

GREEN CONE LIMITED

“The solution to the disposal of household food waste”

Summarised findings of Independent Consultants' Reports

(Prepared January 2006)



GREEN CONE LIMITED







INTRODUCTION

This report presents factual information drawn from independent consultants' reports on the effectiveness, benefits and problems associated with using Green Cones.

This document summarises the most important findings from reports written for local authorities. The authorities were: West Sussex County Council (Sussex), Moray Council (Moray), Guildford Borough Council (Guildford) and Dorset County Council (Dorset) The individual authorities are willing to confirm the accuracy of this report to interested parties. The names of the individuals who can be contacted are in Appendix 2.

All extracts from the consultants' reports are shown in parenthesis. Comments of a general nature have been extracted from the reports and recorded as accurately as possible but are not direct quotations.

The report has been extracted from four consultant reports commissioned for the following authorities; the information concerning these reports is included in Appendix 3:

West Sussex County Council	Sussex	WSCC		
Moray Council	Moray	MC		
Guildford Borough Council	Guildford	GBC		
Dorset County Council	Dorset	DCC		

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SUMMARY OF TRIAL FINDINGS

(details referenced to subsequent pages)

i. **Waste Reduction (Page 4)**

The two largest surveys Sussex and Moray reported a reduction of 184 and 151 kilos per house per annum respectively through using Green Cone. Guildford reported “using Green Cones has helped to reduce overall ‘waste arising’ in the Borough from the national average of 1,000 kilos per annum per household to just 886 kilos”. Dorset reported a reduction of 204 kilos per household per annum.

ii. **Performance (Page 6)**

All reporting councils stated that over 70% of all respondents thought the Green Cone was satisfactory/neutral/good/very good/excellent.

iii. **Composition of Waste (Page 7)**

In two of the surveys Guildford and Moray, the respondents had had the Green Cones before instructions were given that the Green Cone should only be used for food waste. The residents of these councils were therefore using the Green Cones for garden as well as food waste. However overall the respondents were using the Green Cone as suggested for food waste that would be unsuitable for traditional garden composters.

iv. **Installation and Location (Page 8)**

By far the majority of respondents were able to position the Green Cone in reasonable conditions, i.e. sun or partial shade (only 25% of Green Cones were in the full sun). Most respondents experienced some difficulty in digging in the Green Cone but not enough to prevent them installing it.

v. **Problems (Page 9)**

The most reported problem by respondents was flies. There is no doubt that these can be a nuisance and fruit flies cannot be avoided. However the Company is promoting the use of an organic fly killer that resolves this problem.

vi. **Pricing (Page 11)**

The surveys show that even in wealthy parts of the country, respondents are not willing to pay more than £20 for a Green Cone. £5 or £10 appears to be a sum that makes residents take ownership of the Green Cone and therefore use it without being prohibitively expensive.

Note

The summary reflects statements in the main body of the report, which were extracted directly from the Independent Consultants' Reports prepared for the individual councils. Guildford and Moray Councils, which have 14,000 and 6,000 units respectively, have been promoting Green Cones for many years. Only in 2001 did the Company start marketing the Green Cone as a food waste digester as opposed to a traditional garden composter. Thus only relatively new users are disposing of just food waste and not garden waste as well in their Green Cones. This practice has resulted in Green Cones working more efficiently (the units do not become over-filled) but has made comparison of the data difficult.

EXTRACTS FROM CONSULTANTS' REPORTS

i. WASTE REDUCTION

a. General

Councils sought to accurately determine the amount of food waste placed in Green Cones over a specific period.

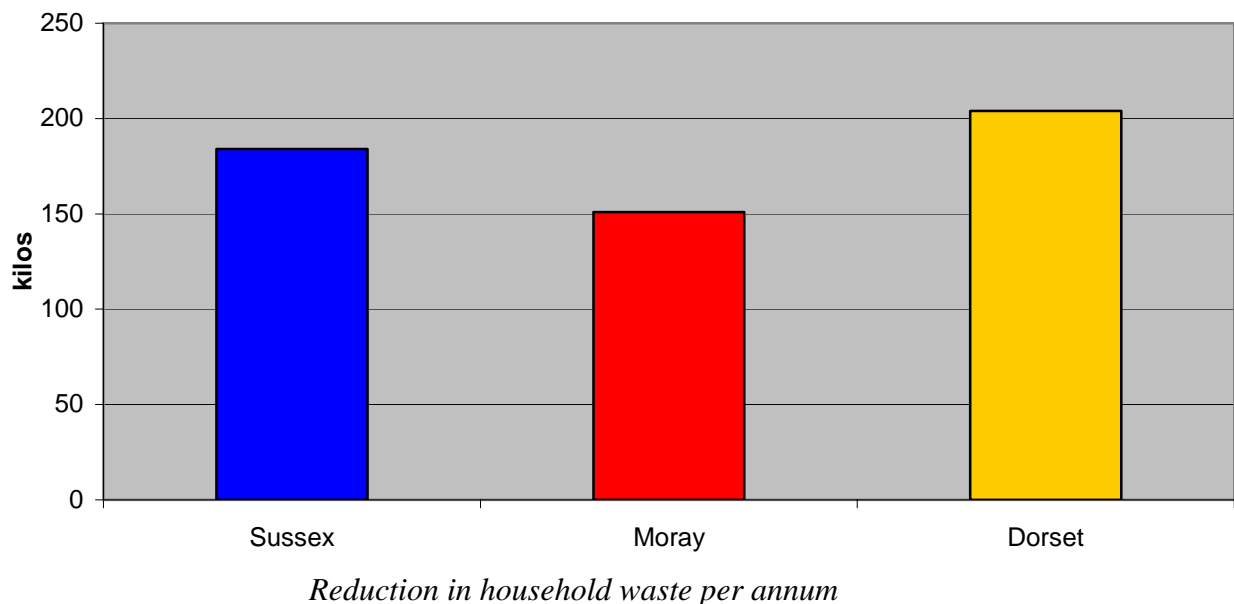
Sussex surveyed 48 households over six weeks between September and October 2002. The respondents were supplied with spring balances.

