

# Barriers to Environmental Sustainability Facing Small Businesses in Durham, NC

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## **Abstract**

Conventional approaches to implementing environmental practices within a business often rely on assumptions and measures predominantly developed for large corporations. Small and medium-sized enterprises (SMEs) frequently operate differently and encounter a variety of barriers to the implementation of environmental practices that may not exist in the larger corporate arena. This paper analyzes the barriers SMEs face when implementing environmental measures through information gathered from small businesses in the Durham, North Carolina area. The study finds that financial cost is the main barrier, followed by a lack of time to devote to such measures and a lack of knowledge regarding which actions can be undertaken. The study concludes with recommendations for regulatory and policy changes, economic incentives, and improved information resources to help mitigate the environmental barriers facing small businesses in the Durham area.

## Introduction

Awareness of the impacts that businesses have on the environment is an area of increasing concern among many business owners and operators in the United States. Small and medium-sized enterprises (SMEs) face a variety of barriers in achieving environmental sustainability. While significant emphasis and effort has focused on sustainability challenges in large corporations, less attention and research have been devoted to challenges specific to small businesses. These SMEs are often seen as having an insignificant impact on the environment. Statistics show, however, that SMEs comprise over 6 million firms in the United States and employ over 60 million people (U.S. Small Business Administration, 2009). While each business independently may have a smaller impact than the average large corporation, by virtue of their numbers small businesses combined have a significant impact on the environment.

Conventional approaches to environmental sustainability are often based upon assumptions and practices that are predominantly developed for large corporations (Jenkins, 2006). SMEs frequently operate differently and face distinct business environments. These businesses often have different levels of regulation, scale, operations and capital accessibility when compared with larger corporations. As SMEs seek to become more environmentally sustainable, they encounter a variety of barriers, many of which do not exist or are insignificant in the large corporate arena. The goal of this study is to explore the barriers that SMEs face in their efforts to become more environmentally sustainable, as well as to identify areas of opportunity that are common among SMEs. For the study, we gathered information from SMEs regarding their business operations and environmental practices, as well as their experiences as they sought to reduce their environmental impact. The results of the study are intended to be used by the

Chamber of Commerce and the City of Durham to help develop policies and practices that better incentivize and aid businesses in their pursuit of environmental practices.

We begin with a review of the literature regarding SME's environmental practices and the motivations behind these actions. There is a wide range of reasoning and opinion in the literature as to what drives environmental practices in SMEs. The next section reviews the methodology used to gather information from local businesses and subject area experts in an effort to better understand the factors that affect decision making in local SMEs regarding environmental practices. The focus centers on why a business takes action, does not take action, and what incentives could persuade a business to take the extra step. The discussion section analyzes the exhibited limitations and barriers of local businesses. We conclude with an examination of the areas of opportunity and suggestions for practices and policies that can be put in place to aid SMEs in their path to environmental sustainability.

## Literature Review

Much attention on corporate environmental sustainability has focused on large businesses with high visibility. However, a growing body of research has been done on the unique challenges that small and medium-sized enterprises (SMEs) face in adopting environmental practices. SMEs are of particular interest because they make up 99.7% of all employer firms in the U.S. and employ over half of all private firm employees (U.S. Small Business Administration, 2009). They also contribute about 60% of carbon dioxide emissions and 70% of all pollution (Parker et al., 2009).

It is important to note that although SMEs make up most of private business, no universal definition of an “SME” exists in the literature (Jenkins, 2006). Many studies define SMEs by number of employees (Revell et al., 2009), with levels ranging from 0 to 500 based on the country where the research is carried out (Parker et al., 2009). Other studies look to internal parameters of businesses, such as profit. One study defined an SME as having a turnover of between £250,000 and £70 million (Taylor et al., 2003). For our study, we adopted the definition used by the U.S. Small Business Administration (2009): a small business is one with less 500 employees.

Research on SMEs and sustainability varies widely in scope. Some studies examine specific environmental practices while others include broader aspects of business culture and values. The practice of “corporate social responsibility” (CSR), for example, seeks to integrate environmental, economic, and social frameworks (the so-called triple-bottom-line approach) to develop and implement responsible businesses policies. Researchers in CSR cite many common

barriers small businesses confront in implementing environmental practices and a variety of reasons for those barriers. We therefore reviewed literature focusing on both environmental practices and more broadly on CSR activities. We also looked at several studies on SMEs in the United Kingdom (UK) since much of the existing research has focused on businesses in that country.

While SMEs tend to view environmental issues as a high management priority (Revell et al., 2009), numerous barriers have been found to hinder implementation of environmental measures. The common difficulties cited included lack of information, lack of time, regulations and ineffective dissemination of regulatory or legislative information, high costs, attitudes, lack of internal champions, and lack of customer demand for environmental practices. Each is discussed below.

### **Information**

Several research studies found a lack of information as a common barrier to implementing environmental practices within SMEs. In one study of 220 small firm owner-managers, about one-third of respondents cited lack of information on what to do as a barrier to environmental reform, and about 57% wanted more information about how their business could help the environment (Revell et al., 2009). Two research studies pointed to low “eco-literacy” and the lack of understanding or expertise about laws, environmental management, and best practices as barriers (Schaper, 2002; Revell & Blackburn, 2007). When faced with environmental regulations, some businesses, particularly in the UK restaurant industry, had difficulty

interpreting regulations or did not understand how regulations might impact their business (Revell & Blackburn, 2007).

