# Waste recycling: local methods for successful interaction with small business

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**Abstract:** Environmental management practices are common in large companies, but rare in small businesses even though, collectively, their environmental footprint is substantially greater. There is, therefore, a crucial need to engage small businesses in practices that reduce their environmental impact and assist sustainability. However, the management of environmental issues in small business is the domain of the owner–manager who is often resource poor, both financially and in the amount of time available to implement new sustainable practices. A survey of 139 small businesses in a light industrial area has provided an indication of the environmental footprint of small business by showing the volume of waste generated compared to the amount recycled. An intervention programme to increase recycling in this area and reduce the negative impact of these businesses has produced positive results. These results demonstrate that engaging small business in environmental management can be a catalyst both for reducing the environmental impact of small businesses, and for the implementation of local initiatives. Of critical importance in the success of the intervention was direct consultation from the outset with small business owner–managers. This consultation meant that when a barrier to recycling was identified with a particular waste item the owner–manager was provided the opportunity to agree on a solution and cooperate in the efforts to implement beneficial changes. As a consequence of the research and intervention, an increased awareness of waste disposal, recycling issues and opportunities has been created, with improved communication and cooperation between small businesses, recycling contractors and local environmental organisations. The results achieved in this pilot project could be used to direct policy to encourage and support others in this important business sector to implement effective environmental practices.

**Keywords:** environmental education; environmental management; waste management; stakeholders; small business; sustainable development.

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## 1 Introduction

The Secretary General of the United Nations recently confirmed that human activities are negatively contributing to global climate change (UN News, 2007). This statement has been a catalyst for greater global focus on the environment. In particular, the focus has been on the need for increased action to be taken by businesses to reduce the negative impact they are having on the environment. Large businesses have to be engaged in environmental management, however, this is new ground for many small businesses who until recently operated, for the most part, without giving due attention to their environmental impact.

This paper contributes to increasing our knowledge regarding the environmental management practices of small businesses. It reports on a recent pilot project that sought to engage small businesses in order to improve their waste management practices. This paper also examines whether a one-on-one awareness raising, education and support intervention project can have a positive effect on small business owner–managers interest in environmental issues and waste management practices.

## 2 Literature review

### *2.1 Business response to environmental management*

Businesses respond to environmental management responsibilities differently (Gonzalez-Benito and Gonzalez-Benito, 2006) and often the difference between the response of business has been attributed to the size of the business (Bowen, 2002;

Condon, 2004; Connell and Flynn, 1999). However, Bowen (2002, p.123) found that it was "not size *per se* that promotes environmental responsiveness, but elements of an organisation's visibility and the resources available to it that might result from its size". These elements create differences in both their motivation for engaging and the processes used when they do engage.

Generally, large businesses have responded to the tenets of corporate social responsibility where environmental management is concerned (Luetkenhorst, 2004; Naffziger et al., 2003). However, their motivation to engage in environmental management practices is largely due to their visibility which attracts external pressure and ultimately legislative sanctions. This external pressure comes from two sources, that being legal pressure and also social pressure. Regulatory enforcement agencies, such as the Environmental Protection Authority (EPA), apply legitimate pressure and they also monitor large business involvement more thoroughly than they do to small business (Connell and Flynn, 1999; Wills, 2003). Large businesses also receive more pressure from their customers and the general public to do the 'right thing' environmentally than do small businesses (Gonzalez-Benito and Gonzalez-Benito, 2006).

Moreover, in many ways it is easier for large businesses to respond to the environmental management issues than it is for smaller businesses. "The scale of large business allows them to face the indivisibilities associated with environmental management, such as those requiring investments in technology and human resources or certifications" (Gonzalez-Benito and Gonzalez-Benito, 2006, p.91). Large businesses also have more resources to allocate to the implementation and monitoring of environmental systems (Condon, 2004; McKeiver and Gadenne, 2005). The advantages of implementing environmental management practices are also more easily realised by large business.

These advantages include: cost savings, increased staff loyalty, reputation and consumer response, establishing a culture of innovation and learning, and improved government relations (Luetkenhorst, 2004; Wills, 2003). In addition, multinational companies are seen to be able to influence environmental issues more readily than small companies (Dunning, 1993 cited in Child and Tsai, 2005). On the other hand, they can also exert influence over environmental policies and their environmental protection codes are often used by governments as templates on which to base their regulations (Childs and Tsai, 2005). This has led in the past to large business having a significant voice in what environmental sanctions are appropriate, and not surprisingly they have often pleaded the economic argument, rather than the social argument.

