

Implementing Environmentally Sustainable Practices at Small and Medium Enterprises

by

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List of Acronyms and Abbreviations

BS	British Standard
CERCLA	Comprehensive Environmental Response, Compensation & Liability Act
CPGs	Consumer Packaged Goods
DENR	Department of Environment and Natural Resources
DPW	Department of Public Works
DWM	Department of Water Management
EMAS	Eco-management and Audit Scheme
EMS	Environmental Management System
EMSs	Environmental Management Systems
EPA	Environmental Protection Agency
LEED	Leadership in Energy and Environmental Design
ISO	International Organization for Standardization
RFP	Request for Proposals
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SME	Small and Medium-sized Enterprises
SMEs	Small and Medium-sized Enterprises

Keywords:

small and medium-sized enterprises (SMEs), motivating forces, social norms, environmental management systems (EMSs), EMS guides/tools/templates, peer-to-peer mentoring network

Executive Summary

North Carolina is challenged to foster economic development while protecting environmental assets under regulatory and legislative mandate. Small and medium enterprises are the major economic drivers in North Carolina, and in the United States as a whole, but existing support networks for small business looking to pursue sustainable practices are insufficient. The U.S. Environmental Protection Agency (EPA) is required to ensure that its regulations do not unreasonably burden US small and medium enterprises (SMEs). The EPA is also investigating ways that it can assist SMEs that are voluntarily trying to improve their environmental footprints, specifically looking at the feasibility and appropriateness of using environmental management systems (EMSs) and peer-to-peer mentoring to help small businesses address their corporate practices. This report provides the results of the first phase of work for the EPA.

Analysis of qualitative data from small and medium businesses in two North Carolina cities shows that barriers and motivations for sustainable behavior in small firms are different than in larger firms. Identifying and analyzing the motivations that small firms cite as the reasons for implementing sustainable practices assists our analysis and recommendations for tools that serve the needs of small businesses.

Small businesses need a simple and flexible framework for developing and implementing EMSs appropriate to their needs. Introducing SMEs to the newly-developed “EMS Guide for SME” tool may help smaller businesses at different level of EMS potential to incorporate an informal environmental management system into their daily business operations. By separating small and medium enterprises into three categories based on their EMS development potential and providing specific guidance for companies across the potential range, companies will be able

to customize their environmental analysis and procedures to fit their capabilities as well as identify areas for future development and continuous improvement.

Mentoring has been identified as another a feasible and appropriate strategy to assist small businesses that may help them achieve sustainability goals. Based on comments from respondents and literature review, initial recommendations for the structure of a mentoring program were developed. These recommendations will be incorporated into the next phase of the EPA research – establishing a peer-to-peer network in North Carolina for small businesses interested in sustainability.

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1. Introduction

North Carolina is challenged to foster economic development while protecting environmental assets under regulatory and legislative mandate. Small and medium enterprises (SMEs) are the major economic drivers in North Carolina, but existing networks for small enterprises looking to pursue sustainable practices are insufficient. The U.S. Environmental Protection Agency (EPA) is required to ensure that its regulations do not unreasonably burden SMEs, which are major economic drivers state and nationwide. The EPA is investigating ways that it can assist SMEs that are voluntarily trying to improve their environmental stewardship, specifically looking at the feasibility and appropriateness of using environmental management systems (EMSs) and peer-to-peer mentoring to help small businesses address their corporate practices.

This report provides the results of the first phase of work for the EPA Region 4 Regional Priority Project to study small and medium business environmental management practices. The collaborative study; based at Duke's Nicholas School of the Environment and UNC's Institute for the Environment; looks at barriers, opportunities, and motivations for North Carolina's SMEs to incorporate environmentally sustainable practices into day-to-day operations, as well as the social and political context of these efforts. A series of surveys and semi-structured interviews with SME representatives in Durham and Fayetteville, NC produced the data for this report. Analysis of qualitative data from SMEs in these two NC cities shows that barriers and motivations for sustainable behavior in small organizations are different than those for larger entities. Our analysis and recommendations for tools to help SMEs improve their environmental footprints were aided by identifying and analyzing the motivations that SMEs cite for implementing sustainable practices.

The EPA is interested to learn how tools such as environmental management systems (EMSs) and peer-to-peer mentoring may effectively assist SMEs to improve their environmental stewardship. The information gained through this study will be used to develop a mentoring network to foster communication and information-sharing among SMEs interested in sustainable business. It may also assist the EPA in developing technical assistance tools appropriate for SMEs. Results indicate that SMEs are motivated to implement sustainable practices for a unique combination of reasons. Illuminating these motivations allowed us to conclude that both EMSs and mentoring options are feasible and appropriate strategies to assist small businesses. Initial recommendations for the structure of a specific environmental management and mentoring programs for small organizations are provided herein.

2. Research Questions and Objectives

What are the mechanisms by which small businesses can most effectively identify and incorporate environmentally sustainable practices into their business practices? To address this question, this report explores the motivations and driving forces for improving environmental stewardship at SMEs. It also examines links between small business management strategies and inter-enterprise mentoring and knowledge sharing relationships. Specifically, we address the following issues:

1. When small firms in the Durham and Fayetteville areas adopt sustainable practices, what are their motivations for doing so? Who, or what, drives SMEs to pursue sustainability and how can we capitalize on these drivers to create the correct tools to encourage their success?
2. Is it feasible for small and medium-sized businesses to incorporate environmental management systems into their business practices to enhance their sustainability; if so, what steps should they take to accomplish this?
3. Can mentoring and knowledge sharing relationships facilitate small business efforts to become environmentally sustainable; if so, how? How should a pilot peer-to-peer mentoring project established under the auspices of the EPA be structured?

This project's primary objective is to evaluate the motivations and obstacles faced and resources needed by SMEs in order to determine how the EPA can assist SMEs that seek to incorporate environmental actions into their operations. We break this into separate tasks specifically related to behavioral analysis, EMS, and mentoring. We address the social and

political background that defines the working environment for SMEs and also relevant regulatory agencies that are tasked with keeping track of SMEs's financial and environmental performance.

The project's primary objective for the behavioral analysis section is to analyze the motivations behind green practices adopted by SMEs in the Durham and Fayetteville areas. We use research on firm and consumer behavior to analyze an organization's motivations for improving environmental performance. We also identify the relevant reference groups and social identities that should be leveraged to shape strategies to further encourage the adoption of green practices within the identified firms.

The project's primary objective for the EMS section is to determine if small and medium sized enterprises have the capabilities necessary to implement an EMS during day-to-day operations. First, we analyze the current use of EMS in small and medium-sized businesses to determine which characteristics (of the EMS and of the business) enhance sustainability efforts, and which constitute barriers to their efforts. Based on this, we develop an informal metric that helps determine the ability of SMEs to implement EMSs (called EMS potential) and helps produce the concrete EMS templates with guidelines to assist small and medium-sized businesses understand and manage their environmental impacts through the implementation of an appropriate EMS. The EMS templates are technical tools for implementing the informal EMS that can be used by SMEs. They provide SMEs with a written guideline for developing business environmental awareness.

The project's primary objective for the mentoring section is to understand if and how mentoring can help small businesses evaluate their environmental stewardship and sustainability options. We analyze characteristics of mentoring relationships that may enhance a company's capacity to understand environmental tradeoffs and implications of its actions. We investigate

motivations and barriers to establishing knowledge-sharing efforts for both mentor and mentee firms. We highlight the potential benefits and potential barriers to participating in a peer-to-peer mentoring relationship. Based on this, we provide guidelines for the establishment of effective mentoring relationships.

Each main issue (research questions) and its respective objectives are broken into specific components for analysis, findings, discussion, elaboration, and conclusion in Parts A, B, and C of this report.

3. Motivations for Research: The Three Ecologies

This section describes social, economic, and environmental background to provide the context and impetus for the study. It highlights the institutions and agencies with interest in, oversight of, and authority and responsibility for business and environmental concerns, i.e. the institutional ecology. It describes the relationship between SMEs and the biophysical environment, i.e. the biophysical ecology. Lastly, it describes the public and private sector entities which are concerned with or affected by the issues of business and environmental protection, i.e. the human ecology.

3.1 Introduction

The federal government and the State of North Carolina are challenged to foster economic development while protecting environmental assets under regulatory and legislative mandate, reflecting the sometimes conflicting and sometimes mutually beneficial interests of American constituents. Small and medium enterprises (SMEs) are the major economic drivers of the U.S. in general and North Carolina in particular, but are inadequately served by existing networks of small business support. There is an increasingly widespread belief that adoption of environmentally sustainable business practices by small businesses is essential to this country's environmental health, but few SMEs have the ability and technical knowledge to adopt these practices without assistance. Furthermore, the degree of environmental protection afforded by U.S. environmental legislation and the extent to which it may have been compromised to minimize impacts on small entities due to the Regulatory Flexibility Act and Executive Order 13272 is unknown. The Small Business Administration claims that these rules have saved small entities approximately \$200 billion dollars since 1998 without compromising the government's

environmental goals (SBA Office of Advocacy, Annual Report on Implementation of the Regulatory Flexibility Act, 2009); however, without baseline knowledge of cumulative environmental impacts of small businesses, this claim cannot be substantiated.

This section of the report describes the government's legal mandates regarding economic and environmental protections as well as the institutional, biophysical, and human ecologies of this complex system, using the local contexts of Durham and Fayetteville, NC. As previously mentioned, the institutional ecology refers to the agencies with authority and responsibility for these protections. The human ecology refers to the private sector constituencies concerned with and affected by these issues. The biophysical ecology refers to the specific set of environmental factors of a particular location. The small business challenges of navigating a confusing array of legislation and a complex regulatory structure are discussed. Policy alternatives and their potential impacts on the small business and environmental concerns are also proposed.

The EPA is operating under the assumption that small business impacts on the environment must be addressed. This research project was designed to help the EPA assist SMEs taking voluntary steps to be better environmental stewards. Since the EPA is interested in specific techniques that may help SMEs improve their environmental sustainability, we address EMS and peer-to-peer mentoring guidelines that take advantage of SME motivations for "going green" in this report. Thus, we provide recommendations that may help the EPA now and with future sustainability-related endeavors. This section suggests that the EPA also consider the necessity of these efforts by collecting baseline information about the cumulative environmental impacts of small business and the effects of environmental legislation on small businesses. We also recommend simplifying access to environmental business resources by increasing coordination among various constituents.

3.2 Background Information

This section discusses small businesses as well as their economic and socio-political contexts. It also provides a discussion on obstacles for sustainability in small organizations.

3.2.1. Small Businesses

Under Public Law 85-536 aka the Small Business Act (1953), the Small Business Administration (SBA) was mandated to aid, counsel, assist, and protect the interests of small businesses and increase their ability to compete in international markets. This act defines small businesses as independently owned and operated for-profit institutions. These institutions are located and/or operated primarily within the U.S. or make a significant contribution to the U.S. economy through taxes or using American products, markets, or labor. They may be of any legal form, e.g. sole proprietorship, partnership, or corporation. Size and financial specifications are defined by the Small Business Act as per Office of Management and Budget guidelines in Title 13, Code of Federal Regulations, part 121 (13 CFR §121) and North American Industry Classification System (NAICS) in terms of number of employees or millions of dollars. The specific definition of a small business depends on the industry and classification purpose. A small business is not nationally dominant in its field.

