

4 WASTE AND ENERGY

4.1 Introduction

- 4.1.1 For both waste and energy, the importance of environmental issues is increasing all the time. Current European and UK waste policy is to ensure that the full environmental costs of waste management are included in the costs of providing such facilities. In addition, current thinking is to manage the legal, institutional and economic framework so as to encourage a move away from landfill, towards waste minimisation, re-use, recycling and recovery of the energy value inherent in waste.
- 4.1.2 The use of energy at present is bound up with a raft of environmental problems, including environmental damage caused by extraction, burning of fossil fuels (acid rain and climate change) lack of long-term sustainability and local pollution. Again, current UK and European policy is to encourage a shift away from the use of fossil fuels to provide energy, via increased investment in energy efficiency and the development, demonstration and adoption of renewable energy technologies e.g. wind power and solar energy.

4.2 National Planning Policy

NATIONAL POLICY: WASTE

- 4.2.1 National policy on waste issues has undergone a quiet revolution in the 1990s, with the emphasis now placed on reducing the production of waste and reducing its environmental impact, as well as providing disposal sites.
- 4.2.2 The main planning guidance is contained in NPPG 10 "Planning and Waste Management". This offers guidance on general principles for waste planning, as well as advice on specific waste management options.
- 4.2.3 In general, planning authorities should seek to:
- * *implement the planning aspects of the Waste Management Licensing Regulations 1994. For structure plans this should express the general proposals for the development and use of land, including policies for suitable waste disposal sites or installations;*
 - * *encourage the development of an integrated and adequate network of waste disposal installations taking account of the Best Available Technique Not Entailing Excessive Cost (BATNEEC). The network should provide for self-sufficiency in waste disposal at the national and EU levels. It should allow for disposal in one of the nearest appropriate installations. The 1994 Circular accompanying the regulations suggests that in deciding whether there are already adequate facilities within a reasonable distance will depend on the type of waste concerned, quantities arising and geographical circumstances;*

- * *apply the principles of sustainable development to planning. In particular, the principles of proximity, regional self-sufficiency and the so-called waste hierarchy should be taken into account (see below); and*
- * *implement SEPA's National Waste Strategy. Planning Authorities are expected to implement the land use aspects of the National Waste Strategy in their development plans.*

4.2.4 The National Waste Strategy for Scotland was published by SEPA in December 1999. It provides the main framework for waste management in Scotland with the aim of reducing the amount of waste produced and dealing with the waste that has been produced in more sustainable ways.

4.2.5 In seeking to improve the environmental performance of waste management the National Waste Strategy has 3 fundamental concepts :

- * *the waste hierarchy of reduce - re-use - recycle - recover (energy value) - dispose, with preference given to options towards the top of the hierarchy.*
- * *the Proximity Principle which seeks to manage or dispose of waste as close to the source of arisings as possible.*
- * *Regional Self-Sufficiency, which for Structure Plan areas should generally seek to provide sufficient facilities for managing local waste in establishing provision for the network and taking a broader view for more specialised waste streams (e.g., UK level for special waste).*

4.2.6 NPPG 10 requires that the overlap between the planning and pollution control regimes, regulated by local Councils and SEPA respectively, is minimised. Thus Planning Authorities should seek to ensure that any development is an acceptable use of the land, with the control of operations left to SEPA.

NATIONAL POLICY: RENEWABLE ENERGY

4.2.7 NPPG 6 "Renewable Energy" contains the government's advice on planning for renewable energy. The NPPG concentrates on those renewables likely to attract support under the Scottish Renewables Order. It therefore excludes some technologies which, when the guidance was produced in 1994, were considered to be in need of further research.

4.2.8 The guidance offers advice on general principles for renewable energy planning, as well as specific advice on individual renewable energy technologies.

4.2.9 In general, Planning Authorities should seek to:

- * *provide positively for renewable energy developments, where this can be achieved in an environmentally acceptable manner;*
- * *safeguard sites with potential for renewable energy projects against sterilisation by types of development that would prevent or hinder such projects and could be accommodated elsewhere;*
- * *protect areas of important natural and built heritage from inappropriate forms of development; and*
- * *achieve acceptable operating standards during the working life of any project, and the early restoration of sites, once operation has permanently ceased.*

4.2.10 The guidance is clear that although renewable energy developments can have significant environmental benefits, sustainable development dictates that the localised impacts of such schemes must also be acceptable.