### **Time**

SMEs also cited lack of time as a challenge. Revell et al. (2009) found that almost 53% of businesses surveyed pointed to a lack of staff time as a barrier for introducing environmental measures. Another study found that the major obstacles for corporate social responsibility included time and resources, except for companies with between 100-120 employees (Jenkins, 2006). A study of architects and builders in the UK also found time and effort as limiting factors, particularly when the firms had only a few staff members who work long hours at construction sites. Some UK restaurant owners did not view financial savings associated with business practices worth the time and effort, particularly with waste separation. Likewise, builders did not believe the time or effort required for reusing or recycling materials was worth the amount of labor and storage needed (Revell & Blackburn, 2007)

### **Regulations and Legislation**

Four studies mentioned regulations or legislation as challenges to implementing environmental practices. In particular, two studies found voluntary approaches to environmental regulation ineffective (Taylor, 2003; Parker, 2009). One of the studies, however, argued that voluntary standards can be effective when implemented out of personal ethics or when external demand to comply exists (Taylor, 2003). Alternatively, voluntary regulations will not work when the challenges outweigh the benefits or when it is the only strategy used (Parker, 2009).



Another challenge to advancing environmental practices for SMEs is the lack of awareness about environmental regulations. Many businesses do not know about legislation relevant to their business (Taylor, 2003). Revell & Blackburn (2007) found that restaurant owners in the UK pointed to a lack of information dissemination about new or updated regulations by the government. They also found a dearth of legal regulations specific to environmental practices in restaurants and more legal regulations on food hygiene. One study found, however, that 63% of 40 firms interviewed had a general awareness of relevant environmental regulations. The volume and complexity of legislation, however, prevented most from being fully aware of environmental regulations (Williamson & Lynch-Wood, 2001).

In cases where mandatory environmental regulations do exist, compliance can be a motivator for businesses to adopt environmental measures. However, businesses will generally fulfill only the minimum requirements (Revell & Blackburn, 2007). The UK restaurant owners believed that regulations were the most effective way to encourage environmentally-friendly practices in the industry even though this industry does not face a large number of environment-specific regulations (Revell & Blackburn, 2007). This belief comes from the idea that regulations eliminate a 'free rider' problem and place businesses on equal footing (Revell & Blackburn, 2007).

Revell et al. (2009) found that 60% of SMEs surveyed agreed that legislation could help ensure a 'level playing field' and that 60% also believe there should be 'more legislation to control the environmental and social impacts of business.' Legislation is the most important factor for most SMEs to implement environmentally friendly practices (Schaper, 2002).

## **Cost**

Many studies have found financial concerns and perceived elevated costs of implementing environmental practices to be one of the biggest barriers for SMEs. In their research, Taylor et al. (2003) cited a 1995 study of SMEs where 73% of firms surveyed said they would make environmental improvements if business costs declined. Revell et al. (2009) found that almost two-thirds of SMEs indicated 'increased costs' as a barrier. Interestingly, though, 52% believed that "environmentally friendly" measures could increase profits (Revell et al., 2009).

A study of the construction industry found that builders do not believe a clear business case exists for energy or waste efficiency measures (Revell & Blackburn, 2007). To support their view, they cited: a lack of incentives to pursue efficiency measures; the fact that clients pay the energy bills; the time it takes to sort waste; and the extra funding needed to store reusable materials (Revell & Blackburn, 2007). Williamson & Lynch-Wood (2001) found that among 40 SMEs of different types, most cited waste regulations as having the highest environmental cost burden.

Similarly, in the restaurant industry, many businesses did not see a financial return in implementing environmental measures nor did they view investments in energy reduction measures worth the initial cost (Revell & Blackburn, 2007). Restaurants cited quality of service and food as their primary business drivers, and did not believe environmental practices would attract more customers (Revell & Blackburn, 2007).

In another study of 63 SMEs of diverse types, 75% agreed that environmental responsibility would come at a cost to their organization. Half had not examined the business case for

environmental measures. However, many of these companies had invested in at least some environmental measures, particularly in energy efficiency (Taylor et al., 2003).

### **Attitudes**

Attitudes of SME owners and managers play a mixed role in the implementation of environmental practices. Some businesses believe that their operations have a minimal impact on the environment (Taylor et al., 2003) while others believe that they have a moral imperative to act (Jenkins, 2006).

Businesses had a variety of opinions on whether customer satisfaction improved with environmental practices. Some felt a direct link existed while others did not (Taylor et al., 2003). There was also disagreement on whether environmental improvements give businesses a competitive edge. Some firms showed skepticism towards making environmental improvements and did not view them as an opportunity for a competitive advantage. Other firms reported having a competitive edge after implementing measures (Taylor, 2003). As noted above, in the construction industry, many firms did not believe the payback would be worthwhile (Revell & Blackburn, 2007).

Some firms perceive implementation of environmental practices as time and resource-intensive. Williamson & Lynch-Wood (2001) showed that firms rated themselves as generally aware of environmental issues but unsatisfied with their current performance; improving performance would require “quite a bit of effort”.

On a more positive note, Revell et al. (2009) found businesses possessed a mostly optimistic attitude towards environmental measures. More than 80% of SMEs believed that “environmental issues should be a high priority”. Additionally, 75% disagreed that their business was too small to make an environmental impact. Firms cited altruism as one of the most important reasons for environmental practices. However, a majority of firms perceived increased costs as a barrier, meaning that they may often achieve “low hanging fruit”- easy to do environmental measures- but may not proactively implement more advanced measures (Revell et al., 2009).

### **Champions**

Many studies agreed that a commitment to environmental improvements can only be achieved in SMEs if the owner or top-level manager champions the effort. The owner or manager is often the driver of actions and can influence the values of the business. Therefore, top-level commitment is a critical component to success (Jenkins, 2006).