3.2.2. Economic Background

Small businesses create most of new jobs in the U.S., employ approximately half of the nation's private sector work force, and generate over half the U.S.'s nonfarm, private GDP (McGibbon & Moutray, 2009). The Small Business Administration revealed that 99.7% of all

U.S. businesses in 2004 were small firms, excluding self-employed persons (SBA Office of Advocacy, 2005). Furthermore, according to the U.S. Census Bureau, in 2002 small businesses employed 54.2 million people in the U.S. and generated \$8.3 trillion in revenue (Census Bureau, 2002). Their success is important for the overall success of the U.S. economy. In 2008, SMEs and the rest of the economy faced a deepening recession in which average unincorporated self-employment declined from 10.4 million in 2007 to 10.1 million in 2008. Small firms were less likely or able to expand, hire new workers, invest in new plants and equipment, or borrow money than in 2007 (McGibbon & Moutray, 2009).

The economic impact of small businesses in North Carolina is great. Approximately 94% of businesses had less than 50 employees, yet they generated about \$41.5 billion in wages and employed nearly 1.5 million in 2002 alone (Business Resource Alliance White Paper, 2005). According to the Greater Durham Chamber of Commerce, over 40,000 people are employed at companies with fewer than 50 employees, amounting to approximately 30% of the local workforce (Employer Size). Information about small business contributions to the local economy of Fayetteville was not forthcoming from the Fayetteville-Cumberland County Chamber of Commerce; nor was it readily accessible on the U.S. Bureau of Labor Statistics website. However, the breadth of events for small businesses at both Chambers implies that small businesses are a valuable part of the local economy (Durham Chamber of Commerce, "Economic Profile," 2009; Fayetteville-Cumberland Chamber of Commerce, "Small Business Resources," 2010).

Durham is the fourth largest city in NC (US Census Bureau, "Subcounty Population Estimates," 2006). Durham is a focus of economic growth because of its knowledge resources (Duke, UNC, NC State, and community/technical colleges), high quality of life, easy access to

the rest of the eastern seaboard, talented labor pool, reasonable cost of business, and supportive business and academic environments. Durham's economy focuses on research and development, electronics, telecommunications, health care, and medical related industries (Durham Chamber of Commerce, "Community of Vision," 2009)

Fayetteville is the sixth largest city in NC (City of Fayetteville, 2007) is the county seat of Cumberland County and home of the U.S. Army post Fort Bragg. In 2008, the Fayetteville metropolitan area had a population of approximately 312,696, including those in annexed territory since the 2000 census. The median household income in 2008 was \$44,658, which is less than the statewide median income of \$46,574 (US Census Bureau, "State and County Quick Facts," 2008). The target industries in Cumberland County are defense, distribution, customer care centers, and automotive (Fayetteville-Cumberland Chamber of Commerce, "Target Industries," 2010). Fayetteville has received the "All-American City" award from the National League twice in the last decade (Fayetteville-Cumberland Chamber of Commerce, "Relocation Information," 2010) and was ranked as the third best job market in the nation by ManPower, Inc. in December 2009 (Fayetteville-Cumberland Chamber of Commerce, "Fayetteville Ranked as 3rd Best Job Market in the Nation," 2009). The 2009 Milken Institute economic performance index ranked Fayetteville the 31st Best Performing Large City in the nation, third in NC behind Durham and Raleigh, based on how well the city creates and fosters jobs via short-and long-term employment, salary, and technology growth measurements (Fayetteville-Cumberland Chamber of Commerce, Fayetteville Ranked as 31st Best Performing City in America, 2009).

The Great Recession has national and local implications on the economy and labor force. The average US unemployment rate was 10.2% in October 2009, up from October 2008 (US Department of Labor, Regional and State Employment and Unemployment, 2010). In 2008,

North Carolina was ranked #38 nationally in terms of unemployment rate, with 6.3% of the labor force unemployed (US Department of Labor, “Local Area Unemployment Statistics,” 2008). From January 1999 to August 2009, the Durham metropolitan area labor force increased approximately 14% from 224,118 to 260,899 individuals and the Fayetteville metropolitan area labor force increased approximately 11% from 133,296 to 150,326 individuals. The Durham unemployment rate over this time period went from 2.0% to 8.0%; the annual unemployment rate in 2007 was 3.9% and in 2008 was 4.8%. The Fayetteville unemployment rate over this time period went from 4.5% to 9.1%; the annual unemployment rate in 2007 was 5.3% and in 2008 was 6.2%. In terms of actual numbers, unemployment went from 4,490 to 20,765 individuals in Durham and from 5,998 to 13,733 individuals in Fayetteville (US Department of Labor, “Local Area Unemployment Statistics,” 2009). As of November 2009, Fayetteville had an unemployment rate of 9.1% among its labor force of 153,009 individuals (Fayetteville Chamber of Commerce, “NC Cost of Living Index,” 2009). In October 2009, NC had the 4th largest over-the-month increase in nonfarm payroll employment in the country; 12,100 jobs statewide. However, compared to October 2008 in NC, there was an employment rate decrease of 4.0%, or 185,800 jobs.

3.2.3. Social and Political Background

Under the Small Business Act (1953), the newly formed Small Business Administration (SBA) was mandated to aid, counsel, assist, and protect the interests of small business concerns and increase their ability to compete in international markets. In 1970, the National Environmental Policy Act (NEPA) declared a national policy encouraging “productive and enjoyable harmony between man and his environment”, the promotion of efforts to protect and

alleviate harm to the environment and human health, and research about ecological systems and natural resources (Lewis, 1985). The formation of the EPA under Reorganization Plan No. 3 and EPA Order 1110.2 gave the government both the authority and responsibility to develop knowledge of the environment and effectively ensure its protection, development and enhancement.

Environmental regulations throughout the 1970s including the passage of the Clean Air Act, Clean Water Act, and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), required public and private entities to consider the environmental effects of their operations and to maintain some basic level of environmental quality. As a result of the actual and anticipated financial burdens placed on small entities to comply with these and other regulations, the Regulatory Flexibility Act (1980) and Executive Order 13272 (2002) mandated that agencies, including the EPA, review the prospective impact of proposed rules on small entities and consider alternatives to minimize these impacts. This may have resulted in a decrease in environmental protection afforded by national environmental laws in favor of economic protections, but the SBA claims that this is not the case (US SBA, “Annual Report on Implementation of the Regulatory Flexibility Act,” 2000-2009). We currently have no way to prove or disprove this claim because of the lack of data of the cumulative environmental impacts of small entities’ operations. To date, there have been limited numbers of published studies of the cumulative environmental effects of the small businesses.

One study we found reports that small businesses, as a sector, contribute up to 70% of all industrial pollution (Hillary, 1995; 2004). Although comparable data for cumulative contribution to industrial pollution by SMEs in the U.S. are currently unavailable, we extrapolate (given the number and industry make up of small and medium-sized enterprises) that they are

responsible for a significant share of the total environmental burden in the United States as well. It has been suggested that SMEs cause relatively more pollution than larger same sector companies because of their production techniques (Hobbs, 2000). Hillary (2000a) suggests that SMEs must be included in environmental sustainability improvements because if they are alienated and isolated from environmental actions, then sustainability will never be achieved.

Concurrent with major environmental legislation, corporate social responsibility and the expanded ethos of the U.S. environmental movement emerged in U.S. business literature during the 1970s and 1980s (Hillary 2000a). This led many concerned individuals to try to integrate sustainability thinking and operations into their personal and professional lives – a phenomenon which is gaining momentum today in large and small organizations. In fact, tenets of the United Nations Environment Programme's (UNEP) green economy movement were incorporated in the Obama Administration's 2009 economic policies to revive the U.S. economy (United Nations Environment Programme, n.d.). There is an increasingly widespread belief among citizens that adoption of sustainable business practices by small businesses is essential to this country's environmental health because they believe small businesses as a group have a major impact on the quality of earth's environment. However, most SMEs are ignorant of environmental legislation that affects them or, if they are aware of legislation, do not fully understand the practical implications of the legislation (Fanshawe, 2000). Also, small businesses are driven to different degrees of engagement with environmental regulations depending on industry sector, owner/executive officer ideology, and employee ideology. Most SMEs need assistance from either the government or outside organizations to implement these practices, largely because they lack resources that large organizations have at their disposal (Thompson & Smith, 1991 as cited in Hillary, 2000a).

The push towards environmental sustainability based on government regulation and philosophy tends to focus on larger companies with larger impacts. Most corporate social responsibility, ethics and environmental impact research has focused on larger firms because “small firms are perceived as lacking sufficient resources, research methodologies created for large companies are not readily adapted to small firms, more information is accessible to research large firms, and large companies have a higher public profile which generates more interest in the theories and research about these organizations and their corporate social responsibility” (Thompson and Smith, 1991 as cited in Hillary, 2000a). This is problematic because “small firms are not little versions of big firms” and have distinctive, non-uniform environmental attitudes and behavior (Tilley, 2000). SMEs may fall into discrete groups with specific needs based on size (ex. microenterprises with fewer than 5 employees or enterprises with greater than 25 employees), industry sector, or locale; and may be reached through different channels (ex. professional associations or trade magazines) (Fanshawe, 2000). Furthermore, different levels of technical competency and other constraints on sustainable behavior mean that there is no one size fits all approach to addressing environmental stewardship in SMEs.

It is crucial that small business move proactively towards more environmentally sustainable practices. Although small businesses are the engines of the American economy, they often experience less public scrutiny about environmental and labor practices since they are often locally or often family owned. Smaller companies often go under the radar in terms of their impacts, regulation and monitoring, and knowledgeable tailored support for their initiatives. Since small businesses create most of America’s jobs, employ about half the country’s private sector workforce, are responsible for many innovations, and generate half of the country’s

nonfarm, private Gross Domestic Product (GDP) (“The Small Business Economy,” 2009); addressing and engaging small businesses in the environmental sustainability debate is vital.

3.2.4. Obstacles for Sustainability in Small Organizations

Research has shown that small businesses face common barriers that may prevent them from adopting sustainable practices. For example, they often lack time, financial resources, and adequate staff needed to search for information about sustainable practices. They may lack the required knowledge to ask necessary questions (Fanshawe, 2000) and may not have the technical competency to incorporate sustainability practices into their daily operations. Small businesses often have difficulties determining what technical and scientific information they do find is relevant (Gerstenfeld & Roberts, 2000) and need help thinking through the information they receive (Clark, 2000).

Environmental assistance and supportive activities and information are not clearly centralized or consistent; small businesses find it difficult to assess environmental information and know whom to trust regarding the applicability and appropriate response to environmental regulations (Clark, 2000). The 1996 Small Business Regulatory Enforcement Fairness Act (SBREFA) amendments to the Regulatory Flexibility Act require federal agencies to make existing pamphlets, handbooks, and other compliance materials available to small businesses through a central source and to write compliance guides that clearly explain regulations issued after June 28, 1996 (US Department of Labor, “SBREFA: Key Points for Small Business,” n.d.). While the guides are available through the Office of Small Business Programs (OSBP), Regional Offices of the relevant agency, and the Small Business Administration's (SBA) Small Business Development Centers, constituents have to work hard to access information sources for

environmental issues at business-focused agencies. For example, the Green Business Guide directs businesses to references, background information, and best practice case studies for implementing environmental practices (Business.gov, 2010); however, the guide is not properly promoted on the web and is difficult to find. Furthermore, the guide is of dubious usefulness to small businesses since its suggestions are generally tailored to large businesses.

