations, such as supermarkets.

Well designed and maintained sites are vital, as poor levels of cleanliness and visual appearance can discourage users and patronage will suffer. Experience elsewhere is that the popularity

of bring sites can be improved by treating users intelligently, with information on-site explaining what happens to the materials after collection and the amount of materials recycled to date.

To assist in the expansion and enhancement of the current bring bank system, it will be important to use Planning controls to ensure suitable space is allocated for these facilities in new development projects.

RECOMMENDATIONS

Develop an Island-wide network of mini-recycling centres. Each centre should provide a collection point for each of the materials being recycled. This project would need to be initiated and co-ordinated by the States, but working closely with the parish authorities. Initially the sites would cater for steel and aluminium packaging, textiles, newspaper and magazines and high quality plastics.

Work with administrators of sites frequently used by the public, such as community centres and supermarkets, to install extra collection points for materials to augment the network described above.

7.2 Reuse and recycling centre (including bulking and baling facility)

The existing Bellozanne site provides a facility for both commercial and domestic vehicles delivering bulky waste. Opening hours are extended into the weekends for domestic users. Mixing large commercial vehicles with private cars on a busy site (often over 500 vehicle movements per day) is not ideal, and the site layout allows few opportunities for segregating different types of waste.

A new Reuse and Recycling Centre, purpose-built for safe and convenient public access and providing receptacles for a range of separate materials, is needed. This would allow the separation of commercial and domestic users by retaining Bellozanne as the reception site for commercial customers. Model sites exist in other countries, with good signage and vehicular access and features such as a reuse shed, where working appliances and other items can be deposited for others to put back into service if they choose.

The proposed operation would include bulking and baling facilities for the efficient storage of recyclables destined for off-Island reprocessors. Materials collected from the bring bank system would also be managed here. Ideally this facility would be located near the main port which would allow larger vehicles to be used for exporting the recycled materials, thus maximising efficiency.

RECOMMENDATIONS

Develop a Reuse and Recycling Centre for domestic users including an integrated bulking and baling facility to manage

source segregated materials to be exported for recycling. La Collette may provide a suitable location for this facility, subject to the consideration and amelioration of any health, safety, environmental and traffic implications and planning consents being granted.

7.3 Composting facility

The location of the green waste composting facility has been a continual problem since inception. The nuisance issues, particularly smells, have tarnished the image of this valuable recycling process. As described in Section 4.7, the recommendation is to install an enclosed, in-vessel composting facility with air filtering equipment, which will prevent nuisance odours.

For the most efficient operation, the facility should be adjacent to the Reuse and Recycling Centre, improving public access, minimising transport costs and sharing staff with the Centre. The building will be sized to cope with the green waste arisings currently envisaged, with provision for expansion if agricultural or kitchen green waste has to be dealt with in the future.

RECOMMENDATION

Develop a Composting Facility for green waste. The facility will be sized for anticipated volumes of waste, with room for expansion to accommodate agricultural or kitchen waste should this become necessary. La Collette may provide a suitable location for this facility, subject to the consideration and amelioration of any health, safety, environmental and traffic implications and planning consents being granted.

7.4 Energy from waste plant

The preferred location for the new plant is in Bellozanne Valley, as stated in the Island Plan, Policy WM4, approved by the States in July 2002. This is the site of the current Refuse Handling Plant (RHP), handling bulky waste, near to the existing Bellozanne EfW plant. Construction of a new plant on this site would involve only limited disruption to current operations, and the waste management operation would continue to use the existing infrastructure. Being sited in a valley, the plant would be much less visible than at other sites, such as La Collette.

La Collette has two disadvantages:-

- it is near the coast, and very visible from the sea; and
- roads in the area are already congested, and the resulting increase in traffic would have to be considered. However, changes are planned to the commercial traffic flows associated with freight from the Harbour area, and this should reduce slightly the present levels of traffic in the area.

A preliminary study was carried out, in December 2004, into the option of having a joint EfW plant to serve Guernsey and Jersey.

Guernsey would ship its waste to Jersey, in which case it would be essential to locate this EfW plant close to the Harbour to keep road transport to a minimum. La Collette would be the obvious location for this plant, which would be considerably larger than a plant to serve Jersey alone. The area to the west of the existing JEC Power Station was investigated, as a plant here would be less visible than one on the Reclamation Site, and it could benefit from the proximity of the existing Power Station facilities. In this case, it would be necessary to relocate the existing Abattoir and some of the JEC facilities; the considerable cost of these enabling works was taken into account. The conclusion of the report was that the economies of scale, in having a single plant to serve both Islands, could offset the additional costs of shipping the waste and of relocating the existing facilities from the site at La Collette.

La Collette could be considered for the location of a Jersey-only plant, but a study would be required to determine how the costs would compare with the Bellozanne site. Subject to approval of the Strategy, the EIA will be commissioned for both sites and a more detailed financial appraisal undertaken to assess the additional costs of building a Jersey-only solution at La Collette.

If the new EfW plant occupies the current RHP site at Bellozanne, the RHP will be relocated to La Collette during the construction of the new plant. Following the commissioning of the new EfW plant, the old plant will be demolished, and a new RHP facility will be provided on the site of the existing EfW plant at Bellozanne. This will be intended for commercial use, and the public would use the Reuse and Recycling Centre. However, if the new EfW plant is constructed at La Collette, it may be more practical to locate the RHP at La Collette permanently.

RECOMMENDATION

Commission environmental and health impact studies once the Strategy is approved by the States. These studies, together with a decision on the joint Jersey/Guernsey solution, will provide the basis for the final site selection.