Williamson (2001) found a correlation between the time spent on environmental issues and whether or not a business had a dedicated environmental manager. Of 40 SMEs, 36 did not have an environmental manager; those 36 businesses also spent less than 3% of their time on environmental activity. The four remaining businesses with environmental managers spent over 3% of their time on environmental activity. In most of the firms without an environmental manager, the director-level staff took responsibility for environmental issues by default because of a lack of resources to hire dedicated staff, and because they were already responsible for legal environmental compliance.

## **Customer Demand**

Research has found that, on the whole, SMEs do not face significant external pressure from customers, suppliers, or stakeholders to implement environmental practices. In Revell et al.'s (2009) study of 220 small firm owner-managers, two-thirds cited pressure from customers as 'not important' or 'neutral', and 78% said that pressure from suppliers was 'not a driver' or was 'neutral'. Likewise, 74% did not feel pressure from business stakeholders. Jenkins' (2006) study of 24 SMEs in the UK found that internal rather than external pressure provided the main motivation to enact CSR practices.

## Methodology

This study aims to explore the various barriers that SMEs face in implementing environmental practices in the Durham, North Carolina area. The study involves a qualitative analysis of data gathered through two rounds of surveys, one conducted online (the Green Plus assessment, described below) and one conducted in person. This methodology allows for exploration of participants' motivations and decision processes, and provides a better understanding of the barriers faced. The Green Plus surveys were filled out in the latter part of 2009 and the in-person interviews were conducted in early 2010. We collected additional information through meetings with local subject experts and government officials as to trends observed across local businesses and business sectors.

The first round of surveys involved businesses participating in the Institute for Sustainable Development's (ISD) Green Plus Green Business Certification Program (Green Plus). The Durham Chamber of Commerce sponsored twenty local businesses to participate in the Green Plus program. The ultimate goal is for businesses to become "Green Plus Certified" by scoring a certain amount of points related to social, business, and environmental practices. As a first step, each business filled out an online, structured survey to assess their current practices. The business indicated "yes", "no", or "commit" in response to whether or not they currently practice the specific action or plan to do so. They could also add comments to their answers. A "yes" response to each question awarded the business 1 point and a "no" responses resulted in 0 points. For the purposes of this study, we only analyzed the environmental portion of the survey, concentrating on responses to energy, waste, water, and transportation. We did not

analyze the social or business operations questions. Due to proprietary concerns, the specific Green Plus questions are not included in this report.

Ten local businesses were selected for further study based on their participation in the ISD's Green Plus Program. Nine out of the ten businesses agreed to participate in a follow-up, in-person interview to provide more information on their environmental practices. The businesses interviewed spanned diverse industries, including real estate services, restaurant, lodging, staffing solutions, food and beverage services, hospitality, property management, and product development. They ranged in size from 3 employees to over 100. The majority were locally owned and operated, but one was part of a larger multinational corporation. The age of the businesses varied from only a few months in operation to 50 years.

For the second round of data gathering, we conducted semi-structured interviews with the Green Plus participant businesses in January and February of 2010. We interviewed owners or upper-level managers of nine businesses. Each interview lasted approximately one hour. We asked participants an identical series of questions (see Appendix). The questions sought to identify the basic business structure, target markets, and general operations. Questions about the owner or manager's educational and environmental background were also included. We asked additional, business-specific questions of each participant based upon responses to environmental practices in the Green Plus survey. The purpose of these follow-up questions was to identify the reasons why businesses had or had not decided to undertake a specific environmental action.

Because our investigation focused on SMEs that had previously agreed to participate in the Green Plus program, our study population has an inherent selection bias. It therefore cannot be assumed that responses and practices of the nine businesses reflect the majority of area business practices and opinions. This bias is intentional, however, as our research aims to examine the barriers that businesses face when implementing environmental practices, not whether there is a general willingness to become environmentally sustainable. The results of the study are intended to be used to develop policies and practices that better incentivize and aid other businesses as they pursue environmental activities.



## Results

Our results include data from both the Green Plus on-line survey as well as in-person interviews conducted with nine businesses. Each data set is described below. Table 1 describes the industry sector of the participating businesses; the names of the businesses have been kept confidential and are identified as “Business 1”, “Business 2,” etc.

**Table 1**  
Industry Sectors

Business 1	Restaurant
Business 2	Entrepreneur
Business 3	Staffing Company
Business 4	Lodging
Business 5	Information and Hospitality
Business 6	Realty
Business 7	Food and Beverage Service
Business 8	Restaurant
Business 9	Commercial Property Management

### Green Plus Survey Results

The results of the Green Plus Survey are shown in Table 2. These results are tabulated by the percentage of “yes”, “no” and “commit” responses in relation to the subject matter of the question. One participant did not complete the survey so the percentages do not reflect all of the businesses in the study.

**Table 2**  
Participant Results of Green Plus Survey as Percentage of Total Responses

	<b>Yes</b>	<b>No</b>	<b>Commit</b>
<b>Energy</b>	62%	32%	6%
<b>Transportation</b>	61%	39%	0%
<b>Water</b>	45%	45%	11%
<b>Solid Waste</b>	67%	25%	7%

Of the four environmental areas, the energy, transportation and solid waste categories all had similar response rates with over 60% of businesses performing the specified actions. Solid waste received the highest “yes” response rate (67%). Actions to reduce water consumption were the least employed among the group of SME’s surveyed; 45% of the participant businesses responded “yes” and an equal percentage responded “no”. While water had the lowest affirmative rate, it also saw the highest percentage of “commit” responses. The transportation category is the only category where the percentage of “commit” responses was zero.

**In-Person Survey Results**

The businesses surveyed varied greatly in their size, revenue, and years of operation. Table 3 displays some characteristics of the participant businesses in relation to the number of full time employees on staff, years of operation, and estimated annual income.