Moray surveyed 63 households over 3 weeks in February 2002. The respondents were supplied with spring balances.

Dorset surveyed 56 households over 52 weeks ended 29 May 2005. The respondents recorded the No of caddy fulls emptied into the Green Cone and the weigh calculated by 'laboratory' reference methods. .

Guildford has provided Green Cones to households in separate collection rounds yearly and is therefore able to accurately determine the reduction in the 'waste arisings' as Green Cones are supplied.

b. Results at a glance



c. Extracts from executive summaries

Sussex – “Almost 60% stated they had reduced their waste between a quarter and a half overall. Further analysis showed waste reduction to be at 1 bag per week on average for the whole sample”.

EXTRACTS FROM CONSULTANTS REPORTS (Cont'd)

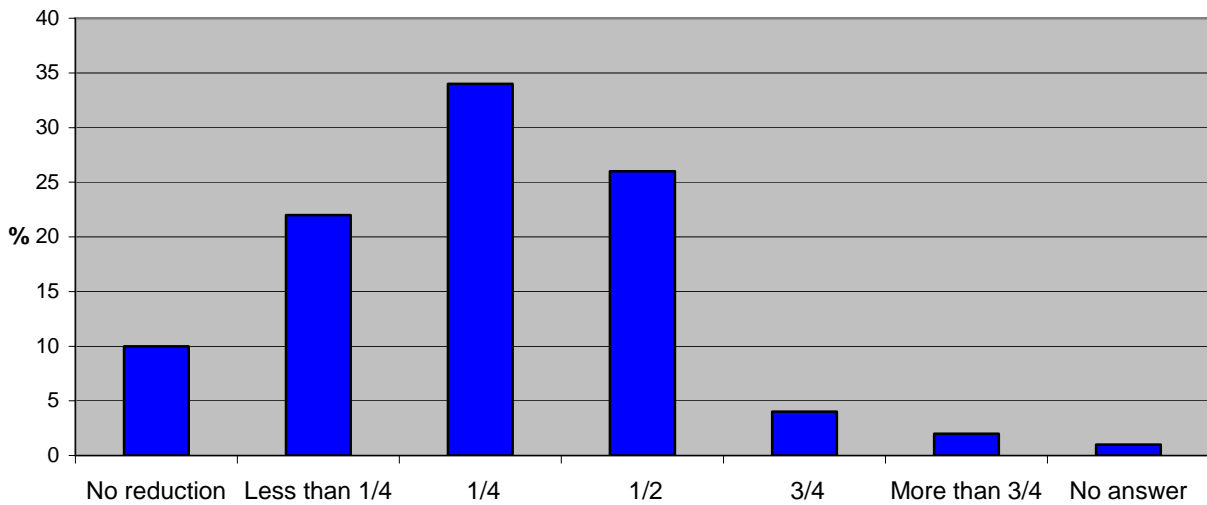
i. WASTE REDUCTION (Cont'd)

Moray – “In the light of the government policy on legislation, it is recommended that the opportunity, political will and necessary finance to expand the Waste Away Scheme to other areas of Moray should be sought.”

