

ECOFEEEDBACK AS A MEANS TO SAVE ENERGY
AT HOME

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ABSTRACT

Local Agenda 21 is a resolution of the Earth Summit in Rio de Janeiro 1992, aimed to encourage local authorities to design a plan of sustainable development in cooperation with the communities. Within this context, the Woking Borough Council launched the Save Energy at Home Campaign in February 1994, based on the scheme which has been working successfully in The Netherlands since 1979.

Using feedback as a tool to encourage saving energy at home, the scheme asked the households to read their electricity and gas meters every week and fill in a card with these figures. Moreover, they had to compare their consumption with a weather adjusted target estimated from their annual consumption, which was published in local papers weekly.

This study was aimed to evaluate the Ecofeedback scheme in Woking and analyze how it could be improved.

500 households in Goldsworth Park were approached with a questionnaire, asking them about their energy saving behaviour, their attitudes and their participation in the scheme.

From the analysis of a sample of 148 households, who sent the questionnaire back, the results showed that:

- no energy efficient actions were significantly associated with the participation in the scheme,
- attitudes towards the consequences of the Ecofeedback scheme and towards discomfort caused by energy saving actions, were the only attitudinal

predictors of the participation in the scheme,

- The Woking Review was the most effective paper in promoting the scheme and distributing the target tables,

- and young people were less likely to participate in the scheme.

The discussion tries to explain the pattern behind energy efficient actions and to draw suggestions in order to improve the Ecofeedback campaign in Woking.

Using Woking as an example, the energy reduction goals set at the Rio Conference can be met in the U.K.

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CHAPTER 1. INTRODUCTION

1.1 Energy use and environmental concern

With the oil crisis in the 70's, and after a period in which people were encouraged to consume as much energy as they could, environmental policies changed.

Industrialized countries had experienced an exceptional development thanks to the introduction and exploitation of a great variety of natural energetic resources. This development transformed modern societies considerably in a short period of time.

During the 60's, the idea that the resources were unlimited was a common belief. The economic development and the low cost of energy reinforced this conviction. Lay people got used to waste and the idea of saving went completely against the new world they were creating.

The increasing use of energy in industry, homes, transport and urban facilities changed, to a large extent, the habits of the population. Thus, we had the benefit of a great variety of facilities to which we got used very easily and without which it seemed impossible to go.

In a context where expenditure and consumerism, instead of conservation and saving, were encouraged, some changes in oil producing countries' policies led to important consequences for the world economy.

Furthermore, the micro economics and the new wonderful wasteful way of living suffered the consequences.

The Arab oil embargo of 1973-74 and the disruption in the international energy distribution systems meant a crisis in the supply of cheap fuels. The price of energy raised and the myth of the unlimited energy disappeared. As a consequence, industrialized countries which had based their economic growth on this source of energy had to change their policy in this field. The energy crisis brought the need for restriction in the use of energy. Besides, what it provoked was a first look to the Earth as a planet which needed a more rational management, and some people started to feel responsible for its continuity.

During the late 70's and the decade of the 80's, there was an increase in the concern about environmental issues, mainly led by the "green movements". Friends of the Earth and Greenpeace are two examples of movements which existed before and gained greater popularity in the 80's. Due some events such as the discovery of a hole in the Ozone layer, the ecological groups increased their influence in national and international policies and, since then, a quicker or longer reference to the environment could be seen in each political party program.

What started in the 70's as a still egocentric response to the energy crisis, changed its motive. Nowadays a high concern about the continuity of the global environmental system is being expressed by all the industrialized countries and a conference in Rio in 1992 puts it on record.

1.2 Earth Summit in Rio de Janeiro 1992

The spirit of the conference was focused on the need for partnership between rich and poor nations in order to promote sustainable development and protect the global environment. Thus, the Presidents and Prime-Ministers from 117 countries signed two treaties, to put the shared responsibility on record:

- Treaty on conserving bio-diversity, which calls on countries to protect their richness and diversity of plant and animal species.

- Treaty on man-made climate change caused by atmospheric pollution. This treaty request developed countries to do their best to stabilise rising emissions of global warming gases (CO₂) at current levels by the year 2000.

The key concept in the resolutions of the Earth Summit in Rio de Janeiro is the idea of sustainability. The philosophy behind the sustainable developments promoted is, in the words of John Gummer, the British Secretary of the State for the Environment, that "we cannot pay for our development out of our children's purses". Thus, this concept implies that development and economic growth should not compromise the ability of future generations to meet their needs

Nicholas Schoon, environment correspondent for "The Independent" summarized the "seven deadly environmental" sins, as key unsustainable trends:

- 1- Emissions of carbon dioxide from burning coal, oil and gas.

- 2- Worsening local air pollution, caused mainly by decreasing emissions from road transport.
- 3- The rising demand for water, threatening to dry our streams.
- 4- Water pollution caused by farming, sewage, industry and acid rain.
- 5- Loss of countryside to roads, homes and other development.
- 6- Damage to habitats and loss of wildlife.
- 7- Rising demand for sand, gravel and rock quarries and pits that harm wildlife, landscape and communities.

1.3 Sustainable Communities

These are the main issues that programmes such as the "Local Agenda 21" aim to work on. Local Agenda 21 is a resolution of the Rio Conference that invites local authorities to design a plan of sustainable development in co-operation with the communities.

This thesis has been developed within the Local Agenda 21 of the Woking Borough Council, in one of its campaigns called Save Energy At Home. The aim of the campaign was to reduce the energy consumption at home and therefore reduce the level of emissions of global warming gases. The campaign was designed to work within the community as a way to increase its responsibility for helping the environment.

Some psychological concepts have been used in the design of the scheme, and the research background on this field is reviewed in the following chapter.

CHAPTER 2. PSYCHOLOGY IN ENERGY CONSERVATION

2.1 Energy conservation studies

During the 70's, after the oil embargo, the interest in energy conservation increased considerably. Therefore, all kinds of studies in this field were welcome.

Although improvements in technology were required, most of the variance in energy consumption in the home was seen to be due to behaviour (Woteki, 1977; Socolow, 1978; Sonderegger, 1978). Psychologists were directly involved and, from different approaches and conceptual frameworks, tried to define new concepts and models for explaining and changing energy consumption behaviour. Thus, a large number of studies were carried out from different psychological approaches.

The aim of these approaches was to provoke a change either in attitudes or in the targeted behaviour. Cook and Berrenberg (1981) summarise them in seven approaches used to encourage energy conservation:

- 1/Promoting pro-conservation attitudes, through persuasive communication.
- 2/Evoking attitude-consistent conservation behaviour.
- 3/Inducing conservation behaviour with material incentives and disincentives.
- 4/Inducing conservation behaviour with social incentives and disincentives.
- 5/Providing models of conservation behaviour.

6/Facilitating the implementing of conservation intentions.

7/Providing information on the effectiveness of conservation efforts.

The last approach is the one we are interested in. It refers to the idea of feedback as a means to reduce energy conservation. Thus, feedback is given in form of information about the energy consumption and conservation.

2.2 Studies about feedback in energy conservation

Large is the list of studies focused on feedback as a tool to reduce energy, either electricity or gas, consumption at home. Some of these studies are summarized below:

Seligman and Darley (1977) tested the effect of immediate feedback to homeowners concerning their daily electricity use. The feedback represented the actual daily electricity consumption as a ratio of a predicted one (according to the weather conditions). The results showed a 10.5% reduction in electricity used by the feedback group.

Becker (1978) proved the joint effect of feedback and goal setting. Among different experimental conditions the only one that was successful in decreasing the energy consumption was the one of those households with a high goal (20% of reduction, while the low goal was 2% of reduction) and feedback.

Winett, Neale and Grier (1979) carried out a study comparing the effects of feedback and self-monitoring on residential electricity consumption. The results

showed a 13% reduction in the feedback group and a 7% reduction in the self-monitoring group.

De Boer and Ester (1985) applied the biweekly feedback, monthly feedback and self-monitoring conditions to the study of natural gas conservation in the home. All the conditions resulted in decreasing the consumption without showing differences in the effectiveness between interventions.

In addition to these, other studies have shown that feedback can result in reduced energy consumption: Kohlenberg, Phillips and Proctor (1976); Hayes and Cone (1977); Palmer, Lloyd and Lloyd (1978); Winett, Neale, Williams, Yorkley and Kauder (1979).

A review of the studies carried out in this field during the 70's and 80's is offered by Winett and Neale (1979). There are many variations in the way the feedback is presented as well as the results, which are positive or negative in some cases. However, the overall result of the studies shows a promising and optimistic use of feedback in order to introduce energy conservation or as a support to other strategies.

2.3 Feedback effect

The feedback as a technique to improve performance has been used in psychology since the early 1900s, a review of which can be found in Bilodeau and Bilodeau (1961).

Seligman, Becker and Darley (1981) reviewed the different assumptions under the concept of feedback

and the way it works as a strategy. They analyzed three possible explanations of the feedback effect in energy conservation and gave a fourth one as an alternative.

1/ Human Factors Approach.

In new skilled responses (such as driving), which require constant information of new situations, feedback helps to control performance and the system modifications. However, energy conservation is a different kind of learning, in which people only need to know the correct action and take it. In this behaviour feedback does not work in teaching how to make appropriate conserving responses.

2/ Reinforcement Approach

Feedback has been used as an equivalent concept of reward, assuming that the presence of feedback is a reward for some actions. Nevertheless, some studies have shown that feedback is not a reward in itself, because when the feedback was withdrawn the energy saving actions went on for a while. Thus, feedback in itself does not reward appropriate conservation actions increasing the likelihood of their being repeated. Although it is not a reward in itself, it leads to self-reinforcement from the information about the energy saved.

3/ Motivational Approach

Some researches assume that feedback leads people to set aims for themselves to achieve. However, feedback in itself does not motivate or provide a person with the initial drive to conserve. Feedback can help someone with the goal to conserve, but it is not a primary motivator.

Related to the previous idea, the authors introduce the approach of feedback as goal relevant information.

Feedback provides useful information to evaluate the performance with regard to an implicit or explicit goal. Thus the existence of a goal is an important condition. The way feedback works is by providing information that helps in some cases to encourage the enlargement of the goal if it is too easy, to perceive the effect of the efforts made (sometimes big efforts are overestimated) and to maintain the commitment when the task gets rough. To sum up, feedback signals when more effort is required to reach the desired performance.

Other authors (Winett and Neale, 1979; Cook and Berrenberg, 1981) have already pointed out the function of feedback as filling a knowledge gap. Most of the households do not know the level of their energy consumption or the resources of those expenses. Bills are not a good source for this information.

2.4 Effectiveness of bills as feedback

The Department of Environment (1991) carried out a research about attitudes towards energy conservation at home. The results showed the failure of energy bills as a means of informing consumers about their energy consumption.

People asked, could often remember the last payment but rarely much further back. They did not know in specific terms how much they would spend if they used an appliance or turned on the heating. The

information of what they spend one day arrives at the end of the quarter, so there is no way to identify the expenses of their actions. Households who used coin meters were much more aware of their expenses and how much money each action took, given that this is a more direct feedback.

The arrival of the energy bills gives them a jolt, and the attention is then focused on energy consumption with the intention to reduce expenses. However, this normally is temporary and after a few weeks is forgotten.

2.5 Successful feedback

Seligman, Becker and Darley (1981) analyzed conditions for a more successful feedback.

The information given as feedback must be credible. People should see a relationship between the feedback scores and the conservation behaviour. They must be informed how much each action saves. Great changes in scores, even if they are true, should be avoided because they are difficult to understand. Thus, information does not need to be very accurate, in some studies lights and colours were used to show the changes in energy consumption.

People must initially be committed to save energy. To enhance commitment procedures, goal settings or public declarations are useful.

The frequency of feedback has been studied but it seems not to be a definitive answer. Authors recommend that feedback must be frequent enough in order to maintain conservation behaviours but not to

annoy the households.

The optimal way to display feedback is not known, but whatever unit employed, comparison baseline or display used, the information must be clear and understandable by the households.

One of the inconveniences in the application of feedback as a energy saving strategy is the cost. The need for agents providing the information does not allow this system to be cost effective. Feedback via self-monitoring is a good solution for this problem. This new approach consists of teaching people to read their own meters and interpret the information. Some studies have shown the effectiveness of self-monitoring in order to reduce energy consumption (Pallak and Cummings, 1976; Winett, Neale and Grier, 1979).

Although, in the 70's the outdoor meters seemed to be a disadvantage for this strategy, new developments in the design of meters have made self-monitoring a promising option.

CHAPTER 3. ECOFEEDBACK CAMPAIGNS

3.1 Ecofeedback in The Netherlands

The literature of feedback effects on energy conservation has had its successful application in a campaign called Campaign Easy on Energy in the Netherlands.

The campaign started locally in Brielle, in 1979. In four years they went from 18 to 600 participants. In 1983, the initiative was taken by the local authorities of Rotterdam and The Hague. And in the last phase, it became a nationwide scheme in 1985.

Now, 75% of households in the country have heard of the campaign. Almost 25% of Dutch households (1.5 million households) have joined the activity. Of those, 60% save gas by an average of 10%, which represents lower bills as well as a reduction in the production of CO₂.

The scheme in the Netherlands is run by local authorities, which own the Dutch gas distribution companies. Moreover, since the country has important natural gas resources, this type of energy has a dominant place in the average Dutch household.

3.2 Elements in the Ecofeedback scheme

The main elements in the Ecofeedback campaign are:

- A card, in which households are asked to register meter readings weekly for gas and electricity (normal and low rate). On the same card they have to register the target given for comparison and the difference, which says whether they are above or below target (see card enclosed in the Appendix II). After a given number of weeks, people are asked to calculate the summary figures and send the card back to the Council.
- Target tables, which tell the households the amount of energy they should have spent during the week. The targets are estimated for each group of households based on their annual consumption (of the previous year) and the weather that week. In this way, each household is compared with its own previous performance (weather adjusted). The tables are published weekly in a local newspaper.
- Energy saving tips. A list of cheap and easy tips to reduce energy consumption are provided. Either printed on the card or published in the local newspapers, households are given some advice and recommendations of how to succeed in beating the target.

3.3 Ecofeedback in the United Kingdom

The Dutch initiative was launched in the U.K. by the New Economics Foundation in October 1993. From this organization, Mr. Perry Walker is coordinating the pilot schemes carried out in Cardiff, Leicester,

Middlesborough, Nottinghamshire, Woking and others.

The aim of these campaigns is to reduce energy consumption at home. The way to do it, is by asking the households to read their gas and electricity meters weekly, compare the scores to a target published in the local newspaper and try to hit the target. Thus, assuming people already have the goal to save energy, this task would help them to evaluate their performance and see if their efforts are enough.

3.4 Save Energy at Home Campaign in Woking

The Woking Campaign was initiated in February 1994, when 5125 cards were delivered by hand to all the dwellings that form Goldsworth Park. The card was enclosed with a letter from the Leader of the Council introducing the scheme (a copy of the letter is provided in the Appendix III).

The campaign was been implemented by the Woking Borough Council in co-operation with the Surrey County Council. In addition to this, Seeboard, British Gas South Eastern, Times Review, The Informer and The Woking Magazine collaborated in the scheme.

Goldsworth Park area was selected for the pilot scheme because it is a mixture of housing stock ranging from 1 bedroom flats to 5 bedroom detached houses and various type of space and water heating methods. Moreover, the residents had been keen to participate in environmental initiatives in the past. There is a map enclosed in the Appendix I to locate this area.

The target tables were provided by the Council's Building Management System, who adjusted the weather variations, and published weekly by The Woking Review and The Woking Informer.

After 20 weeks of operation, households were asked to return the cards to the Woking Borough Council, in order to allow them to make a global analysis of the scheme.

By the first of August 1994, 75 reply cards were returned and some figures estimated from them.

Of the 5125 cards sent the 1.52% (78) were returned. This rate of participation is favourable compared with other percentages in United Kingdom: Nottingham City 1.57, Bassetlaw 1.09, Nottingham County 0.5, Leicester 0.02. However, the data of my research, which will be discussed later, gives a rate even more optimistic for the Woking Campaign.

The results of energy saved and emissions reduced are quite successful, and show the potential of the scheme if it were applied more widely.

The following table shows the average energy (in kWh) saved by one household, the actual energy saved by the 72 households (of the 75 cards, 3 were not usable) that filled in the card, and the estimated energy saved if all 35655 households in Woking would follow the scheme. The estimates refer to a 20 weeks period.

TABLE 1. Energy saved in the Woking Campaign and estimated energy saved for the Woking Borough households

| kWh per 20 weeks | Average saved per household | Total saved per 72 households | Estimated total saved for 35655 Woking Borough households |
|------------------|-----------------------------|-------------------------------|---|
| Electric | 26.44 | 1983 | 942,718.2 |
| Gas | 322.11 | 24,158.25 | 11,484,832.05 |
| Total Energy | 348.51 | 26,138.25 | 12,426,124.05 |

Table 2 shows the estimated reduction in emissions (in Tonnes) due to energy saving in one household and in the 35655 households of Woking, for a period of one year.