Improved coordination and cooperation between organizations is needed to reduce duplicated efforts and increase SME access to existing information by targeting them more effectively (Fanshawe, 2000). Supportive activities and information are neither centralized among nor within organizations. Nonprofit organizations, private consulting companies, and government departments the world over promote corporate environmentalism. The EPA is one of the many players who are attempting to advise on environmental problems, business sustainability initiatives and programs, and corporate partnerships. The EPA is trying to promote sustainable business practices among small businesses through programs like Greening Your Business, Performance Track, Energy Star, and Design for the Environment.

As importantly, small businesses often have difficulties applying the technical and scientific information they do find in a useful manner. While research on how perceived environmental uncertainty impacts decision making and planning has been developed extensively in large firms (Aldrich, 1979; Boulton et al., 1982; Duncan, 1972; Hambrick, 1983; Jauch & Kraft, 1986; Pfeffer & Salancik, 1978), this phenomenon has been largely ignored in small and entrepreneurial firms (Bruno & Tyebjee, 1982; Cooper, 1979). In small companies, individuals can have great impact on business practices. Unless individuals are knowledgeable about alternative practices and implementation guidelines, have an established way to evaluate their options, and can see returns of some kind for their efforts, incorporating environmental

sustainability initiatives into their operations is likely to be a low priority while they work towards surviving in the competitive economic environment. Large firms increase planning in the face of turbulent environments (Lindsay & Rue, 1980), but small firms, constrained by their resources and their range of strategic options (Dandridge, 1979; Robinson & Pearce, 1984), may be less likely to do so (Matthews & Scott, 1995). As a result, even though small firms may want to implement environmental sustainability efforts, they are often unable to do so effectively.

Many small businesses are interested in sustainability and the technical assistance that would help them to achieve it (Revell et al., 2009). However, there is a gap in understanding the conditions these companies face in pursuing sustainable practices (EPA, 2009) and the specific needs of small businesses. Small companies need to have specific resources and programs to help them reach their sustainability goals. This project explores the underlying motivations for environmental stewardship within SMEs. Understanding specific motivations for improved environmental performance helps the EPA to better select and design tools and programs that capitalize on the unique attributes of SMEs. Modified environmental management systems, and mentoring and information sharing networks, are two EPA priority programs that address the unique needs of SMEs. These two tools are examined in detail within this report.

Establishing ways to organize environmentally sustainable actions at SMEs is plausible. SMEs may learn about organizational methods through mentoring and incorporate them into practice through informal environmental management systems. Having environmental management systems in place may integrate sustainability into SMEs's core business. Mentoring may be more useful for helping individuals learn about best practices and what sustainability considerations other organizations have made.

Our research addresses sustainability issues from an SME perspective. As a result, we believe the EPA and the U.S. Small Business Administration, among other organizations, will be able to better provide the appropriate support for small businesses interested in environmentally sustainable business practices. Ultimately, the aim of this work is to aid SMEs in their attempts to mitigate their collective environmental impacts regardless of their industry sector.

3.3. Institutional Ecology: A discussion of the agencies with interest in, oversight of, authority and responsibility related to small business and environmental concerns

This section discusses the government agencies with interest in, oversight of, authority and responsibility for small business and environmental concerns on national, state, and local levels.

3.3.1. Business

The Small Business Act (passed in 1953 during the Eisenhower Administration) established the SBA with the responsibility of aiding and assisting small businesses to preserve free competitive enterprise and enhance the economic strength of the nation as America recovered from the effects of World War II. The statute mandates the SBA to help small businesses export products, facilitate technology transfers, compete with imported goods and services, and access long-term capital. The SBA is required to disseminate information about state, federal, and private programs and initiatives that will help small businesses, represent small business interests in trade negotiations, and foster the ownership and development of small businesses by minorities, women, and disadvantaged individuals. The SBA is authorized to set standards for defining small businesses, ensure that a fair proportion of government contracts go

to SMEs, make direct loans to small businesses or people trying to start small businesses, and request money from the Secretary of the Treasury to carry out its obligations.

The SBA is under the general direction and supervision of the President and is not affiliated with any other agency or department in order to avoid potentially biasing the other agencies. The President, with the advice and consent of the Senate, appoints a civilian Administrator and Deputy Administrator who are known to be familiar with and sympathetic to small business needs and problems. The Administrator must establish and maintain a database of economic indices including employment statistics, the number and types of small business establishments, and financial indexes. The SBA must also develop and implement an information sharing system and develop a plan to enhance export potential of small businesses with applicable state agencies and the U.S. Department of Commerce. The Advisory Board is responsible for outreach and recruitment of eligible small businesses for Administration programs.

The NC Department of Commerce is the state's lead agency for economic, community and workforce development. Its mission is to improve the economic well-being and quality of life for all North Carolinians by serving existing business and industry. To do so, it provides international trade assistance, recruits new jobs and domestic and foreign investment, encourages entrepreneurship and innovation, markets North Carolina and its brand, and supports workforce development. Furthermore, it provides data, statistics, information and reports for other state agencies that regulate commerce (North Carolina Department of Commerce, "About Our Department," 2010). The NC Department of Commerce is an executive branch agency headed by the Secretary of Commerce who is appointed by and directly reports to the Governor and

serves as a member of the Governor's Cabinet (North Carolina Department of Commerce, "Management Team," 2010).

Additional state bodies affect small businesses, but their impact varies by industry, locale, and small business needs. The NC Department of Agriculture and Consumer Services is the lead agency supporting farms and agribusinesses. The NC Department of Revenue collects taxes from NC citizens and businesses and provides them with free information about tax questions and requirements. The NC Department of Secretary of State is serves and protects citizens, the business community and governmental agencies by facilitating business activities, providing accurate and timely information and preserving documents and records. The NC Minority Business Development Center (part of the federal Minority Business Development Agency) fosters the establishment and growth of minority-owned businesses of all sizes through one-on-one technical assistance and referrals (N.C. Rural Economic Development Center Institute for Rural Entrepreneurship, 2010).

Locally, the City of Durham's Office of Economic and Workforce Development serves as the gateway to business services and workforce development services. The Office assists with business advocacy, regulatory requirements, training programs, financing, employee recruitment and training, starting a business, and taxation (City of Durham, Office of Economic and Workforce Development, 2006).

In Fayetteville, the Community Development Department creates positive economic development situations resulting in job opportunities for low to moderate income persons and an expanded tax base (City of Fayetteville, Community Development, 2006). The city has a Downtown Loan Program that will assist small businesses expanding or relocating to the area (City of Fayetteville, Community Development, 2006). Fayetteville city government also has a

comprehensive gateway for small business needs on their website, but most of these resources are not provided by government (City of Fayetteville, Community Development, 2009). Small business resources in the Fayetteville-area include the College of Albemarle Small Business Center, the Edgecombe Community College Small Business Center, and the Women’s Business Center of Fayetteville, among others (US SBA, Local Resources, n.d.).

3.3.2. Environment

President Nixon founded the EPA to combine the responsibilities and authorities of various government agencies under one roof in order to establish a unified system for evaluating and protecting the U.S. environment in terms of water, air, pesticide, radiation, and solid wastes, among other issues. The Re-organization Plan No. 3 from July 9, 1970 outlined the requirements, functions, and structure of the EPA while EPA Order 1110.2 on Dec. 4, 1970 actually established the federal agency. EPA authority and responsibilities include the establishment and enforcement of environmental and human health protection standards consistent with national environmental goals, conduction of environmental research, provision of assistance to others combating environmental pollution, and assistance to the Council on Environmental Quality in developing and recommending to the President new policies for environmental protection (US EPA, “Reorganization Plan No. 3 of 1970,” 1970; US EPA, EPA Order 1110.2, 1970). The EPA implements Congressional environmental laws by writing regulations, setting national standards, and enforcing regulations. It also gives grants, sponsors partnerships, helps with public education and publishes information about its actions (US EPA, “Our Mission and What We Do,” 2010). An Administrator, Deputy Administrator and over 23 regional and subject matter directors comprise the EPA – in addition to the various offices and

divisions that support them. The Office of the Administrator is directly responsible to the President and provides overall supervision of the EPA (US EPA, “Our Mission and What We Do,” 2010).

On the state level, the NC Department of Environment and Natural Resources (DENR) is the lead stewardship agency for the preservation and protection of outstanding natural resources. DENR administers regulatory programs designed to protect air quality, water quality, and public health. DENR offers technical assistance to businesses, farmers, local governments, and the public and runs education programs encouraging environmentally responsible behavior (NC DENR, n.d.). DENR also regulates fisheries and agricultural pollution, develops NC’s forest resources, and catalogues marine and aquatic resources. DENR works with the General Counsel, independent Wildlife Resources Commission (that regulates and guides the protection and preservation of NC’s wildlife resources), and the public.

In Durham, the Departments of Water Management (DWM) and Public Works (DPW), and planning and zoning commissions all have responsibility to the public to address environmental quality (City of Durham, “Economic Stimulus Information,” n.d.). These agencies are responsible for the operation and maintenance of Durham's water supply, wastewater and stormwater services (City of Durham, “Water Management,” n.d.; City of Durham “Public Works,” n.d.). They are also responsible for land use and open space decisions.

In Fayetteville, environmental quality concerns are addressed by the Engineering and Infrastructure Department, the Parks and Recreation Department, the Planning Department, the Environmental Services Department, and the Transit Department (City of Fayetteville, 2010). These agencies are responsible for land use and open space decisions (City of Fayetteville, “Engineering and Infrastructure,” 2006; Fayetteville-Cumberland Parks and Recreation, 2009;

City of Fayetteville, “Planning and Zoning,” 2006; Fayetteville Area System of Transit, 2009) as well as water supply (City of Fayetteville, “Engineering,” n.d.) and sanitation (City of Fayetteville, “Environmental Services,” 2007).

3.3.3. Integration

Overall, integration among various business agencies and among various environmental agencies is better than that between the two types of agencies. Described herein are the efforts made to improve the situation. The SBA is required to comment on proposed EPA regulations in terms of how they will affect small businesses and bring small business concerns to the attention of EPA administrators. Their comments are posted on both agencies’ websites. The EPA established a Small Business Advocacy Chair (SBAC) as per the SBREFA requirements. The SBAC provides guidance, training, recordkeeping, reporting and general support of EPA's implementation of the Regulatory Flexibility Act and advises EPA's program offices on how to involve SBA and the Office of Management and Budget in the process, and on the implications of the results of their screening analysis (US EPA, “Regulatory Flexibility Act / Small Business Regulatory Enforcement Fairness Act,” 2009). Furthermore, the EPA has established a Small Business Ombudsman Team in its Office of Small Business Programs, which has collaborated to create a website called Small Business Environmental. The website lists environmental regulations and requirements, and a checklist to help small businesses determine what environmental regulations apply to them (Small Business Environmental, n.d.).

Small businesses that are non-compliant with environmental regulations may actually be incentivized to comply rather than be penalized for non-compliance through the EPA Small Business Compliance Policy. For small businesses with 100 or fewer employees that voluntarily

discover violations of environmental law and promptly disclose and correct them, the EPA will eliminate or significantly reduce penalties. This policy is partly a result of the Small Business Act mandate that requires agencies to ensure that federal regulations will not place unnecessary burdens on small businesses, and partly to comply with section 223 of the SBREFA (US EPA, “Small Business Compliance and Enforcement,” 1996). This speaks to the problem of neither assessing the impact of small businesses on the environment or of compliance with environmental regulations on small businesses; this program may be an unnecessary expenditure.