8.0 Financial appraisal

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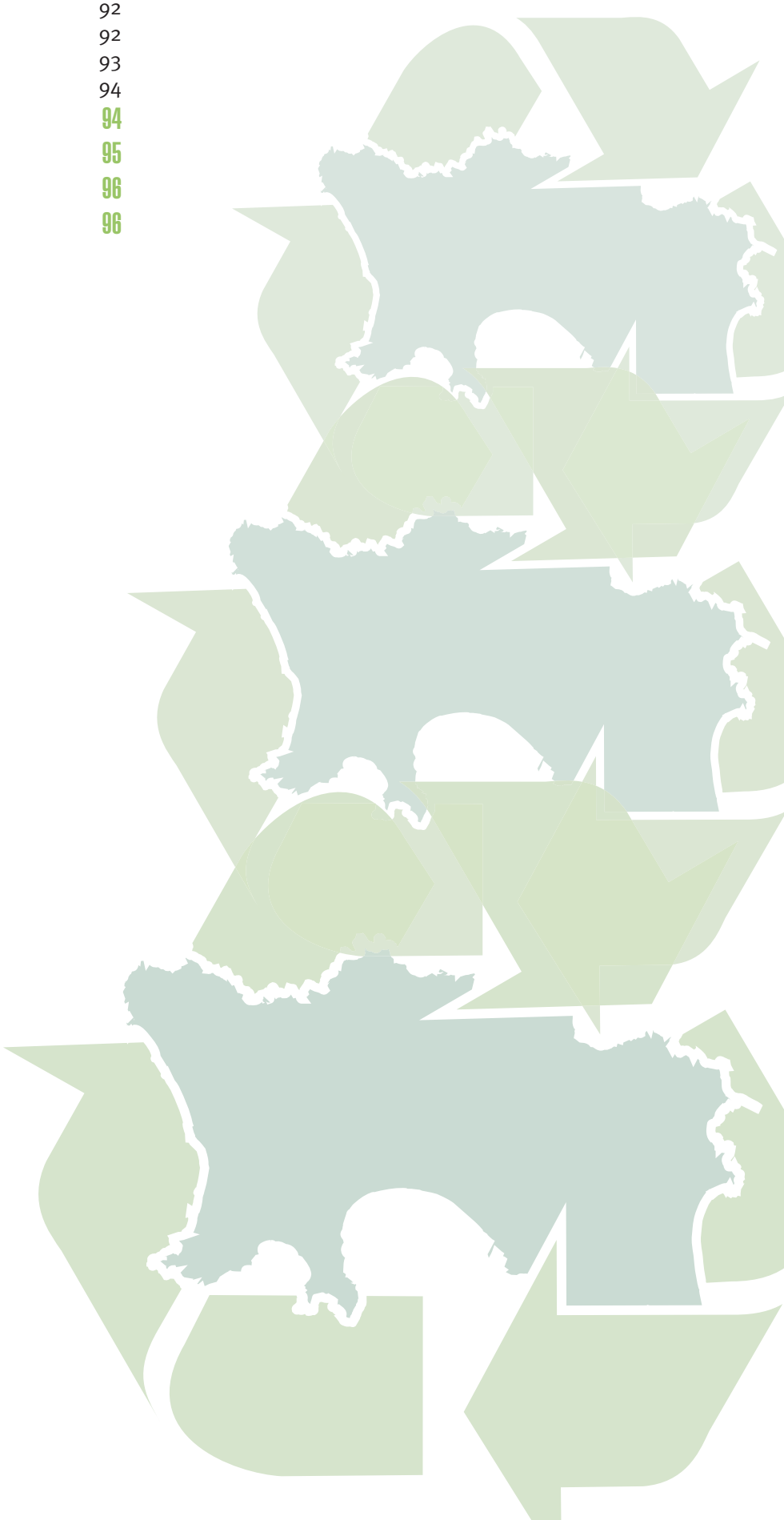


8.0 Financial appraisal

8.1 Capital expenditure

The estimates used here are based on current trends in the UK waste market and an allowance has been made for local factors. Actual costs for each project will be known when individual tenders have been received.

8.1.1 Reuse and recycling centre

The capital cost is estimated at £1.4m (2004 prices). On the assumption that the facility is located at La Collette, the costs of providing local basic infrastructure will be met from the Committee's existing capital vote for infrastructure at La Collette. (If an alternative site is required, for example as a result of the Planning process, there is likely to be additional cost.)

Civil Works	**£**
Concrete for platforms, foundations, tipping & unloading areas	420,000
Lightweight buildings for operations, 'swap shop', recycling	600,000
Plant & Equipment	
Compactor	50,000
Relocate baler from Bellozanne	15,000
Containers	100,000
Glass processing	225,000
Total	**£1.4m**

8.1.2 Composting facility

The capital cost is estimated at £3.9m (2004 prices). On the assumption that the facility is located at La Collette, the costs of providing local basic infrastructure will be met from the Committee's existing capital vote for infrastructure at La Collette. (If an alternative site is required, for example as a result of the Planning process, there is likely to be additional cost.)

Civil Works	**£**
Concrete platforms and building foundations	1,390,000
Creating tipping, loading and unloading areas	180,000
Building to house operations	1,050,000
Leachate control	190,000
Plant & Equipment	
Composting vessels	810,000
Atmospheric management	150,000
Material handling	130,000
Total	**£3.9m**

8.1.3 Energy from waste plant

The capital cost is estimated to be £75.5m (at 2004 prices). This is based on likely costs for a conventional technology plant, although no decision on technology will be taken until tenders are received.

Item	2004 Costs
Development of Solid Waste Strategy and Project Planning (PSD, and Technical, Legal and Financial Advisers)	£2m
Relocating Refuse Handling Plant, plus Site Preparation (for EfW Plant)	£3.0m
Enabling Works – Electrical Upgrading, Grid Connection, and Demolition of Old EfW Plant	£6.5m
Cost of New EfW Plant (equipment & construction) (See Notes below)	£62m
Project Management Costs (during and following construction)	£2m
Total Estimated Capital Cost	**£75.5m**

Important Notes:

- It must be emphasised that these costs are estimates, based on similar plants recently built in the UK, with a Jersey allowance applied.
- It has been assumed that the total costs will be funded from the States capital programme and, therefore, borrowing of the funds will not be necessary. (If the funds had to be borrowed, interest charges would be incurred and these would have to be added to the costs above.)
- These costs have been estimated at December 2004 prices, and the final out-turn costs will differ.
- Although no final decision has been made on the type of technology to be used, for the purposes of this cost evaluation the estimates are based on an example of a conventional two-stream incineration plant. The capacity of the Plant has been based on the assumed quantity of residual waste as identified in the Strategy. **This is smaller than used in the consultation document**. The cost of the Plant could vary significantly, depending on the final choice of technology and capacity.
- The companies competing in the market for these plants fluctuate, and the tenders obtained will be subject to market forces.