- 4.2.11 Planning Authorities are expected to consider the contribution their area can make to developing renewable energy, reflecting the nature and extent of the resources available.
- 4.2.12 Structure Plans should therefore include policies which express the Council's strategy for renewable energy developments, balancing a positive provision against the requirements of other environmental interests. They should also set the framework for local plans including priorities for development control.

4.3 Current Situation

Current Situation - Waste

- 4.3.1 Historically, the pursuit of economic growth and improvements in the quality of life have been associated with increases in waste generated and energy used. More recently, due to efficiency improvements and the development of cleaner technologies, that linkage has been to some extent uncoupled. Figure 4.1 shows the estimated current annual waste production for the Falkirk area.

Figure 4.1 - Current (1997) Waste Production for the Falkirk Area.

	Annual Tonnage
Household Waste	67,000
Commercial Waste	110,000
Industrial Waste- Construction and Demolition	148,000
Industrial Waste- Other	98,000
Total	423,000

Source: Falkirk Council (1999); EAG Environ (1999)

- 4.3.2 The Council commissioned EAG to assemble estimates of the total waste arisings for the Falkirk area in 1997, in order to fulfil the requirements of NPPG 10 to conduct a survey of waste arisings. The survey also examined current waste management sites in the area (see below).

4.3.3 The EAG study used a combination of weighbridge arisings, operator returns, surveys of waste producers and recognised estimation techniques. Despite this, a number of problems emerged in gathering accurate data. The figures quoted above therefore represent a ‘worst case’ scenario, and could in fact be up to 20% lower.

4.3.4 Due to problems with data collection and quality, it is difficult to be precise but a number of trends can be discerned in the overall UK picture. Firstly, industrial waste has stabilised, with increased efficiencies balancing growth due to economic expansion. Secondly, household and per capita household waste generation rates have increased, due to changes in consumption patterns and the trend towards smaller households. To some extent the latter has been offset by increases in household recycling levels.

4.3.5 Despite the government objectives noted above, the vast majority of Falkirk’s (and indeed Scotland’s) waste is still landfilled (see Figure 4.2). Scottish and UK waste management routes still tend towards a greater reliance on landfill than the European average.

Figure 4.2 - Falkirk Waste Management Disposal Routes (by percentage)

Waste Type	Landfill	Incineration	Recycled/ Re-used	Other
Household	91%	0%	9%	0%
Commercial	n/a	n/a	n/a	n/a
Construction/ Demolition	97%	0%	3%	0%
Other Industrial	81%	2%	8%	9%

Source: EAG Environ (1999)

4.3.6 Falkirk Council has a good record in encouraging recycling in the local area and has recently published its revised Recycling Plan. The Council works in partnership with both Scottish Conservation Projects and Alloa Community Enterprises in providing household waste recycling services.

Current Facilities - Waste

4.3.7 Notwithstanding the Council's efforts, as noted above the bulk of current waste generated is disposed of to landfill. Waste management facilities in the Falkirk area are therefore dominated by landfill sites, although smaller recycling sites and transfer stations, including specialist facilities do exist (see Map 4.1: Current waste management facilities).

Map 4.1 Waste Management Facilities



4.3.8 Landfill sites tend to cater for two main waste streams - active or inert waste, with some taking a mix of both. Inert waste landfill, receiving wastes such as soils, stones and demolition waste, tend to be relatively small and inexpensive to run, with management requirements far less strict than active sites, reflecting the lower risk from pollution.