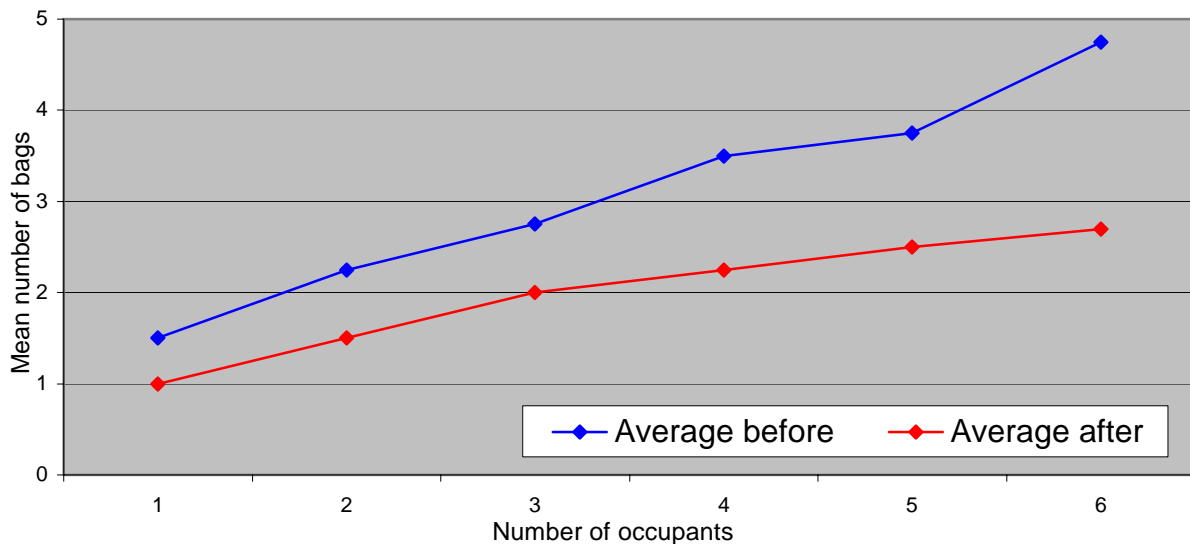
Dorset – “The average annual amount of waste diverted to the Green Cone was measured to be 204 kg/year/household.”

Guildford - “Using Green Cone has helped to reduce overall ‘waste arisings’ in the Borough from the national average of 1,000 kilos per annum per household to just 886 kilos.”

d. Extracts from main body of Report



Reduction in the amount of refuse put out for weekly collection by households (Sussex)



Average number of bin bags according to number of occupants placed out for collection before and after installation of the Green Cone

EXTRACTS FROM CONSULTANTS REPORTS (Cont'd)

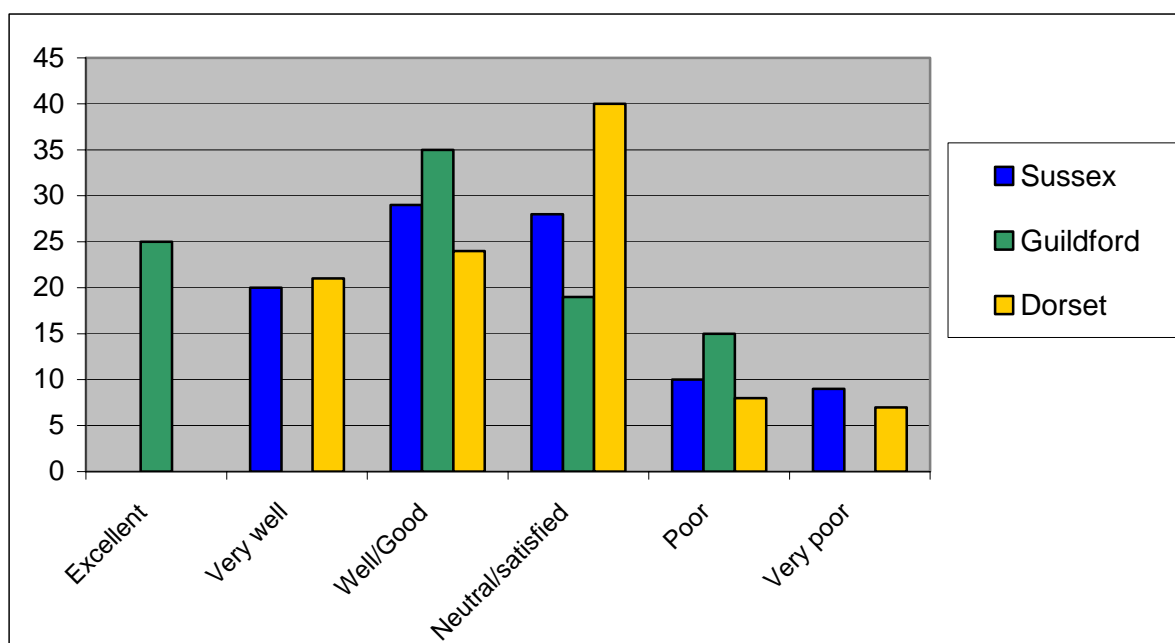
ii. PERFORMANCE

a. General

Each Council asked questions to determine the respondents' attitude to the efficiency/effectiveness of the Green Cone. Both Moray and Guildford started using Green Cones in the 1990's when the unit was marketed as a garden composter that could handle all food waste as well as traditional composting material such as leaves and grass. Under these conditions the Green Cones were sometime overfilled which slowed or stopped the degradation process.

<u>Council</u>	<u>Respondents</u>	<u>Duration Cones were in use</u>
Sussex	433	1 year
Moray	243	5 years +
Guildford	2,393	3 -5years
Dorset	80	1 year

b. Results at a Glance



How respondents vote the performance of their Green Cone

c. Extracts from Executive Summaries

Sussex – 49% of the people thought that the digester was performing very well to well and 78% would recommend it to a friend.”

Moray – “The majority of the respondents – 81% still have their Green Cone with majority response being that the cone has been in use for between 3 to 5 years.”

Dorset – “70% of participants agreed with the statement that using Green Cone “has reduced the amount of rubbish collect from my home.”