- It has been assumed that the main facility will be procured as a turnkey contract, with the States owning and operating it and providing the finance. This is the option that has been recommended by PricewaterhouseCoopers (in their Procurement Report) and by the Technical Advisers.

- A balanced view has been taken in these estimates. An optimistically low estimate will run a serious risk of being exceeded, while a pessimistically high estimate will make the project seem out of reach.

8.1.4 Bellozanne covenant

When the Bellozanne site was sold by the Parish of St Helier to the Public of the Island, a covenant was included, stipulating how waste should be received. The legal advice to the Committee is that it is implicit in this obligation to accept the refuse free of charge. The Committee has made preliminary investigations into the options for resolving this situation, and will negotiate with the Parish of St Helier to find a satisfactory way forward. This may incur some costs which cannot be quantified in advance of discussions with the Parish.

8.2 Revenue expenditure

REUSE AND RECYCLING CENTRE AND COMPOSTING FACILITY

The operating costs of the Recycling Centre and the Composting Facility will be met from the existing revenue budgets for Solid Waste processing and handling, Recycling, and Composting. (Existing revenue budgets £2.24m.)

ENERGY FROM WASTE

The operating costs of the EfW Plant will be met from the existing revenue budget for Energy from Waste. The increase in operating costs will be offset by the additional revenue from the sale of the increased quantity of electricity generated. (Existing revenue budget £2.21m.)

RECYCLING SCHEMES

Most materials exported from Jersey for recycling have to be subsidised, because the value at the recycler's gate is less than the handling and shipping costs. The quantities forecast to be recycled by 2010 will require subsidising by the amounts given below, based on February 2005 values for the materials. Note, though, that these market values are very volatile.

Material	Tonnage recycled (2010)	Subsidy required (£ pa)
PET plastic	119	2,000
Ferrous cans	731	22,000
Domestic paper & card	8,613	472,000
Packaging timber	1,495	161,000
Electrical and electronic goods (domestic)	250	30,000**
Total		**687,000**
Aluminium cans	100	(50,000 potential income)*
Total		**637,000 inclusive of aluminium income***

* The Committee's current policy is to encourage private enterprise to carry out as much of the recycling as possible, and the more profitable materials will be more attractive to them. Therefore, the income from the profit on these materials would not necessarily come to the Committee to offset the subsidy on other materials.

** assumes a reprocessing cost of £20/tonne

It is anticipated that the other materials (e.g. textiles, office paper) can be recycled at no cost to the States, because of lower transport costs per tonne and higher values at the reprocessor's gate. Glass is excluded as it is not exported, and costs will not be substantially different from the present. There is no allowance in these figures for kerbside collection costs; an estimate of the annual collection costs from the proposed bring bank network is £150,000, which will require additional revenue funding.

The Committee's existing revenue budgets are sufficient to cope with the recycling initiatives up to the level of recycling that was previously proposed (29%), but to increase to the level of 32% proposed now will require additional revenue funding in the order of £300,000 per year.

8.3 Funding

Waste is an Island-wide problem and this Strategy identifies the sustainable, long-term solutions for dealing with it in the most appropriate way for Jersey.

The funding required for the capital works required to deliver this Strategy is substantial:

- Reuse and Recycling Centre - £1.4m
- Composting Facility - £3.9m

- Relocation of Refuse Handling Plant, plus Site Preparation (for EfW Plant) - £3.0m
- Energy from Waste Plant and enabling works - £72.5m

It is proposed that the cost of providing the enclosed Composting Facility, estimated at £3.9m, the Recycling Centre (civic amenity site), estimated at £1.4m, and relocation of the Refuse Handling Plant plus Site Preparation for the EfW Plant, estimated at £3.0m, (all at a 2004 price base) should be met from the States capital programme in 2006.

It is recommended that the States should request the Policy and Resources Committee to propose the inclusion of a funding strategy for the Energy from Waste Plant and the enabling works required to clear the site and upgrade the infrastructure, estimated at £72.5m (at 2004 costs), within the States Business Plan 2006-2010 by, if necessary, re-prioritising or deleting existing projects, or by identifying additional sources of funding.

However, the Committee will develop, alongside this, funding solution proposals for alternative funding in the form of environmental taxes. If these are approved by the States, they will reduce the burden on the capital reserve allocation.

Additional revenue (operating) expenditure will also be required. The total annual cost of recycling initiatives is estimated at £687,000 with additional collection costs of £150,000. Some of this can be met from existing revenue budgets, but an additional annual revenue expenditure of £450,000 will be required by 2009 to achieve the proposed recycling targets. This additional revenue expenditure will be the subject of a bid in the Fundamental Spending Review process in 2007, and, in the interim, the initiatives will be rolled out subject to availability of funds.

The Committee will take a considered, long-term view for the implementation of the various initiatives of the Strategy.

8.4 Manpower resources

Manpower requirements for the implementation of the Strategy will be dependent on both the technology chosen and the location of the various facilities. During the construction of the new EfW Plant, there will be a period of overlap, where the old Plant is still running and the new Plant is being finalised and commissioned. During this period, there will be a requirement for additional staff. This will be a temporary situation, and preliminary indications are that the new EfW Plant will require the same number or fewer staff.