- 4.3.9 Active landfill sites carry a larger pollution risk, and are therefore far more heavily regulated. Again there tend to be two types:
- * *modern sites installed after 1990, that require synthetic liners to capture leachate. They also tend to have formal restoration plans designed in advance, leachate and gas collection systems and substantial monitoring programmes to enable early detection of potential pollution problems;*
 - * *older unlined sites, based upon the principle of 'dilute and disperse'. These sites pre-date modern controls and any modern features in operation tend to have been retro-fitted;*
- 4.3.10 Falkirk Council owns an older unlined site at Kinneil Kerse. Historically the site has accepted a range of active, inert and liquid wastes. However, inputs are now restricted to inert material as part of a long term restoration plan.
- 4.3.11 West Carron landfill is an older active site currently accepting commercial and industrial waste. The site has an estimated life of up to 15 years.
- 4.3.12 A modern lined facility is operated by Shanks Avondale Ltd. at Avondale, Polmont. The site in 1999 had capacity for at least 3.1 million m³ and is licenced for the disposal of household, commercial, industrial and some special wastes.
- 4.3.13 In addition to landfill sites, the Council provides Civic Amenity Sites at Roughmute and Kinneil Kerse.
- 4.3.14 Transfer stations are used by waste operators to treat and bulk up waste for onward (and more economic) transport to final management or disposal points. Falkirk Council operates a transfer station at Roughmute for household and commercial waste. A private company operates a liquid waste transfer station in Falkirk.
- 4.3.15 There are numerous smaller recycling facilities for a range of household, commercial and industrial wastes. Many of these are the familiar 'scrap-yards'. Most will be acting as collection, storage, treatment and transfer operations for onward transport to final treatment facilities. There are no recycling facilities such as glass manufacturing, recycled paper mills or aluminium smelting facilities in the Falkirk area.
- 4.3.16 Another major waste management option is incineration, that is the controlled burning of waste to strict pollution standards. These processes are largely regulated by SEPA under air pollution licences, rather than the waste management licensing system. Older 'mass burn plants', when waste was simply burnt, have now been replaced by waste-to-energy plants, where the energy value inherent in waste is recovered to varying degrees. There are no current incinerators in the Falkirk area.
- 4.3.17 Smaller specialist facilities may sometimes be encountered including clinical waste treatment facilities, sludge drying plants and tyre processing plants. None of these present special problems that cannot be managed by allocating them to industrial areas, as again SEPA will exercise strict controls on operating procedures.

Current Situation - Renewable Energy

- 4.3.18 The Council is not aware of any installed renewable energy capacity within the Falkirk area at the present time. In addition, there have been no awards under the Scottish Renewables Order for government subsidy. BP are currently constructing a large (60MWe) Combined Heat and Power Plant at Grangemouth, to be operational by December 2000. Such a plant, whilst principally aimed at providing for BP's energy needs, could allow more environmentally friendly forms of heat supply, such as district heating schemes, to be explored.
- 4.3.19 A study of the potential renewable energy resource for Scotland conducted in 1993 identified a relatively small practicable renewables resource for the Falkirk area of approximately 8MW. This compares with an estimated electricity consumption for the area of 150-200 MW (peak demand) or about 4% of peak demand (see Figure 4.3).

Figure 4.3 - Practicable Renewable Resources for Falkirk, Stirling, Clackmannanshire and West Lothian Councils (all figures in megawatts MW)

District	Wind	Hydro	Energy Crops/ Forestry	Waste Combustion	Sewage gas	Land-fill gas	Farm wastes	Total
Stirling	0	6	1	0	0.1	0	0	7.1
Falkirk	5.6	0.6	1.3	0	0.1	0	0.4	8
Clackmannanshire	0	0	0	0	0	0	0	0
WestLothian	32.4	0	0	0	0	2	12.6	47

Source: DTI 1993

4.3.20 By way of comparison, Figure 4.4 shows the latest UK breakdown of renewable sources used to generate electricity and heat.

4.3.21 Whilst the above is a useful overall indicator, the size of the estimated practicable resource is sensitive to planning, economic, financial and technical assumptions. For example, waste-to-energy plants are now far more competitive than when the study was completed in 1993. Costs of wind generation have fallen by at least 60%.

Current Situation - Energy

4.3.22 Although detailed energy statistics are available at the UK and Scottish levels, it has not proved possible to generate accurate local energy statistics. The privatisation of energy utilities has rendered the companies involved sensitive to the commercial value of such information. Nevertheless, the Council has attempted to estimate local energy consumption and CO2 emissions (see Figure 4.5).

Figure 4.4 - UK renewable energy utilisation 1997

Biofuels	81%	————	Landfill Gas	13.4%
			Sewage Gas	8.3%
			Domestic Wood	8.8%
			Industrial Wood	21.9%
			Straw Combustion	3.1%
			Refuse Combustion	18.5%
			Other Biofuels	7.8%
Hydro (large scale)	14.8%		Active Solar Heating	0.4%
Other	3.4%	————	Wind	2.4%
			Small Scale Hydro	0.6%

Source: *Energy Statistics 1998*.

Figure 4.5 - Estimated local energy consumption and CO2 emissions for 1997

	Energy use (GJ/p.a.)	CO ² emissions (tonnes/p.a.)
Domestic	6,900,000	486,458
Commercial/industrial	Not available	Not available
Transport	Not available	259,150
Minimum usage/emissions	6,900,000	745,608

Source: *Falkirk Council Strategic Services (1998)*

4.3.23 The planning system can influence energy consumption in two main ways: by setting a planning framework which minimises the need for unnecessary or longer trips (e.g. by reducing reliance on out-of-town developments) and by ensuring that the built environment is energy efficient.