On the state level, NC DENR Customer Service Center has a Small Business Assistance Program that assists SMEs with air quality and other regulatory requirements and encourages environmental compliance and stewardship (NC DENR, “Small Business Environmental Assistance,” n.d.). On the local level, the City Mayor’s Office Sustainability Division helps to protect and improve Durham’s environment through wise use of natural resources. The Sustainability Division provides guidance and resources to City and County employees, businesses, and citizens; and develops policies, educates staff, and promotes the ethics of environmentally responsible leadership (City of Durham, “Durham City/County Sustainability Office,” n.d.). The Environmental Services Department of Fayetteville developed a Sustainability Master Plan in October 2009 with the help of Sustainable Sandhills and GreenWorks Partners, LLC. Major goals of this plan were to make Fayetteville a more attractive city and develop green city policy. Specific features of the plan address energy efficiency, renewable energy technologies, coordination of energy policies across jurisdictions, energy security, job creation, air quality, and funding. Select guiding principles include increasing competitiveness and producing economic benefits by supporting regional multimodal

transportation systems, improving green job opportunities, and developing clean energy and recycling industries (City of Fayetteville, “Sustainability Master Plan Final,” 2009).

Figure 1. Schematic Illustration of Formal and Informal Links between Government Bodies Addressing Small Business and Environmental Concerns



3.4. Biophysical Ecology: The environment under consideration

Operating and managing a small business has environmental impacts on the air, water, and land – both locally and globally. The specific nature and magnitude of the impact will depend on the individual business. In general, air quality impacts relate to the transportation of employees to and from the site, electricity use within the building, heating and cooling requirements, and the impacts associated with transporting supplies and creating and using equipment. Water quality and quantity concerns relate to its use for mechanical processes within the facility; irrigation, fertilization and landscaping; and consumption (i.e. toilet, sink, and

shower, laundry facilities). They also are associated with runoff from the impervious structure of the building, changing the hydrologic system of an area through ground compaction, and channelization. Land related impacts relate to the physical footprint of the facility, the disposal of waste materials, and the creation of needed products, e.g. effects on forests to make paper.

3.4.1. Durham, NC

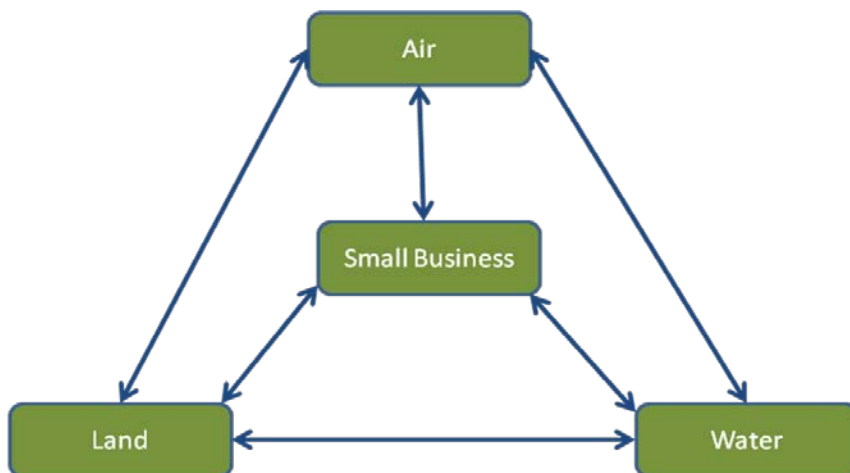
Durham, NC is located midway between the Great Smoky Mountains and the Atlantic Ocean in the southeastern U.S. (City of Durham, n.d.). The 299 mi² single city county of Durham is 25 mi long, 16 mi wide, and 28 mi from corner to corner – making it ½ to 1/3 the size of neighboring counties. Within Durham’s borders are 98,000 acres of hardwood and evergreen forests, including the last remaining old growth Piedmont bottomland forests; 7,800 acres of cropland; meandering rivers and streams (e.g. Little River); several lakes (e.g. Lake Michie); 26 rare plant species and several rare bird and mammal species (Durham Convention & Visitors Bureau, 2010).

The environmental impacts of Durham’s businesses may extend beyond its boundaries and affect the nearby cities or counties all the way to the coast. Lake Michie and Little River are connected to the Falls and Jordan Lake watersheds and ultimately all the way to the Albemarle Pamlico Sound and the Atlantic Ocean. Due to the heavy reliance on cars and increased manufacturing in Durham, pollutants are released into the atmosphere and travel across the country following regional wind circulation patterns to contribute to lung problems locally and elsewhere. Trash is landfilled out of state.

3.4.2. Fayetteville, NC

Fayetteville is in the western Coastal Plain region on the Cape Fear River. The city has a total area of 60.0 square miles, of which 1.2 square miles (1.98%) are water (US Census Bureau, “State and County QuickFacts,” 2000). There are seventeen recreation centers in the Fayetteville area (Fayetteville-Cumberland Parks and Recreation, “Recreation Centers,” 2009) and many more community and regional parks (Fayetteville-Cumberland Parks and Recreation, “Parks,” 2009). Land cover in the parks is a mixture of woodlands, recreation areas, fishery ponds along the Cape Fear River, and botanical gardens (Fayetteville-Cumberland Parks and Recreation, “Parks,” 2009). Environmental impacts of business operations are similar to those of Durham’s SMEs.

Figure 2. Schematic Illustration of Biophysical Ecology



3.5. Human Ecology: Public and private sector entities concerned with or affected by the issues of business and environmental protection

This section presents information on public and private sector entities which deal with or are affected by business and/or environmental protection on national, state, and local levels.

3.5.1. Business Stakeholders

At the federal level, there is a very powerful business lobby. The two most important lobbyists are the U.S. Chamber of Commerce and National Federation of Independent Business (NFIB). The U.S. Chamber is world's largest business federation representing 3 million businesses, more than 96% of which are small businesses with 100 or fewer employees, as well as state and local chambers and industry associations (US Chamber of Commerce, 2010). NFIB is a nonprofit, nonpartisan small business association representing small and independent businesses and the consensus views of its members in Washington and all 50 state capitals (National Federation of Independent Business, 2010). Both organizations mention the possibility for concurrent economic and environmental progress to be made, yet their actions demonstrate that their priorities lie with businesses' financial needs. The U.S. Chamber opposes most environmental legislation, believing it would hurt its member's interests; while NFIB has a less firm stance on environmental issues.

At the state level, several dozen organizations provide technical support, education and financial assistance to North Carolina's SMEs as part of the NC Rural Center Business Alliance. The alliance is committed to developing a comprehensive, integrated network of business services and to identifying and filling unmet needs. To do so, it strives to enhance, strengthen, and improve access to business development and assistance services; to improve the quality and integration of services in underserved areas; and to serve as the primary advisory and action body for the Institute for Rural Entrepreneurship. Member organizations include regional economic partnerships, federal-state agencies, public and private university centers, nonprofit and for profit institutions, industry associations, and American Indian organizations (NC Rural

Economic Development Center Institute for Rural Entrepreneurship, “Business Resource Alliance,” 2010).

In Durham, the Greater Durham Chamber of Commerce founded in 1906 is a thriving, pro-active business leadership organization with programs and activities that support public policy, economic and workforce development, and small business needs and interests. Furthermore, many of the Business Alliance partners are based in the Durham area, including Self Help, Golden LEAF, Inc., Triangle Solutions Alliance, and Research Triangle Regional Partnership. Departments at Duke University, NC Central University, Durham Technical Community College, and UNC-Chapel Hill are also involved in the SME community. The public wants the local economy to be successful.

The Fayetteville-Cumberland County Chamber of Commerce is also a thriving, pro-business organization with programs and activities to assist SMEs (Fayetteville-Cumberland Chamber of Commerce, n.d.; and City of Fayetteville, “Community Links,” n.d.). Partners like the Women's Center of Fayetteville and Fayetteville State University Cape Fear Region Small Business Development Center work to promote economic development by nurturing entrepreneurs and aiding SMEs’s growth and development. The Fayetteville Business Center works to establish an entrepreneurial community atmosphere (Fayetteville Business Center, n.d.). Fayetteville Downtown Alliance represents the common interests of downtown merchants, professionals, property owners and residents in order to encourage downtown business, residential and retail growth and promote the downtown to the public (Fayetteville Downtown Alliance, 2006). The Fayetteville Business & Professional League also assists local business interests (Fayetteville Business & Professional League, n.d.).

In both Durham and Fayetteville there are small business centers, mostly associated with academic institutions that offer free seminars, training, counseling, referral services, and literature resources for owners of smaller businesses. These seminars include advice on marketing, sales, bookkeeping, financial management, and other relevant topics.

3.5.2. Environmental Stakeholders

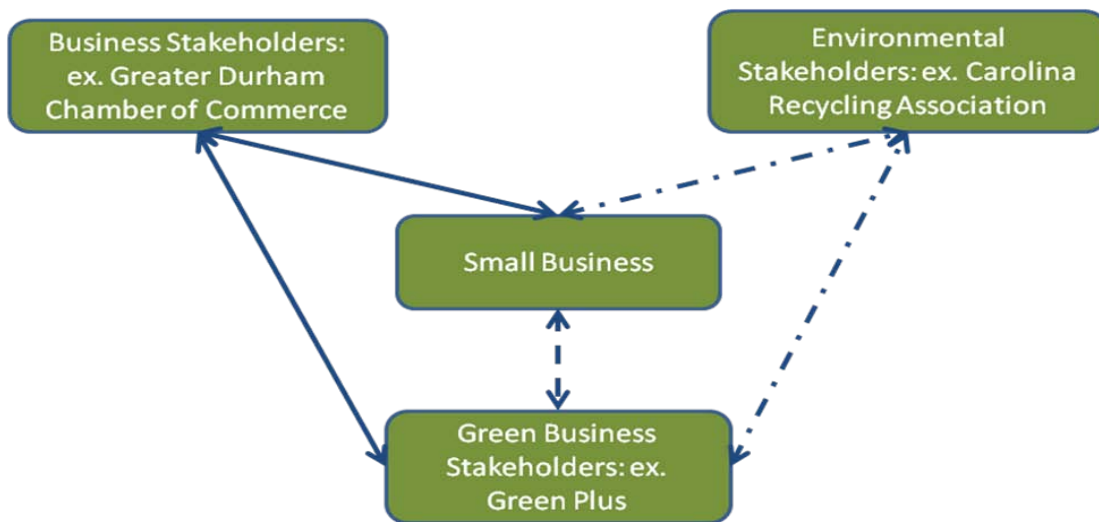
Nonprofit organizations such as the World Wildlife Fund, the Conservation Fund, Conservation International, Earth Watch, Environmental Defense, Environmental Law Institute, National Association of Conservation Districts, National Audubon Society, The Nature Conservancy, and Sierra Club are heavily involved in setting the environmental agenda at the national and state levels (World Wildlife Fund, “Local Links for Biodiversity,” n.d.). There is a 63-member nonprofit alliance entitled EarthShare North Carolina that works to preserve and enhance the natural environment (EarthShare North Carolina, 2010). While these organizations have historically focused on specifically conservation issues, some are beginning to branch out and partner with for-profit corporations to help achieve their environmental agendas. However, these partnerships are rare. Departments at the same academic institutions and local citizens are also concerned about the environment.