In contrast to this, small businesses individually have no voice, but they are also unlikely to be monitored by regulatory enforcement agencies and this has allowed them to operate without due attention to the environmental impact of their business (Wills, 2003). In general, small businesses do not perceive environmental issues as important as they are ignorant of their impact and often they do not know what regulations are applicable to them or how to comply with them (EPA, 2003; Hillary, 2000; McKeiver and Gadenne, 2005; Redmond, et al., 2008; Revell and Blackburn, 2004; Simpson et al., 2004).

As a single entity small businesses are often reliant on the owner–manager and that person may lack the strategic mindset necessary to see the advantages that could be achieved by implementing better environmental management practices (Condon, 2004; Simpson et al., 2004) or they are at the least sceptical that they exist (D'Souza and Peretiatko, 2002; Hillary, 2000; Schaefer, 2007; Simpson et al., 2004). The diversity

amongst small businesses is evident in their coverage of every industry sector and every type of business. They are owned and operated by sole traders, families, business partners of all ages, genders and ethnic backgrounds. Their business skills vary from poor to excellent with their one common trait being that most small business owner–managers are competent technicians in their area of expertise but often have limited managerial experience. Complicating this further, they often do not have sufficient resources to allocate to matters outside core functions and therefore the environment is often a low priority (Condon, 2004; Redmond et al., 2006). This is a real issue as their collective impact is significant and therefore, they need to become engaged in the environmental management debate.

### *2.2 Engaging small business in environmental management practices*

The collective contribution of small business both to the economy and to the negative impacts on the environment is significant and continues to grow, so it is critical that they become involved in improving their environmental performance (Hillary, 2000; Stokes et al., 2007). In UK, small- and medium-sized businesses make up to 99.8% of all businesses and provide around 60% of carbon dioxide emissions (Condon, 2004; Simpson et al., 2004).

In Australia, there are 1.88 million small businesses, they employ 3.7 million people and contribute an estimated 39% of Australia's economic production (Department of Industry Tourism and Resources, 2007). Whereas, the economic and social importance of small business is well documented, there is a real problem in how to interact and engage with them, in particular from a government perspective.

The complexity of Australia's three tiered Government system can cause boundary problems related to responsibilities such as legislation, monitoring and advice to business. Calls for an integrated government approach to assist in managing sustainability have been made and this is particularly important when recent research has suggested that small and medium enterprises contribute up to 70% of global pollution (Hillary, 2000; Stokes et al., 2007).

For these reasons, some effort has been made to engage small business in environmental management practices (Revell and Rutherfoord, 2003). However, progress has been complicated by the fact that they can be difficult to work with, mainly because they are resource poor, both in time and capacity to change existing systems (Condon, 2004; Hillary, 2000; Redmond and Walker, 2008; Walker et al., 2007). Compounding this, small businesses have different ways of responding to their environment (Antonio et al., 2006) and see meeting the sustainability agenda as a cost to their business that cannot be recovered (Simpson et al., 2004).

Whereas, this might seem a depressing picture some progress has been made, mainly in the area of the environmental management practices of small business in relation to waste management.

### *2.3 Small business and waste management*

Among environmental management issues waste management is critical, particularly how waste is disposed of by businesses and consumers, due to the impact they have on both the environment and the community (Department of Environment, 2005).

For example, Australia currently consumes more resources than at any other time in its history and is in the top 10 solid waste generators in the OECD (Australian Bureau of Statistics, 2003).

The majority of small businesses operate on a survival management culture rather than a strategic management culture, making long-term operational changes difficult to action as they require a level of forward thinking. The absence of a strategic management approach, which is known to be rare in most small businesses (Jennings and Beaver, 1997; Wang et al., 2007), is unfortunate as this approach may help to counter the need, perceived or otherwise, for immediate economic benefit from these strategies. Indeed, while creating competitive advantage by adopting good environmental practices has been advocated, the general perception among small businesses is that there are no real cost savings from environmental improvements or competitive advantage to be gained (Simpson et al., 2004). For this reason, it is not expected that small businesses will engage voluntarily in these practices (Revell and Rutherfoord, 2003). Therefore, what is needed is a more proactive model of holistic community engagement and one that demonstrates the economic argument for all parties.