Guildford – “Overall, the survey indicates that the majority of residents are pleased with their Green Cone and are using it productively.”

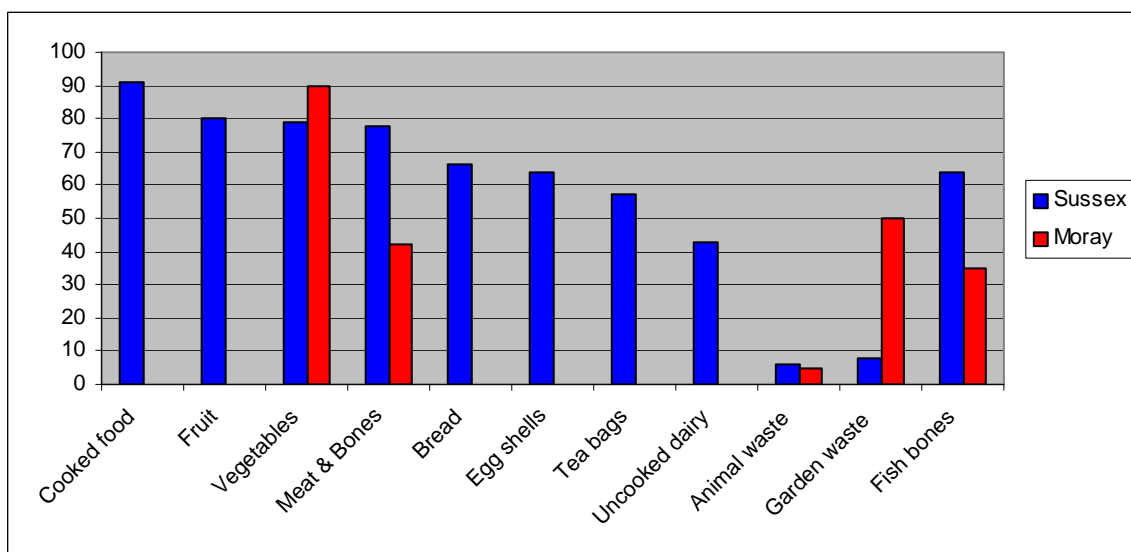
EXTRACTS FROM CONSULTANTS REPORTS (Cont'd)

iii. COMPOSITION OF WASTE

a. General

Prior to 2001 the Green Cone was marketed as a general-purpose garden composter that had the ability to digest food waste. In 2001 Green Cone began to be marketed solely as a food waste digester. This change was necessary as the units were sometimes being over-filled with grass cuttings, which affected their efficiency. Thus when reviewing the surveys of Guildford and Moray, where Green Cones have been in use for many years, the results have been influenced by the type of waste put in the Green Cones.

b. Results at a glance



Composition of Waste disposal by households

c. Extracts from Executive Summaries

Sussex – “The waste material most frequently put in the digester was cooked food, followed by fruit waste, vegetable waste and bones and meat. Some respondents were using it for garden waste and animal waste from pets.

Guildford – “68% of the material being put into the cone is the correct type (vegetable waste, kitchen waste and meat, fish and bones).”

Moray – “A common misconception of householders was evident as to the amount of organic kitchen food waste they actually produce. Prior to starting the weighing programme 66% of households underestimated how much they would actually put in the Green Cone. 40% are putting their garden waste into the Green Cone and avoiding disposal to landfill.”

Dorset - ”This study has demonstrated that the Green Cone system has the potential to divert significant quantities of food waste from landfill.”

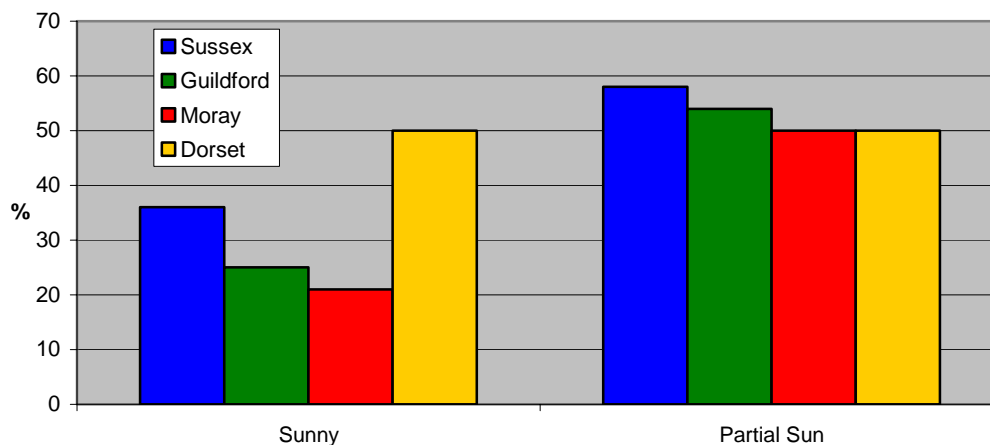
EXTRACTS FROM CONSULTANTS' REPORTS (Cont'd)

iv. INSTALLATION AND LOCATION

a. General

It is recommended that Green Cones are installed in the sunniest position possible since heat hastens the degradation process. This advice cannot always be accommodated and the chart below shows the actual location of the Green Cones.

b. Results at a glance



Percentage of households siting their Green Cone in Full Sun or Partial Shade

c. Extracts from Executive Summaries

Sussex – “Most respondents did not experience any problems locating the digester. 94% were able to install their Green Cone in either full or partial sun.”