3.5.3. Green Business Stakeholders

As mentioned previously, business owners and government officials alike are taking interest in environmentally responsible business practices through the green jobs campaign at the national, regional, state, and local levels. Nonprofits such as Green Plus, B Lab, and Rocky Mountain Institute are operating nationally; for-profit firms such as EMS Environmental Inc. and

SJF Ventures are operating at the regional level; and other nonprofits such as Good Work, Inc. work at the state and local level. These organizations help SMEs access resources for environmental, financial, and social sustainability programs/operations. They help SMEs address energy and water use, transportation, waste, and purchasing and connect universities, Chambers of Commerce, business and philanthropic foundations. However, these organizations do not have coordinated ways established to monitor progress toward achieving environmental goals – largely because they are voluntary initiatives undertaken at an individual level. Furthermore, while these organizations may have a good idea of what environmental regulations are in place, they may not have as good a handle on how they apply to small businesses in particular – still leaving a lot for small businesses to do.

Figure 3. Schematic Illustration of Human Ecology



3.6. Discussion and Conclusions

In summary, the U.S. government has developed a legislative and administrative framework supporting both business and environmental protections. The extent to which the Regulatory Flexibility Act and Executive Order 13272 undermine environmental protections for economic ones is yet unknown; however the EPA believes that small businesses must achieve compliance with environmental regulations for the nation to meet its environmental goals. Thus, the EPA established its Small Business Compliance Policy.

The Obama administration, environmentally sustainable for and nonprofit organizations, and many private citizens believe that a green economy may enable better environmental protections and economic growth, thus meeting both government responsibilities to its citizens. However, there are obstacles to achieving these objectives. Small businesses have to assess many different sources of information created by individuals and organizations with different agendas in order to figure out how to comply with applicable regulations and to become environmentally responsible corporate citizens. The comprehensive government listing of green business resources is not geared to small businesses and small business access to environmental information often depends on the local resources available to them. The SBA and EPA are two of many players attempting to advise small businesses about environmental issues, business sustainability initiatives and programs, and corporate partnerships.

The complex legislative structure applying to small business and economic protection should not be complicated by the creation of additional agencies. Furthermore, the current Administration has a full legislative agenda in terms of economic stimulus, healthcare reform, and the war in Afghanistan; it is hard to imagine President Obama championing another major revision of status quo systems. Additional legislation would further complicate the situation.

Rather, we believe that in order to address the problems faced by small businesses, sufficient authority and responsibility already exists, but implementation and coordination need to be improved.

3.6.1. Recommendations

The EPA is working to comply with the Regulatory Flexibility Act under the assumptions that SMEs have a cumulative environmental impact that must be addressed and that there are specific tools that may help SMEs minimize their individual impacts. Our research has examined the necessity of EPA assistance for SMEs and identified two major gaps in understanding. We have also developed specific recommendations for the EPA and SMEs regarding EMS, mentoring, and reporting, so that the EPA may proceed with its obligations should the work be deemed necessary.

To determine the effects of the Regulatory Flexibility Act on the environment, an assessment of baseline cumulative environmental impacts of small business is needed. Addressing the lack of baseline knowledge on cumulative environmental impacts has been challenging because it is hard to access small businesses and find out about their environmental footprints. Furthermore, while big business is often seen as the foe of the environment, that is not necessarily true for small businesses. Small businesses do not generally garner major public or media attention for causing major environmental catastrophes and, since the environment has generally improved since the 1970s even with the Regulatory Flexibility Act in place and there is little hard data to the contrary, small businesses are assumed to have minimal impacts on the environment.

There is no way to confirm or deny whether environmental goals are being compromised without further research. Therefore, a database should be established which keeps track of basic economic expenditures on water and energy consumption, pollution and waste generation in the U.S. This database may be established and maintained by the EPA Small Business Center since it has the authority to collect data on small businesses environmental impacts, but as yet does not do so. Alternatively, it may be established and maintained by the SBA since expenditures for electricity and water are economic indices affecting a small business' profitability. Initial data may be information on kilowatt hours of electricity consumed and the volume of water used from a municipal supply. While this is incomplete, this information can easily be reported by small businesses over the internet or by the utilities with consent of their customers. Furthermore, we expect there will be debates as to how to account for small businesses operating in personal residences and how to measure other environmental issues of concern. We believe that this debate should occur and data collection should be promoted.

To determine the necessity of the EPA Small Business Compliance Policy, an assessment of the economic effects of implementing environmental regulations on small business is needed. We recommend that the EPA put out a request for proposals (RFP) for research on whether SBA predictions about hardships of environmental regulations bear out on small businesses. We also recommend monitoring "green" small businesses to examine effects of increased environmental responsibility on profitability and long-term survival of a company. Furthermore, to facilitate access to necessary information for small businesses we suggest using local business resources to connect small businesses to the EPA Small Business Portal and the Green Business Guide and having increased outreach among local information providers to communicate knowledge about what is available. Once data has been collected, an assessment can be made about major issues

affecting the government's responsibilities for economic and environmental protection and the push towards a green economy.

The specific tools discussed in the following sections may help SMEs and regulatory agencies gather data and provide the background for more thorough assessment of the issue. They may also help SMEs address their environmental impacts and operating procedures. We discuss the methods used to evaluate each tool and provide relevant background information, analysis, and conclusions for the work.

4. Methods

This section connects the background research on the impetuses for the project and the field research on motivations, EMS, and mentoring. In this study, general academic research is enhanced by the collection of data from local SMEs. Methods for field research and subsequent data analysis follow.

4.1. General Summary

This research is based on literature review and the collection of qualitative and quantitative data gathered through a cross-sector round table, emailed pre-survey questionnaires and two rounds of in-person semi-structured interviews of SME representatives. On March 30, 2009, representatives from select local businesses, academic institutions, government agencies, nonprofits, and foundations convened at the Chapel Hill Carrboro Chamber of Commerce for a round table discussion on sustainable business. The goals of the round table were threefold: to increase awareness of programs and activities related to sustainable small business in the Triangle area, to identify gaps and overlaps among those programs/activities, and to make connections and develop productive partnerships among participants. Two major discussions occurred; a sector-specific conversation about the activities, initiatives, and programs in the participants' organizations and a multi-sector conversation about gaps and overlaps of activities. Participants were pleased with the discussion and indicated their desire to continue the dialogue.

Initial interviews (round one interviews) followed the round table, and were conducted in summer 2009 in Durham and Fayetteville, North Carolina. Each interview lasted approximately 50 to 90 minutes. Additional interviews (round two interviews) were conducted in fall 2009,

lasted approximately 90 to 120 minutes, and were conducted in Durham, Fayetteville, Chapel Hill, and Burlington. Pre-survey questions provided us with background about the company, while the in-person interviews addressed our research questions. Transcripts were analyzed using data management software and background research provided context and insights into our work.

In fall 2008 we began to identify key topics for assessing the viability of implementing environmental practices and potential issues that might be faced during the fieldwork. We also reviewed literature related to sustainable behavior of SMEs and to sustainability management tools. In spring 2009, the team created an informed consent form, a 16-question pre-survey and a multi-part semi-structured interview guide that addressed our research questions in order to receive the Duke University Institutional Review Board approval. We identified a sample of 87 SMEs who might be surveyed and interviewed through the help of the various sources. To develop our list, we included additional industry sectors. A representative from each organization had to complete a pre-survey before we would interview them.

The research team performed a total of seventeen interviews: one pilot interview, 12 round one interviews, and 4 round two interviews. One of the principle investigators and a graduate researcher conducted 9 interviews in Durham, 5 in Fayetteville, 1 in Chapel Hill and 1 in Burlington. Interviews were recorded and transcribed. Round one interview subjects were then asked to review transcripts for accuracy. Round two interview subjects were not asked to review transcripts due to time constraints.

Small and medium business representatives were from a variety of business sectors – manufacturing, financial and marketing services, food and entertainment, healthcare, construction and nonprofit. We interviewed representatives from 1 municipality-owned

organization, 11 privately owned organizations, and 5 non-governmental organizations. Nine respondents were female and eight were male. Respondents tended to be high level individuals within the organizations with decision-making and financial authority. Specifically, 8 owners, 4 executive director, 2 chief executive/operating officers, 1 president, 1 associate director, and 1 manager of SMEs were questioned for our project.

Qualitative analysis of the transcripts from the initial interviews was done using the NVivo software package. Qualitative data is defined as interview transcripts i.e. words and sentences of the interviewees, interview audio files, and photographic images. This data was “coded” or organized into themes to interpret findings. Attribute data, information that cannot be quantified on an infinitely divisible numeric scale (for example, if the respondent was male or female or the respondent’s age), was also organized in NVivo. Surveys and transcripts were formatted consistently to enable the identification of themes representing specific information. Computer-aided auto-coding schemes based on individuals, organizations, location, themes, and questions were developed. Transcripts were evaluated based on the location of SME, individuals and organizations, themes and questions both manually and using computer-aided analysis, called autocoding. Relationships between the themes were identified and some particular codes were grouped together as related information. Unrelated themes, called independent free nodes, and related themes, called tree nodes (because one theme stems from another like branches from a tree), were developed by research team members for use in each particular research section.

A casebook, or listing of information about the respondents and their associated organizations, was created and linked to the qualitative data. Cases were created for individual transcripts of both the pre-questionnaire and semi-structured interview in order to assign attributes and facilitate querying, a computer-assisted process of interrogating the data. A

casebook for round one interviews was created in Excel and imported into NVivo. The casebook is comprised of 24 attributes for 13 cases (1 pilot + 12 round one interviews); attribute data included information about both the interviewed organization and the individual who was being interviewed. Text queries (based on the words of the interview) and matrix queries (based on the casebook/attributes) were performed in order to gain further insight from the data.

4.2. Round One Survey and Interview Process

Our research on motivation and driving forces, EMS application, and mentoring in SMEs focused on gathering qualitative data along with a minimal amount of attribute data. Data was collected using a research protocol that involved a short, web-based introductory pre-survey questionnaire and a one and one-half hour in-person interview. The pre-survey questionnaire provided background information on participating firms, and the interview provided more detailed information about the businesses' experiences and practices. The interview guide was structured to gather information on both individuals and organizations. Organizational information was gathered according to key themes: (a) management, (b) strengths and weaknesses, (c) auditing, environmental impact assessment, and health and safety, (d) environmental management systems, (e) industry-specific information, and (f) collaboration and mentoring. Surveys and interviews included a mixture of open-ended and closed (or ranked/rated/directed-answer) questions. Prior to interviewing, data was collected via a pre-material review process examining online and news sources. During the interview, on-site direct observations were made. After interviewing, additional data was collected via post-material review of received information and additional references provided by interviewees. The field work targeted small business in Durham and Fayetteville, North Carolina.

Initially the goal was to target small businesses in Durham and Fayetteville, North Carolina in five dominant business sectors: manufacturing, construction, finance and insurance, accommodation and food services, and nonprofit. Very quickly, it was determined that SMEs are extremely hard to reach, and the Great Recession increased this difficulty. Moreover, the specific industry codes of prominent sectors sometimes fail to correspond with the North American Industry Classification System of industry sector names, which made it more difficult to map cross-sectors in both locations. Therefore we extended our engagement to a variety of business sectors such as professional and technical services, educational services, retail trade, arts, entertainment, recreation, health care, and social assistance. We aimed to reach a wide range of the small business community, in terms of interest and engagement in sustainability practices, from highly interested and engaged enterprises to uninterested and unengaged enterprises.