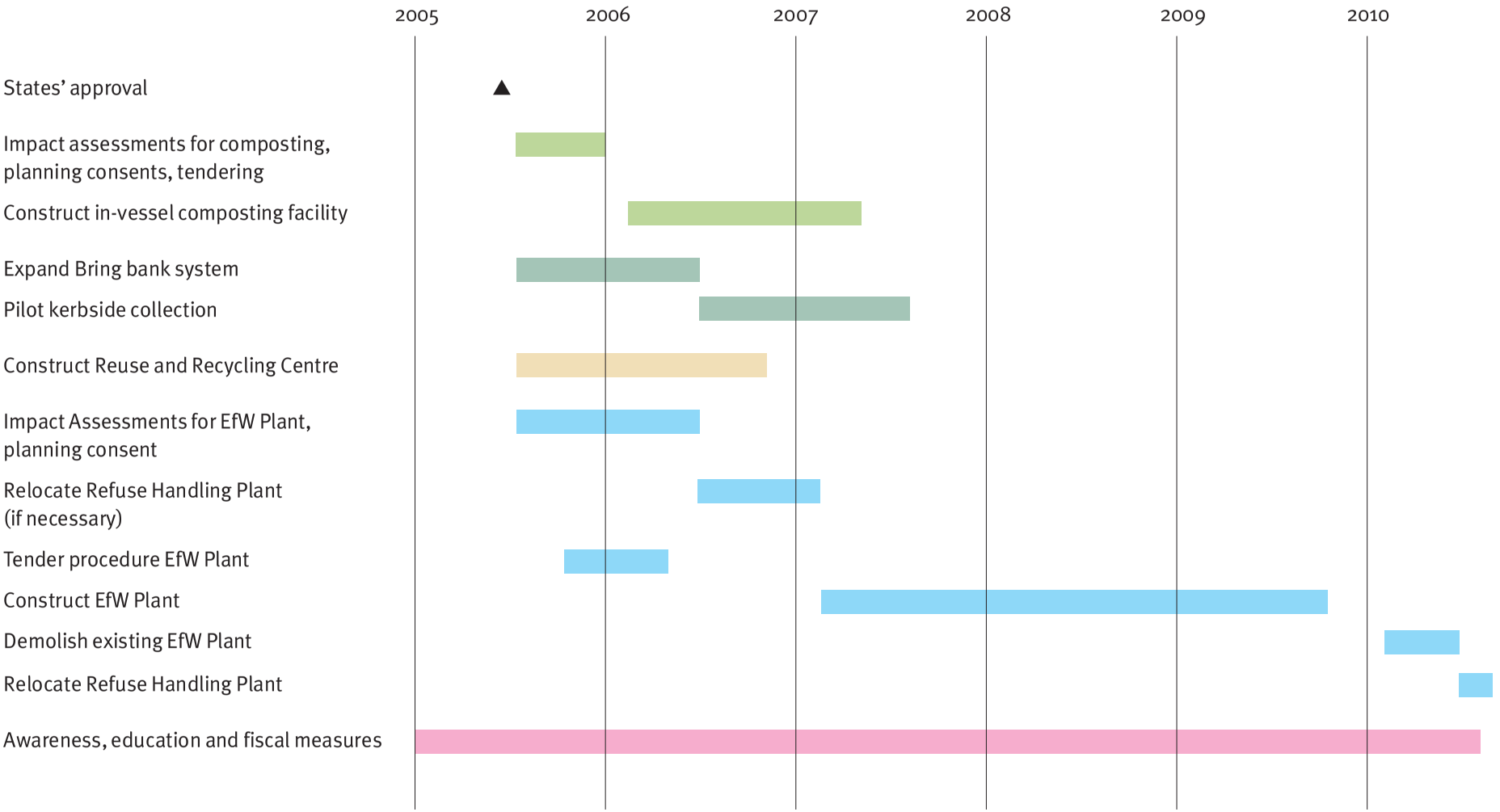
8.5 Recommendations

The States should request the Policy and Resources Committee to propose the inclusion of a funding strategy for the capital projects, identified in the Solid Waste Strategy, within the States Business Plan 2006-2010 by, if necessary, re-prioritising or deleting existing projects, or by identifying additional sources of funding.

The States should request the Finance and Economics Committee to take States decisions on the Solid Waste Strategy implementation into consideration, when proposing the allocation of revenue funds in the resource allocation and budget processes 2006-2010.

9.0 Programme

The programme for key steps in the Strategy is set out here in bar chart format. The dates are estimates.



10.0 References

[i] WEEE Directive 2002/96/EC. End of Life Vehicles Directive 2000/53/EC.

[ii] Pollution Prevention and Control (England and Wales) Regulations 2000 SI 2000/1973

[iii] Fichtner Consulting Engineers 'Review of Waste Strategy' (report 0608-0100-0091 waste strategy report rev4) issued in July 2001

[iv] Case studies on waste minimisation practices in Europe, Topic Report 2/2002 by European Environment Agency

[v] Data source ENDS report October 2000 (issue no 309). Data is most recent year available. Jersey data provided by Jersey PSD, latest UK data from DEFRA website.

[vi] Eurostat statistics available on http://europa.eu.int/comm/eurostat.

[vii] 'Application of Waste-to-Energy Solutions on Islands Opportunities and Considerations', by Nafsika Zevgolis. Available from www.islenet.net

[viii] Data provided by Jersey PSD based upon weighbridge records at Bellozanne and other waste reception facilities.

[ix] Composition estimated from various UK sources – EA waste analysis 1999, Hounslow, Cheshire and Scotland.

[x] UK BSI PAS 100 and EU BTB –2nd Draft Class 2

[xi] Directive 2000/76/EC of the European Parliament and of the Council of 4th December 2000 on the incineration of waste.

[xii] Directive on Hazardous Waste 91/689/EEC

[xiii] Decision 2000/532/EC as amended by decision 2001/118/EC

[xiv] Clarke, A.G. (1994). 'Dioxins in Jersey Soils. A Report to the States of Jersey Planning and Environment Committee'. CREH, The Environment Centre, Leeds.

[xv] Clarke, A.G. (1998) 'Dioxins in Jersey Grass and Milk. A Report to the States of Jersey Planning and Environment Committee'. CREH, The Environment Centre, Leeds.

[xvi] 'Jersey bottom ash characterisation 2003: full characterisation', A report for the Public Services Department

[xvii] 'Bellozanne Energy from Waste Plant: Development Strategies' (report 0608-0100-0167 EfW Final report) issued by Fichtner in June 2001 for Jersey PSD

[xviii] Various UK planning inquiries, for example for energy from waste facilities at Hull and Kidderminster.

[xix] 'Waste Management in Island Communities: Strategy to Integrate Waste-to-Energy Policies', 5th Framework Programme of the European Commission, DG-TREN

[xx] 'The Viability of Advanced Thermal Treatment of MSW in the UK', published by the Environmental Services Training and Education Trust in March 2004, written by Fichtner Consulting Engineers Ltd.