Moray – “Only 21% of respondents were able to position their Green Cone in the recommended position to intercept maximum sunshine whenever possible. Without the necessary sunshine the unit may not be able to perform to its optimum. Incorrect positioning may also be a reason why the unit is perceived by some as “too slow.”

Dorset - “Based upon previous experience and the fact that 92% of households provided with a Green Cone are known to have actually installed and used the system it is anticipated that most of the installation issues were minor.” *(Extract from main body of Report)*

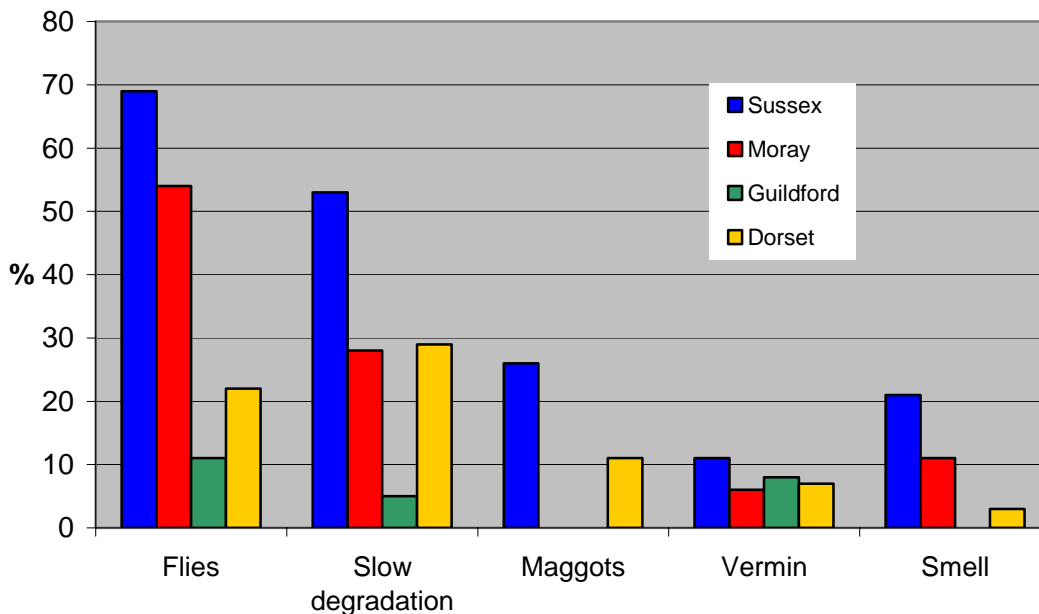
EXTRACTS FROM CONSULTANTS' REPORTS (Cont'd)

v. PROBLEMS

a. General

The five most frequently occurring problems relate to flies (usually small fruit flies), the slower degradation of the waste than anticipated, maggots, vermin and smell. Some respondents had had more than one problem.

b. Results at a glance



Percentage of households experiencing primary problems

c. Extracts from Executive Summaries

Moray – “85% of those still using the cone have at least one problem with it whilst 15% stated they had no problems with the Green Cone. “Of those who were not satisfied, some of the reasons given were that the Green Cone is: too slow; difficult to load/unload; attracts flies.”

Dorset - “Although a majority of households experienced some issues with the Green Cone only 4% had a problem that caused them to stop using it entirely.”

Guildford – “A large proportion of respondents reported no problems with the Green Cone.”

EXTRACTS FROM CONSULTANTS' REPORTS (Cont'd)

v. PROBLEMS (Continued)

d. Extracts from main body of Reports

Sussex – “A total of 90% of the respondents out of the 402 with cones installed experienced at least one problem whilst using the Green Cone. The most common experience was flies, which accounted for 69% out of the total. The authors had also witnessed incidences of flies during visits to volunteer households and these had all been small fruit flies. In cases where respondents had experienced difficulties with installation and a problem such as flies (50), vermin (10) or slow decay (44) it could be that the Green Cone had not been installed properly and this had become a contributing factor. A total of 72 people or 17% of the total 433 respondents had stopped using the Green Cone completely (because of problems).”

Moray – “Whilst 55% of all respondents have a problem with flies, 30% of all respondents who put in organic material other than meat, fish or vegetable food waste and have a fly problem. Of those saying it is difficult to empty, 80% are putting in organic material other than or as well as meat, fish or vegetable food waste (i.e. not what the Green Cone is designed for).”