TABLE 2. Estimated reduction in emissions in the Woking Campaign

| Tonnes pa | Average estimated reduction in emissions due to energy saving per household | Total estimated reduction in emissions due to energy saving for the 35655 Woking Borough households |
|-----------------|---|---|
| CO ₂ | 0.218904 | 7805.02 |
| SO _x | 8.02482×10^{-4} | 28.61 |
| Nox | 3.83725×10^{-4} | 13.68 |

The Save Energy at Home Campaign in Woking is one of the actions taken by the Woking Borough Council in its plan of sustainability, following Local Agenda 21. In 1994 they introduced the Ecofeedback scheme in order to save energy at home, but this is not its final intended application. The Council is planning to use Ecofeedback to reduce water consumption, petrol consumption and waste, in order to create a sustainable community.

CHAPTER 4. ECOFEEDBACK GOOD PRACTICE CASE STUDY

The Building Research Establishment (BRE), on behalf of the Environment's Energy Efficiency Office, carried out a Good Practice Case Study on the Ecofeedback scheme which would be issued nationwide as a publication on good environmental practice for other local authorities throughout the U.K.

Perry Walker, from The New Economics Foundation, was in charge of this study which was based on focus group discussions and questionnaire research.

The focus group coordinated by himself met in Leicester and Woking with the aim to discuss the mechanics of the Ecofeedback scheme, as it was being run in each community, and to discuss the way it could be improved.

A study was carried out in Leicester as well as in Woking. The Woking survey was implemented by myself during the period May-July 1994 and the present thesis represents a report of its results and conclusions.

The theoretical background and the aim of the study are introduced in this chapter.

4.1 Theoretical background in attitudes studies

The second approach used to study energy consumption behaviour, according to Cook and Berrenberg (see page

5), is the one based on attitudes as predictors of behaviour. This approach has focused on the change of attitudes that would lead to a change of behaviour.

Becker et al. (1981) argued that it was important not only to know the attitudes towards energy matters, but also study the correlations between these attitudes and the measurements of energy consumption. Following this idea of attitudes as predictors of the behaviour, they carried out a study and concluded that the attitudes which were best predictors of energy consumption were attitudes towards thermal comfort and health. Macey (1989) found, as well, health and thermal comfort concerns to be the major barriers for energy conservation measures in elderly persons.

Moreover, Becker's study demonstrated that people's perception of the energy crisis did not correlate significantly with energy use, and neither did the state of family finances. However, Stutzman and Green (1982) found that income was the best predictor of energy consumption.

The fact that the dependent variable chosen for these studies is the energy consumption, measured either in the electricity bill or with the meter reading, instead of the behaviour itself, makes it more difficult to compare the studies which have been done under different conditions that can interfere in the results. It must be taken into account that the energy use is not behaviour but the consequence of behaviour and Verhallen and Van Raaij (1981) showed that only 26% of the variance in energy use was explained by household behaviour.

In the present study, the different attitudes towards

these topics related to energy conservation, (health, thermal comfort, economical situation, crisis...), were studied as possible predictors of the Ecofeedback participation.

4.2 Fishbein and Ajzen model

Within the approach aimed to evoke an attitude-behaviour consistence, the Fishbein and Ajzen Model (1975), tries to explain the gap between attitudes and behaviour, introducing the concept of behaviour intentions or goals.

The intention is defined as "the subjective likelihood that a person will engage a behaviour" and, as the model specifies, it is the immediate determinant of a behaviour. Unlike attitudes which refer to a general situation, intentions are more specific and, therefore more likely to be a good predictor of behaviour.

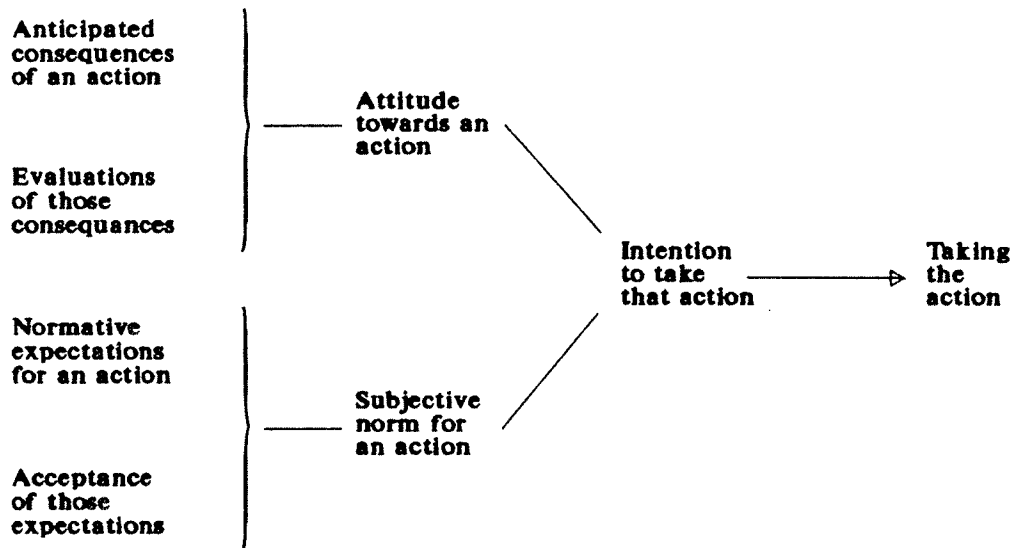
According to the model, intention is at the same time dependent on the attitudes towards the behaviour and a subjective norm, which says whether the behaviour should be performed or not.

Two subcomponents predict the attitude towards an action: these are the anticipated consequences of the action and the evaluation of those consequences. Thus, in order to form an attitude in favour or against an action, people take into account which are the consequences and how good or bad they are.

The social norms are also predicted by two subcomponents, which are the belief of what the reference group thinks about the action and the

motivation to comply with this reference. Thus, the social norm is a function of what other people expect us to do and how important it is for us to do what other people say.

Fishbein and Ajzen model is summarized in the following diagram:



The model has been found successful in predicting a number of behaviours. Studies on energy conservation have applied the model, finding new factors that have to be added.

Stutzman and Green (1982) found that the Fishbein-Ajzen model predicted the energy use to a lesser extent than did the knowledge and the income, which they called situational factors affecting the ability of the consumer to conserve.

Macey and Brown (1983) studied repetitive energy conservation behaviour, which involved repeated actions, sometimes accompanied by inexpensive

purchases. The results showed that the past experience is the best predictor of repetitive behaviour (in that case: reducing nighttime thermostat, cleaning furnace filters and caulking some of the exterior of the house).

The idea of the beliefs about the consequences of a behaviour and the evaluation of them, as determinants of the attitude towards the behaviour, were taken in this research. Thus, the attitudinal questions were mainly based on the anticipated consequences of energy conservation behaviour, in general, and the Ecofeedback scheme in particular. The social norms component was not taken into account in this specific study.

4.3 The aim of the research

Feedback is a tool used to help people in achieving their goals by allowing them a more realistic evaluation of their performance. Assuming that households are already interested in reducing their energy consumption, the Ecofeedback scheme would be a good help for them and therefore a useful task.

The Good Practice Case Study and therefore the present thesis were not interested in predicting the energy conservation behaviour through the application of the Ecofeedback scheme. However, the aim of the study was to predict the participation in the Ecofeedback programme.

On an attitudinal level, some statements related to the anticipated consequences of energy conservation behaviour and of the Ecofeedback participation, were evaluated. These consequences determined attitudes

towards different issues such as thermal comfort, health, economical situation, energy crisis..., which were analyzed as potential predictors of the "filling in the card" behaviour.

Furthermore, the study focused as well on the analysis of a list of energy efficient actions in order to find a pattern behind them. These actions were also analyzed as possible predictors of the Ecofeedback behaviour.

Based on these goals, this piece of applied research was mainly explorative. Although there were some theoretical models to support it, I was open to new variables. Understanding how the participation in this scheme could be improved was explored.

CHAPTER 5. METHODOLOGY

5.1 Sample

The population on which I based my sampling was the households in the area of Goldsworth Park, Woking, which was the focus of the pilot Ecofeedback scheme. There are 5.125 dwellings in the area and a total population of 12.443.

The fact that the Park was a mixture of types of houses with different number of bedrooms, detached houses and various types of space and water heating methods, guaranteed variety of a 500 households sample taken at random.

Making use of the Electoral Register and of a map, in order to cover all the subareas of Goldsworth Park, a set of 500 personalized questionnaires was prepared. The questionnaires were delivered by hand, on a Friday afternoon and a Saturday morning. The fact that the envelope did not arrive with the mail should lead people to pay more attention to it. I suspect that during the weekend people would also have more spare time to answer it, without postponing it for a less busy moment.

The questionnaires were sent with an introductory letter signed by Allan Jones, Building Services Manager of the Woking Borough Council. The letter, a copy of which is enclosed in the Appendix VII, was written on headed paper from this office. Thus, the questionnaire was sent on behalf of the Woking

Borough Council, leaving the positive and negative feelings, that would arise, aside.

Two weeks after having sent the first set of questionnaires, a prompt was sent to a 200 households sample of those who still had not answered. Since the questionnaires had been numbered, people who had not answered were easy to identify.

The prompt consisted of a letter reminding them that we were still interested in their opinions, and another questionnaire in case they had mislaid the first one. In this case the letter was addressed and signed by myself as the responsible person for the data analysis from the University of Surrey (letter enclosed in the Appendix VIII). This would give those who had negative feelings towards the Woking Borough Council, a chance to answer the questionnaire.

All the envelopes of the first and second set contained an introductory letter, a copy of the questionnaire and an empty envelope stamped and addressed to myself at the University of Surrey. The purpose of this envelop was to make the task of answering the questionnaire and sending it back, simpler.

To sum up, the sample was initially made up by 500 households from Goldsworth Park, 200 of which were contacted twice.

5.2 Questionnaire

The method used to gather the data was through a questionnaire. It was designed in collaboration with Perry Walker, the consultant from The New Economics

Foundation, in order to cover the information that both were interested on.

The questionnaire, a copy of which is provided in the Appendix IX, was divided in four sections:

Section 1 referred to some classifying data about the household, which would help to define the profile of those households who are more likely to follow the Ecofeedback scheme.

Questions such as the number of people belonging to certain age groups, the number of female and male adults, and the occupation of the adult members of the household were asked.

Section 2 included questions about some energy conservation actions related to the home.

People were asked whether they had performed some particular behaviours in the past or they were intending to display them in the future. Since some behaviours were repetitive actions which people are likely to keep taking, the fact that they had taken one specific action in the past did not exclude the intention to do it again. Therefore, the two answers were allowed.

A total of 14 behaviours and their respective intentions were asked:

1. Lag the hot water tank
2. Lag the hot water pipes
3. Fit draught-proofing to windows and doors
4. Insulate the loft

5. Insulate the walls or floors
6. Install double glazing
7. Install heating controls such as thermostats
8. Buy a gas fired condensing boiler
9. Buy energy saving lightbulbs
10. Buy "savaplugs"
11. Put shelves over the radiators
12. Turn down the thermostat
13. Try to use only heat, lights and appliances needed
14. Buy energy efficient domestic appliances

The answer to these questions had to be marked with a tick in the box of those behaviours they had already displayed or of those actions they intended to take in the future. Thus, the answers can be considered a qualitative yes or no to each behaviour and intention.

Section 3 asked the degree of agreement they had to 23 statements about the issue of energy conservation. This section is focused on the attitudinal components that predict the behaviour of following the Ecofeedback scheme or not.

A five points ordinal scale was provided as a guide to answer this section. They were asked to write down the number that corresponded with their feelings about the different statements. From strongly agree to strongly disagree, the degrees were rated as follows:

| | | | | |
|----------|--------|---------------|----------|----------|
| Strongly | Agree | Neither agree | Disagree | Strongly |
| agree | | nor disagree | | disagree |
| 1..... | 2..... | 3..... | 4..... | 5 |

The statements were intended to cover the following areas:

a) Attitudes towards discomfort and making an effort in conserving energy:

9. It is not worth putting clothes on in order to save energy

11. Saving energy would decrease my comfort at home

14. My heating consumption habits are well fixed and I cannot see myself changing them.

b) Attitudes towards the impact of energy conservation on health:

8. Houses should be kept warm to prevent illnesses

20. It is essential to my family's health for the house to be well heated in the winter

c) Attitudes and perception of the state of the household's finances:

4. I find it necessary to cut down my spending

15. I am optimistic about my family's financial condition in the near future

d) Attitudes and perception of the energy crisis:

7. Energy crisis is something we should not worry about

21. The energy crisis is something belonging to the 1970's

e) Attitudes towards the environment and the need to help it:

3. Reducing my energy consumption would help the environment

5. Everybody should make an effort to help the environment

f) Perceived control and self-efficacy in energy consumption:

6. There is not much I can do to reduce my energy bills

22. No matter how hard I try to conserve energy, I could only save a few pennies each day

g) Attitudes towards the actions of saving energy and its consequences:

1. It is essential to reduce household energy use

2. Reducing my energy consumption would save money

10. Following the tips given, I would save energy

17. Most energy saving home modifications cost more money than they save

18. Conserving energy in the house does not save much money

h) Attitudes and beliefs about the Ecofeedback scheme and its consequences:

12. Following the scheme would keep me aware of my energy expenses

13. Following the scheme would help me save energy

19. Filling in the Save Energy Card every week causes me more trouble than advantages

23. The Save Energy at Home scheme is a successful one and should be followed by all households in this country

i) Attitudes towards Science and future development:

16. Science will soon provide society with a long lasting source of energy

Section 4 referred to the mechanics and details about the Ecofeedback scheme.

People were asked where they had read or heard about the Ecofeedback scheme. Five options were given for this question and more than one could have been answered: Letter from the Council in February 1994 (enclosed with the Ecofeedback card), The Woking Magazine, The Woking Informer, The Woking Review and other sources, which were asked to be specified. A part from the letter sent by the Council the other options referred to three free delivered local papers in Woking, a copy of which communications is provided in the Appendices IV, V and VI. Each option had a box which had to be ticked if they had read that specific information. Thus, in my analysis I treated these as 5 yes-no questions.

They were asked if they had received the Ecofeedback card and if they had filled it in. More specifically they were asked to state from which week to one they had done so. This intended to show whether they were still following the scheme or they had already given up, and if they had started straight away from the moment they had received the information.

Some open questions in this section asked them

- reasons why they had decided to follow or not the scheme,
- reasons that made it harder to fill in the card,
- difficulties in understanding the weekly energy target tables,
- difficulties in understanding the saving energy tips given,
- reasons that helped or hindered them in carrying out the energy saving tips
- suggestions in order to improve the Woking campaign.

Apart from the first one of these open questions, the rest were addressed to those who were following the scheme (or had done it at some point).

The participants in the scheme were asked where they were getting the weekly energy target tables required in order to fill in the card. This was a five options question: The Woking Review, Helpline, Civic Offices, Community Centre and others. In this case, more than one answer in the task of ticking the boxes, were allowed.

People who were following the scheme were asked if they thought they had saved money by following the Woking campaign. The options in the answer were: yes, no and don't know

Finally in this section, people were asked about their intention to follow the scheme and fill in the card in the future. The answers had to be given in a yes or no option.

Section 5 was a reproduction of part of the tables presented in the Ecofeedback card. This information was easy to get as it was registered on the card and people were supposed to only copy some figures. Again, this was a section to be answered only by those households who were following the scheme.

The intention of this section was to quantify the behaviour and allow some comparison between the level of consumption and savings of the different households who were participating in the scheme.

5.3 Data analysis

5.3.1 Codification

As soon as the questionnaires were returned, the first step in the analysis of the data consisted in the codification of the answers.

Some questions did not need to be coded either because the number given corresponded to a real quantity (eg.: number of people in each group of age, meter reading...) or because people had answered it following a scale already coded (eg.: degree of agreement to the statements given in section 3).

The questions which had been answered with yes or no options were coded as follows:

yes=1 no=0 don't know=2

This refers to the behaviours and intentions in section 2 and most of the closed questions in section 4.

For the open questions the procedure followed was to make a list with all the answers given and shift similar ones to the same category. The categories for the different questions are described below.

Question 6: The last possible answer, "others":

- 1- School
- 2- Phone call
- 3- Neighbours
- 4- Cannot remember or not specified

Question 9: Reasons for following the scheme or not. Two sets of categories were needed in this question

as three different groups of people answered with a different sense.

a) Reasons for those who followed the scheme and still do:

1- Assist in the study, collaborate

The first category included the answers which referred to the idea of taking the action in order to collaborate and help. There was always a reference to someone else who expected us to take the action.

2- Be aware of energy, save energy

In the second category the answers referred to the advantages for the own household.

3- Encouraged from school

The third category referred to a specific case.

b) Those who did not follow the scheme and those who started filling in the card but gave up should be included in the same group, as both gave reasons for not following the scheme:

1- Too much trouble, too complex, too busy, no time

This category includes those reasons given related to the complexity and time required for the activity.

2- No card received, don't know about it, probably mislaid

This refers to the lack of information about the Ecofeedback scheme, either because they did not receive the card or because it was mislaid.

3- Already followed suggestions, so there is no need

There was a group of people who defended that as they were already taking actions to save energy, they did not see any reason to read the meter

and fill in the card.

4- Personal problems: baby, being away, age...

This category includes reasons given for particular cases where some circumstances prevented the household from follow the scheme.