11.0 Glossary and Abbreviations

AD	Anaerobic Digestion – biological breakdown of organic material
BAT	Best Available Technology
Biodegradable	Capable of being decomposed by bacteria or other living organisms. Examples of biodegradable waste are vegetable peelings, paper and natural fibre textiles.
BPEO	Best Practical Environmental Option
BSE	Bovine Spongiform Encephalopathy ('mad cow disease')
CHP	Combined Heat and Power – a plant supplying heat as well as electricity
E&PSC	Environment and Public Services Committee
EIA	Environmental Impact Assessment
EfW	Energy from Waste
EU	European Union
EU15	The first 15 European member state countries
FGT	Flue Gas Treatment – chemical cleaning of flue gas to minimise potentially harmful emissions
HCl	Hydrochloric Acid – an acidic component of flue gases
HIA	Health Impact Assessment
Inert Waste	Waste which is stable in the presence of normal biological and chemical agents. Examples include concrete, brick, stone and asbestos.
IPPC	Integrated Pollution Prevention and Control
LCA	Life Cycle Analysis
MRF	Material Recycling Facility, where mixed waste is separated into different material streams to assist recycling
MSW	Municipal Solid Waste – the mixed waste collected by the municipal collection service
MWSF	Mixed Waste Sorting Facility
mg/Nm^3	Milligrams per normal cubic metre
ng/Nm^3	Nanograms per normal cubic metre
Non-Inert Waste	Waste which is not considered inert, from households, commercial and agricultural establishments, consisting of biodegradable and combustible waste and other municipal waste material such as plastic, grit and dust.
NOx	Oxides of nitrogen
Organic	Used here to describe the components in the waste stream such as plant-derived waste and solid residues from the sewage treatment works
PET	Polyethylene terephthalate, typically used to make plastic drinks bottles
PPC	Pollution Prevention and Control
PRN	Packaging Recycling Notes
PSD	Public Services Department
Putrescibles	Used here to describe organic matter that easily decomposes
RDF	Refuse Derived Fuel
T	Tonne (always metric)
Tpa	Tonnes per annum
WEEE	Waste Electrical and Electronic Equipment
WSSG	Waste Strategy Steering Group

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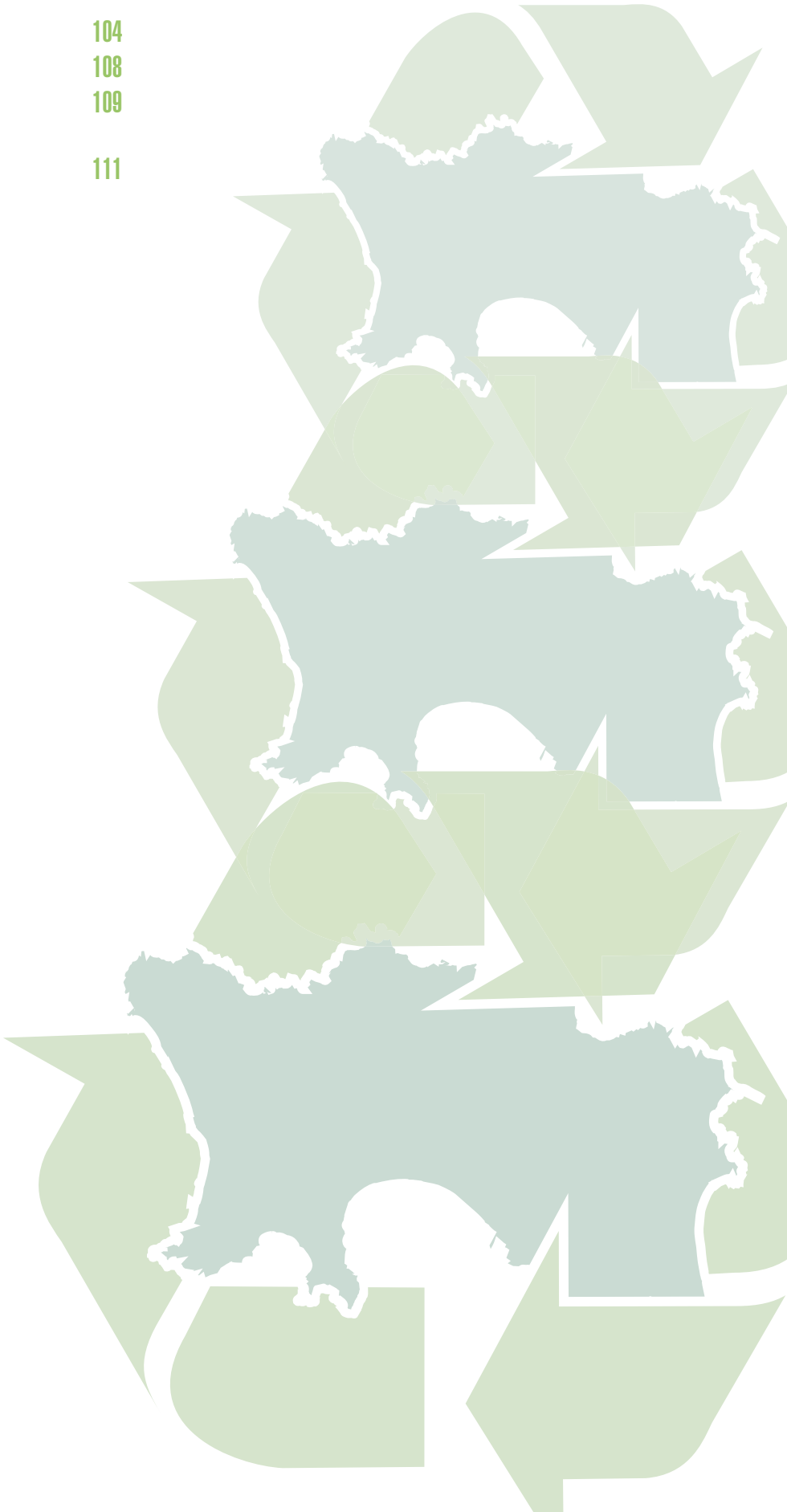

Appendix A

Contributors

To produce this strategy, the Environment and Public Services Committee has called upon the experience and knowledge of its environmental and engineering staff, the expertise of consultants, research into the waste management industry, and feedback from consultation with the public, relevant organisations and the Shadow Scrutiny Panel.