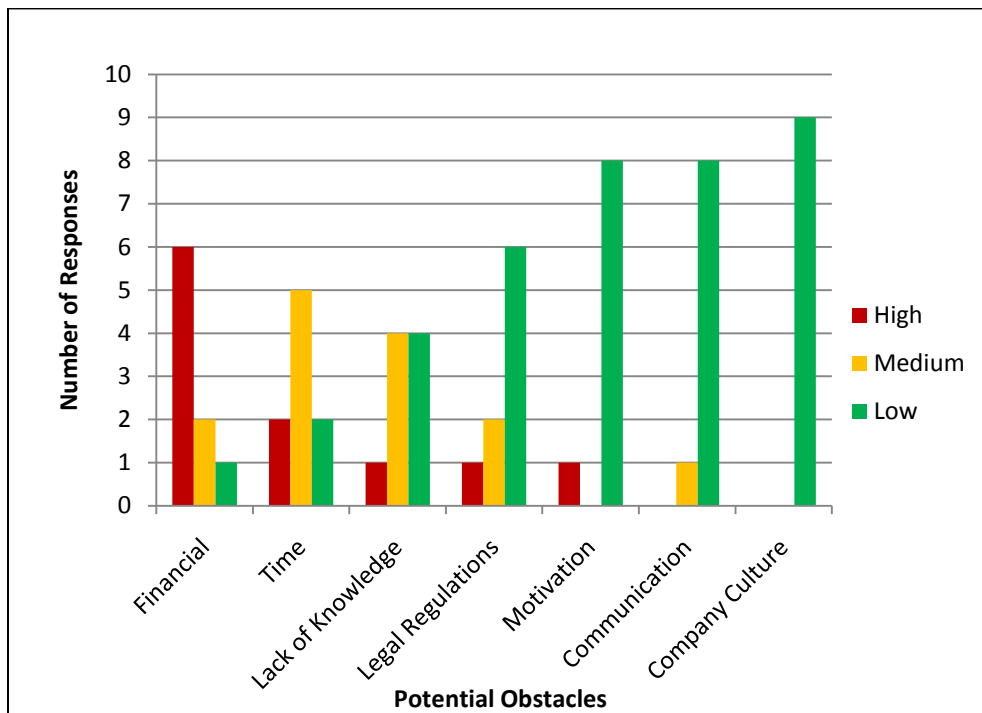
**Table 3**  
Characteristics of Participant SMEs

	<b>Range</b>	<b>Median</b>	<b>Mean</b>
<b>Number of Full Time Employees</b>	3 to 100	20	28
<b>Years of Operation</b>	2 months to 50 years	2 years	12 years
<b>Estimated Annual Revenue</b>	\$0 to \$18,000,000	\$500,000	\$4,180,000

Overall, the number of employees tended to be small, with only two businesses having over 25 full time staff members. The number of years in operation of the SMEs varied greatly, with most businesses being either well established or very new. Four businesses had been operating for a year or less, and three others had been operating for over 2 decades. While the mean annual revenue is reported at \$4,180,000, it should be noted that these numbers do not reflect all of the businesses interviewed, as four participant businesses chose not to list their annual income.

During the survey, SMEs were given a list of potential barriers to implementing environmentally sustainable practices, and asked to rank these obstacles as “high”, “medium” or “low”. The results of this ranking are shown in Graph 1.

**Graph 1**  
Ranking of Potential Obstacles



Most businesses identified financial obstacles as the greatest barrier to implementing environmental practices. When undertaking a new project or modification, all small businesses believed that significant financial capital must be set aside. The majority of the businesses also ranked lack of time as a medium or high barrier due to the limited size of their staff and the busy schedules of the owners and managers. Five businesses said that knowledge was a medium or high barrier, and many businesses expressed a desire for more information on their environmental impact as well as what further actions they could reasonably take to lower their environmental footprint. When asked about motivation, internal communication, company culture, and legal regulations, most respondents did not regard these areas as significant obstacles to their environmental practices.

Many participant businesses had implemented a wide variety of actions and initiatives to make their operations more environmentally sustainable. These actions ranged from recycling and reusing office supplies to capital-intensive projects such as installing grey water systems and cisterns to trap rainwater. Table 5 lists the actions and initiatives undertaken by the participant SMEs.

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**Table 5**  
Environmental Actions Taken by SMEs

**Solid Waste Reduction**

Recycling glass, aluminum, plastics  
Re-use of material and paper  
Strict use of electronic documents  
Compost waste  
Compostable to-go foodware  
Double-sided printing

**Energy Efficiency and Renewable Energy**

Energy management systems  
Variable drive hot water boiler  
CFL, LED and other energy efficient lighting  
Efficient HVAC  
Solar thermal hot water heater  
Passive solar  
Occupancy sensors

**Use of Green Products**

Low volatile organic compound paint  
Purchase of organic cotton

Biodegradable cleaning supplies  
Recycled carpet  
Green supply chain management tracking

**Transportation Emissions Reduction**

Purchase local food and items  
Employee public transport incentive system  
Tele-commuting and video conferencing

**Water Efficiency and Water Quality Improvements**

Grey water system  
Rain garden  
Cistern and/or rain barrels  
Native and drought tolerant landscaping  
Low flow toilets and faucets  
Automatic toilets and faucets  
Timed drip irrigation  
Pervious concrete parking lot

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## **Discussion**

The nine businesses interviewed had taken some actions to implement environmental practices or had shown interest in assessing their environmental actions using the Green Plus survey. Some common themes emerged as part of their survey responses and follow up explanations.