5- Forget

The reason given was that they did not remember to do the task.

6- No excuse, apathy, sorry

These answers reflected no reason found to justify their decision. Some felt sorry and guilty for not following the scheme.

7- Tables difficult to get

People referred to the difficulty to find the tables. This reason was given mainly by the group who had given up.

Question 11: Reasons that made it harder to fill in the card:

1- Forget

2- Personal problems: holiday, being away, moving house...

3- Units from paper differ from units from meter

4- It was not stated when to start

5- Tables difficult to get

These reasons were similar to some given for not following the scheme. Some of them, such as answers 3 and 4, were particular cases but they were still codified.

Question 12: The last answer, "others":

1- Post

Question 13: Difficulties in understanding the weekly energy target table:

1- Printed very small

2- Units differ from my meter

3- Difficult to remember which week ending date the week numbers in the card referred to
In some cases the answers were repeated in different questions.

Question 14: Difficulties in understanding the energy saving tips:

1- What is the point in double glazing and draught proofing if you have gas appliances that call for large quantities of fresh air? Why draught proof windows if they contain trickle ventilation? What advice is taken/given to deal with condensation?

Only one household answered this question with some comments which were not coded but which I have reproduce here.

Question 15: What helped or hindered you in carrying the energy saving tips?

- 1- To maintain adequate temperature for young baby
- 2- House is heated at night, storage heaters, no gas
- 3- Money, cannot afford
- 4- Husband, children not closing doors...

This category includes references to members of the household whose behaviours and attitudes do not make it worth it to take actions in order to save energy

- 5- No time to think about it, other priorities

Question 17: Suggestions to improve the Woking campaign.

The suggestions were neither coded nor included in the data matrix for the analysis. However, they were listed (see page 64) and taken into account for discussion.

Of the previous questions, numbers 9, 11, 13, 14, 15 and 17 allowed more than one answer.

Lack of a answer for any of the questions, including those in section 3 (with the five points scale) was coded with a "0".

Each questionnaire was given a case number, according to the order they were received and introduced in the computer. No specific reason was followed for that number, which was only intended to find the source of data more easily.

5.3.2 Data Matrix

The data was introduced in the computer using the SPSS for Windows (Release 6.0), which was used for the rest of the analysis.

A data matrix was created after having coded the answers to the different questions.

The rows represented the questionnaires sent back by the different households.

The columns showed a large number of variables corresponding to the different questions.

5.3.3 Analysis

The kind of data determined the type of analysis followed. Apart from section 3 and section 5, the rest of the questions had been answered or coded as qualitative and categorical data.

Two levels of analysis were run:

5.3.3.1 Descriptive

The descriptive analysis for the qualitative data was based on the computing of frequencies. However, for the answers to the five point scale after a test of normality, the means and standard deviation were calculated.

5.3.3.2 Explorative

In order to get a deeper understanding of the data, allowing the comparisons between variables, other analyses were run.

The main variable to be predicted was whether people would follow the scheme or not, in other words, if they filled in the card. This was a qualitative variable with two categories: "yes" or "no". Originally, it included the opportunity to say "Don't know", but these answers were rejected.

Different kinds of variables were used to predict the Ecofeedback participation.

a) Some variables were categorical and qualitative (eg.: previous conservative behaviours carried out or intentions for future actions).

The analysis used to compare two categorical variables were the crosstabulations based on frequencies and the associated Chi square. The Chi square compares an observed distribution with an expected one. A significant Chi square coefficient

would tell us that the two variables were associated in some way and that the distribution of their frequencies cannot be explained at random.

b) Other variables were ordinal and quantitative (eg.: attitudes in section 3).

In order to link the quantitative variables (attitudes) with the qualitative ones, a Factor Analysis, followed by a t-test, was run. The Factor Analysis reduced the 23 attitudinal statements to a lower number of factors. The factors were tested with a reliability test in order to create scales. Afterwards, a t-test comparing the two group's means for each scale was run.

CHAPTER 6. RESULTS

6.1 Response to the questionnaire

Of the 500 questionnaires which were delivered, and the 200 prompts sent two weeks later, the total number of questionnaires received back was 148. This represents a 29.6% of response, taking into account that 8.4% (42) of the households needed a second demand to take action in sending them back.

TABLE 3. Answered questionnaires

| | Question. sent | Question. back | % |
|-----------|-------------------|-------------------|-------|
| 3rd June | 500 | 106 | 21.2% |
| 25th June | 200 | 42 | 21% |
| Total | 500 | 148 | 29.6% |

6.2 Cards Received

68.2% (101) of the households said they had received the Ecofeedback card and the information enclosed with it, in February 1994. The rest either denied having received it or did not know if they had received it.

TABLE 4. Households who received the Ecofeedback card

| | YES | NO | DON'T KNOW | TOTAL |
|---|----------------|---------------|---------------|---------------|
| Did you receive an Ecofeedback card? | 68.2% (101) | 15.5% (23) | 16.2% (24) | 100% (148) |

6.2.1 Comparison between cards received and answering the questionnaire

A significant ($p < 0.05$) association was found between recalling having received the card and sending the questionnaire back at the first time or after the prompt. Those households who remembered having received the card tended to answer earlier than those who did not know about the scheme, who tended to answer after the prompt.

However, no significant association was found between the fact of filling in the card and answering the questionnaire before or after the prompt.

6.3 Cards filled in

Of the 148 households who answered the questionnaire, 33 (22.2%) filled it in. Of these 33, 24 households were still following the scheme, while 9 had already given up (as of July 30th).

TABLE 5. Participation in the Ecofeedback scheme

| | YES | | NO | DON'T KNOW | TOTAL |
|---------------------------------------|---------------|--------------|----------------|-------------|---------------|
| Did you fill in any part of the card? | 22.2% (33) | | 76.3% (113) | 1.3% (2) | 100% (148) |
| | STILL DO | GAVE UP | | | |
| | 16.2% (24) | 6.08% (9) | | | |

6.4 Age

Among the total of the 148 households, there were 419 people distributed in the following age groups:

TABLE 6. Age distribution of the sample

| GROUP OF AGE | N. OF PEOPLE | % |
|--------------|--------------|-------|
| 0-10 years | 87 | 20.7% |
| 10-17 years | 41 | 9.7% |
| 18-30 years | 61 | 14.5% |
| 31-40 years | 105 | 25% |
| 41-50 years | 69 | 16.4% |
| 51-60 years | 29 | 6.9% |
| + 60 years | 27 | 6.4% |
| TOTAL | 419 | 100% |

6.4.1 Comparison between age groups and participation in the scheme

Looking for an age profile for the households more likely to follow the scheme, the only significant tendency was the one of those households with any person between 18-30 years old which did not tend to fill in the card. On the other hand, those households in which the adults were older than this age tended significantly ($p < 0.05$) to follow the scheme. No relation was found with the fact of having children (people younger than 17 years old) in the house or not.

6.5 People and sex

The average number of people for the households was 2.83. The people per household ranked in numbers from 1 to 7:

TABLE 7. People distribution per household

| NUMBER OF PEOPLE | NUMBER OF HOUSEHOLDS | PERCENTAGE |
|------------------|----------------------|------------|
| 1 | 25 | 16.9% |
| 2 | 42 | 28.4% |
| 3 | 30 | 20.3% |
| 4 | 40 | 27% |
| 5 | 7 | 4.7% |
| 6 | 3 | 2.0% |
| 7 | 1 | 0.7% |
| TOTAL | 148 | 100% |

The distribution of sexes between the adults (people older than 18 years) was well balanced (148 males and 142 females). In 80.4% of the households there was a couple formed by one adult male and one adult female.

6.5.1 Comparison between sex and number of people in the household and participation in the scheme

Not significant association was found between the number of people or the sex distribution in a household and the fact of following the scheme.

6.6 Energy efficient actions

The energy efficient actions which were taken and which are intended to be taken in the future, have been measured in section 2.

The following table shows the level of popularity of the different actions in the past and in the future:

TABLE 8. Percentages of households who displayed each specific action and who had each specific intention

| | PAST BEHAVIOUR | FUTURE INTENTION |
|--|-------------------|---------------------|
| Lag the hot water tank | 87.2% (129) | 0.7% (1) |
| Try only to use the heat, lights, appliances needed | 85.1% (126) | 6.1% (9) |
| Insulate the loft | 81.1% (120) | 1.4% (2) |
| Turn down the thermostat | 67.6% (100) | 2.7% (4) |
| Lag the hot water pipes | 66.9% (99) | 3.4% (5) |
| Install heating controls such as thermostats | 66.9% (99) | 2.0% (3) |
| Fit draught-proofing to windows and doors | 46.6% (69) | 7.4% (11) |
| Install double glazing | 43.2% (64) | 11.5% (17) |
| Insulate the walls or floors | 31.8% (47) | 4.7% (7) |
| Buy energy efficient domestic appliances | 26.4% (39) | 14.2% (21) |
| Buy energy-saving lightbulbs | 21.6% (32) | 13.5% (20) |
| Buy a gas fired condensing boiler | 11.5% (17) | 4.7% (7) |
| Put shelves over the radiators | 8.1% (12) | 5.4% (8) |
| Buy "Savaplugs" | 2.7% (4) | 8.1% (12) |

6.6.1 Comparison between energy efficient actions taken and participation in the scheme

The frequencies for behaviours and intentions in the different groups (those households who followed the scheme and those who did not), are displayed in Table 9.

No significant association was found between any of the behaviours and intentions and the fact of filling in the card or not.

TABLE 9. Frequencies for the energy efficient action among those households who followed the scheme and those who did not.

| | Followed the scheme (33 households) | | Did not follow the scheme (115 households) | |
|---|-------------------------------------|--------------|--|---------------|
| | BEHAVIOUR | INTENTION | BEHAVIOUR | INTENTION |
| Lag the hot water tank | 93.9% (31) | 0% (0) | 85.0% (91) | 0.9% (1) |
| Lag the hot water pipes | 69.7% (23) | 0% (0) | 66.4% (71) | 4.7% (5) |
| Fit draught-proofing to windows and doors | 54.5% (18) | 6.1% (2) | 44.9% (48) | 6.5% (7) |
| Insulate the loft | 87.9% (29) | 0% (0) | 80.4% (86) | 0.9% (1) |
| Insulate the walls or floors | 39.4% (13) | 0% (0) | 29.0% (31) | 5.6% (6) |
| Instal double glazing | 51.5% (17) | 6.1% (2) | 40.2% (43) | 13.1% (14) |
| Instal heating controls such as thermostats | 69.7% (23) | 0% (0) | 66.4% (71) | 2.8% (3) |
| Buy a gas fired condensing boiler | 12.1% (4) | 3.0% (1) | 11.2% (12) | 5.6% (6) |
| Buy energy-saving lightbulbs | 24.2% (8) | 21.2% (7) | 22.4% (24) | 11.2% (12) |
| Buy "Savaplugs" | 6.1% (2) | 9.1% (3) | 1.9% (2) | 8.4% (9) |
| Put shelves over the radiators | 12.1% (4) | 0% (0) | 7.5% (8) | 7.5% (8) |
| Turn down the thermostat | 72.7% (24) | 0% (0) | 64.5% (69) | 3.7% (4) |
| Try only to use heat, lights, appliances needed | 84.8% (28) | 9.1% (1) | 86.9% (93) | 2.8% (3) |
| Buy energy efficient domestic appliances | 24.2% (8) | 15.2% (5) | 29.0% (31) | 15.0% (16) |

6.6.2 Comparison between energy efficient actions and their future intention

It was expected that the repetitive behaviours would be displayed in a 2x2 chi square table tending to the congruence and the non-repetitive actions tending to the incongruence, as follows:

| | | INTENTION | | | | INTENTION | |
|--------------|-----|-----------|-----|------------|-----|-----------|-----|
| | | NO | YES | | | NO | YES |
| BEHAVIOUR | NO | | X | BEHAVIOUR | NO | X | |
| | YES | X | | | YES | | X |
| Incongruence | | | | Congruence | | | |

The incongruence situation has occurred quite often. Some of the energy efficient actions were significantly associated with its intention in such a way that the fact of having displayed the behaviour led them not to have the intention to do it again in the future. Moreover, if they did not take the action in the past, they would probably have the intention to do it in the future. The actions with a significant ($p < 0.05$) association with the intention to take them, are normally the most popular actions (see Chi square tables on page 46):

Lag the hot water tank
 Try only to use the heat, lights, appliances needed
 Insulate the loft
 Lag the hot water pipes

Install heating controls such as thermostats
Fit draught-proofing to windows and doors
Install double glazing

On the other hand, no significant congruent situation has happened, even in the repetitive behaviours. In this kind of behaviours some scores appear in the YES-YES cell but this intention is never high enough to allow the significant Chi square tending to congruence. Nevertheless, it prevents the association from being significant tending to incongruence. Thus, when there is a non-significant association, this means that it tends non-significantly to the congruence (see Table 10 on next page).

Turn down the thermostat
Insulate the walls or floors
Buy energy efficient domestic appliances
Buy energy-saving lightbulbs
Buy a gas fired condensing boiler
Put shelves over the radiators
Buy "Savaplugs"

TABLE 10. Behaviour x Intention (2x2)
crosstabulations with p associated to the chi square

| | | | | | | | |
|--------|-----|-------|-----|--------|-----|-------|-----|
| | | INT 1 | | | | INT 2 | |
| | | NO | YES | | | NO | YES |
| BEH 1 | NO | 18 | 1 | BEH 2 | NO | 44 | 5 |
| p<0.01 | YES | 129 | 0 | p<0.01 | YES | 99 | 0 |

| | | | | | | | |
|--------|-----|-------|-----|--------|-----|-------|-----|
| | | INT 3 | | | | INT 4 | |
| | | NO | YES | | | NO | YES |
| BEH 2 | NO | 68 | 11 | BEH 4 | NO | 26 | 2 |
| p<0.01 | YES | 69 | 0 | p<0.01 | YES | 120 | 0 |

| | | | | | | | |
|---------|-----|-------|-----|---------|-----|-------|-----|
| | | INT 5 | | | | INT 6 | |
| | | NO | YES | | | NO | YES |
| BEH 5 | NO | 94 | 7 | BEH 6 | NO | 67 | 17 |
| No sig. | YES | 47 | 0 | p<0.001 | YES | 64 | 0 |

| | | | | | | | |
|--------|-----|-------|-----|--------|-----|-------|-----|
| | | INT 7 | | | | INT 8 | |
| | | NO | YES | | | NO | YES |
| BEH 7 | NO | 46 | 3 | BEH 8 | NO | 124 | 7 |
| p<0.05 | YES | 99 | 0 | No sig | YES | 17 | 0 |

| | | | | | | | |
|--------|-----|-------|-----|--------|-----|--------|-----|
| | | INT 9 | | | | INT 10 | |
| | | NO | YES | | | NO | YES |
| BEH 9 | NO | 98 | 18 | BEH 10 | NO | 132 | 12 |
| No sig | YES | 30 | 2 | No sig | YES | 4 | 0 |

| | | | | | | | |
|--------|-----|--------|-----|--------|-----|--------|-----|
| | | INT 11 | | | | INT 12 | |
| | | NO | YES | | | NO | YES |
| BEH 11 | NO | 129 | 7 | BEH 12 | NO | 46 | 2 |
| No sig | YES | 11 | 1 | No sig | YES | 98 | 2 |

| | | | | | | | |
|---------|-----|--------|-----|--------|-----|--------|-----|
| | | INT 13 | | | | INT 14 | |
| | | NO | YES | | | NO | YES |
| BEH 13 | NO | 16 | 6 | BEH 14 | NO | 91 | 18 |
| p<0.001 | YES | 123 | 3 | No sig | YES | 36 | 3 |

6.6.3 Comparison between energy efficient actions and the answer to the questionnaire

The intention to install double glazing was associated significantly ($p < 0.01$) with the fact of answering the questionnaire after the prompt, in the sense that those households who answered later tended to have a higher intention to take this specific action.

6.6.4 Comparison between energy efficient actions and the recall of receiving the Ecofeedback card

Some significant associations were found with the energy efficient actions and recalling to have received the card and information about the Ecofeedback scheme.

Among those households who received the card, there was a significant ($p < 0.001$) rate that had insulated the loft.

The action of turning down the thermostat is taken significantly ($p < 0.05$) more often among those households who did not receive the Ecofeedback information. In the same way, those who did not receive the card have a significant ($p < 0.05$) higher intention to install thermostats.

6.6.5 Comparison between energy efficient actions and groups of age

Some households with members belonging to different groups of age have significant ($p < 0.05$) tendencies to have taken or intend to take specific actions, as the following table summarizes.