4.3.24 Good practice in the field points to the need to design layout, built form, aspect, and location so as to ensure that energy efficiency is maximised.

4.4 Future Estimates & Projections

Future Estimates - Waste

4.4.1 In order to plan effectively for waste in the area, it is important to know both the amount of waste that will be generated and the likely range of facilities that will be available.

4.4.2 The waste generated is affected by a very wide range of factors: international and UK legislation and policy; consumer choices and demands; changes to technology and improvements in process efficiency; the strength of the recycling markets; changes to industrial structure; and changes to household sizes, number and types.

4.4.3 An important part of the EAG brief for the study mentioned above was to estimate likely waste arisings in 2002, 2007 and 2012. It was originally hoped to include estimates for 2017 but this was not possible with any degree of accuracy.

4.4.4 Figure 4.6 reproduces the study's findings.

Figure 4.6 - Projected Waste Arisings- Falkirk (all figures in tonnes)

Waste Type	Current	Projection for 2002	Projection for 2007	Projection 2012
Household	67,000	68,909	71,696	74,779
Commercial	110,000	110,000	110,000	110,000
Construction and Demolition	148,000	148,000	148,000	148,000
Other Industrial	98,000	98,000	98,000	98,000
Total	423,000	424,909	427,696	430,779

4.4.5 It is clear that with the exception of household waste, which is expected to grow slowly (due to falling household sizes), EAG do not predict any changes from current levels.

4.4.6 In reality, the figures above are likely to represent worst case figures, for several reasons. Firstly, the whole thrust of UK government policy is to reduce waste arisings and waste sent to landfill. Thus, it is likely that further policy instruments to change the relative cost effectiveness of different options will be introduced (e.g. landfill tax, quarrying tax and further Producer Responsibility Initiatives are likely). Secondly, the introduction of the Landfill Directive at European level, forcing reductions in the amount and type of waste sent to landfill, will have a major effect on the UK waste management industry, and indirectly therefore, on producers of waste. Thirdly, increasing environmental awareness in both household and industry is likely to result in further increases in process efficiencies and consequent reductions in waste.

4.4.7 The estimates produced are based upon qualitative assessments. Projections based upon GDP, employment statistics or rateable values were all considered and rejected.

4.4.8 Landfill sites, are by their nature, very dependent on favourable land conditions being available. Assuming that land-raising techniques are not appropriate, then new landfill sites depend upon former minerals workings at sites that are geologically, hydrologically and technically acceptable, as well as being free from major planning constraints. It is therefore clear that potential landfill sites will always be at a premium.

4.4.9 The above discussion does not apply to other waste management facilities, as these have the characteristics of general industrial processes and can therefore be sited as part of industrial sites.

4.4.10 Therefore, in assessing the Council's policy on landfill, three factors must be considered:

- * *waste arisings (demand);*
- * *current and future landfill sites (supply); and*
- * *the need to implement the Government's policy of moving away from landfill.*

4.4.11 Figure 4.7 shows the Council's assessment of the balance of supply and demand up to 2012.

Figure 4.7 - Assessment of Balance of Supply and Demand for Landfill Sites in the Falkirk Area- to 2012

Waste Arisings (tonnes)

From 1999-2009	
Active waste	283,000
Inactive waste	148,000
Total	431,000
From 2010,	
Active waste	212,000
Inactive waste	148,000
Total	360,000

Current and Future Landfill Capacities (total capacities in tonnes)

Active waste

Avondale (1999-2012)	at least 3,100,000 tonnes
West Carron	up to 800,000 tonnes
	=3.9m tonnes

Therefore:

Current active waste land supply at least 13 years

Assumptions:

- * landfill densities of 1 tonne/m³
- * all construction and demolition waste inactive
- * smaller inactive waste sites discounted
- * No new active landfill sites developed/identified
- * Landfill Directive requires 25% reduction in active waste going to landfill by 2010
- * Land supply = capacity/waste arisings

4.4.12 Thus it is clear that even on a worst case basis, with maximum waste arisings assumed, the Falkirk Council area has ample landfill capacity for active waste for the foreseeable future.

4.4.13 Waste disposal markets are not confined to Council boundaries. The landfill facility at Avondale for example could accept waste generated from elsewhere and therefore fill up more quickly than indicated in Figure 4.7. However, the converse is also true, waste arisings in Falkirk could be disposed of in a number of other sites in Central Scotland (see Fig 4.8). The issue of inter regional transfers of waste can only be effectively addressed by SEPA through the Regional Waste Strategies.