### **General Barriers**

#### ***Cost***

The most common obstacle mentioned by all SMEs focused on the cost of implementing environmental practices. This finding is consistent with previous research on barriers for SMEs (Revell et al., 2009; Taylor et al., 2003). Participants had a variety of specific financial concerns. Some of the concerns appeared to be perceived while others appeared to be real. For example, a majority of the questions on the Green Plus survey are low-cost or no-cost measures, such as setting goals for energy or water reductions and completing a solid waste audit. However, four businesses had not implemented any goals for energy and water reductions and three had not done a solid waste audit. On the other hand, some of the practices in the survey do have real costs, such as using renewable energy. A few business owners cited costly measures not included in the Green Plus survey, such as applying for the LEED Green Building Rating System certification. The findings indicate a key area of potential for helping businesses implement low-cost, easy measures.

Several businesses mentioned that customer service priorities come first, above investments in environmental measures. This aligns with the fact that some of the businesses had only been

open for a few months and needed to concentrate their financial capital on measures that would attract and retain customers, and keep the business afloat.

### ***Time***

Lack of time appeared as a medium to high-level barrier for most of the businesses, in keeping with previous findings by Revell et al. (2009) and Jenkins (2006). Several participants spoke about their busy schedules ensuring the day-to-day functioning of the business and the need for most of their attention to focus on customers. One participant mentioned that he did not have enough time to do research into what environmental practices could be implemented (Business 3). The results support research by Jenkins (2006) that having a top-level champion with dedicated time to oversee environmental efforts would help SMEs reach more of their environmental goals.

### ***Legal or regulatory barriers***

Legal and regulatory barriers seemed to be a lesser concern than cost or time for most businesses. Only Business 4 reported regulatory and administrative difficulties, but this business had also undertaken some of the most advanced environmental practices out of all the businesses interviewed. In particular, they encountered administrative difficulties when installing a gray water system in part due to the city staff's unfamiliarity with the technology. The participant mentioned "it was more like educating the inspectors because we were pioneering these things" (Business 4). In addition, installing a rain collection system using a cistern proved difficult because of unclear city regulations and user definitions. Initially the city

inspectors placed the business in a large commercial user category requiring high inspection fees, but eventually the business succeeded in convincing city officials to develop a new policy for cisterns exclusively for a smaller business. However, Business 4 was not able to install a solar hot water heater for their lodging facility due to health codes that require the water temperature to be between 116-128 degrees within 30 seconds at every faucet at all times.

### ***Operations***

Another common obstacle for the businesses included company operations and procedures. While not specifically asked to rank “operations” in the interview, many participants gave examples of why they could not implement certain practices in the Green Plus survey. For example, two businesses could not turn computers off at night because of software updates during that time (Business 5 and 9). One of them does not buy and print on recycled paper because the paper does not work well in their copiers and printers (Business 9). Some businesses also contract out their cleaning services so they do not control what kinds of products are used (Business 9). One participant whose business is located in a residential neighborhood pointed out problems with regular recycling pick-up (Business 2). These kinds of barriers might be more difficult to overcome because they involve more than just a behavior change by the business itself.

### ***Lack of Knowledge***

Eight businesses ranked lack of information and knowledge about environmental practices as a medium to low barrier, with one business ranking it high. One of the main obstacles included



not knowing what kinds of options existed for improving environmental practices. One participant had decided to use a rain barrel and compost food and waste, but did not know if local or state regulations existed for these measures (Business 1). A few participants did not know if renewable energy credits were an option for them and one was not familiar with how to purchase them. Business 2 was familiar with renewable energy credit options from Duke Energy, but indicated that the option to sign up for credits was not on every bill. Business 8 did not know if the water appliances in the office were efficient, and another participant was unfamiliar with solid waste audit procedures. These findings demonstrate a need for better information dissemination and education for SMEs about environmental measures and options available.

### ***Alternative Transportation***

When asked if incentives existed for alternative transportation for employees, most businesses responded “no”, and many mentioned that public transportation routes in the Durham area lacked convenience. Bus routes tend not to go where people live, or do not go to the business location. Many businesses mentioned that improving the extent of the public transportation system would encourage the business to provide incentives for employees who use alternative transportation.

As shown in the survey results, 39% of businesses responded “no” to the questions about transportation practices, and not one business committed to implementing any new practices.

This may indicate that businesses believe that the transportation improvements are beyond their control.

### ***Leased Office Space***

The fact that several of the businesses lease their office space adds an extra challenge to implementing environmental measures, particularly with determining the role of the tenant and the landlord and paying for improvements. Some businesses felt constrained by what practices they could and could not implement as tenants. Business 1 had a particularly unique situation as it leases space in a historic building where the landlord aims to achieve LEED certification. Many environmental measures for the building were therefore already in development by the time the business had moved in.

### **Low Barriers**

Most businesses ranked motivation, internal communication, stakeholders, and company culture as low obstacles. Considering the group of businesses interviewed and their interest in the Green Plus program, it is not surprising that motivation ranked low for all but one business. In fact, many of the participants showed great enthusiasm and motivation just to participate in the interviews, but as mentioned before, some had difficulties knowing what could be done. At the time of the interviews, none of the businesses had achieved Green Plus Certification, however several were close. All indicated an interest in trying to become certified and one participant called her business a “best practices-thriving organization” (Business 5).

Motivation ranked high for only one business likely due to the large number of staff working in the day-to-day operations who may not practice habits such as reusing paper or turning lights off. However, the same business ranked company culture as a low obstacle, indicating that there may be more top-down, management interest in environmental practices.

All but one business ranked communication as low; this might be due to the small size of the businesses or the close proximity of staff members. Stakeholders and company culture were not seen as a barrier, indicating that people both within the business and externally realize the value of environmental practices.