Working with small business is most effective when the approach taken is contextualised and uses strategies that are specific to the business. In regard to training they also prefer informal approaches rather than traditional institutional approaches (Billett, 2001; Walker et al., 2007). Research on those in the small business sector has identified site visits and one-on-one face-to-face advice as successful strategies with this sector (Condon, 2004; Groundwork, 1998) and poor communication as a barrier to engagement (The National Centre for Business and Sustainability, 2006; Tilbury et al., 2005). By using these successful strategies and direct delivering to the small businesses an exploratory investigation was undertaken in a small industrial area in metropolitan Perth to examine the attitudes and waste management behaviour pre and post an intervention programme being implemented.

## 3 Methodology

### *3.1 Aim*

To examine whether an intervention which provides one-on-one awareness raising, education and support can have a positive effect on small business owner–managers interest in environmental issues and their waste management practices.

### *3.2 Research design*

The research design incorporated survey data collection and an intervention programme with small business owner–managers in a small industrial area. Both the data collections and interventions were conducted by local expert waste management consultants. All small business owner–managers that participated in the preintervention data collection phase were eligible to receive the intervention. It was acknowledged that the overall design of the interventions as well as other aspects of the research, including data collection methods, would be labour intensive, however, this approach was considered vital in engaging the small business owner–manager in this process.

The broad research questions were:

1 What are the owner–managers' current attitudes towards the environment?

2 What waste management behaviours are being practiced by the owner–managers?

3 Are the owner–managers willing to engage in environmental improvement programmes?

### *3.2.1 Sample*

The sample consisted of small business owner–managers from a discrete industrial area in metropolitan Perth. The industrial area was selected as it was geographically located in a part of the metropolitan area that had evolved over time rather than being planned. This was an important criterion as the lack of planning had allowed businesses to develop close to a major waterway and operate without close environmental monitoring. The industrial area was also small enough to provide an isolated sample, had a considerable number of small businesses and had a recent history of significant pollution incidents.

### *3.2.2 Survey*

A survey approach was chosen for several reasons. The survey method provides an avenue to control the process of data collection while allowing interaction with the subjects to elicit their participation (Brewer and Hunter, 1989). Survey research also helps to organise and analyse the data (De Vaus, 2002). In a pre–post study this method was also important as it allowed exact replication of questions as well as modification in the post-data collection phase to explore further items of interest. Although interaction was an important ingredient in this research the survey method also acknowledges that small business owner–managers are time poor and helps reduce the imposition on their workload.

The survey data were collected directly with the small business owner–manager at two points in time over 18 months, pre and post an intervention programme. The survey utilised both quantitative and qualitative methodologies to collect statistical as well as more in-depth responses from the small business owner–managers.

*3.2.2.1 Preintervention survey instrument* Preliminary meetings with stakeholders led to the development of a survey instrument which was piloted with eight small business operators in the industrial area. After analysing the pilot data further input from professionals working within local environmental management organisations was sought and the survey instrument refined. A decision was made not to include the data collected from the pilot study beyond this point as some survey items were changed in the final document and, therefore, the results were not directly comparable.

The final 30 item instrument consisted of a mixture of qualitative and quantitative questions which related to the business (e.g. What is your business?), the environment (e.g. Are you interested in the environment?), waste management (e.g. What type(s) and approximate volume of waste is produced and disposed of during your business operations each week?) and the local environment (e.g. What would you rate as the top environmental issue currently in this location?). Where Likert scales were used the

response options ranged from 1 (not important or very poor) to 7 (very important or very good). Prior to conducting the main survey checks of the instrument for both face validity and content validity were made (Cavana et al., 2001).

The survey was taken to 139 businesses in the industrial area. This protocol of one-on-one collection of the data contributed to a high response rate with 120 responding (86%) to the preintervention survey. This is an excellent result and provides a true reflection of the industrial area.

Key topics covered in the survey were:

- a profile of the business owner–managers
- basic business information
- perceptions of the industrial area
- views on environmental issues
- waste volume, storage and disposal method
- barriers to recycling
- waste management behaviour.

*3.2.2.2 Post-intervention survey instrument 2007* The preintervention survey was modified to reflect changes in the timing of the survey and to extend the questionnaire to elicit more in-depth information. For example, in the preintervention survey the business owner–managers were asked whether they were interested in the environment and why. These questions were extended in the post-intervention collection by asking if their level of interest had changed over the previous 18 months and a list of reasons why this might be the case were offered for them to choose from, so that the cause of any change could be determined. The final questionnaire consisted of 47 questions.

In the post-intervention survey collection the level of sophistication and accuracy was improved with the use of Personal Digital Assistant (PDA) technology. The post-intervention survey was taken to the original 120 businesses surveyed preintervention and 85 responded. It was apparent that 24 of the businesses that had participated in the first survey had moved out of the area. The post-intervention response rate was 71%, which was less in percentage terms to the preintervention survey, but gives sufficient data in order to be representative. However, the results must be read in the context of this change.