The Committee would like to record their grateful thanks to all those who contributed.

The groups involved in formulating the Strategy were comprised as follows:

Environment and Public Services Committee (current)

Senator Philip Ozouf	President, E&PSC
Deputy Jerry Dorey	Vice President, E&PSC
Deputy Guy de Faye	
Deputy Jacqui Huet	
Deputy Mike Taylor	
Connétable Richard Dupré	

WASTE STRATEGY STEERING GROUP

Senator Philip Ozouf	President, E&PSC
Deputy Guy de Faye	E&PSC
Senator Stuart Syvret	President, Health and Social Services (H&SS)
Deputy Geoffrey Grime	Representing Finance and Economics Committee
Connétable Tom du Feu	Representing the Comité des Connétables
Duncan Nicholson	Acting Medical Officer of Health, H&SS
Steve Smith	Assistant Director, Health Protection, H&SS
Ray Foster	Head of Corporate Capital, Treasury
Chris Newton	Director of Environment, E&PSD
Kevin Pilley	Assistant Director (Policy and Projects), E&PSD
John Richardson	Chief Officer, E&PSD
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Boyd Bennie	Director, Waste Strategy Project, E&PSD
John Rogers	Director, Waste Management, E&PSD
John Weatherby	Consultant, Babtie Fichtner

CONSULTANTS

As well as reviewing previous studies undertaken by Carl Bro, Babtie Fichtner were appointed consultants to provide technical advice and feasibility studies during the development of this Strategy. Those directly involved include:

John Weatherby	Chemical Engineer
Kevin Hutchings	Environmental Scientist
Chris Maltbaek	Biologist (ex-industry, waste management expert)
Terry Penhaligan	25 years experience in waste collection industry
Steve Blackburn	Environmental Scientist
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With additional support from planning experts, electrical, mechanical, civil and process engineers as well as composting experts from Fichtner Stuttgart.

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John Richardson	Chief Officer
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John Rogers	Director, Waste Management
Richard Fauvel	Manager, Waste Management and Support Services
John Rive	Recycling Officer
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Allyson Holmes	Planning and Project Manager
Barry Redfern	Assistant Project Manager

With additional support from other officers with specialist expertise in waste management and environmental issues.

Appendix B

European legislation and Multilateral Environmental Agreements

THE PACKAGING DIRECTIVE

The Packaging Directive[i] requires Member States to recover and recycle a growing proportion of packaging waste. The aim is to stimulate new markets for recovered and recycled products, and reduce the amount of packaging in the waste stream.

Furthermore, the Packaging Directive requires Member States to minimise the amount of packaging produced, and to make it more amenable to reuse and recovery, or to environmentally benign disposal, moving packaging waste up the waste hierarchy. Packaging must be designed at the outset to limit environmental impact. This could be by simply minimising the amount of material used, reducing the number of materials used, or omitting a label finish that makes a paper package less biodegradable. Supporting legislation for this element of the directive has been enacted in the UK (the Packaging (Essential Requirements) Regulations 1998).

The Directive offers EU Member States the opportunity to restrict the range of packaging materials being used, and hence reduce the contraries from recycling and recovery systems. This is a legal tool that can be directed at particular packaging streams that are giving specific problems to a chosen technology.

THE LANDFILL DIRECTIVE

The Landfill Directive requires EU countries to reduce the landfill of biodegradable waste. This is a key driver in increasing recycling. By increasing the cost of landfill (the UK is significantly increasing the landfill tax as the main mechanism to encourage diversion from landfill), recycling becomes more comparable in cost with landfill.

DIRECTIVES ON SPECIFIC PRODUCTS

The Waste Electrical and Electronic Equipment Directive, End of Life Vehicles Directive[ii], and the Disposal of Fridges Regulation[iii] are all examples of new legislation in Europe that seeks to minimise environmental impact at source, and to make manufacturers more responsible for the wastes they produce.

Manufacturers have to incorporate a percentage of recycled material in the manufacture of new equipment, and reduce the hazardous components. All equipment must be easy to dismantle, and different component materials must be identified. One of the benefits will be a reduction of residual hazardous components in the municipal waste stream, as well as a market for components. Vehicles and electronic equipment will be labelled to promote their return for recycling and ease of dismantling. This type of legislation could affect the States in several ways, if it chooses to implement these EU policies.

It is unlikely that manufacturers will source their recycled plastic materials for new production from Jersey, since this will add an additional shipping charge to the cost of collection, compared with recovery from elsewhere. However, the more valuable elements of the waste will be identified, easier to remove, and have a ready market. A proportion of the waste will be concentrated and require specialist disposal: cathode ray tubes for example.

The existing scrap yard in Jersey could undertake dismantling of end of life vehicles (and larger electronic equipment in due course), prior to putting the ferrous rich elements through the fragmentiser. Fragmentiser wastes would be reduced, and the stream to incineration reduced. There may be a need for additional storage, to cover the larger numbers of types of material needing shipment from Jersey, or storage prior to incineration. The dismantling area would need a permit to issue certificates of destruction. Dismantling of small-scale electronic equipment would probably need new premises.

The main benefit of implementing such legislation in Jersey will be a reduction of hazardous materials going through the incinerator, from fragmentiser residues and from waste electronic equipment. Electronics are thought to be responsible for a large proportion of the mercury, lead, and copper in incinerator emissions, as well as a source of chlorine through PVC. Copper is a catalyst in the formation of dioxins, and its removal from the incinerator feedstock provides the double effect of removing the catalyst for dioxin production, as well as heavy metals in the ash or air emission control systems.

WASTE STRATEGY 2000[iv]

The UK Government published its Waste Strategy in 2000. This promised to encourage recycling and composting, in order to achieve the goals of the Landfill Directive. Specific targets for recycling and composting of 30% by 2010 and 33% by 2015 are proposed. To promote recycling, the UK Government has set targets for recycling (including composting) for each council in England and Wales, based upon current levels. The new targets vary from council to council, but typically range from 18% to 40% in 2005/6. Whilst these are statutory targets, set as Best Value Indicators, there is no clear financial penalty system imposed for failure to achieve these, and it is unclear how waste management will develop under this mechanism. However, the current impact is that most councils are now pursuing recycling and composting initiatives, aimed at achieving these targets.