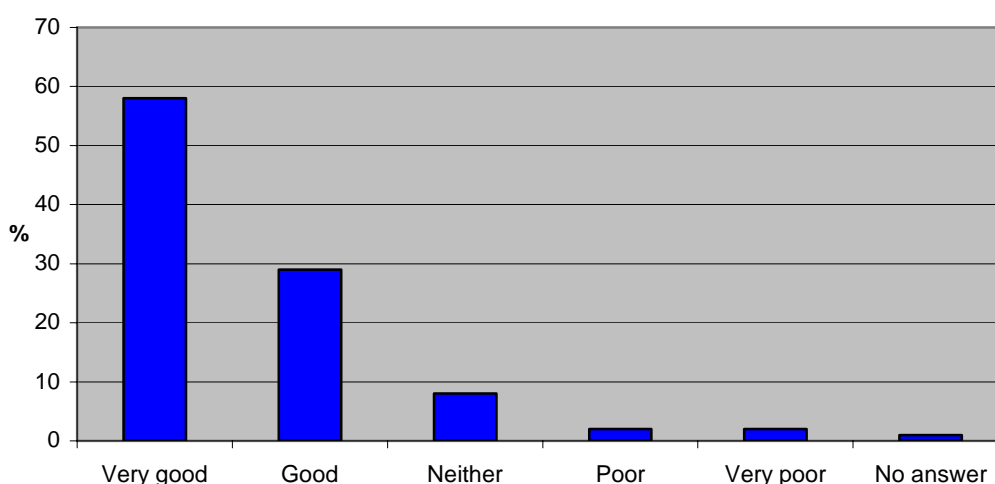
EXTRACTS FROM CONSULTANTS REPORTS (Cont'd)

vi. PRICING

a. General

There is no uniformity of pricing among the councils in the UK promoting Green Cones. Some councils distribute the units free of charge, others charge householders between £5 - £20. Since residents usually argue that councils have an obligation to collect their waste it appears that even in wealthy areas by far the majority of users are unwilling to pay more than £20 per unit and a figure of between £5-£10 is deemed 'fair' by the public.

b. Results at a glance



Respondents expressions of value for money at £19.95 (Sussex)

c. Extracts from Executive Summaries

Sussex – “88% of respondents thought the promotional price of £19.95 had been very good or good value, whilst 57% of people thought the future proposed price of £29.95 high and 30% thought it about right.”

Moray – “58% stated they would be prepared to pay half the cost, 5% stated they would bear 75% of the cost of a new home composting unit.”

d. Extracts from main body of Reports

Sussex – “The clear majority of respondents (88%) were of the opinion that the price of £19.95 during the promotion had been good and very good value for money. Only 4% thought that the digester had been poor or very poor value. The price was therefore likely to have been a considerable influence in the decision to purchase.”

Moray – “24% that had said they would not contribute anything to the cost of a home composting unit.”

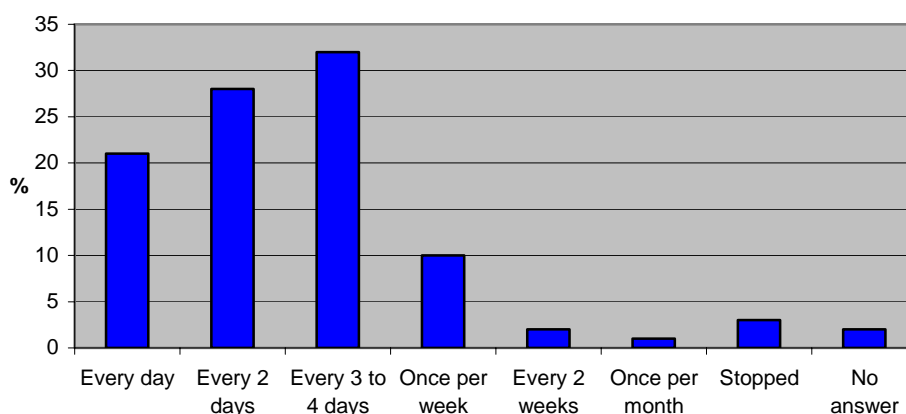
EXTRACTS FROM CONSULTANTS' REPORTS (Cont'd)

vii. SUNDRY MATTERS OF INTEREST

a. General

The independent consultants' reports for Moray and Sussex are comprehensive and include data on the Green Cone users such as their type of house, size of garden, age, gender and number of persons in households. This information is available from the Company, however information of a more general nature is shown below.

b. Results at a glance



Frequency with which waste material is put in the Green Cone (Sussex)

c. Extracts from Executive Summaries

Sussex – “Responses to the postal questionnaire were mainly by females (62%) and people in the 35-54 age groups, although generally a wide cross section of age groups and employment status was reached. Most respondents (46%) were working for an employer and 29% were retired. 41% of respondents lived in detached properties and 57% of them had large gardens.”

Moray – “25% never empty the Green Cone implying it is working to maximum efficiency. Only 10% empty their Green Cone every 6 months, which implies that 90% of the Green Cones are reasonably/very effective in their reduction of organic waste volume.”

Dorset - “73% of participants agreed with the statement that Green Cone should be made available to every household with a garden.”