Prior to both survey data collections the business owner–managers were given details regarding the purpose of the study, advised that participation was voluntary, they could withdraw at any time and that information provided by them would remain confidential. Survey data were then collected from those that agreed to participate.

### *3.2.3 Intervention*

The intervention programme was designed based on one-on-one, face-to-face consultation, awareness raising and education using various direct delivery methods and support. All intervention strategies were delivered by local expert environmental management consultants directly to the small business owner–managers after baseline data were collected. The intervention strategies focused on improving the small business

owner–manager's interest in environmental issues, and knowledge and practice of waste management in an effort to reduce the negative impact the businesses had on the environment. The intervention was delivered over the intervening period between pre- and post-data collection, a period of approximately 18 months. The intervention programme included the following:

- advice to the businesses of waste reduction strategies
- creation of a steering group to monitor the progress of the project
- development and distribution of a newsletter to disseminate information about the project
- development and delivery of information fact sheets about pollution control and waste management
- establishing links between the small businesses and local waste recycling contractors
- provision of communal cardboard and paper bins
- a survey of waste recycling companies to ascertain their views on small business engagement in waste collection and reduction
- development of case studies
- advocacy to local authorities.

## 4 Results

The results are presented in two sections. The first section relates to the intervention and provides an overview of the level of consultation and how the outcomes of this project were achieved by reviewing each of the intervention strategies. The second section outlines the findings from the post-intervention survey and discusses changes between pre- and post-data.

### *4.1 Intervention*

#### *4.1.1 Waste reduction strategies*

After the preintervention data collection was collected and analysed the businesses were revisited to verify results and determine a strategy with the business owner to reduce waste from the business operations. Assistance was then provided where appropriate to help implement the strategy while allowing the owner–managers to drive the process. This proved to be an effective strategy as it allowed the owner–managers autonomy and the capacity to implement changes to the level the business could manage.

#### *4.1.2 Steering group*

A steering group was established to monitor and provide input as the project unfolded. A strategic membership plan for the steering committee was created and membership was drawn from small business owner–managers in the industrial area, local stakeholders

and the researchers. This group was important in many ways, and particularly in regard to the timing of small business involvement and feedback about the practicalities of what would and would not work.

### *4.1.3 Advocacy*

After analysis of the preintervention data, the findings were presented to executive management at the local authority to create awareness of initial project outcomes and to ask for consideration of environmental issues raised by the business residents. In addition, other meetings were held and letters were written to formalise the transfer of information. As yet there has not been a formal response to these approaches however it is hoped that some positive outcomes may be announced in the near future.

### *4.1.4 Newsletter*

Preintervention data confirmed that small businesses in the area preferred to obtain business information by newsletter. In response, the industry partner developed a newsletter to inform the businesses, stakeholders and wider community of the project and key outcomes being achieved. Three editions of the newsletter had been disseminated prior to the post-intervention survey. These newsletters have been well received in the local area and this strategy will continue to inform local small businesses of environmental issues and other project outcomes in the future.

### *4.1.5 Fact sheets*

Ten fact sheets were developed that provide advice to small business about pollution control and waste management. These were delivered directly to the small businesses involved in the project. These fact sheets have been well received and as a consequence a second series which progressively develops each sheet is currently being developed.

### *4.1.6 Linking recycling contractors and Bellevue businesses*

Considerable effort was made to establish links between the recyclers and the small businesses to allow them to liaise about specific waste issues that were affecting their ability to recycle waste products. During this process it became apparent that recyclers were not promoting their services to small and medium enterprise and this was contributing to the use of landfill by the owner–managers. In response to this, a survey of recycling contractors was conducted to determine their views and business practices with small and medium enterprise. The results of this survey are not within the scope of this paper, however, they have helped establish greater understanding of the interaction between recyclers and small business. This knowledge will be used by the project stakeholders to develop methods of creating greater cohesion and cooperation between small businesses and recyclers in the future.

### *4.1.7 Communal bins*

To respond to the issue of business capacity to recycle small amounts of waste, three communal recycling bins were trialed in the industrial area for three months. With the consent of three owner–managers, collection of small quantities of paper and cardboard

was arranged by placing a communal bin on their premises for use by their business and other local businesses in the industrial area. The location of the communal bins was advertised in the project newsletter and letters were sent to surrounding businesses in each location. The project stakeholders paid for the use of two of the bins and the third was provided by a recycler at no cost.