## **Drivers for Implementing Environmental Practices**

### ***Cost Savings***

All nine of the businesses surveyed have implemented a variety of environmental measures and several common themes emerged as drivers. First, many businesses started with “low hanging fruit”, carrying out the easiest practices first, along with practices that would reduce operating costs. For example, seven businesses regularly review monthly electric and gas bills primarily to reduce expenses and eight businesses purchase energy-efficient appliances and equipment. Six businesses encourage employees to turn off lights and electronic equipment at night. Carrying out these sorts of actions is not financially or administratively difficult, and some even provide long-term cost savings.

Many businesses implemented environmental actions even if there were no direct cost savings. For example, all businesses recycle office paper and all but one recycles at least 75% of

recyclable waste such as paper, plastic and glass. These actions do not reduce operating costs and Business 8 even mentioned that there's a fee for recycling plastic and glass. Businesses still carried out these actions likely due to a personal ethic discussed below.

### ***Ethics***

Many participants cited their personal ethics as drivers for implementing environmental measures. When asked why practices had been implemented, Business 1 said "it's just doing the right thing.... your conscience talks to you." The participant from Business 6 reflected a similar ethic when asked where the interest in becoming a certified EcoBroker® came from. She replied "I think you'd have to be out of your mind not to be, it's just the right thing to do." Business 9 commented that staff "have always tried to be a good community citizen." These comments show a personal ethic exists to be more environmentally sustainable and are consistent with literature citing altruism as a main driver for SMEs (Revell et al., 2009).

### **Customer Demand**

Customer demand did not appear to be a direct driver for most businesses, but some had received customer inquiries about business practices. Business 4 mentioned that customers love learning about the environmental technologies in the business, but don't expect the business to be environmentally friendly. Business 8 remarked that customers ask more about organic food than about specific environmental practices in the restaurant.

While many businesses indicated a lack of customer demand for green practices, Business 7 commented that they do have customer demand for the use of green products. They were the

only business pursuing a formal Environmental Management System, and had implemented a supply chain management program to track the sustainability of their products. They used a tracking system to help in their bids for services, particularly for universities such as the University of North Carolina at Chapel Hill that has implemented a program to purchase products within a 150-mile radius of campus. By tracking products, Business 7 felt they had a competitive edge against other companies, noting it “just makes us more successful.” In this case, gaining a competitive edge seems to be an outgrowth of customer demand.

### **Survey Design**

Many businesses commented that some of the questions in the Green Plus Survey were not relevant to their business. For example, some businesses do not own company vehicles or ship products, and some, such as restaurants or hotels, cannot use teleconferencing or online meetings due to the nature of their business. Some businesses therefore suggested tailoring the survey to different industry sectors and adding questions relevant to particular sectors. For example, a question on composting practices could be added to a survey designed for restaurants or food services.

## Recommendations

### Regulation

While some obstacles will be difficult for small businesses to overcome, progress can be made through governmental updates of regulations and codes. One of the businesses interviewed encouraged the State of North Carolina to keep codes up-to-date with language and processes that reflect the latest available technology, particularly related to green building practices.

Fortunately, some updates have already been made. For example, the North Carolina Plumbing Code (2009) includes an appendix section on rain water recycling systems and allows for the use of gray water and rain water to flush toilets and urinals. Keeping regulations as current as possible would help decrease the amount of administrative time spent inspecting and assessing new ideas and practices.

Health code regulations have prevented some businesses from implementing environmental practices. One business could not install a solar hot water heating system because hotel health codes do not allow for uncertainty in hot water temperature. In this instance, the business installed the system elsewhere in the building for private use. The owners found little justification for the code as the water temperature was constantly higher than needed and could easily be regulated by using a mixing valve to bring the temperature down. The owner also installed an electric backup heater in case the water temperature fell below a certain level. With these kinds of technology, there is no clear justification for why a solar hot water heating system is prohibited by health codes for the commercial part of the building, particularly given

the ability to regulate the water temperature and the significant cost savings that result from using solar panels to heat the water.

Two businesses did not know whether health codes permitted them to compost and grow herbs in outdoor containers and subsequently use the food in restaurant dishes. While these practices are, in fact permitted (*communication February 2, 2010 with and Environmental Health Director, Durham County Health Department*), the information is not easily found. Businesses would benefit from easy access to this kind of information.

Increased enforcement of environmental regulations in businesses would have a positive impact. In an interview with a local waste auditing organization, the expert staff member explained that some businesses do not comply with mandatory recycling of cans and glass containers in bars simply because the law is not enforced. The City of Durham could allocate more funding to enforcement and make efforts to eliminate any information gaps or confusion amongst businesses in the food and beverage industry.

The Durham Chamber of Commerce works in partnership with the City and County of Durham and provides local and state legislative updates to businesses through its Web site, <http://www.durhamchamber.org>. The Chamber has three active committees that monitor legislation at all levels of government. The Chamber could consider creating an environmentally-focused subcommittee to monitor and advocate for better and more up-to-date environmental regulations at the local level.

## **Knowledge Dissemination**

One of the most common requests of area businesses reflected a desire to have better access to information that would help businesses and the community decrease their environmental impact. Businesses want to better understand the environmental impacts of their day-to-day operations as well as what actions can be taken to address such impacts. While most SMEs had a working knowledge of where their impacts lay, eight out of the nine businesses surveyed expressed the need for improved environmental education and information dissemination within the community and/or the business itself.

One way to increase education and information dissemination is for local businesses to work with consulting services such as Waste Reduction Partners. Waste Reduction Partners is a local, non-profit organization that offers consulting services to municipalities, academic institutions and businesses of all sizes at no charge. This organization is funded by the U.S. Department of Energy, North Carolina State Energy Office and North Carolina Division of Pollution Prevention and Environmental Assistance. The organization works to decrease the environmental footprint of businesses by providing energy, water, and solid waste audits. Audits cover the business' current impact as well as cost effective measures that may be implemented with a reasonable return on investment (ROI). Qualified local contractors that can provide or install these measures are included in the audit if requested by the business.