4.4.14 Inert waste is largely construction and demolition waste. Unfortunately data on its disposal outside of Council operated facilities is limited. It does appear that less construction and demolition waste is being landfilled. Indeed the EAG study reported that there may be difficulty in the availability of material for daily cover and restoration of landfill sites. Available sources of disposal include recycling, small scale land improvements and restorations and the significant amounts of inert material required for the restoration of Kinneil Kerse.

Figure 4.8 - Other Privately Owned Landfills outwith FVWSA accepting MSW*

Landfill	Location	Remaining Capacity m ³
Auchenlee	North Lanarkshire	15 years
Auchennarroch	Dumbarton	75,000 m ³
Binn Farm	Perth	15 years at current tipping rates
Balbarton	Fife	Several years
Greengairs	Airdrie	15 million m ³
Greenoakhill	Glasgow	4 million m ³
Lochhead	Fife	Several years
Melville Wood	Fife	Several years
Riggend	Airdrie	350,000 m ³
Winchburgh	Winchburgh	250,000 m ³

Source: Forth Valley Waste Strategy Area, Envirospire 2000

*** Municipal Solid Waste**

Future Estimates - Renewable Energy

4.4.15 The UK Government has recently adopted a target that 10% of the nation's electricity requirements should be met from renewable energy by 2010. With costs of new technologies falling, and with increasing interest from business and support from Government, it is clear that at a national level, installed renewable energy capacity should increase.

4.4.16 Ideally, a review of the technical, economic, environmental and planning constraints on renewable energy development in the Falkirk area would have been carried out to inform this review. However this has not been possible for this report.

4.4.17 It is clear that the potential for renewables in the area has increased since the DTI report in 1993. At the time, around 4% of electricity needs were estimated to be able to be met from renewables.

4.4.18 Without further detailed local studies it is difficult to be precise, but it is considered that potential exists for the following renewable energy technologies within the Falkirk area: wind power, small scale hydro-power, energy crops and farm bio-mass/wastes and solar power. In particular, there may be potential for wind power development on the Slamannan Plateau. As noted above, any development of BP's combined heat and power facility may open up opportunities; similarly the development of Avondale landfill site may allow landfill gas recovery to occur.

4.4.19 Due to the lack of data or models available, it has not been possible to estimate future energy use or CO₂ emissions for the Falkirk area. The increasing emphasis given to climate changes issues should mean that in future, more data and localised models become available to aid local planning.

4.5 Summary of Main Findings

Waste

- 4.5.1 Waste is predicted to be stable or falling over the life of the plan. With the proviso that household waste levels are expected to increase, the overall amount of waste generated in the Falkirk area is expected to remain stable.
- 4.5.2 The Falkirk Council area has ample active landfill capacity to deal with expected waste arisings for the foreseeable future, as in 1999 there was at least 13 years supply of active waste landfill capacity.
- 4.5.3 The National Waste Strategy requires planning authorities to provide forward capacity with planning permission and full environmental authorisations for a period of between 5 and 10 years. In the light of capacity within the Council area, there is no need for further active landfill capacity within the foreseeable future. The Council must strike a balance between the need to ensure adequate capacity against the need to encourage waste management to move up the waste hierarchy. This issue will need to be reviewed upon the publication of the Forth Valley Regional Waste Strategy.
- 4.5.4 With the exception of landfill sites, other waste management facilities can be located within industrial areas with no special requirements. SEPA recommends that most waste management facilities can be located subject to the normal restrictions on industrial sites.

Renewables

- 4.5.5 There is a paucity of information on both renewable energy potential and energy use at the local level. It is difficult to assess satisfactorily the potential for renewable energy and energy efficiency without further exploration of the baseline position.
- 4.5.6 There is a growing recognition that renewable energy developments will play an increasing part in meeting the UK's energy needs. EU and UK policy, together with increased interest from industry, all point to much larger level of installed renewable energy capacity in the future
- 4.5.7 The Falkirk Council area can make a modest but useful contribution to the development of renewables. Although Falkirk will always have a relatively modest level of renewable energy developments installed, it is realistic to think that this could reach 10% of total electricity needs by 2010.
- 4.5.8 National Guidance makes clear that although renewable energy developments have an important role to play, their national importance must be balanced by their effects locally. Sensitive siting and clear guidance to local plans is required to ensure that renewable energy developments do not unreasonably affect the local environment.

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