We selected SMEs using a sole criterion: a business with between 5 and 25 employees. This definition is much narrower than the definition the U.S. Small Business Administration uses. However, we observed that when it comes to the small business community the number of employees, as a factor, outweighs the industry or revenue income factors. This hypothesis was supported by analyzing the audio tapes and transcripts of interviews and questionnaires of the three interviewed businesses that did not fit within this definition.

The pre-survey questionnaire and interview guide were tested with a small business in Durham. As a result of this pilot test, the team revised some questions. Also, the order of key themes was changed before the questionnaire and interviews were administered to the entire sample. After reviewing three interviews, we finalized the form of the Sustainable Small and Medium Enterprise (SSME) Pre-Survey Questionnaire and SSME Structured Interview Guide.

To enhance the flow of the interviews and make the process easier on the interviewers, a handout of tables was created and distributed to interviewers. This handout was used during the interviews to facilitate answering questions about capabilities, benefits, obstacles, and mentoring and collaboration.

Although there are a large number of SMEs operating in Durham and Fayetteville, locating them and subsequently convincing them to participate in our research was quite challenging. We contacted several local organizations to assist us in identifying small businesses. The Durham Chamber of Commerce and a nonprofit organization in Fayetteville, Sustainable Sandhills, provided researchers with a listing the companies of varying industry sectors and size. The businesses that met our sustainability engagement and size objectives were contacted. Even with this assistance in identifying businesses, it was extremely difficult to reach SMEs. Therefore, other Durham and Fayetteville authorities such as Green Plus, Durham Technical Community College: Small Business Center, North Carolina Small Business and Technology Development Center, Council for Entrepreneurial Development, and Fayetteville-Cumberland County Chamber of Commerce helped us to improve our outreach efforts. This helped us to identify and engage with a few additional businesses. The team wrote a project synopsis and gave it to potentially helpful individuals to explain the goals of our study so they could assist in identifying small businesses to contact. Confidentiality concerns regarding the distribution of contact information for small businesses also slowed down our field work. We found that when we were introduced to a contact at a targeted small business through e-mail or personal introduction by one of these cooperating entities, the communication was faster and more productive. We also reached out directly to SMEs found by browsing websites and phone books, referred by interviewed businesses, and personal visits to complete our sample.

We developed a standard initial communication with small businesses that included an introductory letter describing our study and enclosed the SSME Pre-survey Questionnaire as an attachment. Businesses were contacted via e-mail, fax, and/or in-person delivery of hard copies. Subsequent phone calls and e-mails were necessary to explain the study and make an appointment to conduct in-person interviews. Each interview began with the respondent signing a consent form. Interviews lasted between 50 and 90 minutes, and were recorded. Recorded responses were transcribed and participants were asked to review transcripts for accuracy.

After conducting round one pre-surveys and follow-up interviews, a response rate of 16% was achieved. In total, 83 pre-survey questionnaires were delivered to selected firms in Durham (58) and Fayetteville (25). From 83 companies, 15 companies returned their completed questionnaires, ten of which were in Durham and five in Fayetteville. Out of the 15 firms, 13 were personally visited and face-to-face interviews were conducted. Ten of the interviewed businesses fall in the 5-25 employee range. Two had between 1 and 4 employees and one had 50-99 employees. The round one field work was done with organizational representatives between June 1 and August 21, 2009.

4.3. Round Two Survey and Interview Process

To complete the field work, the research team conducted interviews with four mentor firms that currently implement environmental stewardship practices and have agreed to serve as mentors for a subsequent stage of the project. Contacts were approached via email and telephone to enable us to describe the study, establish interview dates, and deliver pre-survey questionnaires. Again, each interview began with the respondent signing a consent form. Interviews occurred at respondents' offices, lasted between 90 and 120 minutes, and were

recorded. Recorded responses were partially transcribed, but were not reviewed by participants due to time constraints. One mentor organization fell within each of the following size ranges: 5-10, 11-24, 25-49, and 100+ employees. The round two field work was performed between October 20 and December 15, 2009.

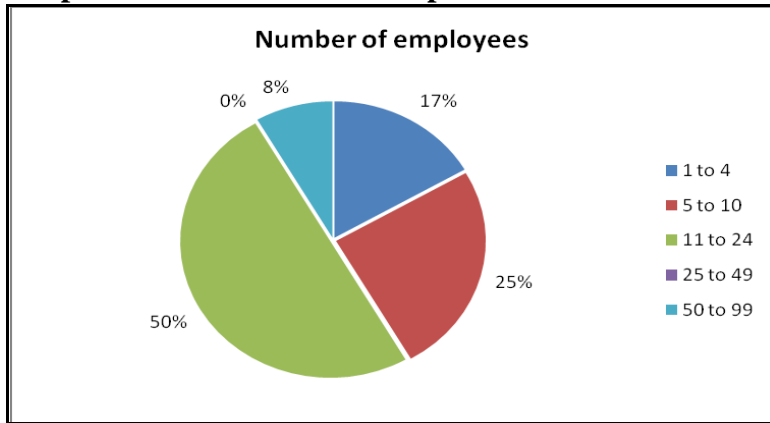
4.4. Round One Survey and Basic Statistics

Information about the round one organizations follows.

4.4.1. Profile of Participating Firms

Out of 13 interviews (pilot included) performed in round one, 9 interviews were conducted in Durham and 4 in Fayetteville. Graph 1 illustrates that 10 firms fall in the 5-25 employee range. All interviewed small businesses except one had been in operation 6 or more years. Graph 2 presents the estimated annual income distribution of all interviewed firms. The annual incomes of our participant organizations range from less than \$100,000 to more than \$10,000,000. Twelve firms were not part of a larger business or government organization. Nine firms were privately owned. In addition, we interviewed 3 non-governmental organizations and 1 municipality-owned organization. Table 1 shows that small enterprises interviewed represented a variety of business sectors and that the goods and services they provided were representative of more than one primary business sector.

Graph 1. Percent of the Participant SMEs with Particular Employee Size Ranges



Graph 2. Percent of SMEs with Particular Estimated Annual Incomes

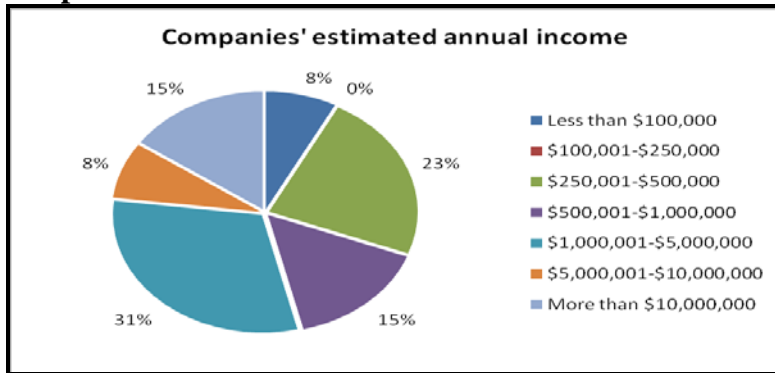


Table 1. Listing of SMEs's Primary Business Sectors

Accommodation and Food Services
Arts, Entertainment, and Recreation
Construction
Educational Services
Information
Manufacturing
Other Services (except Public Administration)
Professional, Scientific, and Technical Services
Real Estate and Rental and Leasing
Retail Trade
Wholesale Trade

Note: Based on the North American Industry Classification System

4.4.2. Profile of Participating Interviewees

Out of 13 initial respondents (pilot included), 9 interviewees were female and 4 were males. The majority of interviewed individuals were in the 41-60 years-of-age-category. Participants' education levels varied, with 1 two-year degree recipient, 4 four-year degree recipients, 7 graduate degree recipients, and 1 PhD recipient. Eight out of 13 respondents said they had taken a class specifically related to the environment either in school or as part of a continuing education program. Only one respondent indicated a primary academic focus was on environmental science. All respondents' current job positions or titles were reported to be at high levels within the organization: 7 owners, 3 executive directors, 2 chief executive/operating officers, and 1 manager.

4.5. Round Two Profile of Participating Firms and Participating Interviewees

All of the round two respondents were males 41-60. Their education levels ranged from some college to graduate degree holders. Three had taken a class specifically related to the environment, but none had environmental science as a primary academic focus. Respondents held upper level positions within their organizations; one was an owner, another an executive director, the third was a president, and the last was an associate director. The industry sectors of the round two SMEs were accommodation and food services, manufacturing, nonprofit, and educational services. The SMEs's estimated annual incomes ranged from \$100,000-\$250,000 (nonprofit) to \$5,000,000-\$10,000,000 (accommodation and food services).

5. Division of Responsibilities: Parts A (Motivations and Driving Forces), B (Environmental Management Systems), and C (Mentoring)

While the research team worked collectively on the initial work, each member of the team had a primary area of focus. Minna Friedlander focused on motivations, Sona Stenclova focused on EMS, and Vanessa Meer focused on mentoring and the socio-political context for SMEs. We collaborated on the literature review, interview and survey guides, fieldwork, and NVivo coding analysis, but each had a primary area of responsibility related to the deliverables for our respective topics.

6. Part A: Implementing Environmentally Sustainable Practices at Small and Medium Enterprises: Motivations and Driving Forces

A discussion of the motivations and driving forces of SMEs's sustainability practices follows.

6.1. Motivations for Sustainable Behavior

Motivations for sustainability can generally be classified into four overarching categories: legislation, stakeholder pressures, economic opportunities, and ethical motives (Bansal & Roth, 2000). Using these categories as a basis for our literature review, we examined the implications of each motivation as it pertains to SMEs, and used these findings to form a hypothesis about why the selected local SMEs would choose to implement sustainable practices.

6.1.1. Legislation

As discussed in the section entitled "Motivations for Research: Political and Social Context," small firms may face reduced regulatory measures in the United States and less public scrutiny about environmental and labor practices. Furthermore, studies show that firms that implement sustainable practices organically and voluntarily tend to do so more efficiently and productively than if they do so in response to government legislation (Cetindamar & Husoy, 2007). Respondents in our study didn't see regulations as problematic which is likely because they businesses are accustomed to the existing regulatory climate. Additionally, some regulations are industry specific and therefore the impacts cannot be generalized. Further, service providers are subject to fewer environmental regulations than are manufactured or

industrial goods industries. Given these factors, we expected that legislation and compliance would be a less significant motivating factor in our sample.

6.1.2. Stakeholder Pressures

In large companies, motivations for going green tend to be distributed much more heavily towards strategies that increase competitiveness and legitimacy (Bansal and Roth, 2000). In other words, most firms cite competitive advantage and stakeholder demand for environmentally sustainable practices as the primary motivations for going green. Further supporting the existence of strategic advantage for companies who adopt greener practices is a 2009 Deloitte study in which consumers were surveyed through 6,000 shopper intercepts at 11 major retailers. The study found that:

Consumer businesses are missing a substantial opportunity to market and provide greener products. Ninety-five percent of shoppers surveyed indicated they are ready and willing to consider more sustainable products but...there are substantial gaps between the market's readiness for sustainable products and the delivery of those products to the shopper's market basket (Bears et. al., 2009).