Another way to improve knowledge dissemination would be for the Durham Chamber of Commerce to establish a central directory of resources for area businesses to obtain information about green practices, products, and services. This directory could be a website that is frequently revised to have the most up to date information. The information provided should include best practices, relevant regulations, green product sourcing and green incentives. This site could educate and facilitate the redemption of tax credits and financial incentives available for SMEs. It would also be helpful if the site suggested projects as well as projected energy savings, costs savings and return on investment (ROI) estimates for such projects. The site could be tied to the Green Plus online forum to allow businesses to share information and connect to local contractors and green service providers. In addition, several participant businesses noted that it would be especially helpful for information to be subdivided by industry or sector, with sector-specific recommendations. Furthermore, case studies could be created and included on the website that give actual examples of local businesses taking on environmental projects and policies. These case studies would allow businesses to know what actions have been successful as well as what details they should know before undertaking such a project on their own.

A resource center similar to the Businesses for an Environmentally Sustainable Tomorrow (BEST) Website could be used as a model for Durham (<http://www.bestbusinesscenter.org/>). The City of Portland, Oregon has partnered with BEST, an organization that provides a “one-stop shop” for Portland businesses to help them become more sustainable. BEST provides free audits for businesses and also houses a listing of online environmental resources at the national

and local level. While not as comprehensive as we envision, the BEST Website provides a good framework and model that Durham could expand upon.

Currently, the Chamber has partnered with the Green Plus program, and promotes Green Plus on the home page of their Website. They should continue to work with Green Plus and encourage businesses to use the online forum as a way to learn from one another. The Chamber could also build strategic partnerships with area organizations to help facilitate a central “green” directory and increase local environmental knowledge. A partnership could be formed with local organizations such as Waste Reduction Partners and the Chamber to promote this free service to new and existing local businesses. The Chamber could hold business roundtables focused on sustainability in SMEs and invite local businesses to attend. A forum like this would allow businesses to interact with each other and would help with knowledge dissemination, particularly with where to find information.

Finally, several businesses suggested that it would be beneficial to hold a local, annual green business expo. This would not only allow area businesses to communicate and exchange ideas about environmental practices, but would also allow local vendors to market their services. Businesses could learn about measures that have been successful, and assess how their practices compare to other local enterprises. Other cities, such as Atlanta, Charleston, and Minneapolis hold similar conferences that allow businesses to share best practices and network with one another.

## **Incentives**

Almost all participant businesses suggested that incentives would play a significant role in compelling them to implement more environmental practices and projects. The incentives should be aimed at decreasing the barriers that SMEs face and can be split into three main categories: financial, ease of implementation, and recognition.

As discussed earlier, financial obstacles were the most prominent barrier that SMEs faced in implementing environmentally sustainable practices and projects. One local business owner stated “It’s a cost thing” (Business 1) when deciding whether to implement practices. Return on investment is often the most significant factor that businesses examine when implementing costly projects. Many SMEs prefer to target projects with an ROI of a year or less (communication Feb. 10, 2010, Waste Reduction Partners). Financial incentives can be put in place that significantly lower the time period required to recoup costs and increase the return on investment of a project. These projects can also help to reduce operating expenses of a business (Business 4).

There are several tax credits available through the federal and state government for offsetting the expense of some energy-related projects. Such incentives include a credit of 30% of the gross cost of installation for solar photovoltaic (PV) and solar thermal systems (DSIRE, 2010). There is also an incentive administered by North Carolina Green Power that allows electricity generated by solar PV systems installed on businesses to be purchased by their local utility at \$.19 per kWh, far above market price. This revenue stream incentivizes solar PV installation by

providing a much shorter payback period and increased return on investment. Additionally, Duke Energy provides a utility rebate program that helps businesses offset the cost of installing energy efficient appliances and devices (DSIRE, 2010).

While these incentives significantly help small businesses decrease their electricity consumption, there are not many financial incentives in place to reward businesses that reduce water consumption or solid waste. Even though there is a cost savings associated with such reductions, additional financial incentives for water and waste reduction do not approach those available for energy efficiency and alternative energy generation projects. State and local governments should put in place additional tax credits or provide low-interest loans for projects aimed at decreasing solid waste generation, water consumption, and other environmental practices.

Our study also revealed that the easier it is to implement an environmentally sustainable practice, the more likely the business is to adopt the practice. A key example of such an action is recycling. All businesses interviewed took part in recycling at some level. Recycling is a common practice because it is fairly easy to carry out and is relatively inexpensive. However, businesses within Durham have to pay to have their recycled materials picked up, according to Business 8. Recycling participation may increase if the City of Durham chose to expand its recycling pick up and provided the service free of charge for area businesses, similar to the free service already provided to residents.

Recognition is also an important incentive for businesses to act. As Green Plus grows nationally and continues to gain credibility, more SMEs may opt to participate in the program to receive recognition. Publicly highlighting sustainability achievements through programs like Green Plus provides a valuable marketing opportunity for businesses both locally and nationally. Green Plus is especially beneficial because it is a low-cost program, noted as an important aspect of participating in a certification program. Several businesses showed interest in other recognition programs but some, such as LEED certification, are cost prohibitive for SMEs. While a couple SMEs inhabited offices and buildings that approached the LEED standards, none were LEED certified due to the significant expense required to gain certification.

Green Plus has newly created a national awards program that highlights certified businesses and their sustainability achievements. The City of Durham and the Durham Chamber of Commerce could help promote this annual awards program to local businesses as a way to bring businesses together to learn from each other. Several businesses stated that it would be helpful to know what other local businesses are doing and how their practices compare to other businesses in the area. An awards program would stimulate competition among local businesses to become environmentally sustainable and create visibility for those undertaking the best environmental practices.