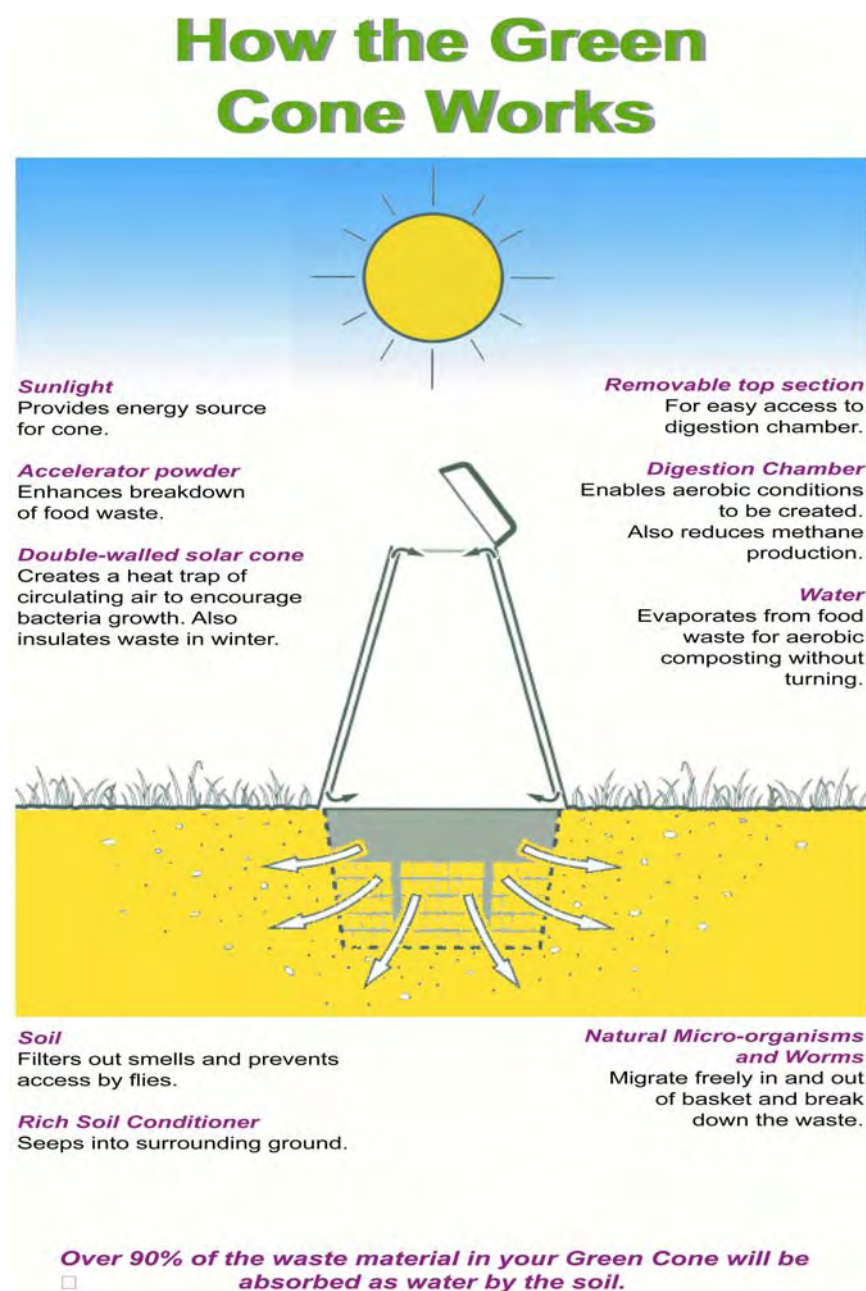
d. Extracts from main body of Report

Sussex – “However, when the total weights for the complete sampling period are taken into consideration, it is clear that total food waste increases as the number of people in the household increases.”

Moray – “Over 71% of respondents who are still using the Green Cone replied positively to this question (Do you think your garden soil condition improved by using your Green Cone?). This is a good endorsement of the Green Cone, since its main function is to produce a liquid fertiliser, which seeps into the ground surrounding the cone and improves the soil condition, (25% replied no and 3% were uncertain).”

THE GREEN CONE SYSTEM

The primary unit, the Green Cone itself, is a four-part plastic injection moulded unit comprising a lower basket that is installed below ground and which forms the base for an upper assembly that consists of an inner and an outer cone with an access lid. The complete unit is unobtrusive, standing only 75cm above the ground. In use the unit is installed in a sunny location of a garden and takes all putrescible household food waste, including meat, fish and bone. The design of the unit utilises solar heating to accelerate and enhance the naturally occurring reduction of the organic waste by creating an ideal environment for microbial and vermin-composting degradation.



The Green Cone disposes of all types of food waste, including meat, bones, dairy products and cooked food.

WHY THE GREEN CONE IS DIFFERENT FROM TRADITIONAL GARDEN COMPOSTERS

There are many fundamental differences between a Green Cone and the familiar garden composter. These may be summarised as follows:

- i. The Green Cone digester takes all types of food waste including meat, bones, dairy products and cooked food. If these were disposed of in traditional garden composters they would attract vermin and compost very slowly; whereas in the Green Cones they are ignored by vermin and disappear rapidly.
- ii. The Green Cone's digestion chamber is below ground level and thus worms are able to migrate in and out more easily, minimising the amount of residue from the degradation process. The soil between the decaying waste and the atmosphere acts as a very efficient barrier to prevent smells escaping and vermin being attracted.
- iii. Many residents who have had Green Cones for a long time, some for as long as 5 years, have never needed to empty them, since if they are installed correctly they can readily handle the waste food from a family of 4/5.
- iv. The design of the Green Cone ensures that aerobic conditions are maintained without any intervention by the user, unlike a garden composter which may need stirring or turning the waste to ensure that there is sufficient oxygen to make certain the composting process continues.