In addition to the opportunity to capitalize on a market niche for green products, there may also be advantages by simply responding to consumer demand for increased information regardless of if it reveals green tendencies. In a 2006 study from the United Kingdom, researchers found that providing increased amounts of information on products has been associated with "positively accelerated increases in total brand revenue" (Foxall et. al., 2006).

It is important to note that most studies on the strategic advantages of implementing sustainable practices are focused on consumable products or consumer packaged goods (CPGs) industries (Bearse et al., 2009). A CPG is a type of good that is consumed nearly every day by the average consumer and needs to be replaced frequently (Investopedia ULC). The CPG market is highly competitive and firms are constantly battling to differentiate their product from hundreds of others, and therefore an ability to effectively communicate green product attributes can be a very effective strategy to differentiate a one CPG from another. While only one company in our sample was a true CPG manufacturer, several organizations provided direct consumer-facing services, thus we expected to see strategy as an important motivating factor within our sample.

6.1.3. Economic Opportunity

Currently, there is a great deal of low hanging fruit to be collected through simple environmentally sound improvements. Implementing basic practices such as using more efficient compact fluorescent or LED light bulbs, or installing water saving devices such as faucet aerators or low-flow toilets, creates cost savings that are often realized in short time periods.

These scenarios provide easily quantifiable economic gains, however it is more challenging to estimate the long-term returns that may occur due to the implementation of more major sustainable practices, such as those which might necessitate large-scale organizational changes or require long periods of information gathering and analysis. While many firms recognize that marketing their sustainability efforts can be a benefit in terms of financial performance (Clemens, 2006), some firms are still “captured by short termism, [and] managers

would be reluctant to accept the cost imposts of [corporate responsibility] if they could not readily determine the likelihood of an economic return” (Haigh & Jones, 2006).

6.1.4. Ethical Motives

Ethical motives tend to be important drivers for individuals in dictating our everyday actions, but for business managers, some researchers have found that “business is first. Social considerations come second and providing only that such considerations would not open an exploitable weakness.”(O’Dwyer, 2003 as cited by Haigh & Jones, 2006). Others disagree, citing that given the limited number of forcing mechanisms such as legislation or binding agreements, many firms have chosen to sign on to voluntary initiatives for ethical reasons (Cetindamar & Husoy, 2007). However, “The owner-managers’ moral behavior is restricted by their low awareness of environmental issues combined with a low level of ecoliteracy” (Tilley as cited by Hillary, 2000b). While the ethical impetus for environmental change is an important motivating factor, most firms that make environmental improvements for ethical reasons also cite a secondary reason such as increased stakeholder involvement (Cettindamar & Husoy, 2007).

6.2. Hypothesis

We hypothesized that the responses we received from SMEs would fall roughly into the above four categories; however, we anticipated that the breakdown of firms that cited each motivator would be slightly different than the patterns exhibited by larger corporations. We

expected the following trends to emerge regarding the four motivating factors of legislation, economic opportunity, stakeholder pressures, and ethical motives:

Legislation: Not likely to be a significant driver in our sample due to the nature of small businesses and the regulatory environment as it applies to SMEs in the United States.

Stakeholder Pressures: Likely to be a significant motivator particularly for firms with a direct consumer goods market such as the CPG and hospitality industries. We expected this factor to be less prevalent among service providers. We also expected strategic motivations to emerge more frequently in the firms located in Durham County rather than Fayetteville, largely because of the demographic makeup. In Durham, 41.8% of the population holds a bachelor's degree or higher, which is almost 15% higher than the national average (City of Durham, 2000). In Fayetteville in the year 2000, only 19.1% over age 25 has a bachelor's degree or higher, versus the 22.5% state average (US Census Bureau, 2000).

We expected education levels and corresponding income levels to create an opportunity for strategic advantages created by implementing sustainable practices. We anticipated that SMEs would recognize these advantages and cite stakeholder demand as a driver of their green practices. We also expected that small firms would be able to capitalize on their size and flexibility to tap into strategic opportunities such as information transparency.

Economic Opportunity: Because there is a great deal of low hanging fruit to be collected simply by implementing basic environmental practices such as using more efficient compact fluorescent or LED light bulbs or installing water saving devices such as faucet aerators or low-flow toilets, we expected that many of the practices implemented within firms in our sample would fit this category of economic opportunity through basic improvements. These improvements can be made in a wide spectrum of firms, from service providers to manufacturers. Therefore, we expected firms across all sectors and locations would cite economic opportunity as a driver for at least the most basic improvements.

Ethical Motives: We expected a higher prevalence of ethical motives to appear as drivers within SMEs than is typically found in large corporations. This is because the SMEs in our sample have a different accountability structure than do many large corporations. None of the firms in our sample are publicly traded, and simply because they are often locally or often family owned, they are often subject to less public scrutiny. This structure of accountability allows SMEs the flexibility to implement practices that they personally deem valuable. Therefore we expected to see more responses citing ethical motives than are typically seen in studies on large firms.

6.3. Analysis of Firm Motivations

Responses regarding motivations and justifications for implementing sustainable practices were woven throughout various portions of each interview, but a majority of the responses were elicited through two targeted questions. We asked each business the following:

1. Does your organization want to incorporate environmentally sustainable practices?
2. What do you think might be the main benefits your company would gain from implementing sustainable practices?

Responses to the questions on motivations for implementing sustainable practices fell into five major categories rather than the four we initially anticipated. Legislative mandates were almost entirely absent as a response. Economic opportunity, stakeholder pressure/strategy, and ethical motives all appeared throughout the data, and two additional categories emerged. These categories were labeled “personal interest” and “community betterment.” Of the collected responses, the breakdown can be illustrated as such:

Figure 4. SMEs’s Stated Motivations for Implementing Environmentally Sustainable Practices



The breakdown of responses was different than initially hypothesized. The data displayed the following trends in each category:

6.3.1. Strategy/Stakeholder Pressure

Ten firms acknowledged that there might be benefits to environmental stewardship because of stakeholder demand, but only two firms (F1, F3) cited strategy as the primary reason for why they implemented sustainable practices. Both F1 and F3 specifically cited marketing as an important benefit of improved environmental practices, explaining,

“You know that’s so important to our vendors, like Wal-Mart, Walgreens and everybody out there now so you know we definitely need to comply and compete for the business... We are going to start using the logo, the green business logo, you know. You will see it on our front door, you will see it on our website and in our printed materials... you know that’s one of the reasons we’re involved in that [green business certification] program”
(F1).

As expected, this firm was the only firm in our sample that produces a true consumer packaged good (CPG). However, other firms did identify the need for marketing. They explained that publicity there could create strategic advantage, but there are too many existing barriers to effective marketing including the existence of marketing avenues and limited funding (D3, F4).

In contrast, three firms in our sample asserted that there was no strategic gain to be captured. For instance, one owner quipped “*if environmental sustainability were something that was respected in our profession and in our field then I think our reputation ... and in some sense some leadership in our field would be helpful in doing that but I don’t think it’s important in our profession*” (D3). Another interviewee opined that certifications like LEED have become heavily commoditized and while they are still elicit positive changes, they are no longer a distinguishing element (D6). Furthermore, one firm explained that sharing information and environmental accomplishments among SMEs may be difficult because there is a fear of information stealing, and hence the loss of competitive advantage (D4).

6.3.2. Economic Opportunity

Views on the economic benefits of implementing sustainable practices diverged. Two firms cited cost reductions as a benefit of sustainable practices, but a majority explained that the practices that they have implemented have cost more than simply continuing to practice business in a more traditional manner. Firms that cited cost savings often referred to low hanging fruit, for example one interviewee acknowledged,

“I can see in some areas some cost savings as I think about the fact that we moved some years ago to paperless payroll, you know, those kinds of things. That solved an efficiency issue in addition to our cost-saving issue” (D6). Another firm explained, “*We made a choice that walls are brick and some places it has paint on it and some places it doesn’t. We made the decision to leave them as they are rather than paint – less expensive*” (F3).

Firms that felt environmentally sustainable practices were cost prohibitive referred to a wide array of changes, from small changes (buying recycled paper towels) to large changes (going off-grid by using solar energy). Some notable responses include:

“I think the only answer to that question [what prevents you from implementing sustainable practices] is time and money. If any of these things actually would reduce our work load and make pay for itself that would be ideal. I can’t envision how that could work but maybe someone else can” (D1).

“It is going to cost us a little bit more in our paper towels [buying only recycled paper], you know, in our products that we are buying. A little bit more expensive” (F1).

“You know people would love to have for instance solar panels. Who wouldn’t, right? But it costs so much that they don’t even think they are going to reap benefits throughout their lifetime. So it’s very hard to really encourage something that somebody can’t afford so that’s a problem” (F2).

6.3.3. Community

Several firms cited a very strong place-based response as their motivation for going green. This indicates that many small business owners identify as a part of a greater whole and are centered not only on their own bottom line, but feel accountable to the community to which they belong. While the community is also treated as a stakeholder, responses were categorized in a separate section due to the large volume of responses directly related to community activism.

The following is a selection of quotes that illustrates the attitudes of interviewees who cited community stewardship as a major driver for going green:

“I think if you look at an organization like ours that cares about its community and wants to make it a better place... We see ourselves very much as a steward for placed-based assets... it’s a quality of place, it’s quality of life” (D6).

“[Through our practices] we are trying to reflect community’s values” (D7).

“[We are going green] just to be a good citizen of the community” (F1).

6.3.4. Personal Interest

Personal interest was another additional motivational category that emerged in several of our interviews. In literature focused on studies of large firms, personal interest did not emerge as a driver of sustainability. Because of differing structures of accountability in large firms, rarely can a CEO or other C-suite executive take on a project simply because they have a personal interest in the topic. In our study, however, firms cited no reason other than personal interest as the main driver for implementing sustainability. One firm explained, *“Really I don’t think the company would gain anything. I think that I personally would just have more satisfaction knowing that you know we were doing some or all of the stuff that we could do” (D3).*

There was an additional notable trend in the “personal interest” category. Many interviewees cited their own personal interest in sustainability, and explained that their staff was also interested in implementing green practices. Some even acknowledged that such a culture was excellent for recruiting and for employee morale. However, some of these same firms cited

that their stakeholders were not particularly interested in sustainability. This demonstrates a disconnect between what an interviewee perceived as demand for sustainability within the firm and outside of the firm. While their responses may be accurate to the best of their knowledge, it raises a question about whether local interest in sustainability is much more widespread than our interviewees recognized. To reference the Deloitte study discussed earlier in this section, 95 percent of people say that they would buy green but are unable to do so, because of a lack of product availability. These perceptions of a lack of widespread interest in sustainability are particularly illustrative of a key disconnect that would prevent the market from aligning with actual stakeholder demand.

6.3.5. Ethical Motives

Ethical motives were a much larger driver for the implementation of sustainable practices than we anticipated. Responses ranged from “*It’s a right thing to do*” (D1) and “*your conscience talks to you*” (F1) to much more forceful concerns such as, “*I can say as the owner that yes we try to lead a principled existence here*” (D8) and “*Well, first we are not ‘schmucks’*”(F4).