TABLE 11. The significant associations (Chi square with $p < 0.05$) between the different groups of age and the energy efficient actions

| | 0-10 | 11-17 | 18-30 | 31-40 | 41-50 | 51-60 | + 60 |
|--------|------------|-------------|-------------|-------------|------------|-------------|-------------|
| Beh 1 | | | | | | | |
| Beh 2 | | $p < 0.05$ | | | | | $p < 0.05$ |
| Beh 3 | | $p < 0.05$ | | | | | |
| Beh 4 | | | | | | | |
| Beh 5 | | | | $p < 0.05$ | $p < 0.05$ | | |
| Beh 6 | | | | $p < 0.001$ | | $p < 0.05$ | $p < 0.001$ |
| Beh 7 | | | | | | | |
| Beh 8 | | $p < 0.001$ | | | | | |
| Beh 9 | | $p < 0.001$ | | | $p < 0.05$ | | |
| Beh 10 | | | | | | | $p < 0.05$ |
| Beh 11 | | | | | | | |
| Beh 12 | | | | | | | |
| Beh 13 | | | | | | | |
| Beh 14 | | | | | | $p < 0.001$ | |
| Int 1 | | | | | | | |
| Int 2 | | | $p < 0.001$ | | | | |
| Int 3 | | | $p < 0.05$ | | | | |
| Int 4 | | | $p < 0.05$ | | | | |
| Int 5 | | | $p < 0.001$ | $p < 0.05$ | | | |
| Int 6 | | | | | | | |
| Int 7 | | | $p < 0.001$ | | | | |
| Int 8 | | | | | | | |
| Int 9 | | | | | | | |
| Int 10 | | | | | | | |
| Int 11 | $p < 0.05$ | $p < 0.05$ | $p < 0.05$ | | | | |
| Int 12 | | | | | | | |
| Int 13 | $p < 0.05$ | | | | | | |
| Int 14 | | | | | | | |

Households with children of between 0 and 10 years old, are more likely to have the intention to put shelves over radiators and to try to only use the energy they need than those households who do not have children of this age.

Households with children between 11 and 17 years old are more likely to have lagged the hot water pipes, fitted draught proofing to windows and doors, bought a gas fired condensing boiler and bought energy saving lightbulbs, than those households without children of this age.

Households with people between the ages of 18 and 30 are more likely to have the future intention to lag hot water pipes, fit draught proofing to windows and doors, insulate the loft, insulate walls and floors, install thermostats and put shelves over the radiators than those households with adults older than 30.

Households with people between 31 and 40 years old are more likely than households without people at this age, to have not insulated the walls and floors nor installed double glazing. However, they have a significant higher intention to insulate walls and floors.

Households with people between 41 and 50 years old are more likely to have insulated walls and floors and bought energy saving lightbulbs, than households without people at this age.

Households with people between 51 and 60 years old are more likely to have installed double glazing and bought energy efficient domestic appliances than households without people between these ages.

Households with people over 60 years old are more likely to have lagged the hot water pipes, installed double glazing and bought Savapluggs than households without people of this age.

6.7 Attitudes

The first step in the analysis of the attitudinal components was a Factor Analysis run in order to reduce the 23 statements to a lower number of dimensions. A Principal Components Analysis and a Oblimin rotation led to a 6 factors solution with a simple structure.

TABLE 12. Pattern matrix for the Factor Analysis, with the loadings of each attitude in its factor

| | FAC 1 | FAC 2 | FAC 3 | FAC 4 | FAC 5 | FAC 6 |
|----------|---------|--------|---------|--------|--------|---------|
| ATTITUD3 | -.76636 | | | | | |
| ATTITU10 | -.67287 | | | | | |
| ATTITUD6 | .62190 | | | | | |
| ATTITUD1 | -.50401 | | | | | |
| ATTITUD2 | -.48718 | | | | | |
| ATTITUD8 | | .80235 | | | | |
| ATTITU20 | | .78711 | | | | |
| ATTITU12 | | | -.77159 | | | |
| ATTITU23 | | | -.73027 | | | |
| ATTITU13 | | | -.72810 | | | |
| ATTITU19 | | | .71067 | | | |
| ATTITU14 | | | | .72093 | | |
| ATTITU22 | | | | .58832 | | |
| ATTITU11 | | | | .52388 | | |
| ATTITUD9 | | | | .42080 | | |
| ATTITU15 | | | | | .81622 | |
| ATTITUD4 | | | | | .72371 | |
| ATTITU21 | | | | | | .67851 |
| ATTITU18 | | | | | | .61566 |
| ATTITU17 | | | | | | .57805 |
| ATTITUD7 | | | | | | .49448 |
| ATTITU16 | | | | | | .47318 |
| ATTITUD5 | | | | | | -.39615 |

After having reduced the variables to 6 factors, the items were recoded in order to get more rational scales. An Alpha test of reliability was applied to the factors creating 5 reliable scales and 1 with low Alpha coefficient.

Self-Efficacy Scale (Factor 1) Alpha=0.65

This scale refers to the consequences of energy consumption and own actions taken to reduce it. The idea of oneself as responsible of the energy used and the self-efficacy in controlling this consumption are expressed here. Moreover, it also includes the need to reduce energy consumption in order to help the environment.

Health Scale (Factor 2) Alpha=0.68

This scale is related to the importance of warmth to one's health. The idea of the scale is that we have to keep the houses well heated in order to prevent illnesses.

Ecofeedback Scale (Factor 3) Alpha=0.75

This scale refers to the attitudes and beliefs of the positive consequences of the Ecofeedback scheme. The idea is that the project is good practice to help the household save energy and it is worth the trouble.

Discomfort Scale (Factor 4) Alpha=0.63

This scale refers to the discomfort and effort required in order to save energy. The affirmation that the energy saving activities would decrease the comfort at home, or would require an effort which is

not worth it, are the main ideas in this scale.

Finances Scale (Factor 5) Alpha=0.49

This scale refers to the perceived economical situation of the household. The sense of the scale is that the financial condition of the family is not bad and does not need specific actions.

Crisis Scale (Factor 6) Alpha=0.66

A generic scale about the economical problem of energy. This scale refers to the idea that the energy crisis is something we should still worry about. Moreover, the energy policies should focus on home energy reduction through home energy efficient improvements.

Through an additional method, a score was created for each household in each scale. The higher values in the scale meant a disagreement with the idea supporting the scale, while lower values meant agreement. The following analysis was a t-test comparing the means of different groups, according to different variables, in each scale.

6.7.1 Comparison between attitudes and participation in the Ecofeedback scheme

The means of the group of households who followed the scheme and the group of those who did not, were significantly different in the Ecofeedback and Discomfort Scales.

TABLE 13. t-test comparing the participant and non-participant group's means for each scale

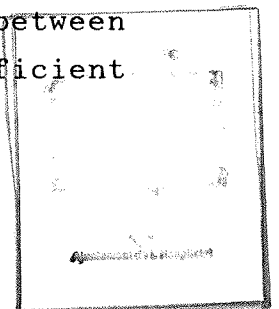
| | Followed scheme | | t-test |
|---------------------|-----------------|------|-------------|
| | YES | NO | |
| Self-Efficacy Scale | 1.96 | 1.95 | No sig |
| Health Scale | 2.96 | 2.71 | No sig |
| Ecofeedback Scale | 2.19 | 2.72 | $p < 0.001$ |
| Discomfort Scale | 3.58 | 3.23 | $p < 0.01$ |
| Finances Scale | 3.28 | 3.25 | No sig |
| Crisis Scale | 2.21 | 2.29 | No sig |

People who did not fill in the card scored closer to the neutral point, "neither agree nor disagree", in the Ecofeedback Scale, while those households who followed the scheme had a more positive score.

Moreover, those households who filled in the card scored significantly higher in the Discomfort Scale.

6.7.2 Comparison between attitudes and energy efficient actions

Other behaviours and intentions to take energy efficient actions were predictable by these attitudinal scales. The following table summarizes the t-test comparing the attitudinal means between those households who took some energy efficient



actions or had the intention to do so, and those who did not.

TABLE 14. t-test comparing in each attitudinal scale the means for those households who took an energy efficient action and those who did not, and the same with those households with and without the intention (only the significant differences are displayed)

| | SELF-EFFICACY | HEALTH | ECO FEEDBACK | DISCOMFORT | FINANCES | CRISIS |
|---------------------------|-------------------------|------------------------|-------------------------|-------------------------|-------------------------|------------------------|
| BEH8 NO YES T-TEST | 1.99 1.72 p<0.05 | | | | | |
| BEH9 NO YES T-TEST | 2.01 1.77 p<0.05 | | | | | |
| BEH12 NO YES T-TEST | 2.12 1.88 p<0.001 | | 2.76 2.51 p<0.05 | 3.14 3.39 p<0.05 | | |
| INT4 NO YES T-TEST | | | | | 3.26 2.50 p<0.001 | |
| INT7 NO YES T-TEST | | | 2.57 3.62 p<0.05 | 3.29 4.00 p<0.001 | | |
| INT8 NO YES T-TEST | 1.98 1.51 p<0.001 | | | | | |
| INT9 NO YES T-TEST | | | 2.65 2.23 p<0.001 | | | |
| INT11 NO YES T-TEST | | | | | | 2.26 2.62 p<0.05 |
| INT12 NO YES T-TEST | | | | | 3.23 4.00 p<0.05 | |
| INT13 NO YES T-TEST | | 2.73 3.33 p<0.05 | | | | |
| INT14 NO YES T-TEST | 2.01 1.70 p<0.001 | | | | | 2.32 2.06 p<0.05 |

6.8 Publicity

Of the different kinds of publicity about the Ecofeedback scheme, the one which proved more seen was the letter enclosed with the Ecofeedback card and sent by the Leader of the Council in February 1994, with a percentage of 71.6% (106) of households who recalled receiving it. The information was read in The Woking Review in 50 cases (33.8%), in The Woking Informer 40 times (27%) and in The Woking Magazine 32 times (21.6%). In some single cases people had heard about the Ecofeedback scheme from the neighbours (1) or through the children's school (5).

TABLE 11. Percentage of households who saw each type of publicity

| | | |
|----------------------------------|-------------------------------|-------------|
| Letter from the Council, 16/2/94 | | 73.1% (106) |
| The Woking Magazine | | 21,6% (32) |
| The Woking Informer | | 27.0% (40) |
| The Woking Review | | 33.8% (50) |
| Others | | 5.5% (8) |
| | School | 3.4% (5) |
| | Phone call | 0.7% (1) |
| | Neighbours | 0.7% (1) |
| | Cannot remember not specified | 0.7% (1) |

6.8.1 Publicity Contents

The Ecofeedback articles were published in three local papers: The Woking Informer, The Woking Review and The Woking Magazine. All three are delivered door by door free of charge to the reader. Unlike the first two, The Woking Magazine is not a weekly publication and is published by the Woking Borough

Council and delivered together with The Woking Review few times a year.

Analyzing the information published in the different papers and the letter sent by the Woking Borough Council we can see that the contents are mainly the same, and are listed below:

- The Ecofeedback scheme is launched in Goldsworth Park, Woking, in order to save energy at home.
- The scheme would help households saving money while harmful emissions are reduced.
- The scheme works by making households read their meters and compare the scores with an estimated target based on last year's consumption and taking weather variations into account.
- The reading must be registered weekly on a card provided and compared with the target tables published every week on The Woking Informer and The Woking Review.
- The scheme is launched at a time when VAT is added to fuel bills.
- The scheme was initiated in The Netherlands in 1979 where it has been working successfully since then.
- A list of cheap energy saving tips was provided (eg.: "draw your curtains at dusk").

The Woking Review published another article focused on useful energy efficient actions aimed to save energy at home. Moreover, The Woking Magazine and The Woking Review published a picture of Woking

basketball celebrity Renaldo Lawrence giving support to the Ecofeedback campaign.

Although the information is very similar, there was a difference in the publication date of these articles.

The letter by the Woking Borough Council enclosed with the card was sent the 16th of February 1994, with which the scheme started. The article on The Woking Informer was published in the week ending the 18th of February 1994, and therefore delivered probably before the card reached the homes. The articles in The Woking Review and The Woking Magazine were published on the 25th of February 1994.

6.8.2 Comparison between different types of publicity

Having received the Council letter is not associated with any other type of publicity. However, the three publications are associated in the sense that those households who had read about Ecofeedback in one of them tended significantly ($p < 0.05$) to have seen it in the others (The Woking Magazine, The Woking Informer and The Woking Review). 52.8% of the 148 households did not read the information in any of these three publications.

6.8.3 Comparison between the publicity of the scheme and the participation in the Ecofeedback scheme

The only publicity which is associated with the fact of filling in the card is The Woking Review. Those households who had read the information in this publication tended significantly ($p < 0.01$) to follow

the Ecofeedback scheme.

6.8.4 Comparison between the publicity of the scheme and energy efficient actions

Recalling having read the Ecofeedback information on the different publications is associated significantly ($p < 0.05$) with other actions, as Table 15 on next page summarizes.

Those households who received the letter of the Woking Council tended not to turn down their thermostats as often as those who did not receive this letter.

Those households who had read the information in The Woking Magazine had fitted draught proofing to windows and doors, insulated walls and floors, installed double glazing and have the intention to buy energy saving lightbulbs more often than those people who did not read this magazine.

Households who had seen the information in The Woking Informer were more likely to have installed thermostats.

Households who had read the information in The Woking Review tended to have insulated the loft and to have the intention to install double glazing, buy energy saving lightbulbs and put shelves over radiators more often than those people who did not read The Woking Review.

TABLE 15. Significant associations (chi square with $p < 0.05$) between the different types of publicity and the energy efficient actions

| | Letter Council | The Woking Magazine | The Woking Informer | The Woking Review |
|--------|-------------------|------------------------|------------------------|----------------------|
| Beh 1 | | | | |
| Beh 2 | | | | |
| Beh 3 | | $p < 0.05$ | | |
| Beh 4 | | | | $p < 0.05$ |
| Beh 5 | | $p < 0.05$ | | |
| Beh 6 | | $p < 0.001$ | | |
| Beh 7 | | | $p < 0.05$ | |
| Beh 8 | | | | |
| Beh 9 | | | | |
| Beh 10 | | | | |
| Beh 11 | | | | |
| Beh 12 | $p < 0.05$ | | | |
| Beh 13 | | | | |
| Beh 14 | | | | |
| Int 1 | | | | |
| Int 2 | | | | |
| Int 3 | | | | |
| Int 4 | | | | |
| Int 5 | | | | |
| Int 6 | | | | $p < 0.05$ |
| Int 7 | | | | |
| Int 8 | | | | |
| Int 9 | | $p < 0.05$ | | $p < 0.001$ |
| Int 10 | | | | |
| Int 11 | | | | $p < 0.05$ |
| Int 12 | | | | |
| Int 13 | | | | |
| Int 14 | | | | |

6.9 Reasons to participate in the scheme

People were asked openly why they decided to follow the scheme or not. 35.1% of the households did not answer this question, while this percentage was higher in the group of people who followed the

scheme. The reasons given and related frequencies are shown in Tables 16, 17 and 18.

Among those households who followed the scheme and still do, 28% said that they did so because it was a useful exercise for them, since they were aware of their energy consumption and were more able to save energy. 20% answered that they followed the scheme in order to collaborate in the study.

TABLE 16. Reasons given by households who followed the scheme for the participation

| | |
|-------------------------------------|----------|
| Assist in the study, collaborate | 20% (5) |
| Be aware of the energy, save energy | 28% (7) |
| Encouraged from school | 4% (1) |
| No reason given | 48% (12) |

Among those households who started following the scheme but gave up, 50% gave no reason for it. 20% said that it was too complex and time consuming. Other reasons given were that it was difficult to remember to fill in the card every week or that it was difficult to find the targets tables. Since only 4 households of this group answered this question, it is not worthwhile looking for associations with other variables.

TABLE 17. Reasons given by households who started to follow the scheme but gave up

| | |
|---|---------|
| Too much trouble, too complex, no time | 20% (2) |
| Personal problems: baby, being away, age... | 10% (1) |
| Forget | 10% (1) |
| Tables difficult to get | 10% (1) |
| No reason given | 50% (5) |

Among the group of households who did not follow the scheme, 25.6% (29) answered that it was too complex and a time consuming exercise. 15.5% (21) said that they had not received the card or that they had probably mislaid it since they did not know what it was about. 9.7% (11) argued that they were already taking actions to save energy, so there was no need for them to follow the scheme. Besides personal problems or the fact that they forgot to fill in the card, there was a small group, 3.5% (4), that said not to have any excuse but apathy.

TABLE 18. Reasons given by households who did not follow the scheme

| | |
|---|-----------|
| Too much trouble, too complex, no time | 26.6%(29) |
| No card received, don't know about it, probably mislaid | 15.5%(21) |
| Already followed suggestions | 9.7%(11) |
| Personal problems: baby, being away... | 6.1%(7) |
| Forget | 5.3%(6) |
| No excuse, apathy, sorry | 3.5%(4) |
| No reason given | 30.9%(35) |

6.9.1 Comparison between reasons to participate and energy efficient actions

Those households who followed the scheme to collaborate tended to have insulated walls or floors and bought energy efficient domestic appliances more often than those who did it to be aware of their energy consumption and save energy.

Those who claimed not to follow the scheme because it was too complex, as well as those who did not know about it, tended not to fit draught proofing to windows and doors, not to insulate the walls and

floors and not to have the intention to buy energy efficient domestic appliances.

However, the actions of fitting draught proofing and insulating walls and floors were more common among those who claimed not to follow the scheme because they were already taking energy efficient actions.

6.10 Negative factors in filling in the card

To those households who had filled in the card, some questions were addressed in order to improve the mechanics of the scheme.