THE BASEL CONVENTION

The Basel Convention introduces controls on trans-boundary movements of waste[v] and has a very significant impact on Jersey. Signatories are required to handle and dispose of their waste in

an "environmentally sound manner". These words are not defined, but there is general agreement that this includes areas such as a Duty of Care for labelling and transporting wastes in a safe manner, a permit and inspection regime for waste transfer, and treatment and disposal facilities that cover waste throughput, waste types and the control of environmental emissions. Policies promoting the waste hierarchy are also of relevance, and independent monitoring of waste operations by a competent authority is necessary.

Importantly, the Convention provides that trans-boundary shipments of waste can only be made where they are covered by appropriate legislation. The UK is a signatory to this Convention and, although Jersey is not, the UK has stated that the Convention must be extended to Jersey, in order that Jersey can continue to export its hazardous wastes. Jersey has the capability to deal with its "normal" waste, i.e. household, commercial, clinical, and animal waste and will soon have the facility to deal with animal waste. However, because the Island does not have the facilities to deal with certain hazardous wastes, such as waste chemicals, it must export these for specific disposal and a Memorandum of Understanding existed between Jersey and the UK to allow this to happen. However in June 2002 this memo expired and the UK refused to extend it because Jersey had made no progress towards introducing domestic legislation for waste management as required under the Basel Convention on The Control of Transboundary Movement of Hazardous Wastes. Since then the Island has had no choice but to stockpile hazardous waste at Bellozanne for eventual disposal in appropriate facilities abroad. On June the 8th 2004, The Waste Management (Jersey) Law 200- was approved by the States of Jersey and should be implemented in 2005. Once in force, this law will allow the UK Government to extend their ratification of the Basel Convention to cover Jersey and so allow the Island to apply to export hazardous wastes that cannot be dealt with locally in an environmentally sound manner. The law also contains provisions for the regulation of certain waste streams within the Island and for 'environmentally sound waste management' on the Island.

UNITED NATIONS GENEVA CONVENTION ON LONG RANGE TRANSBOUNDARY AIR POLLUTION (1979).

Article 2 of this Convention is: **'To protect man and his environment against air pollution and endeavour to limit and, as far as possible, gradually reduce and prevent air pollution including long-range trans-boundary air pollution'**. The Convention lays down general principles of international co-operation for air pollution abatement and an institutional framework linking science and policy.

The Convention has been extended by eight protocols, which identify specific obligations and measures to be taken by Parties. Two of these Protocols have been extended to Jersey:

- The **1988 Sofia Protocol** concerning the Control of Nitrogen Oxides or their Transboundary Fluxes.
- The **1991 Geneva Protocol** concerning the Control of Emissions of Volatile Organic Compounds or their Transboundary Fluxes.

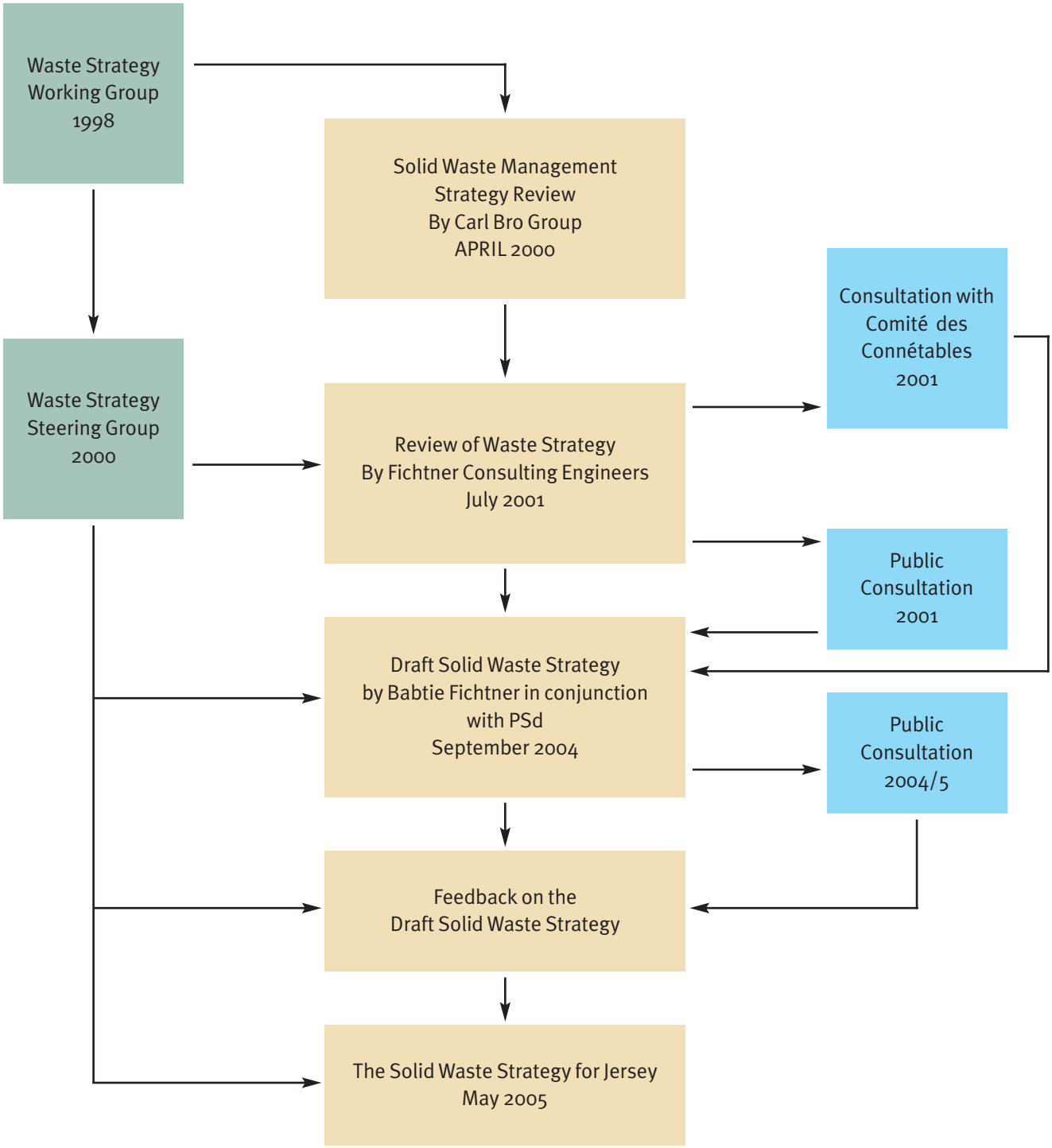
Furthermore, Jersey has declared an in-principle decision to work towards extension of the ratification of –