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**Table 6**  
Summary of Key Recommendations

**Regulation**

- Decrease time lag for updating building codes to keep up with latest available technology
- Reconsider the health code prohibiting solar thermal water heating in hotel use
- Increase the enforcement of existing environmental regulations where possible
- Create a new environmental subcommittee within the Durham Chamber of Commerce

**Knowledge Dissemination**

- Work with Waste Reduction Partners
- Create green business resource center on the Durham Chamber of Commerce website
- Encourage use of Green Plus online business forum
- Create business case studies of environmental actions
- Organize annual green business expo and conference

**Incentives**

- Create new financial incentives aimed especially at reducing solid waste and water consumption
  - Continue to promote Green Plus recognition program as well as create community green business award
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## **Conclusion**

While this study seeks to identify barriers to environmental actions and provide solutions for SMES, it also presents several areas that warrant further investigation and gathering of information. There is a need for more detailed research into sector-specific barriers, as well as barriers specifically related to ownership and management structure. As more detailed information is collected and synthesized, local government and business organizations can better tailor programs to suit the needs of local SMEs.

Based upon the information gathered in this study, it is clear that there are several barriers SMEs face in their efforts to improve their environmental practices. The businesses involved in this study are environmental leaders, as most have voluntarily taken the initiative to strive for best practices. The information collected in the research can be used to reduce barriers to sustainability, and help drive the creation of new programs and incentive structures that allow other area businesses to more easily implement environmentally-responsible practices.

Participant businesses identified several barriers as they sought to implement environmental actions, the most common being cost, time, and lack of knowledge. Businesses also cited various reasons why environmental practices were voluntarily implemented, including personal ethics and cost savings. New regulations, education programs, and incentive structures can be crafted that specifically target the barriers that SMEs face while taking into account the driving forces behind the voluntary implementation of environmental measures.

## Appendix

### In-Person Questionnaire

1. What is the highest level of education you have completed?
2. What was your primary academic focus or discipline of your highest level of education?
3. Have you ever taken a class specifically related to the environment (in school or as part of a continuing education program)?  
Please describe the focus of class or classes you took
4. What is your current job position or title at the organization?
5. How many employees work at your organization?
6. How long has your organization been in operation (years)?
7. What is your company's estimated annual income (\$)?
8. What are your company's target markets? Please select all that apply.
  - Individual consumers
  - Local communities
  - Academic institutions
  - Businesses
  - Sectors of services
  - International parties: Consumers, Communities, or Organizations
  - Non-profit organizations
  - Government institutions
9. Has your company ever faced customer demand for green/sustainable products?
10. Does your company have an environmental policy?  
  
If yes, then please explain
11. Have you conducted an analysis of the environmental impacts of your activities, products, or services?
12. Do you have a procedure to identify legal and other environmental requirements that are applicable to your activities, products, or services?
13. How are decisions made and implemented at your company?



14. Is there someone at your company with responsibility for identifying environmental impacts – both positive and negative – of your company’s operations?

If yes, who is responsible?

15. How receptive do you believe your coworkers/employees would be to changing corporate culture to place more emphasis on environmental concerns?

16. Are there major legislative requirements that affect your organization’s environmental practices?

17. What sort of incentives could be put into place to entice your company to further expand its environmental practices?

18. Out of the subjects discussed (water, energy, etc) what do you think is your company’s largest impact and which do you consider most important?

19. Please rank the following potential obstacles as high, medium, or low:

Potential Obstacles	Rank: H/M/L
<p><b><u>1.Finance: extra financial burden</u></b>  <b>How might financial burdens serve as an obstacle in implementing environmentally sustainable practices?</b></p>	
<p><b><u>2.Time: lack of time to devote</u></b>  <b>How might lack of time hinder your company from implementing environmentally sustainable practices?</b></p>	
<p><b><u>3. Knowledge: lack of information about environmentally sustainable practices</u></b>  <b>How does lack of knowledge about environmentally sustainable practices prevent your company from implementing one?</b></p>	
<p><b><u>4.Motivation: lack of motivation</u></b>  <b>Does a lack of motivation prevent your company from implementing environmentally sustainable practices?</b></p>	
<p><b><u>5. Stakeholders: missing connections</u></b>  <b>Does your company’s lack of connections with stakeholders prevent you from implementing environmentally sustainable practices?</b></p>	

<p><b><u>6.Communication: slow or no communication</u></b>  <b>Do communication weaknesses prevent your company from implementing environmentally sustainable practices?</b></p>	
<p><b><u>7.Company Culture: business specific barriers</u></b>  <b>Are there business-related barriers that prevent your company from implementing environmentally sustainable practices?</b></p>	
<p><b><u>8.Legal regulations: external necessary requirements</u></b>  <b>Do your company's inabilities to fully address legal requirements prevent you from developing environmentally sustainable practices?</b></p>	

20. How did you learn how to implement the environmental actions you took?

21. Did you obtain any help or technical assistance or know what to do? (guides, templates, mentoring)

If yes, what? How did you find them? How did you use them?  
 If no, why not? How did you manage to implement practices?

22. Do you have any specific environmental related questions or general environmental questions that you would like to have addressed in the near future?

**Possible Green Plus Survey Follow Up Questions-** Customized according to answers given in the survey

**Possible Questions**

“Yes”

- Why have you taken these actions?
- What has been the easiest and most difficult environmental action you’ve taken in terms of effort? Cost? (or anything else?)
- Are you glad that you did this? What have been the benefits?

“No”

- What are the reasons for the "no"s?
- What could incentivize you to commit?
- Are there actions you will never take? Why?

“Commit”

- Why are you committing to do this action now? What made you decide?
- Have you ever thought about taking this action before?

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