The main two reason that made it harder to fill in the card, was that the tables were difficult to get (24.2%) and that it was difficult to remember to do it every week (15.2%). Two single cases gave reasons that it was not stated when to start and that the units from the meter differed from those in the card. Table 19 summarizes this data.

TABLE 19. Reasons given by those households who followed the scheme, that made it harder to fill in the card

| | |
|--|-----------|
| Forget | 15.2% (5) |
| Personal problems: being away, moving house... | 9.1% (3) |
| Units from paper differ from units from meter | 3.0% (1) |
| It was not stated when to start | 6.1% (2) |
| Tables difficult to get | 24.2% (8) |
| No reason given | 42.4%(14) |

6.11 Target tables

The main way used to get the target tables was The Woking Review (69.7%). 15.2% of the households who followed the scheme did not get the tables, and 9.1% got them from Civic Offices. These percentages are summarized in Table 20.

TABLE 20. How those households who followed the scheme, got the weekly energy target table

| | |
|---|------------|
| The Woking Review | 69.7% (23) |
| Helpline, occasionally, using usually The Woking Review | 3% (1) |
| Civic Offices | 9.1% (3) |
| Community Centre | 0% (0) |
| Other: post | 3% (1) |
| Not received | 15.2% (5) |

Although most of the people did not answer the question about the difficulties found to understand the tables, the main reason given was that they were printed very small (5.8%). In one case someone also pointed out that it was difficult to remember which week ending date the week numbers in the card referred to (see Table 21).

TABLE 21. Difficulties in understanding the weekly energy target table, according to those households who followed the scheme

| | |
|---|---------------|
| Printed very small | 5.8% (2) |
| Units differ from my meter | 2.9% (1) |
| Difficult to remember which week ending date the week numbers referred to | 2.9% (1) |
| No answer given | 85.2% (29) |

6.12 Energy saving tips

Only one questionnaire answered the question about the difficulties in understanding the energy saving tips. The comments written in this answer are shown in the codification section (5.3.1) in the methodology chapter.

Very few people answered the question about what helped or hindered them in carrying out the energy saving tips. In 11.7% of the cases, the reason was an economical one. as they claimed not to be able to afford them. Table 22 summarizes this information.

TABLE '22. What helped or hindered households in carrying the energy saving tips?

| | |
|---|---------------|
| To maintain adequate temperature for young baby | 2.9% (1) |
| House is heated by night, storage heaters, no gas | 2.9% (1) |
| Money, cannot afford | 11.7% (4) |
| Husband, children not closing doors... | 5.8% (2) |
| No time to think about, other priorities | 5.8% (2) |
| No answer given | 70.5% (24) |

6.13 Suggestions to improve the scheme

There is a list of suggestions given in order to improve the scheme which are listed below:

1) Publish tables missed, repeat the tables at the end of the scheme. All tables displayed somewhere so

that they could fill the cards at the end only completing the reading weekly.

2) Print the tables larger.

3) Difficult to find the tables in The Woking Review, should be more prominently displayed, in the same page.

4) Consumption depend on too many factors, best for campaign just to concentrate on energy saving ideas. Made easier emphasizing actions not analysis.

5) Better distribution in time of targets, usually arrive on Friday, too late to beat it, should be at the beginning of the week.

6) Need guidance to understand what to do. Help for disabled/elderly residents who have difficulties to read the meters.

7) Less time involved exercise.

8) Less complicated and dictatorial (blackmail presentation). Making it simpler, more "user friendly" and not just like an extra chore.

9) Just another piece of waste paper being delivered.

10) Incentives to participate (eg: greenest household prize).

11) "If consumer saves too much, the Big Boys' profits drop, so prices are increased to compensate the Big Boys don't lose".

12) Save on costs associated with refuse collection

and re-cycling facilities.

13) Much wider publicity, hoardings in the town centre.

14) Making it something to fill in 2 weekly, or even monthly.

15) Make people aware of it and make sure they know is worthwhile.

16) Campaign should be more accurate over 4 seasons. People should be asked to declare any peculiarities which may affect the readings from their last years annual readings (eg: a new baby...). This would show clearer the difference by those saving energy by following the tips.

17) Make sure that everyone gets a card.

18) More regular information on energy saving tips.

6.14 Saving money with the scheme

Of the 33 households who followed the scheme, 57.6% (19) answered that they did not know if they had saved money by doing so. 24.2% (8) said they did not save money, while 15.2% (5) affirmed that they did.

TABLE 23. Percentage of households who followed the scheme and saved money

| | YES | NO | NO ANSWER | DON'T KNOW | TOTAL |
|---|--------------|--------------|--------------|---------------|--------------|
| Did you save money by following the campaign? | 15.2% (5) | 24.2% (8) | 3.0% (1) | 57.6% (19) | 100% (33) |

6.15 Future intention

26.4% (39) of the households claimed that they had the intention to fill in the card in the future. 43.2% of households said they did not intend to do so and 30.4% did not answer.

The fact of having followed the scheme in the past is associated with this future intention, in the sense that those who are still doing it significantly ($p < 0.001$) tend to want to do it again in the future. Moreover, those who started to fill in the card but gave up, tend not to have this intention in the future. There are 12 households that, although they did not follow the scheme in the past, are intending to do so in the future. Table 24 summarizes this information.

TABLE 24. Future intention to follow the Ecofeedback scheme

| | | YES | NO | NO ANSWER |
|--|--|---------------|---------------|---------------|
| Of those households who affirm they received the card (101 households) and | followed the scheme and still do (24 households) | 91.7% (22) | 8.3% (2) | 0% (0) |
| | followed the scheme and gave up (9 households) | 44.4% (4) | 44.4% (4) | 11.1% (1) |
| | did not follow the scheme (66 households) | 10.6% (7) | 65.2% (43) | 24.2% (16) |
| | do not know if they followed the scheme (2 households) | 0% (0) | 100% (2) | 0% (0) |
| From those who said they did not receive the card (23 households) | | 21.7% (5) | 13.0% (3) | 65.2% (15) |
| From those who do not know if they received the card (24 households) | | 4.2% (1) | 41.7% (10) | 54.2% (13) |
| From the total sample (148 households) | | 26.4% (39) | 43.2% (64) | 30.4% (45) |

CHAPTER 7. DISCUSSION

7.1 Familiarity with the Ecofeedback programme

Only 68.2% of the questionnaires returned confirm that they have received the Ecofeedback card. This is a striking figure, if we take into account that the Woking Borough Council had delivered one Ecofeedback card to every household in Goldsworth Park by hand. Thus, 31.8% of the households do not recall receiving the information. This shows the risk that the information can be taken as a non-interesting one and not even read.

However, this percentage varies between the two groups of households who answered the questionnaire at the first time or after the prompt. Of the households who answered the questionnaire at the first time, 71.5% said they had received the card. Of the households who answered after the prompt, 54% remembered having received the card. The difference between these percentages is statistically significant ($p < 0.05$).

Those households who did not know about the Ecofeedback-Save Energy at Home Campaign in Woking, tended not to answer the questionnaire. On the other hand, those who knew about the scheme tended to answer the questionnaire, even if they had not filled in the card. In general, people who knew about the campaign wanted to say something in favour or against it, people who did not know the campaign thought the questionnaire was not worth answering.

This makes it difficult to estimate the total percentage of households who remember receiving the card. Of the 500 households that we approached, 352 did not answer, and these are less likely to remember this information.

7.2 Participation in the Ecofeedback scheme

The participation rate in the Ecofeedback scheme is estimated based on the total number of households. Although many of them claimed not to have received the card, the actual fact that the Ecofeedback information was sent to all of them makes us assume that they did receive it. Moreover, the success of the scheme must be calculated over the investment of the Woking Borough Council and the number of cards that they sent.

From my data, I have got an optimistic percentage of households who participated in the Woking Campaign. Of the 148 households who answered the questionnaire, 22.29% (33) filled it in. Although 6.08% stopped doing so, there is still 16.21% of households who keep filling in the card.

The question is whether these 24 households who still follow the scheme are the only ones in the original sample of 500 households or whether there are more households filling in the card of whom we are not aware.

We should pay attention to the possibility that, out of the 500 households asked, all those that filled in the card had as well answered our questionnaire due to their interest in letting us know about their participation. This would mean that, of the 352 that

did not send the questionnaire back, very few of them, or almost none, followed the scheme. In this case the 24 households who are following the scheme should be compared with the 500 households who received the questionnaire. This would decrease the participation rate considerably to 4.8%.

Nevertheless, the fact that no significant association was found between the action of filling in the card and the action of answering the questionnaire initially or after the prompt, makes this hypothesis hard to prove. I would have expected to find less people who followed the scheme between those who answered the questionnaire after the prompt. Comparing the percentage of participation of the group that answered at the first time (25.4%) and the group that did it after the prompt (14.2%), the difference was not significant.

Although people who did not know about the Ecofeedback scheme tended not to answer the questionnaire, those who knew about it tended to answer it regardless of having filled in the card or not. There were people who did not answer the questionnaire the first time, although they had followed the Ecofeedback scheme. Therefore there can be people who did not answer the questionnaire at all and are still following the scheme.

There is no reason to believe that the 24 participants are the only ones of the 500 households approached that are still filling in the card, which allows us to expect a percentage higher than 4.8% and around 16.21% (24 out of 148) of participation.

Furthermore, there is 26.4% (39) of the sample that claimed they had the intention to follow the scheme

in the future. These includes 6 households who did not get the Ecofeedback card but say they would fill it in if they had one.

These are optimistic figures if we compare them with the 1.5% of participation obtained through the number of cards sent back to the Woking Borough Council.

7.3 Attitudes related to the Ecofeedback scheme

The attitudinal scores of people who followed the scheme and those who did not differed significantly in two of the scales: the Ecofeedback Scale and the Discomfort Scale. These are two key ideas in order to understand the participation in the Ecofeedback Campaign.

7.3.1 Ecofeedback Scale

Participants in the scheme tended to defend the advantages of the Ecofeedback scheme on a higher level ($x=2.19$). Therefore, people who filled in the card believed that it was a useful activity, that would keep them aware of their energy consumption and that would help them save energy. They did also deny that the trouble was greater than the advantages. This positive view of the Ecofeedback scheme and of its consequences is what led them to fill in the card.

However, those who did not follow the scheme, although agreed ($x=2.72$) with the positive aspects of the Ecofeedback scheme as well, had a more neutral feeling about it. People who did not fill in the card were not as sure about this positive idea of the

scheme and they normally scored closer to the "neither agree nor disagree" point. This lack of convincement about the positive consequences and the advantages of the scheme is what prevented them from filling in the card.

People who did not recall receiving the Ecofeedback information were in this second group. Since most of them did not answer the questions about the scheme, they were not taken into account in the calculation of the mean on the group. Thus, the mean belongs to those households who knew about the Ecofeedback programme but did not fill in the card. Therefore, this scale is still a good predictor of why people who knew about the scheme decided to fill in the card or not.

7.3.2 Discomfort Scale

This scale refers to the discomfort and effort required in order to save energy. The affirmation that the energy saving activities would decrease comfort at home or would require an effort which is not worth it are the main ideas expressed in this scale.

Those people who followed the scheme tended to disagree more strongly ($x=3.58$) with this idea. They thought that the comfort at home does not necessarily have to decrease due to the reduction of energy consumption. Moreover, they thought that the effort made to save energy is not only worth it but also successful. Thus, they were aware of some negative consequences of the energy saving actions but considered they were not important enough to prevent them from taking action and try to save energy.

Those who did not follow the scheme, have a less strong position ($x=3.23$) with the idea that saving energy decreases the comfort at home, although they also tended to disagree. However, unlike people who followed the scheme, those who did not, tended to agree with the belief that saving energy would require a great effort which they were not capable of doing. Again, people who did not follow the scheme took into account the negative consequences of energy conservation actions instead of trying to think positively about them.

These two scales are the ones that differ significantly between both groups, those who followed the Ecofeedback scheme and those who did not. However, there is an agreement between both groups in the rest of the scales.

7.3.3 Self-Efficacy Scale

This scale refers to the perception of the self-efficacy and responsibility in saving energy. The idea underlying the scale is that everyone should take action to reduce the energy consumption and to help the environment. The sense is that everyone is responsible for its energy consumption and that the own proper actions are believed to reduce it.

People from both groups tended to agree with this idea. They believed that the household activity and actions to reduce energy consumption were successful and depended on the individual. Items in this scale emphasized the first person as the actor for saving energy. People felt responsible and capable of taking action. However, whether they decided to follow the

scheme or not, did not depend on this scale.

7.3.4 Health Scale

This scale is related to the importance of warmth for health. The idea of the scale is that we have to keep our house well heated in order to prevent illnesses.

People do not have strong feelings about this statement and the mean for this scale is located close to the "neither agree nor disagree" point. Not even the presence of children in the household led people to have a stronger view in this scale. The attitudes towards the effect of energy conservation on health is not a predictor of the "fill in the card" behaviour.

7.3.5 Finances Scale

This scale refers to the perceived economic situation of the household. The sense of the scale is that the financial condition of the family is not bad and does not need specific actions.

No significant difference was found between the opinion given in this scale by both groups. Thus, there is not an association between this perceived economical condition and following the scheme.

7.3.6 Crisis Scale

This scale is related to the economical problem of energy from a more generic point of view. The idea that the energy crisis is not over and that everybody

should try to reduce energy consumption is expressed here. The scale also includes the view towards the economic consequences of the energy saving actions and defends the advantages of the tips recommended. Although it is also focused on the household consumption, unlike the Self-Efficacy Scale, this one has a less personal view and is more related to the community response to the energy problem.

Both groups agreed with this statement and there was no significant difference between their degree of agreement.

People in general thought that the energy efficient recommendations were successful in terms of money. They tended to believe, although not very strongly, that energy conservation is required and should be applied at home. Again, this scale does not differentiate between those who followed the scheme and those who did not.

7.3.7 Attitudes summary

To sum up, people in Goldsworth Park seem to be aware of the energy problems. They usually follow energy efficient actions or intend to do so. They generally believe that energy saving actions lead to successful rates on reduction in energy consumption.

However, the main deterrents to the participation in the Ecofeedback scheme are the beliefs about the scheme itself and its negative consequences. Although they seem to agree that the Ecofeedback scheme is a successful one, the inconveniences that it causes are not worthwhile.

As those households who did not fill in the card and those who started the task but gave up have expressed, the scheme is too complex, involves a lot of time and requires an effort that they are reluctant to make.

On the other hand, people who followed the scheme are more enthusiastic about it and they deny any kind of discomfort brought by this task.

It seems that people need to experience the positive consequences of the scheme first before making the effort required by themselves. In this sense, the feedback provided by another person would probably help them to feel more positive about the scheme. Before trying to make them do the task of reading the meter every week, they could be helped to get the feedback during a short period of time. After having observed some positive results, they could start thinking of the Ecofeedback scheme as a worthwhile task.

7.4 Mechanics of the Ecofeedback scheme

Negative aspects of the scheme were expressed in the open questions in section 4.

Some of the difficulties in filling in the card were the time required for the task and its complexity. Some people suggested that the exercise should be done every two weeks or even once a month. Moreover, some households felt that the card was an extra chore for which they did not have time. Although it is not really a difficult task, a long set of instructions is required to understand the task and all the figures. A more friendly approach would be

recommended.

With other preoccupations and priorities, some households reported the difficulty to remember to fill in the card every week. Some households with young children said that Sunday is a busy day for them and that they cannot fit this extra task. Thus, an effective prompt is suggested in order to remind the households with a positive attitude to the scheme to fill in the card every week.

The difficulty to get the weekly target tables is also often mentioned. This is one of the reasons why some households stopped filling in the card. Moreover, other people who are still filling in the card, are doing it only partially without the targets data. Someone suggested that the tables could be published at the end of the scheme, leaving the weekly task only to read the meter, and completing the card at the end of the session. However, this would be totally against the idea of feedback as periodical information. As the papers missed the tables some weeks, there would still be the need to publish them again.

The most efficient publication for this goal is The Woking Review, given that 69.7% (23) of the households who filled in the card at some point, read the tables in this local newspaper.

Tables were also said to be printed very small and therefore, the figures were quite difficult to read. Thus, it is recommended to make them larger as well as to try to publish them always in the same part of the paper in order to make the task even easier.

The best and most effective publicity was the information published in The Woking Review. However, people suggested a wider publicity, making sure that everyone got an Ecofeedback card.

7.5 Ecofeedback publicity

The information published in The Woking Review has proved to be the most effective in promoting the Ecofeedback participation. One reason could be the fact that the information was published after households had received the card, and therefore they had already heard about the scheme, paying more attention to the articles. The Woking Informer had published the information before the cards were delivered.

Moreover, The Woking Review published an additional article about energy efficient actions. The article explained why, although the investments may seem large, the actions are still worth it. This article entitled "Helping the Earth at Home", could be the reason why those households who followed the scheme remember having read the information in The Woking Review.

Furthermore, The Woking Review was more persistent in the publication of the target tables while The Woking Informer missed the tables some weeks. In order to get the tables people seemed to trust The Woking Review more.

7.6 Energy efficient actions

The frequencies of energy efficient actions that had taken place in the past and of the future intentions to carry them out allow an interesting comparison. The percentages of behaviours are in general much higher than those of the intentions. Only three behaviours (buy a gas fired condensing boiler 11.5%, put shelves over the radiators 8.1% and buy "savaplugs" 2.7%) have a lower frequency than the highest of the intentions (buy energy efficient domestic appliances 14.2%).