The outcomes from this strategy were mixed. On the negative side, it was found that provision of communal bins can be difficult to manage and it is not easy to create awareness of their existence even when considerable effort is put into doing so. On the positive side, at collection time, it was found that one of the bins was usually full and the other two were well utilised. It is apparent that for the strategy to be more successful a higher level of resources will be necessary to ensure that management issues can be addressed and the businesses are aware of the existence of the bins. The project stakeholders are currently reviewing how to improve the process for everyone concerned.

#### *4.1.8 Case studies*

It was the intention at the outset of this project to develop case studies to help promote good practice in small business and to inform others of outcomes achieved in the project. Data have been collected during the project that will help to develop the case studies and it is expected that these will be completed in the near future.

### *4.2 Survey results*

The results reported here focus on the post-intervention data and discussion is made to compare the pre- and post-data where it is applicable to the outcomes of the project.

#### *4.2.1 Business characteristics*

At both points of collection, the sample of businesses was similar to other small business samples in Australia and elsewhere in that it is dominated by male owner–managers who operate service businesses (see Table 1). A slight change in the sample over the period related to the type of businesses operating with a greater number providing motor vehicle service ($n = 13$) than previously found ($n = 6$).

**Table 1** Profile of respondents

| | *Gender (%)* | *Age (%)* | *Highest education (%)* |
|---|---|---|---|
| Male | 85 | | |
| Female | 15 | | |
| Under 30 | | 4 | |
| 30–40 | | 18 | |
| 41–50 | | 35 | |
| 51–60 | | 26 | |
| 61 and over | | 18 | |
| High school | | | 39 |
| TAFE | | | 8 |
| Trade | | | 39 |
| University | | | 13 |

*Note*: Figures are rounded to nearest whole number; no response cases are omitted; totals may not add up to 100% due to rounding.

In addition, both the number of independently owned businesses and the number of businesses employing over 5 employees had risen over the 18 month period indicating that stability and growth is occurring in the area (see Table 2).

**Table 2** Profile of businesses

| | *Structure (%)* | *Ownership (%)* | *FT employee (%)* | *PT employee (%)*[a] |
|---|---|---|---|---|
| Independently owned | 93 | | | |
| Subsidiary or branch | 5 | | | |
| Franchise | 2 | | | |
| Owned | | 54 | | |
| Leased | | 46 | | |
| 1 only | | | 12 | |
| 2–5 | | | 47 | |
| 6–19 | | | 33 | |
| 20 and over | | | 8 | |
| 1 only | | | | 13 |
| 2–5 | | | | 11 |
| 6–19 | | | | 1 |
| 20 and over | | | | 0 |

[a]% of all businesses – only 25% has part time staff.

*Note*: Figures are rounded to nearest whole number; no response cases are omitted.

Most of the businesses indicated an intention to stay in the area (94%) and some are planning to move into larger premises in the next 12 months (11%) indicating that they feel it is a good place to have a business.

### *4.2.2 Environmental perceptions and issues*

Table 3 indicates the main concern about the environment of the owner–managers is the impact on future generations (40%). To a lesser extent they are concerned about harm to the global environment (30%) and least concerned about the impact on business (3%).

**Table 3** Main concern about the environment

| *Main concern* | *Frequency (n)* | *Percentage (%)* |
|---|---|---|
| Harm to local environment | 11 | 14 |
| Impact on your business | 2 | 3 |
| Harm to Australian environment | 10 | 12 |
| Impact on future generations | 32 | 40 |
| Harm to global environment | 24 | 30 |
| Other | 1 | 1 |

Post-intervention, the owner–managers still considered responsibility for the environment should be with the individual (44%) but less so than in the previous survey (55%). This change may be due to increased media attention to global climate change since they were last surveyed or it may be that they now see a need for further government assistance to be able to extend their involvement. When asked again which of the three levels government should be managing the environmental issues in their area, the owner–managers remained convinced that local government should be primarily involved (72%) with some charging state government with responsibility (26%).

### *4.2.3 Waste management behaviour and practices*

*4.2.3.1 Waste generated* The volume of waste generated in the industrial area suggests that small businesses in the area contribute a substantial amount of waste (see Table 4). Changes in the volume of waste were evident since the preintervention survey. However, as the number of respondents post-intervention was less due to response rate and business movement from the area it is impossible to assess what may have caused all the change although some explanations are possible.