- The **1999 Gothenburg Protocol** to abate acidification, eutrophication and ground-level ozone - this sets emission ceilings for 2010 for four pollutants: sulphur, oxides of nitrogen, Volatile Organic Compounds and ammonia. Parties whose emissions have a more severe environmental or health impact and whose emissions are relatively cheap to reduce will have to make the largest cuts.
- The **1998 Aarhus Protocol** on heavy metals - this targets three particularly harmful metals: cadmium, lead and mercury. Under one of the basic obligations, Parties will have to reduce emissions for these three metals to below the 1990 levels (or an alternative year between 1985 and 1995). The Protocol aims to cut emissions from industrial sources (iron and steel, non-ferrous metal), combustion processes (power generation, road transport) and waste incineration.

i Directive on Packaging and Packaging Waste 94/62/EEC
ii WEEE Directive 2002/96/EC. End of Life Vehicles Directive 2000/53/EC.
iii Regulation (EC) No 2037/2000 on substances that deplete the ozone layer
iv Waste Strategy 2000 published by the Department of the Environment, Transport and the Regions in May 2000
v Convention on the control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) EU Council Decision 93/98/EEC

Appendix C

Development and Consultation Process



Appendix D

European waste minimisation practice

There are a number of case studies on European waste minimisation practice[vi].

Austria, minimisation of landfilling of biodegradable waste. Composting and recycling has been encouraged by legislation to ensure that organic waste is collected and treated separately and by imposing landfill taxes. This has led to the reduction of landfill from 63% in 1989 to 32% in 1996. Whilst this has been successful in reducing landfill, it should be noted that this initiative encourages recycling and composting, rather than minimising waste. From 1995 to 1999, waste arisings rose from 432 kg/person to 556 kg/person[vii].

Denmark, landfill tax on construction and demolition. A landfill tax was introduced in 1987 (at 5 euros per tonne) and has been increased to 50 euros per tonne in 2001. This led to a large increase in the recycling of construction and demolition waste to about 90% in 1999.

Denmark, weight related collection schemes for household waste. Introduction of weighing equipment so that the householder pays by weight for waste disposal has been tested in some areas. Whilst this did not appear to affect consumer spending behaviour, there is evidence that the level of recycling significantly increased in these areas. Preliminary results indicate that no decrease in waste generation was achieved, but that recycling was increased.

Germany, producer responsibility for packaging waste. Legislation was introduced to oblige producers to collect and recycle packaging waste from their products. Packaging consumption decreased from 6.9 million tonnes in 1991 to 6.0 million tonnes in 1997. Over the same period, recycling of packaging material increased five-fold. Costs of this system are high, with estimates of fees in 1999 amounting to about 300 euros per tonne.

Greece, minimisation of packaging waste. A voluntary scheme has been trialled in Northern Athens, recycling about 3,600 tonnes per annum by source separation and kerbside collection.

Ireland, cleaner production pilot demonstration programme. A pilot trial was run to encourage companies to reduce waste by cleaner production. Whilst this gave successful results, this has not been translated onto a larger scale yet.

Holland, organic household waste action programme. From 1994, local authorities were required to set up separate household waste programmes and to compost the waste. This has led to a large increase in composting, about 21% of the total household waste in 1999. The cost of this was estimated as about 47 euros per tonne in 1998.

Sweden, producer responsibility for packaging waste. Similarly to Germany, Sweden introduced producer responsible for recycling packaging waste. However, this scheme is based upon local bring systems rather than kerbside collection. This has led to a large increase in recycling rates (eg. 84% for glass, 34% for aluminium, 79% for paper).

UK, waste minimisation programme. A waste minimisation programme was set up to assist companies to reduce waste generation via a helpline, publications and waste minimisation clubs. This initiative is estimated to have reduced industrial waste disposal by one million tonnes per annum.

vi Case studies on waste minimisation practices in Europe, Topic Report 2/2002 by European Environment Agency

vii Eurostat statistics available on http://europa.eu.int/comm/eurostat

Appendix E

Requirements of the EU Directive on the Energy from Waste plant

In order to meet the requirements of the EU Directive on the Incineration of Waste the plant must include the following main design features:

- Combustion sufficient to ensure that the Total Organic Carbon (TOC) in the slag and bottom ashes is less than 3% or the loss on ignition is less than 5% of the dry weight material.
- The combustion gases and the injection of air must be even, and controlled homogeneously ensuring that the combustion temperature after the last air injection remains above 850°C for at least 2 seconds.
- Auxiliary burners must be fitted to each incinerator for start-up as waste cannot be fed until the gas temperature is above 850°C. In addition, the auxiliary burners are needed to maintain flue gas temperatures at 850°C during disturbances or with low calorific value waste.
- The control system for the incinerator must prevent waste feed during start up and other such periods when the combustion pass temperature is not achieved.
- The heat generated by the incineration process must be recovered as far as practicable.
- The emissions from the plant must be discharged in a controlled manner compliant with the specified emission limits, thus necessitating the following:
  - A Flue Gas Treatment System
  - A system to reduce the oxides of nitrogen (DeNOx)
  - Continuous monitoring and recording of CO, TOC, NO_x, SO_2, HCl, HF, and dust emission measurements
- Effluent from the gas cleaning system must also be minimised and treated to ensure compliance with the emissions for the specified heavy metals and toxins.
- The plant control system must continuously monitor the process parameters, temperatures, pressure, combustion, emissions.

The above list does not cover all the requirements to meet with the EU Directive, but focuses on the major plant requirements.

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