What goes in a Green Cone

Meat
 Fish
 Bones
 Dairy Products
 Fruits
 Vegetables
 Tea bags
 Coffee grinds
 Poultry
 All cooked or uncooked food

What goes in a Garden Composter

Grass
 Hedge Cuttings
 Prunings
 Dead cut flowers
 Shredded paper
 Torn card
 Rabbit/Guinea pig bedding
 Fallen leaves
 Weeds
 Old plants

LOCAL AUTHORITIES CONTACT DETAILS

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DETAILS OF THE CONSULTANTS' REPORTS

West Sussex County Council:

“Minimisation of Food Waste through Home Digestion – Results of trials in West Sussex commissioned by the County Council”

Prepared by University of Brighton Waste and Energy Research Group in December 2003. The research involved a field trial with 48 volunteer households over a 12-month period and a postal questionnaire sent to 1,000 customers. The research was funded by the County Council.

Objective: “The main aim of the surveys was to determine whether the performance of the digester was satisfactory and if it was effective as a method of reducing household waste.”

Moray Council:

1. “The Waste Away Scheme: is it a success? – Results of a questionnaire survey about the Moray Council’s organic waste minimisation project”

Prepared by Dr Melanie Jones of Roslyn Associates in November 2000. The research involved a questionnaire survey of 863 households. The research was commissioned by ECOLINC and funded by Landfill Tax Credit moneys provided by Moray Council.

Objective: “The aim of this research project was to ascertain the householders’ general satisfaction with the Green Cone , used in The Moray Council’s organic waste minimisation project. Additionally to identify any problems with using the unit and examine the user’s perception of the effectiveness of the Green Cone used in The Waste Away Scheme.”

2. “The Waste Away Scheme Phase Two: - a quantitative survey of the effectiveness of The Moray Council’s waste minimisation scheme to reduce organic kitchen food waste going to landfill”

Prepared by Dr Melanie Jones of Roslyn Associates in November 2001. The research involved 63 volunteer households over a 12-week period. The research was commissioned by ECOLINC and funded by Landfill Tax Credit money.

Objective: “To measure the amount of organic kitchen food waste going to the Green Cones in Moray, during a 12-week period, using 63 volunteer households. To calculate the average weekly weight of organic kitchen food waste and thus calculate the amount that is potentially being recovered and diverted from landfill by current Moray Council’s Waste Away scheme.”

Guildford Borough Council:

“Green Cone Questionnaire by Guildford Borough Council”

Prepared by Guildford Borough Council in July 2002 from 2,393 responses to 11,233 questionnaires.

Objective: “The survey was designed to gain feedback from residents about how many Green Cones were in use and whether they were being used correctly.”

Dorset County Council

“Household treatment of food waste in Dorset”

Prepared by Rebecca Gysin of Bournemouth University in October 2005. The research involved 103 households for a year ending 29 May 2006. The research was funded by the County Council.

Objective: “To measure the average quantity and composition of waste diverted by Green Cone FWD’s in about 100 households over a period of a year.”



THE GREEN CONE

Synopsis

The Green Cone is a kitchen food waste digester that enables all food waste to be disposed of in householders' gardens in an economic and environmentally friendly way.

Independently monitored trials to determine the effectiveness and benefits associated with the Green Cones were commissioned by the following councils:

West Sussex County Council (WSSCC) - Moray Council (MC) - Guildford Borough Council (GBC) – Dorset County Council (DCC)

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This report presents factual information from the consultants' reports on the trials. Based on their experience with these trials the Councils concluded the most important benefits of using the Green Cone were:

“The Green Cone makes a significant reduction in the waste ‘arisings’ per household.”

“The removal of putrescible kitchen waste by the Green Cone provides a useful contribution to meeting landfill targets for household waste.”

“The use of the Green Cone to dispose of putrescible kitchen waste encourages households to separate waste for recycling.”

“The Green Cone is an integral part of the Council’s waste strategy. “

“The Green Cone is valuable in encouraging ownership of the household waste problem by residents.”

“In addition to the other benefits, widespread use of the Green Cone should help reduce household waste disposal costs.”

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From their survey of Green Cone users, Councils learned the following:

“On average each Cone would remove 185 kilos of food waste from the waste stream in a year.” (WSSCC)

“Using Green Cone has helped to reduce overall ‘waste arisings’ in the Borough from the national average of 1,000 kilos per annum per household to just 886 kilos.” (GBC)

“78% would recommend the Green Cone to a friend.” (WSSCC)

69% of participants said the Green Cone has increased my commitment to reduce rubbish (DCC)

..... **and much more – see main body of report**