This means that people, in general, have already taken the actions that they had planned. When they were asked about energy efficient actions they talked about the behaviours they had performed rather than future intentions to do something else. They are quite satisfied with what they have done and only few of them search for new actions and intend to carry them out.

7.6.1 Repetitive behaviours

The analysis of the possible association between each behaviour and its intention aims to find out which energy efficient actions were considered as repetitive and which were not.

The fact that people who had displayed some clear repetitive behaviours did not tick the future intention to do them again as well, can have two explanations.

The first one is that, for any reason, almost everybody who tried these ways of saving energy after

the experience, decided that it was not worth it and changed their mind. This explanation is hard to believe.

On the other hand, the way the actions were enunciated led to assume that in the answer "I have done it", people meant that they would do it again in the future, assuming that they did not have to tick both boxes. Furthermore, the question did not clear that this was an option. This is probably a more convincing reason why people who ticked the repetitive behaviours did not tick the intention to keep displaying them.

The two clear repetitive behaviours are:

- Turn down the thermostat

- Try only to use the heat, lights and appliances needed

There are other behaviours that appear to be repetitive ones, in the sense that despite having been displayed, some people still have the future intention to do it again. This means that these actions are not taken at once but people perform them at different times. These actions are:

- Buy energy saving lightbulbs

- Put shelves over radiators

- Buy energy efficient appliances

7.6.2 Pattern of actions

There is some pattern in the order these actions are taken. If we look at the age groups, we can see that the households with younger couples had significantly more future intentions, while older people had already taken many of the actions. This reflects the

time that people have spent in the dwelling since they settled in. Older people have mainly applied the improvements and big investments they had planned. Young people do have future plans about the improvement of energy efficiency in the house.

This pattern corresponds mainly with the more traditional, and more often taken, actions:

- Lag hot water pipes
- Insulate the loft
- Insulate the walls and floors
- Install double glazing

However, the actions that correspond to new technologies applied to energy conservation are more often taken by older people. It seems that once they have taken most of the traditional actions, they look for new ways to improve the energy efficiency of the household. On the other hand, young people, who still have not installed most of the primary improvements, do not think of new technologies such as:

- Buy Savaplugs
- Buy energy efficient appliances
- Buy energy saving lightbulbs

These new technologies are the ones which are mainly seen as environmental friendly, as publicity in energy efficient appliances is focused on the need to help the environment.

Although the Ecofeedback participation has not been associated significantly with any of the energy efficient actions, it could also be included in this pattern of actions. Households with young couples

tended significantly not to follow the scheme. As I have already pointed out, young people are more focused on traditional investments they still have to do and which have more clear consequences. They are normally too busy to fill in a card every week, from which they do not see a direct energy saving. However, older people, who have already taken the traditional actions look for and are more open to new ways of saving energy.

7.6.3 The actions one by one

The study of energy efficient actions was intended to find some actions to be good predictors of Ecofeedback participation. This has not happened, none of the actions taken or intended to be taken in the future were significantly associated with the scheme.

However, other associations were found between energy efficient actions and other variables. Although some of these associations are difficult to explain from this research, I consider them important to be presented as an initial step in the understanding of the actions.

The different energy efficient actions are discussed below in order of popularity .

7.6.3.1 Lag the hot water tank

This is the most widely spread action taken in the past. However, the intention to do it in the future is the lowest of all (only one household said to have

this intention). The reason is because everyone who has a hot water tank has it insulated (those households who did not mention this behaviour did not have a hot water tank).

This is an energy efficient non repetitive action which is said to be cheap and simple and many expected to recoup the costs quickly.

7.6.3.2 Try to use only the heat, lights and appliances needed

This is a very favoured action as well. Although it is obviously a repetitive behaviour, as I have already explained, the data did not show it.

The reason why the action is so popular can be due to the fact that it is free and does not require any investment apart from one's own commitment to do it.

No association has been found between people who are less fond of trying to save energy by not wasting more than they needed and attitudes towards comfort or making an effort to save energy. We could have expected that those people who were worried about the effort required by some energy saving action (such as the Ecofeedback scheme), were less likely to try not to use more than the energy needed. The lack of this significant association shows that this particular action is not seen as one that decreases comfort.

However, people who do not have the intention to take this repetitive action tend to agree with the need of warmth for health. Thus, they will not try to reduce the heating consumption in order to save energy as it would risk their health.

7.6.3.3 Insulate the loft

Many people have insulated the loft and only two households have the intention to do it in the future. This is an action that has already been taken by those who had planned so, but it does not seem to gain new interest.

The action is significantly more popular among those households who had read the Ecofeedback information in The Woking Review and in the letter sent with the card by the Woking Council. Since this action is not mentioned in any of these two ways of communication, it is very risky to take conclusions about this possible association.

People who have the intention to insulate their loft agreed that their economical situation is not bad. However, those who did not have this intention perceived their finances as less favourable. This means that the insulation of the loft is seen as an important investment. The median cost of the loft insulation is 120 pounds and the payback is 5 years. The fact that the loft is a hidden part of the house creates competition with investments in home improvements, which are easier to see.

7.6.3.4 Turn down the thermostat

This is a quite popular and repetitive action. However, there is no congruent association between the fact of having turned down the thermostat in the past and the intention to do it again in the future. This can be explained by the assumption that by ticking the behaviour, there is no need to mark the

intention.

Households who have taken this action in the past agreed in a higher level with the idea that individuals are responsible for their energy consumption. They thought more strongly that the Ecofeedback scheme is worth following. They also had a stronger opinion about the false idea that saving energy tips caused discomfort.

Those households who have the intention to take this action in the future thought that their economical situation was not good and that they need to take some actions to help their finances. Turning down the thermostat is a free energy efficient action that can be taken by oneself, which could be the reason why is so popular. It does not cost any money and it is seen as a saving money action by those with lower incomes.

Moreover, households who recalled having received the Ecofeedback card and the letter from the Woking Borough Council were less likely to follow this behaviour. The fact that this particular tip is not mentioned on the card, while other options are given, could explain that people who read the card thought it was not such a worthy action to take.

The risk with the use of thermostats is that in many cases they are not well understood and people just use them to turn the heater on and off.

7.6.3.5 Lag the hot water pipes

This is still a quite popular action that has been followed mainly by households with people over 60 and those with children between 11-17 years (whose

parents must be older than 30 years). However, the intention to lag the hot water pipes in the future is showed mainly by young couples (18-30 years). This means that this action is not normally taken at the beginning of a family setting. Although the need for it is taken into account, it is not after a certain time that people do so.

This is not a repetitive behaviour and people normally display it once.

7.6.3.6 Install heating controls such a thermostats

A non repetitive action significantly associated with its future intention. Those who have already installed controls are not planning to do so anymore.

Those households who had the intention to install heating controls such as thermostats disagreed more with the Ecofeedback benefits than those who did not have that intention. They also disagreed with the idea that energy saving actions require an effort and brings discomfort to the household. Thus, the use of heating controls is not seen as an action requiring too much effort.

Like the action to turn down the thermostats, the households who did not remember receiving the Ecofeedback card, and probably did not read it, had the intention to install this kind of controls in the future. Since this action is not mentioned on the card, people who read the tips underestimated the importance of installing controls. However, people who read the information in The Woking Informer have more often installed them.

The median cost of the installation of controls is 134 pounds. They are expected to reduce a mean of 2% of households energy costs and the payback is a mean of 9 years.

7.6.3.7 Fit draught-proofing to windows and doors

This action is not very popular. Those households who said they were not following the scheme because they were already taking energy saving actions tended to have fitted draught-proofing to windows and doors in the past.

Although this action can be done very cheaply by oneself, it is not an obvious one and unless people are very interested in taking action to save energy, it will not occur.

7.6.3.8 Install double glazing

This is an action more popular among those households with people older than 51 years, probably because it is not one of the first actions to take. Although not many people have installed double glazing, the intention to do it, is one of the highest. This seems to be a very fashionable energy efficient action which main deterrent is the price. However, this action is normally overrated given that the saving rate over the energy costs is 4% and the payback 21 years.

7.6.3.9 Insulate walls and floors

This action is not very popular and is significantly more often taken by households with people between 41 and 50 years old. Moreover, the intention to do it is more often among people from 18 to 40 years old. Thus, this is not one of the first actions taken by the households.

The benefit of this action is normally underestimated, since it is probably the most effective and economic way of insulation. The median cost is 228 pounds and it saves between 6 and 10% of the energy costs, having a payback of 6 years.

7.6.3.10 Buy energy efficient domestic appliances

With a not very high frequency of occurrence, the intention to buy energy efficient appliances is the highest among the different actions. This shows that this action is becoming more popular throughout the time.

People who have the intention to buy them agreed more strongly with the responsibility the individual has towards saving energy and helping the environment. Thus, the energy efficient appliances are seen to be environmental friendly as the publicity campaigns are aiming to demonstrate.

People who bought them are in an age between 51-60 years, which seems to be the age when they have already taken most of the other energy efficient actions and they look for new ones.

7.6.3.11 Buy energy saving lightbulbs

This is a low frequency action as well, with an increasing future intention to take it. It is becoming more popular.

Since those households who had already bought them were those who showed a higher concern and interest in taking actions in order to help the environment, this is an action seen as environmentally friendly.

People who had a positive intention towards energy saving lightbulbs happened to have read the Ecofeedback information in The Woking Magazine and The Woking Review. This second paper published an article introducing the advantages of some energy efficient appliances and the energy-saving lightbulbs were positively defended.

Moreover, those households who intended to buy energy efficient lightbulbs got a lower score in the Ecofeedback Scale and agreed more strongly with the positive aspects of the scheme. A possible explanation for this would be that the article about Ecofeedback in The Woking Review was published together with the article presenting the energy saving lightbulbs as worth buying.

7.6.3.12 Buy a gas fired condensing boiler

This is not a very popular action, not even as a future intention. People in general do not seem to be very aware of this kind of energy efficient boiler.

People who had bought a gas fired condensing boiler or had the intention to do so in the future, agreed

significantly stronger with the idea that energy consumption can be controlled by the household, than those who did not think about taking this action. They are more interested in helping the environment and feel more responsible for energy consumption. Thus this new boiler is seen as an environment friendly improvement as well.

7.6.3.13 Put shelves over the radiators

This is a non repetitive action that one household said to have taken but to intend to do it again in the future as well. This means that putting shelves over the radiators is an action that can be taken during a period of time, as it is probably done by someone in the household.

However, it is very unknown as an energy efficient action, since the frequency of the behaviour and of the intention are very low.

People who seem more fond of this action are young couples (18-30 years old) with young children (0-10 years old). As this is an easy and cheap action that can be taken by themselves, young people with probably less chance for big investments tend to do it.

Moreover, this is an improvement more likely carried out by those households who did not read the Ecofeedback information in The Woking Review, which is difficult to explain.

7.6.3.14 Buy "Savaplugs"

The least popular action, buying "savaplugs", is neither something done often nor something people intend to do. It seems that people do not know this kind of energy saving appliance.

Those households who are significantly more likely to buy them are those with older people (over 60). People at this age may only be interested in easy and cheap new improvement, since they have probably done the big investments already or cannot afford them.

CHAPTER 8. CONCLUSION

8.1 Summary of findings of this study

In order to understand the conclusions better, the main results of the study are listed below:

- Although all households in Goldsworth Park received an Ecofeedback Card, only 68.2% recalled having received this information.
- 16.21% (24) of the households asked, said they were following the scheme.
- 26.4% (39) of the households asked, said they have the future intention to follow the scheme.
- Households who followed the scheme had a more positive view of the consequences of the scheme. Those who did not fill in the card were more neutral in their opinions about whether it is a worthwhile activity.
- Households who did not follow the scheme believed more strongly than those who filled in the card, that it is not worth making an effort and decrease comfort in order to save energy at home.
- People who decided not to follow the scheme believed that it was too complex and that they had other priorities over filling in the card.
- The belief that saving energy depends mainly on

one's actions, and that we are in control of and responsible for energy consumption, did not predict the participation in the scheme.

- Other ideas, such as the importance of warmth for health, the perceived economic situation of the household or the need to save energy as a community response to the energy crisis, did not predict participation in the scheme.

- People older than 30 were more likely to follow the scheme than younger couples.

- The most successful publication in promoting participation in the scheme was The Woking Review. This was also the main publication used by participants to get the weekly target tables.

- Target tables were said to be difficult to get and published in small print. Some weeks, there was inconsistency in publishing the tables and people missed them.

8.2 Suggestions to improve the "Ecofeedback-Save Energy at Home" Woking Campaign

The participation rate seems to be quite optimistic, as well as the future intention rate. In terms of participation, this means the campaign would be worth relaunching again next year.

To increase the number of households who pay attention to the card when it reaches the home, it seems important that they are delivered by hand, as was done in the previous campaign. It is recommendable that the envelope is personalised and

addressed to the family name of the household.

In order to improve participation when people have already got the card, the role of the local newspapers publishing additional information about the scheme is important. If the information is published after they have received the card, it is more effective because people have already heard of it and are more curious about the scheme.

Information to encourage people to participate in the scheme should be focused on the positive consequences of the activity, as was done in the previous campaign. Moreover, people must be convinced that the trouble caused by filling in the card is not great and that the task is easier than it seems. In general, they must feel that participation in the scheme is worthwhile because the advantages are higher than the inconveniences.

In order to help people understand why the scheme is useful, they should be told about the way feedback can help them in achieving their goals, as has been explained in Chapter 2. Once people have set the goal to save energy and are trying to achieve it by taking some energy efficient actions, the frequent meter reading of energy consumption would help them to know if the actions they are taking are successful. Thus, with feedback they are more aware about the results of their efforts and therefore are more encouraged to continue making them. Without understanding the function of feedback, most households who are already taking actions to save energy think that filling in the card every week is a waste of time.

In some cases, people should experience the positive

consequences of the scheme before having to do the task. Most people have a negative view of the scheme because they think it is too complex. They do not fill in the card and therefore they never manage to learn the positive consequences of the task. This is why the convenience of providing the feedback by an external agent before asking them to read the meter by themselves should be considered. This staff could also help them fill in the card and teach them how to read the meter. Since the personnel requirement would increase the cost of the scheme, children or other members of clubs/societies are suggested as agents for this task.

One way of convincing people about how easy the task is using children to show it to their parents. Although the idea of using schools to promote the scheme had already been taken into account, it has not worked during the last campaign. However, it would be helpful to teach children to read a meter while the school encourages the weekly task of reading it at home. Some kind of competition between children would encourage them to ask parents to beat the targets and it would also seem like a game for children. Nevertheless, it is important that the task is included in an educational programme, in which children are taught about the need to save energy and therefore they understand the beating of the target as a success over the degradation of the Earth.

In those households where there are no children at the right age for this activity, which could be mainly couples older than 40, an useful way to promote participation would be the different clubs/societies existing in the community. The success of the Ecofeedback scheme in Kirklees, where 17 cards were distributed and all the 17 households

participated, shows that in smaller communities it is easier to promote the scheme probably because there is a direct contact between participants. Clubs and societies would help in prompting people in the weekly task of reading the meter. Comparison between Ecofeedback participants in the societies would create competition, encouraging members to beat the targets. Moreover, it would be a way to help those who have difficulties reading the meters and understanding the task.

Younger couples do not seem interested in Ecofeedback, probably because they still have the intention to take some energy efficient actions which require bigger investments, and do not see the use of filling in a card if their house is not well insulated yet. A way to approach these households and to try to introduce them to the practice of Ecofeedback would be through the Seeboard and British Gas shops where they probably go to ask for energy saving improvements.

When people have already started to fill in the Ecofeedback Card, it is important that the target tables are published every week without fail. It is difficult to carry a regular task if those who ask us to do so fail in their part of the activity. Regularity and consistency must be promoted by example. Thus, people would be helped if the tables were published in the same section of the paper, where they could find them more easily. Moreover, new energy saving tips should be published regularly, as promised, in order to keep the participants curious.

Although all households should receive The Woking Review and The Woking Informer everyweek, some people said they had difficulties in getting the tables.

Other ways of distributing the target tables should be considered.

Since the Helpline, aimed to give people the chance to ask for the targets, was only used by one of the households in my sample, it should be questioned if this is a real good way to inform. The experience of Woking Borough Council as holders of the line should answer this question. Moreover, tables should be displayed every week in some public boards where people could easily read them. Instead of the Community Centre which is probably visited weekly by only a number of households, other places as the shopping centre or schools more often visited would be more recommended.

Finally, in order to ensure a good analysis of the results of the scheme, the importance of returning the cards should be more emphasized. This could probably be prompted a few weeks before the scheme is about to end, in the same places where targets are displayed. The offer of a prize draw would be a good motivator for people to return the cards, as some of them have suggested. Another way to make sure that people will return the cards is by creating a commitment asking them to register at the beginning of the campaign. This would also help to the Woking Borough Council estimate the number of participants in the campaign.

8.3 The future of Ecofeedback

The potential of the Ecofeedback scheme can be considered as limited in time, due to the decrease of motivation of the different parts:

- active consumers would stop the task after some years of participation,

- gas and electricity companies, as well as Councils would be interested in creating other activities,
- papers could stop their free cooperation for economical reasons.