Substantial increases were only evident in the number of tyres per week (from 420 to 713 per week) and this result is likely to be due to the growth in motor vehicle servicing in the area. Decreased volumes were found in oil, cardboard and paper and radiator coolant. A significant contributor to the oil volume in the preintervention survey did not participate in the post-intervention data set and this will have contributed to some of the decrease in waste oil from 3288 to 1843 l per week. The reason for changes in the volume of cardboard and paper (65–49 cubic metres), and radiator coolant (265–45 l) are unknown. Overall, the key types of waste produced in the area had remained the same. These are steel, oil, plastic and cardboard and paper.

**Table 4** Type and total volume of waste produced by the businesses in one week ($n$ = 85)

| *Material* | *$m^3$* | *kg* | *Units* | *Litres* | *Cost (%)* | *Income (%)* | *Neutral (%)* |
|---|---|---|---|---|---|---|---|
| Steel | | 8321 | | | 3 | 79 | 18 |
| Other metals | | 399 | | | 19 | 81 | 0 |
| Polystyrene | 1 | | | | 100 | 0 | 0 |
| Plastic containers | 15 | | | | 60 | 20 | 20 |
| Shrink wrap | 6 | | | | 73 | 0 | 27 |
| Car bumpers | | | 27 | | 0 | 0 | 100 |
| Other plastics | 8 | | | | 33 | 0 | 67 |
| Cardboard and paper | 49 | | | | 84 | 4 | 12 |
| Solid timber | 11 | | | | 71 | 0 | 29 |
| Pallets | | | 20 | | 83 | 0 | 17 |
| Dust | 18 | | | | 63 | 0 | 37 |
| Particle board | 1 | | | | 100 | 0 | 0 |

**Table 4** Type and total volume of waste produced by the businesses in one week ($n$ = 85) (continued)

| *Material* | *$m^3$* | *kg* | *Units* | *Litres* | *Cost (%)* | *Income (%)* | *Neutral (%)* |
|---|---|---|---|---|---|---|---|
| MDF | 1 | | | | 100 | 0 | 0 |
| Waste oil | | | | 1843 | 70 | 0 | 30 |
| Oil filters | | | 52 | | 78 | 0 | 22 |
| Radiator coolant | | | | 45 | 67 | 0 | 33 |
| Thinners | | | | 75 | 67 | 0 | 33 |
| Tyres | | | 713 | | 86 | 0 | 14 |
| Glass | 0.3 | | | | 100 | 0 | 0 |
| Vehicle batteries | | | 35 | | 22 | 45 | 33 |
| Road sweep waste | 100 | | | | 100 | 0 | 0 |
| Other waste | 14 | | | | 70 | 10 | 20 |

*Note*: Figures are rounded to nearest whole number; no response cases are omitted.
$m^3$ = cubic metres.

Recycling behaviour is only reported here on major items as the volume of other waste was either small or produced by a few businesses. In all major waste materials improvements were found in recycling behaviour (see Table 5). This data confirms the value of the close consultation that was offered during the intervention phase of the project as it has achieved valuable outcomes for the small businesses and the environment. Unfortunately, there was still a considerable amount of landfill use by the businesses for materials such as timber, cardboard and paper and plastics.

**Table 5** Recycled versus landfill comparison 2005 and 2007

| *Material* | *2005 recycle %* | *2005 landfill %* | *2007 recycle %* | *2007 landfill %* | *Change %* |
|---|---|---|---|---|---|
| Steel | 91 | 3 | 97 | 2 | Positive |
| Plastic | 53 | 37 | 64 | 36 | Positive |
| Cardboard and paper | 71 | 25 | 78 | 22 | Positive |
| Waste oil | 96 | 0 | 100 | 0 | Positive |
| Radiator coolant | 60 | | 100 | | Positive |
| Vehicle batteries | 94 | 100 | 6 | 0 | Positive |
| Tyres | 57 | 28 | 100 | 0 | Positive |

*4.2.3.2 Recycling behaviour and competitive advantage* While care must be taken in analysing the statistics as in some cases a small number of businesses may be responsible for the data, Table 5 also shows that large percentages of plastics, cardboard and paper are still being sent to landfill. On several items there is evidence that a different result is achieved from recycling with variations shown between items costing the business, bringing an income or being a cost neutral result for the business.

*4.2.3.3 Commitment to continual improvement* Post-intervention, a key indicator of commitment to environmental improvements was whether the businesses remained interested in obtaining more information about waste reduction. The number of businesses seeking knowledge has reduced by 8% from the preintervention figure and some of this reduction may be attributed to the intervention programme which should have increased their level of knowledge. Perhaps more importantly there is still interest among 52% of the businesses to seek more knowledge on waste reduction, demonstrating that many are willing to continue to be educated about how to improve their environmental performance. This provides an opportunity for further engagement with these businesses to help them achieve improvements in their waste management activities.