However, the scheme is reaching its 14th year in The Netherlands and this duration could easily be achieved by the United Kingdom.

Furthermore, new improvements in the technology of digital meters would have an important effect on the development of the scheme. Meters where readings can be recorded and retrieved at any moment, or connected to teletext networks, would make the task much easier. However, the Ecofeedback scheme would always require an active part of the household in reading the information periodically in order to change their behaviour.

Cable television, ceefax and teletext networks would be an important tool for the prompting and displaying of target tables when the scheme is spread at larger geographic areas.

Woking Borough Council has estimated the total reduction in emissions due to energy savings in U.K. households (total number of households in the U.K. in 1992: 23,093,230 households) assuming a 1.52% participation (351,467.7 households) at 73,200 tonnes per year. This amount would lead the United Kingdom to achieve the goal set out in the treaty of the Rio de Janeiro Earth Summit on the man-made climate change created by atmospheric pollution. Not only would it stabilise rising emissions but it would even decrease them.

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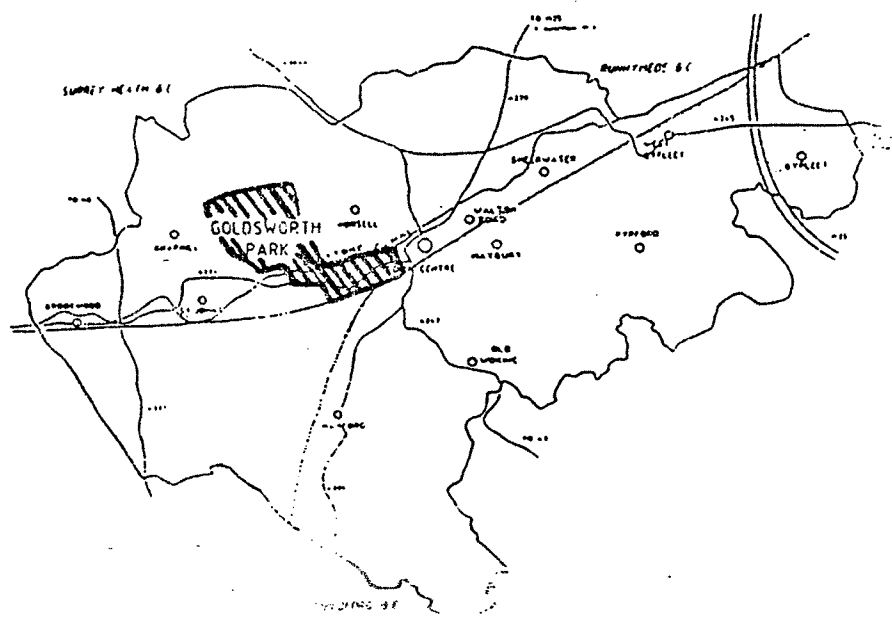
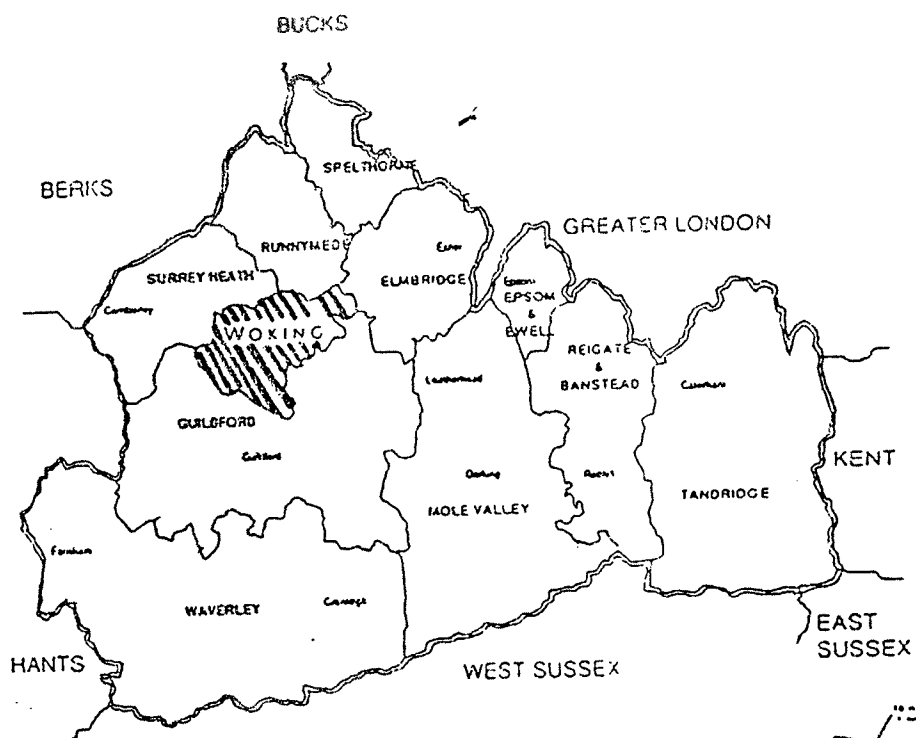
WINETT,R.A., NEALE,M.S., WILLIAMS,K., YORKLEY,J. AND KAUDER,H. The effects of individual and group feedback on residential electricity consumption: Three replications. *Journal of Environmental Systems*, 1979, 8, 217-233.

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APPENDIX I

Location map of Goldsworth Park, Woking

Goldsworth Park, Woking



THE BOROUGH OF WOKING

APPENDIX II

Ecofeedback-Save Energy at Home Card

The **Save Energy at Home** Campaign helps you save energy and consequently money. By using fuel in the home sensibly and not wasting it, not only can you save money on your fuel bills but you can also help protect the environment as well.

Save Energy at Home

WOKING BOROUGH COUNCIL



Electricity Card

1. Enter your annual use in kWh in the boxes marked Annual Usage. If you have Economy Seven tariff enter both normal and low figures. If you have a single rate tariff meter enter your figure in the normal box. If you do not have your usage figure for last year please telephone 0273 430466.
2. Starting from the bottom of the card, and on a Sunday, enter your electricity meter reading in Column 1, remembering to enter both normal and low readings if you are on Economy Seven.
3. One week later on the Sunday read your meter again and enter the figures in Column 1., directly above the reading from the previous week. Then subtract the lower readings from the higher one and write this figure in Column 2. This will be your usage during that week. If you miss a week, simply compare your next reading with the weeks for the same period in the Energy Tables.
4. Your electricity target will depend on how cold it was in the past week. We will calculate this target and

publish it in the Energy Table in the Woking Review and Informer.

5. Now compare your weekly use in Column 2 with your weekly target in Column 3. If you have made a saving and Column 2 is less than Column 3 enter the difference in Column 4, Below Target. If you have used more than your target figure, Column 2 will be greater than Column 3 and if this is the case enter the difference in column 5, Above Target.
6. Repeat this every week until the card is full (20 weeks) and then complete the final additions to obtain your below and above target figures for the whole period. Enter these figures in the appropriate Total Box.

Transfer the total figures to the boxes on the Reply Card and post. The following week, start the process again on the card for weeks 21 - 40.

(For instructions for gas, see over)

Woking Borough Council
 Ecofeedback - Save Energy at Home Campaign
 FREEPOST
 Woking
 GU21 1BR

Electricity

Weeks 21 - 40

kWh

Annual Usage

Normal

Low

| WEEK No. | 1. METER READING | | 2. WEEKLY USAGE | | 3. WEEKLY TARGET | | 4. BELOW TARGET | | 5. ABOVE TARGET | |
|----------|------------------|-----|-----------------|-----|------------------|-----|-----------------|-----|-----------------|-----|
| | Normal | Low | Normal | Low | Normal | Low | Normal | Low | Normal | Low |
| 40 | | | | | | | | | | |
| 39 | | | | | | | | | | |
| 38 | | | | | | | | | | |
| 37 | | | | | | | | | | |
| 36 | | | | | | | | | | |
| 35 | | | | | | | | | | |
| 34 | | | | | | | | | | |
| 33 | | | | | | | | | | |
| 32 | | | | | | | | | | |
| 31 | | | | | | | | | | |
| 30 | | | | | | | | | | |
| 29 | | | | | | | | | | |
| 28 | | | | | | | | | | |
| 27 | | | | | | | | | | |
| 26 | | | | | | | | | | |
| 25 | | | | | | | | | | |
| 24 | | | | | | | | | | |
| 23 | | | | | | | | | | |
| 22 | | | | | | | | | | |
| 21 | | | | | | | | | | |

Start Here

Total 4

(Continue reading
from line 20)

5

2

Woking Borough Council
 Ecofeedback - Save Energy at Home Campaign
 FREEPOST
 Woking
 GU21 1BR



Electricity

Weeks 1 - 20

kWh

Annual Usage

Normal

Low

| WEEK No. | 1. METER READING | | 2. WEEKLY USAGE | | 3. WEEKLY TARGET | | 4. BELOW TARGET | | 5. ABOVE TARGET | |
|----------|------------------|-----|-----------------|-----|------------------|-----|-----------------|-----|-----------------|-----|
| | Normal | Low | Normal | Low | Normal | Low | Normal | Low | Normal | Low |
| 20 | | | | | | | | | | |
| 19 | | | | | | | | | | |
| 18 | | | | | | | | | | |
| 17 | | | | | | | | | | |
| 16 | | | | | | | | | | |
| 15 | | | | | | | | | | |
| 14 | | | | | | | | | | |
| 13 | | | | | | | | | | |
| 12 | | | | | | | | | | |
| 11 | | | | | | | | | | |
| 10 | | | | | | | | | | |
| 9 | | | | | | | | | | |
| 8 | | | | | | | | | | |
| 7 | | | | | | | | | | |
| 6 | | | | | | | | | | |
| 5 | | | | | | | | | | |
| 4 | | | | | | | | | | |
| 3 | | | | | | | | | | |
| 2 | | | | | | | | | | |
| 1 | | | | | | | | | | |

Start Here

Total 4

5



ECOFEEBACK SCHEME

This scheme has been implemented by Woking Borough Council for householders, in co-operation with Surrey County Council and local schools. This is based on a successful Dutch "Ecofeedback" scheme.

To take part all you have to do is complete the cards. The cards have two parts, one for electricity and one for gas. The scheme works by giving you a target to beat, based on your last year's usage. These targets will be published in the Woking Review and the Woking Informer. If you have any problems at all, you can phone (0483) 755855.

Energy Saving Tips

Below are a few tips on things you can do cheaply and easily to save energy and money:

- Make sure your heating system is properly maintained.
- Keep doors to rooms closed.
- Draw your curtains at dusk to prevent heat loss through the windows.
- Do not leave windows open unnecessarily.
- Do not let water taps drip.
- Do not wash up under constant running hot water.
- Take advantage of free heat gains from sources like the sun and domestic appliances, such as ovens.
- Try cooking in batches and keep the heat under the base of the saucepan. Make full use of the oven when in use.

Further tips and articles will be published regularly in the Woking Review and the Woking Informer.

TIMES
review
series

THE
informer
SERIES OF NEWSPAPERS

Gas Card

1. Enter your annual use in cubic feet in the box marked Annual Usage. If you do not have your usage figure for last year please call into your British Gas showroom at 4 Mercia Walk, Woking, Surrey GU21 1XS, or telephone 0483 771820
 2. Starting from the bottom of the card, and on a Sunday, enter your gas meter reading in Column 1. Meter Reading.
 3. One week later, on Sunday, enter your next meter reading in the same way in Column 1., directly above the reading from the previous week. Then subtract the lower reading from the higher one and write this figure in Column 2. Weekly Usage. This will be your usage during that week. If you miss a week, simply compare your next reading with the weeks for the same period in the Energy Tables.
 4. Your gas target will depend on how cold it was in the past week. We will calculate this target and publish it in the Energy Table in the Woking Review and the Woking Informer.
 5. Now compare your weekly usage in Column 2. with your weekly target in Column 3. If you have made a saving and Column 2. is less than Column 3., enter the difference in Column 4. Below Target. If you have used more than your target figure Column 2 will be greater than Column 3, enter the difference in Column 5. Above Target.
 6. Repeat this every week until the card is full (20 weeks) and then complete the final addition to obtain your below and above target figures for the whole period. Enter these figures in the appropriate Total Box. Transfer the total figures to the boxes on the Reply Card and Post.
- The following week, start the process again on the card for weeks 21 - 40.

Use the table to find your weekly target figure, by looking for the annual usage figure which is closest

(For instructions for electricity, see over)

Weeks 21 - 40 Reply Card

Please complete and return the reply card by 1st December 1994 to enter the free prize draw (only one entry per household). Send to Woking Borough Council, having filled in the boxes below. Entry for the competition does not depend on the amount of energy you have saved. Winners will be announced in the Woking Review and the Woking Informer. Rules and Conditions are available on request.

Name

Address

.....

.....

..... Postcode

Electricity

Above Target

Below Target

| | |
|--------|-----|
| Normal | Low |
|--------|-----|

| | |
|--------|-----|
| Normal | Low |
|--------|-----|

Gas

Above Target

Below Target

Gas Weeks 21 - 40

Hundreds of Cubic Feet

Total

Below Target

Above Target

Annual Usage

| WEEK No. | 1. METER READING | 2. WEEKLY USAGE | 3. WEEKLY TARGET | 4. BELOW TARGET | 5. ABOVE TARGET |
|----------|------------------|-----------------|------------------|-----------------|-----------------|
| 40 | | | | | |
| 39 | | | | | |
| 38 | | | | | |
| 37 | | | | | |
| 36 | | | | | |
| 35 | | | | | |
| 34 | | | | | |
| 33 | | | | | |
| 32 | | | | | |
| 31 | | | | | |
| 30 | | | | | |
| 29 | | | | | |
| 28 | | | | | |
| 27 | | | | | |
| 26 | | | | | |
| 25 | | | | | |
| 24 | | | | | |
| 23 | | | | | |
| 22 | | | | | |
| 21 | | | | | |

◀ **Start Here** (Continue reading from line 20) ▶

Weeks 1 - 20 Reply Card

Please complete and return the reply card by 21st July 1994 to enter the free prize draw (only one entry per household). Send to Woking Borough Council, having filled in the boxes below. Entry for the competition does not depend on the amount of energy you have saved. Winners will be announced in the Woking Review and the Woking Informer. Rules and Conditions are available on request.

Name

Address

.....

.....

..... Postcode

Electricity

Above Target

Below Target

| | |
|--------|-----|
| Normal | Low |
|--------|-----|

| | |
|--------|-----|
| Normal | Low |
|--------|-----|

Gas

Above Target

Below Target

Gas Weeks 1 - 20

Hundreds of Cubic Feet

Total

Below Target

Above Target

Annual Usage

| WEEK No. | 1. METER READING | 2. WEEKLY USAGE | 3. WEEKLY TARGET | 4. BELOW TARGET | 5. ABOVE TARGET |
|----------|------------------|---|------------------|-----------------|-----------------|
| 20 | | | | | |
| 19 | | | | | |
| 18 | | | | | |
| 17 | | | | | |
| 16 | | | | | |
| 15 | | | | | |
| 14 | | | | | |
| 13 | | | | | |
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| 10 | | | | | |
| 9 | | | | | |
| 8 | | | | | |
| 7 | | | | | |
| 6 | | | | | |
| 5 | | | | | |
| 4 | | | | | |
| 3 | | | | | |
| 2 | | | | | |
| 1 | |  Start Here | | | |

APPENDIX III

Letter enclosed with the Ecofeedback Card, delivered
by the Woking Borough Council on 16th February 1994



WOKING BOROUGH COUNCIL

CIVIC OFFICES, GLOUCESTER SQUARE, WOKING, SURREY GU21 1YL

TEL: (0483) 755855 · FAX: (0483) 768746 · DX. 2931 WOKING

Our Ref: DBS/BSM/JG

16 February 1994

Dear Resident,

ECOFEEBACK - SAVE ENERGY AT HOME CAMPAIGN
GOLDSWORTH PARK WARD ENERGY EFFICIENCY PILOT STUDY

Woking Borough Council is launching Ecofeedback in the Goldsworth Park Ward (which includes the Kingsway and surrounding areas) as a pilot study in energy efficiency and related emissions harmful to the environment. Enclosed with this letter is your energy card which is being issued to every household in the Goldsworth Park Ward.

The purpose of the scheme is to not only save energy and money for residents, by targeting energy consumption against an established norm, but also to remind people of the link between energy consumption and greenhouse gas emissions contributing towards Global Warming. The Department of the Environment estimates that the energy used by the average home creates 7.5 tonnes of CO² a year. This can easily be reduced by 20%-50% by taking some of the steps that will be recommended during the campaign. At the same time, you will reduce your fuel bills by a similar amount, so benefiting the Planet and your pocket.

Details of Ecofeedback and how to participate in the scheme are included in the attached energy card and it is hoped that as many residents as possible participate in the scheme and return their feedback reply cards to the Council to enable an evaluation of the success of the scheme to be made. The Building Research Establishment in conjunction with the Department of the Environment are carrying out a Good Practice Case Study on Ecofeedback and depending on the success of the scheme Ecofeedback could be extended nationwide so it is very important that the reply cards are returned. There will be a prize draw for both periods of the pilot study and further energy saving tips will be provided in the Woking Informer and Woking Review during the campaign to help residents to save energy.