*4.2.3.4 Overall environmental impact* Post-intervention exploration of both positive and negative impacts from the business on the environment was undertaken. In both categories, a minority (38% and 39%) of owner–manager's acknowledged that their business had an environmental impact (see Table 6). Of those that acknowledged a business impact, the positive impacts were more often rated as having a higher level of impact than negative impacts, which were more likely to be considered as having a low impact on the environment. Of importance is that 42% stated that the positive impacts from their business had increased and 21% suggest that the negative impacts have decreased in the last 12 months. While only a few had a reason for explaining these changes, positive impact were stated as being due to an increase in business and staff interest, while changes in negative impacts were associated with better management/more care, better equipment, not producing shopping bags, use of biodiesel fuel and more work. The reasons provided are encouraging and suggest that further improvements may be made in the future within the capacity of these businesses.

**Table 6** Business impact on the environment

| *Environmental impact* | *Response* | *%* |
|---|---|---|
| *Nature of impact positive* | | 38 |
| Rating of impact | High | 30 |
| | Medium | 39 |
| | Low | 30 |
| Type of impact | Recycling | 58 |
| | Preventative measures/management | 12 |
| | Provision of environmentally friendly products/services | 24 |
| | Use of environmentally friendly products/processes | 6 |
| Impact changed over last 12 months | Increased | 42 |
| | Decreased | 0 |
| | Same | 58 |

**Table 6** Business impact on the environment (continued)

| *Environmental impact* | *Response* | *%* |
|---|---|---|
| *Nature of impact negative* | | 39 |
| Rating of impact | High | 9 |
| | Medium | 18 |
| | Low | 73 |
| Type of impact | Energy and fuel use | 21 |
| | Pollution, dust noise, emissions | 27 |
| | Waste | 39 |
| | Material and resource use | 12 |
| Impact changed over last 12 months | Increased | 12 |
| | Decreased | 21 |
| | Same | 67 |

*4.2.3.5 Engaging small business* Opinion differs on how best to approach small businesses to improve their environmental performance. Some suggest these improvements would be best driven from the businesses while others advocate increased legislation, education and/or support. This question was put to the business owner–managers to find out what method they thought was best and Table 7 shows that the majority (40%) felt that education is the best method to minimise environmental harm by business. Interestingly, they felt that self-management/industry driven methods were least likely to work.

**Table 7** Best method to minimise environmental harm from businesses

| *Method* | *Frequency (n)* | *Percentage (%)* |
|---|---|---|
| Self-management/industry driven | 13 | 15 |
| Education | 34 | 40 |
| Laws and enforcement | 24 | 28 |
| Support for small business | 14 | 17 |

*Note*: Figures are rounded to nearest whole number; no response cases are omitted.

To add support to the dual use of education and support, Table 8 clearly demonstrates that support offered during this project to the small businesses had the greatest impact on increasing their level of interest in environmental issues over the past 18 months (71%). Considering the high level of global mass media attention the environment has had during the survey period this result is encouraging and it endorses the approach used to gain their interest through participation with ‘expert advisors’ to achieve improved environmental performance.

**Table 8** Factors that increased SME interest in environmental issues over the last 18 months

| *Increased interest* | *Frequency (n)* | *Percentage (%)* |
|---|---|---|
| Yes | 51 | 61 |
| No | 33 | 39 |
| *Reason* | | |
| Bellevue SIP* | 34 | 71 |
| Media | 4 | 8 |
| Other | 10 | 21 |

*Note*: *SIP = Sustainable Industry Project
Data are based on whole sample data not just those who had increased their interest.

## 5 Discussion

The results from this study provide some evidence that the intervention used was effective in increasing small business owner–managers interest in environmental issues and reducing the negative impacts of the businesses. Some key issues for small business, policy makers and small business support organisations have also been identified.

Increased environmental interest was clearly demonstrated with a majority acknowledging that the project was responsible for increasing their interest in environmental issues. This result was particularly important as intense media scrutiny on the subject of the environment had occurred during the same period and according to the owner–managers this only attributed 8% to their change in attitude.

Reduction in the negative impacts of the businesses on the environment was evident. In all major waste materials produced in the area positive outcomes were achieved to change waste management practices, with greater percentages of recycling than at baseline. In addition, some of the owner–managers had decreased negative impacts and improved the positive impacts of their business on the environment. Other positive results were found in that the owner–manager's use of a new or different recycling contractor and acknowledgement that environmental responsibility is an individual role.