Contd

If you have any queries or your own energy saving tips please write to Allan Jones, Building Services Manager at the above address or telephone Peter Gay, Environment Officer on extension 3477.

Yours sincerely,

Patricia E Bohling
Leader of the Council

PBLECO

APPENDIX IV

Article published by The Woking Informer delivered on
the week ending on 18th February 1994

NEWS

Beat the VATman

Informer sponsors energy-saving, bill-busting scheme

IT'S YOUR chance to beat the VAT man - and help the environment at the same time.

Ecofeedback is a new scheme aimed at encouraging Woking householders' to save energy in their homes.

And of course, by saving energy, residents save money on their fuel bills - welcome news to everyone facing VAT enhanced fuel bills from April.

The scheme, to be launched for a trial period in Goldsworth Park next week, has been set up by Woking Borough Council and is sponsored by the *Informer*.

The idea is simple.

Using 'energy cards' supplied by the council, householders will work out, from early March, their annual energy consumption for gas and electricity.

Each week the *Informer* will publish targets for energy consumption, supplied by the council and based on

weather predictions, against which householders' energy consumption is based.

Allan Jones, Woking's building services manager explains: "The energy target tables are produced by our building energy management system.

"It uses automatic weather sensors around the borough to provide an accurate energy monitoring and targeting system for householders to compare against and try to beat their own targets.

"This works like a golfer trying to improve his or her handicap.

"If as many people as possible can participate in this campaign the people of Woking will have a very real impact in reducing the seven and a half tonnes of CO2 each of our homes creates each year. This will save money on our fuel bills."

Although the pilot study is initially being run in Goldsworth Park, all readers can participate in Ecofeedback by looking in the *Informer* each week for energy saving tips.

ENERGY SAVING TIPS:

- Ensure your heating system is properly maintained and keep doors closed.
- Draw your curtains at dusk and don't let water taps drip.
- Don't wash up using constant running water and take showers instead of baths.

APPENDIX V

Articles published by The Woking Review delivered on
25th February 1994

The Woking Review, on 25th February 1994

Save money on your fuel bills

WOKING Borough Council launches a major new initiative this week and, together with the *Review*, invites all our readers to participate in a campaign

to save money on fuel bills and to reduce harmful emissions into the environment.

Continued on p2.

Continued from p1.

A pilot scheme — Ecofeedback — Save Energy at Home Campaign — is being carried out specifically in Goldsworth Park but, using the special energy chart and instructions reproduced in this week's *Review*, everyone can participate — welcome news for householders at a time when VAT will shortly be added to domestic fuel bills.

The scheme works by householders calculating their annual energy consumption for electricity and/or gas as instructed, which puts them in a specific annual consumption band. Individual weekly consumption is then compared to weekly targets for the relevant annual consumption band in the energy target tables printed weekly in this newspaper. Householders can then try to beat the targets, in a similar way to golfers improving their handicap. Throughout the campaign, which will last initially for 40 weeks, the *Review* will print energy saving tips and advice, as well as the weekly energy target tables. The target tables are produced by the council's building energy management system (BEMS) using automatic weather sensors around the borough to provide an accurate energy monitoring and targeting system.

If as many people as possible participate in this campaign, the people

of Woking and the surrounding area can have a very real impact in reducing the average 7.5 tonnes of carbon dioxide which each of our homes creates in the use of energy every year, and so reduce the risk of global warming as well as saving money on fuel bills. The pilot scheme is being monitored by the Department of the Environment and, if successful, could form the basis of many similar schemes nationwide. For this reason, is it particularly important that residents of Goldsworth Park not only participate, but also

return their reply cards to the council. Those returning their reply cards will be entered into prize draws, with winners receiving energy efficient products from sponsors of the energy cards, British Gas and Seaboard. Local schools will also be involved in the campaign to increase the awareness of pupils regarding energy usage and the related harmful effect on the environment.

● Readers may be interested to know Ecofeedback began in the Netherlands in 1979

and today many people are still participating in the scheme, with savings estimated at between 10 and 50 per cent. The Dutch realised that if the results of people's behaviour was fed back to them, they might modify it. This principle was first applied to reducing energy consumption, but can also be applied to other environmental initiatives such as reducing water and vehicle fuel consumption and waste minimisation/recycling.

See page 5 for Ecofeedback chart and further details.

The Woking Review, on 25th February 1994

Helping the earth at home

HELPING the Earth starts at home, says Woking Borough Council — and the obvious place to begin is with your domestic appliances and household lighting.

Did you know that electrical appliances vary considerably from model to model in their energy efficiency? So, if you are buying new appliances, it is well worth looking for those which are energy efficient — even if they cost a little more to buy.

Many are now labelled with their energy efficiency rating and annual consumption — look for the green energy efficiency label on fridges and freezers in your local electricity company showroom, or compare energy use information in manufacturers' brochures.

Using your existing elec-

trical appliances sensibly can also mean real savings. For example, a wash cycle at 40 degrees C, fine for most fabrics, will cost you a quarter of the amount of the hottest cycle. Also, place your fridge in a cool place, not next to the cooker or in the sun. And keep the panel at the back well-ventilated and away from the wall, especially if it is under a worktop.

Energy-saving light bulbs can pay for themselves in lower bills —

often within two years. Although they cost more than ordinary filament bulbs (from £5 to £15), they burn just as brightly, use a quarter of the electricity, and last eight times as long. They are ideal for main lighting and other lights which are used for long periods of time. They fit the same bulb-holder as ordinary bulbs, but cannot be used with dimmer switches, some electronic timers, or electronic lighting controls.



Support for Woking's Ecofeedback initiative from Woking's basketball celebrity Renaldo Lawrence of the Slam Dunk School of Basketball at the launch of the scheme at Goldsworth Park by the Mayor, Cllr Rosie Sharpley and leader of the council Cllr Pat Bohling.

APPENDIX VI

Article published by The Woking Magazine delivered on
25th February 1994

The Woking Magazine, on 25th February 1994



BEAT THE VATMAN! BUST THOSE FUEL BILLS

ECOFEEBACK Scheme for Goldsworth Park

Unique in the south of England and one of the first local authorities in the country to do so, Woking Borough Council has launched a scheme which encourages residents to conserve energy and save money on their fuel bills.

'Ecofeedback' is a new initiative in which householders calculate their annual consumption of gas or electricity (or both) and compare it with weekly energy target tables printed in the local papers. The weather is also taken into consideration when calculating scores.

It is welcome news for householders at a time when VAT is to be added to their fuel bills and also reduces the harmful gases pumped into the atmosphere which affect the ozone layer.

The pilot study, being monitored by the Department of the Environment, involves 5125 households at Goldsworth Park and is in its early stages. Energy cards have been distributed with reply cards and these

will be used to judge its success. But already the Council's Building Services Manager, Allan Jones, says that the Goldsworth Park Community Association reports "a pretty good take up."

The idea of Ecofeedback first began in the Netherlands in 1979 when it was realised that if the results of people's actions were fed back to them, they

- Energy Saving Tips**
- Ensure heating system is properly maintained.
 - Keep doors to rooms closed.
 - Draw curtains at dusk to prevent heat loss through windows at night.
 - Do not leave windows open.
 - Do not let water taps drip.
 - Take showers instead of baths.

may modify their behaviour to reduce those effects.

The scheme is sponsored by British Gas, SEEBOARD and two local newspapers. It is being carried out, in cooperation with Surrey County Council and local schools, for an initial period of six months.



Support for Woking's Ecofeedback initiative from Woking's basketball celebrity, Renaldo Laurence of the Slam Dunk School of Basketball, at the launch of the scheme at Goldsworth Park by the Mayor, Cllr. Rosie Sharpley and the Leader of the Council, Cllr. Pat Bohling.

APPENDIX VII

Letter sent on behalf of the Woking Borough Council
on 3rd June, enclosed with the questionnaire



WOKING BOROUGH COUNCIL

CIVIC OFFICES, GLOUCESTER SQUARE, WOKING, SURREY GU21 1YL
TEL: (0483) 755855 · FAX: (0483) 768746 · DX. 2931 WOKING

Our Ref: PG/SMF

3 June 1994

Dear Resident,

ECOFEEBACK - SAVE ENERGY AT HOME CAMPAIGN
GOLDSWORTH PARK WARD ENERGY EFFICIENCY PILOT STUDY

On 23 February 1994 the Council wrote to every household in the Goldsworth Park Ward to launch the EcoFeedback - Save Energy at Home Campaign. As advised in her letter the Building Research Establishment in conjunction with the Department of the Environment are carrying out a Good Practice Case Study on EcoFeedback which is to be published nationally later this year. The University of Surrey are dealing with one aspect of the Case Study.

Whether or not you have taken part in the Woking Campaign, we should very much like your views in order to find out how well it has worked and how we can make it work better in future. So we should be very grateful if you could spare ten minutes to fill in this questionnaire and send it back as soon as possible.

A stamped addressed envelope is provided for your reply to be sent to the Department of Psychology in the University of Surrey, which is helping us to analyse the results. The questionnaire is completely anonymous.

If you have any queries please contact Beatriz Puyal at the Department of Psychology, University of Surrey, Guildford, Surrey GU2 5XH on telephone no. 0483 505180.

Yours faithfully,

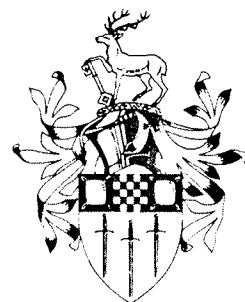
Allan Jones

Allan Jones
Building Services Manager
Directorate of Central Services

AJLECOFE

APPENDIX VIII

Letter sent by the University of Surrey on 25th June,
enclosed with the questionnaire



University
of Surrey

24 June 1994

Dear Resident,

On 3 June 1994 the Woking Borough Council wrote to you asking for your help with the Good Practice Study on Ecofeedback-Save Energy at Home Campaign- which is being carried out by the Building Research Establishment in conjunction with the Department of the Environment. A questionnaire was enclosed in order to find out about your views, how well the scheme has worked and how to improve it in the future.

We have already received some questionnaires back, but are still interested in yours, which we have not received yet. Enclosed, please find another copy of the questionnaire in case you have mislaid the previous one. We would be very grateful if you could spare ten minutes to fill it in and send it back as soon as possible.

A stamped addressed envelope is provided for your reply to be sent to the Department of Psychology in the University of Surrey, where we are analyzing the results.

Although the questionnaires are numbered, all information provided by you will be treated with absolute confidentiality by the researchers. If you have followed the scheme you will need to have your Energy at Home Card handy to answer some of the questions. However, if you have not followed the scheme, you will find some questions difficult to answer, please omit them.

In case you have already sent the questionnaire back, please ignore this note and we would like to thank you for your help.

If you have any queries, feel free to contact me at the telephone no. 0483 505180.

Yours faithfully,

Beatriz Puyal
Department of Psychology
University of Surrey

Department of Psychology
University of Surrey
Guildford
Surrey GU2 5XH
England

Telephone: (0483) 259175
Fax: (0483) 32813
Telex: 859331
E Mail:

APPENDIX IX

Questionnaire

QUESTIONNAIRE

Section 1

1 Please tell us the number of people in your household who fall into each age band. Just put the right number in each box.

0-10yrs 11-17 18-30 31-40 41-50 51-60 over 60

2 Enter the number of adults (18 years old and over) who are:

Female

Male

3 Please write down what are the occupations of the adult members of the household. Be as detailed as you can (e.g.: if you are an engineer, specify whether you are motor or chartered mechanical engineer etc...)

.....

.....

.....

Section 2

4 Please tick any of the following actions that you have taken in the past or that you plan to carry out in the future:

already intended
done in future

| |
|--------------------------|
| <input type="checkbox"/> |
| <input type="checkbox"/> |
| <input type="checkbox"/> |
| <input type="checkbox"/> |
| <input type="checkbox"/> |
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| <input type="checkbox"/> |
| <input type="checkbox"/> |

1. Lagged your hot water tank
2. Lagged your hot water pipes
3. Fitted draught-proofing to windows and doors
4. Insulated your loft
5. Insulated your walls or floors
6. Installed double glazing
7. Installed heating controls such as thermostats
8. Bought a gas fired condensing boiler
9. Bought energy-saving lightbulbs
10. Bought "Savaplugs"
11. Put shelves over your radiators
12. Turned down your thermostat
13. Tried only to use the heat, lights, appliances you need
14. Bought energy efficient domestic appliances

(continue...)

Section 3

5 Please write down the number that corresponds with your feelings about the following statements, according to the following scale:

| | | | | |
|----------------|--------|----------------------------|----------|-------------------|
| Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
| 1..... | 2..... | 3..... | 4..... | 5..... |

- | | |
|--------------------------|--|
| <input type="checkbox"/> | 1.It is essential to reduce household energy use |
| <input type="checkbox"/> | 2.Reducing my energy consumption would save money |
| <input type="checkbox"/> | 3.Reducing my energy consumption would help the environment |
| <input type="checkbox"/> | 4.I find it necessary to cut down my spending |
| <input type="checkbox"/> | 5.Everybody should make an effort to help the environment |
| <input type="checkbox"/> | 6.There is not much I can do to reduce my energy bills |
| <input type="checkbox"/> | 7.Energy crisis is something we should not worry about |
| <input type="checkbox"/> | 8.Houses should be kept warm to prevent illnesses |
| <input type="checkbox"/> | 9.It is not worth while putting clothes on in order to save energy |
| <input type="checkbox"/> | 10.Following the tips given I would save energy |
| <input type="checkbox"/> | 11.Saving energy would decrease my comfort at home |
| <input type="checkbox"/> | 12.Following the scheme would keep me aware of my energy expenses |
| <input type="checkbox"/> | 13.Following the scheme would help me to save energy |
| <input type="checkbox"/> | 14.My energy consumption habits are well fixed and I cannot see myself changing them. |
| <input type="checkbox"/> | 15.I am optimistic about my family's financial condition in the near future |
| <input type="checkbox"/> | 16.Science will soon provide society with a long lasting source of energy |
| <input type="checkbox"/> | 17.Most energy saving home modifications cost more money than they save |
| <input type="checkbox"/> | 18.Conserving energy in the home does not save much money. |
| <input type="checkbox"/> | 19.Filling in the Save Energy card every week causes me more trouble than it is worth |
| <input type="checkbox"/> | 20.It is essential to my family's health for the house to be well heated in the winter |
| <input type="checkbox"/> | 21.The energy crisis is something belonging to the 1970's |
| <input type="checkbox"/> | 22.No matter how hard I try to conserve energy, I could only save a few pennies each day |
| <input type="checkbox"/> | 23.The Save Energy at Home scheme is a successful one and should be followed by all the households in this country |

(continue...)

Section 4

6 Which of the following types of publicity for the EcoFeedback - Save Energy at Home, did you see?

- ☐ Letter from the Leader of the Council dated 23 Feb 1994
- ☐ Woking magazine, issued by Woking Council
- ☐ Woking Informer
- ☐ Woking Review
- ☐ Others (please say what)

7 Did you receive an EcoFeedback - Save Energy at Home card?

Yes ☐ No ☐ Don't know ☐

8 Did you fill in any part of the tables on the card?

Yes ☐ No ☐ Don't know ☐

9 Are there any reasons you can give for your answer to question 8?

.....

.....

10 From which week to which one did you fill in your card?

From week ☐ to week ☐ Don't know ☐

11 Are there any reasons that made it harder to fill in the card?

.....

.....

12 How did you get the weekly energy target table?

- ☐ Woking Review
- ☐ Helpline
- ☐ Civic Offices
- ☐ Community Centre
- ☐ Other.....

(continue...)

13 If you found any difficulty in understanding the weekly energy target table, can you say why?

.....
.....
.....
.....

14 If you found any difficulty in understanding the energy saving tips given on the energy monitoring card or in the newspaper, can you say why?

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.....
.....

15 Could you say what helped or hindered you in carrying out the energy saving tips?

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.....
.....

16 Did you save money by following the Woking campaign?

Yes ☐ No ☐ Don't know ☐

17 Could you suggest ways in which the Woking campaign could be improved?

.....
.....
.....
.....

18 Do you intend to follow the scheme and fill in the card in the future?

Yes ☐ No ☐

(continue...)

Section 5

19 If you did fill in the Save Energy card, would you please copy here the figures corresponding to the last three weeks.

GAS

| WEEK No. | 1.METER READING | 2.WEEKLY USAGE | 3.WEEKLY TARGET | 4.BELOW TARGET | 5.ABOVE TARGET |
|----------|--------------------|-------------------|--------------------|-------------------|-------------------|
| | | | | | |
| | | | | | |
| | | | | | |

ELECTRICITY

| WEEK No. | 1.METER READING | | 2.WEEKLY USAGE | | 3.WEEKLY TARGET | | 4.BELOW TARGET | | 5.ABOVE TARGET | |
|----------|--------------------|-----|-------------------|-----|--------------------|-----|-------------------|-----|-------------------|-----|
| | normal | low | normal | low | normal | low | normal | low | normal | low |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Many thanks for taking the trouble to fill in this questionnaire.