In contrast to these overall positive results, is the continuing overuse of landfill. A contributing factor to this problem was the difficulty some owner–managers experience when trying to recycle small amounts or particular types of waste material. This result indicates that more needs to be done to support the efforts of small businesses to recycle small quantities of materials and educate them on the importance of disposal of all waste.

It is also possible that issues such as the use of landfill is a result of small business owner–managers' concern about the environment being directed towards the impact on future generations rather than environmental harm per se. The consequences of this perception are not fully understood and more exploration of how this view may affect environmental behaviour is necessary.

Some key issues have been raised from the results of the study. Perhaps the most important from a small business perspective, is the variation between a waste product being a cost to the business, neutral or a potential income stream. This is an area that some businesses could exploit more effectively. However, more work may need to be completed with some of the businesses to help them realise where these advantages may be made.

This research has shown that some small business owner–managers were able to provide practical examples of their business impact on the environment. Moreover, against the notion raised by previous research that they are ignorant of their business impact on the environment, they were able to rate these impacts and give advice on how the impacts had changed over time. It also suggests that with ongoing assistance further improvements may be made in the future within the capacity of these businesses.

The intervention strategy was successful in increasing interest and decreasing the negative impacts of small business on the environment and as a consequence the owner–managers are still seeking support in three areas. Firstly, they want help to find recycling contractors for specific waste and small amounts. Secondly, they need access to additional bins to effectively recycle the waste products from their business. Finally, almost half of the participants are seeking more information about waste management practices.

Considerable effort was made to understand stakeholder perspectives and link them with small business to ensure positive outcomes were achieved. Unfortunately, some waste items are not economically viable to collect in small quantities or do not generate sufficient income to warrant collection in any quantity. In an attempt to resolve this issue, communal bins for cardboard and paper recycling were trialled with some success. Further development of this strategy may be worthwhile with other waste products. It is also necessary for key stakeholders to assess the viability of other strategies to either force or encourage better waste management practices (e.g. increased landfill levies and/or contractor incentives).

A key barrier was highlighted when some small business owner–managers looked for additional bins to aid their recycling efforts. For those small business owners that lease their premises it was found that they cannot arrange extra bins from the local authorities, as it is the responsibility of the landlord. This policy area may need reviewing by local authorities as it is the lessees that are generating the waste and they need support to ensure that they are able to minimise the harm from their business operations.

The intervention was successful overall. One of the reasons for this was the direct delivery by expert consultants of specific, relevant information to the small business owner–managers. This approach is fundamental to engaging this sector of the business community. Areas for modification of the intervention have also been identified.

Even with an intervention over an 18 months period where several strategies were in place, gaps in the small business owner–managers' knowledge were visible in regard to key issues such as storm water flow. This demonstrates that to create long-term change in knowledge or behaviour among small business owner–managers not only is a multimethod approach needed but one that builds on existing knowledge and identifies gaps for future programmes. In this way, the awareness raising and education programmes can be modified to promote a culture of continual improvement among the small business community. Ideally, this culture will be passed on by the owner–managers to employees through staff training and other activities.

## 6 Conclusion

The intervention process was shown to have a positive effect both on owner–manager interest in environmental issues and some waste management practices. This is largely due to the high level of resources put towards this project to ensure that face-to-face,

one-on-one advice was available to the businesses. It could be argued that this personal attention is very costly and that the environmental management behavioural changes that result may have a minimal effect overall, given the small size of most businesses and the relatively small amount of waste they produce. The counter argument is that many small businesses are simply unaware of their environmental impact, so by working with them their overall awareness should increase and result in a behaviour change, and a difference will be brought about. And if this is linked to bottom line activity, then 'champions' are developed and those business operators themselves will become advocates amongst their peers. It should also be stressed that any work that has a positive effect is a good result and that any strategy has to be long term and not just a quick fix. What is needed is not a solution to the current environmental problem, rather intervention and behaviour change strategies to stop the problem in the first place.

Small business owner–managers have shown that they are prepared to act but to do so they need support and education. Therefore, rather than legislate without the capacity to monitor small business compliance, awareness raising and education are recommended as the key tenets of efforts to create long-term knowledge and minimise harm from small businesses. The education programmes must be delivered directly to the small business owner–manager and that information should seek to fill gaps in their knowledge and offer them the opportunity to develop a culture of continual environmental management improvement in their business operations.

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