6.4. Identifying Social Norms to Motivate Sustainable Behaviors

Identifying the major factors that drive Durham and Fayetteville area SMEs to adopt sustainable practices is important because the EPA or a local chamber of commerce can leverage the motivators to encourage sustainable behavior in ways that speak directly to SMEs. To expand the scope of our results and the robustness and usability of our data, we asked firms if

they believe that the environmental and social impacts of their organizations are comparable to those industry-wide. This question provided us with important insight into firms' perceptions of their own behavior in comparison to their peers. Knowing that peer reference groups are some of the most important behavioral drivers, we felt that information about the perception of peer performance could provide additional insight into firm motivations for environmental stewardship.

Marketing studies have long focused on social norms as a driver of consumer behavior. We hear references to social norms daily in advertisements that tell us “7 out of ten people choose one brand of automobile over another...or that nearly everyone at the local cafeteria steers clear of the “spamburger surprise” entrée (Goldstein, 2008). It is well documented that these descriptive norms (how people behave in a certain situation) motivate action (Goldstein, 2008), however in order to most effectively employ descriptive norms as a motivator, we must first identify the correct reference group with which the targeted individual identifies. A reference group is defined as “a group with which an individual identifies and whose values the individual accepts as guiding principles” (Dictionary.com LLC, 2010).

Identifying the reference groups with which individuals identify can be extremely difficult. For instance, in a study on motivating hotel guests to reuse their towels, guests claimed that they identified most strongly with their gender and as a citizen, however the most significant behavioral changes were recorded when the subjects were given provincial (place-based) norms such as “75% of guests who stayed in this room reused their towels” rather than a gender identity descriptive norm such as “76% of women and 74% of men reused their towels.” This serves to illustrate that the identities with which people claim to identify may not actually be reference groups on which they actually base most of their decision-making behavior. Furthermore,

individuals tend to be highly subject to their proximate settings (the “when in Rome” syndrome) (Goldstein, 2008). Despite the identities with which individuals claim to associate most strongly, social norms at the neighborhood level have been some of the most effective in encouraging conservation behavior (Chen et. al., 2008).

Responses to the question “Do you believe that the environmental and social impacts of your organization are comparable to those industry-wide?” were extremely uniform. Every respondent explained that their impacts are better than or equal to their industry peers. Given these perceptions, there is very little incentive for firms to increase the scope or pace of their efforts. SMEs in the Durham and Fayetteville areas feel that they behave comparably to, or better than their industry peers and therefore the motivation to improve further for strategic reasons such as market share, is not particularly strong. One motivational strategy could be to identify other firms in each industry that are implementing sustainable practices; however, it is unclear whether other firms in a similar industry serve as the most relevant reference group for SMEs in our sample.

We did not ask a question that directly addressed reference groups; however, the groups with which the local SMEs most heavily identified were woven throughout the data. Similar to our data on motivations and drivers, we did not anticipate the local community to be such a dominant driver of sustainable practices. The repetition of phrases about “community” aligns with research on provincial norms, and therefore lead to the conclusion that place-based comparisons may provide the strongest motivation for SMEs.

6.5. Conclusion, Strategies for Applying Results

From the above analysis, three important conclusions can be drawn:

1. SMEs in our sample are motivated to implement sustainable practices for five main reasons: cost savings, strategy, community, personal interest, and ethics.
2. There is a disconnect between respondents' perceptions about attitudes regarding sustainability. Most firms felt that individuals within the firm were highly interested in sustainability whereas those outside of the firm were less so. A widespread perception that there is a lack of interest in sustainability may prevent firms from aligning their practices with actual stakeholder desires.
3. To motivate firms to implement sustainable practices provincial, or place-based, norms may be more effective reference groups than are firm size or industry sector. We initially did not anticipate this response and as a result, few of our questions directly addressed the local community. The trends in our data emerged organically without direct mention from interviewers, which means that the idea of community as a driver for sustainability may actually be understated. The most effective driver would likely be combination of both provincial and industry behavior.

From these conclusions, there are a variety of takeaways. Firms tended to perceive themselves as interested in sustainability but felt that in general the community values did not support sustainability. National and international research on consumer demand has identified this gap, but more localized research on consumer demand and willingness to pay for more sustainable products would be useful to the SMEs involved in our study. If firms could readily identify strategic advantages from implementing green practices, they could create opportunities for differentiation within the local community.

Furthermore, the identification of provincial norms as a major driver behind firm behavior as it relates to the implementation of sustainable practices supports the idea of a local peer-to-peer mentoring program as discussed in Part C of this report. Peer-to-peer mentoring at the community level could tap into both the industry and provincial drivers that were identified in our study. Based on the identified reference groups, we might expect that if certain SMEs in a location were able to implement unique sustainable practices, firms in the same location and industry would be more likely to follow, thus creating a “race to the top.”

In addition to direct peer-to-peer mentoring, a network that used individual EMS data - perhaps published on a site accessible to industry peers and consumers - could further drive sustainable practices within SMEs. This information network could be hosted by the local chamber of commerce or by the tourism bureau, and would provide a resource for people looking to purchase more sustainably. A collection of information would also provide SMEs with data on what their peers are doing, and this idea sharing could encourage innovation.

7. Part B: Implementing Environmentally Sustainable Practices at Small and Medium Enterprises: Environmental Management Systems

A discussion of environmental management systems, including their history, purpose, and structure, follows.

7.1. EMS Literature Review

Considering the social, environmental, and economic context as discussed in the Motivations for Research section, it is crucial that SMEs move proactively towards more environmentally sustainable practices. Although small and medium sized enterprises occupy a large and financially significant part of the American economy, they may be under less environmental oversight or scrutiny. While online resources, initiatives, and organizations exist to promote small and medium sized enterprises with sustainability tasks, most require previous environmental knowledge, significant time commitment, the creation of extensive documentation, and most importantly, money that SMEs do not possess.

Use of EMSs is a sustainable business practice that could be adopted by small and medium sized enterprises. An EMS is a voluntary effort to create a sustainable, structured management plan addressing a company's impacts on the environment. EMSs address "organizational structure, planning activities, responsibilities, practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining the environmental business policy" (ECS, 1996). The implementation of an EMS can help a company address its overall impacts on the environment. Moreover it provides organizational structure for company efforts to become and remain environmentally sustainable through

planning, implementing, checking, and correcting enterprises' environmentally-related activities continuously.

The EMS has been used primarily by large companies able (and often required) to maintain some level of compliance with environmental standards such as BS 7750, EMAS, or ISO 14001 (Tinsley, 2007). BS 7750 was a United Kingdom's environmental standard that was based on the BS 5750 quality system standard. This standard was developed in reaction to environmental risks and potential damages. BS 7750 led to the development of ISO 14001. After the adoption of ISO 14001, the BS 7750 standard was withdrawn. ISO 14001 belongs to the ISO 14000 family of published international standards by the ISO technical committee ISO/TC 207 and approved by European Committee for Standardization as a European Standard in 1996 (ISO, 2010; ECS, 1996). This standard is known as the world's most recognized environmental management standard and gives organizations a proactive framework for identifying, measuring and monitoring environmental issues in a consistent way. It is a process not a performance standard. It helps organizations to better manage their impacts on the environment through the Plan-Do-Check-Act cycle to help them achieving their own environmental objectives. According to this cycle, the EMS's structure is written, implemented, checked, and improved to ensure continual improvements. The Eco-Management and Audit Scheme (EMAS) is a European standard with a few exceptions very similar to ISO 14001.

The environmental management system standards are designed to assist firms of any size and business sector. Following the formal standards, enterprises develop a formalized management process with the objective of evaluating and continuously improving their environmental and safety performance. Even if they do not let their EMS be certified, they benefit from the developed Plan-Do-Check-Act cycle for addressing their environmental

impacts. Firms may always choose to develop an EMS that could, in the future, be certified to meet externally required standards such as those described above. The certification of conformity to external standards such as ISO 14001 is not an EMS requirement; however, 188,815 firms worldwide have certified their EMSs to this standard as of December 2008 (ISO Survey, 2010). There is no data regarding the number of firms that have implemented a non-certified EMS.

This part of the master's project focuses on the informal environmental management system. Accordingly, the analysis and recommendations for SMEs are not closely aligned with the requirements of a specific standard. Because the ISO 14001 EMS is the most widely recognized standard and the one that some companies encourage or require their suppliers to adopt (Ford, 2010; IBM, 2010), this research is based on the specifications of the International Standard ISO 14001. This will enable SMEs who follow the guidelines offered to later adjust their EMS to easily meet this standard and later have an externally certified system if they so choose.

An informal environmental management system approach enables small and medium-sized enterprises to select a wide variety of environmentally sustainable goals. It also provides an opportunity for SMEs to expand the scope of their EMSs to include the social dimension of sustainability and to shift from environmental management systems to sustainable management systems (Stead, et al., 2004). Integrating process-based quality management systems, occupational health and safety management systems, and other standardized or non-standardized management systems with SMEs's own environmental management system enable SMEs to address several areas of the business operations through connected processes (Bernardo, et al., 2009).

SMEs are often identified by the number of products or services offered, and number of employees. But successful small and medium sized enterprises also tend to quickly respond to changing economic situations, develop close relationships with their customers, address and meet local needs, innovate in their fields, and are more likely to hire women, older people, and part-time workers (Conte, 2001, Longley, 2009). These specific characteristics are likely to provide SMEs with an enhanced ability to adopt EMSs.

7.1.1. EMS Capabilities at SMEs

Past research has established that organizational capabilities are an important determinant in successful business performance including developing and implementing proactive sustainable practices. Barney (1991)'s research classified business capabilities and resources into three categories: physical capital, human capital, and organizational capital. Physical capital includes resources related to hard capabilities transforming physical technology and investments into organization structure such as performance tracking and formal EMS structure. Human capital includes communication, training and education. Organizational capital includes cooperation and relationships among groups. Availability of these capabilities can highly influence the success of organizations' processes, operations, and practices.

Additionally, studies have determined that certain organizational strengths and capabilities such as internal communication, use of technology, employee training, project management, and a loyal customer base can be important to the successful implementation of the EMS into business operations (Wee and Quazi, 2005, Florida, et al, 2001, Daily & Huang, 2001).

7.1.2. EMS Benefits at SMEs

EMS research has shown that smaller businesses can benefit from adopting EMSs. The research identified internal benefits of EMSs, termed benefits to operations, and grouped them into three categories: organizational, financial, and people benefits (Hillary, 2004).

Organizational benefits include improved quality of training, improved working conditions, improved safety, and encouraged innovation. Financial benefits include improved economic conditions for the SME. People benefits include enhanced skills, improved knowledge, and a forum for dialogue between staff and management. Hillary (2004) also described external benefits, which she termed benefits associated with competitive advantage in the market, and grouped these into three categories: commercial, environmental, and communication benefits. Commercial benefits include gaining new customers/business and satisfying existing customers. Environmental benefits include increased recycling, reduced pollution, and increased energy and material efficiencies. Finally, communication benefits include creating a positive public image, improving communication with stakeholders, and setting an example for other companies in a sector (Hillary, 2000a; Hillary, 2004).

Other research studies confirmed Hillary's finding that businesses report either overlapping EMS benefits, or they have found additional benefits gained due to EMS development and implementation. These have included enhanced competitive advantage, cost savings, more efficient production, improved employee morale, increased employee awareness, an expanded market for products and services, an improved company image, assured legal compliance, relaxed relations with authorities, and product differentiation (Zorpas, 2010; Stapleton, 2001; Biondi et al., 2000; Smith et al., 2000; Miles et al., 1999).

7.1.3. EMS Barriers at SMEs

Hilary determined internal and external barriers for adoption of EMSs in SMEs (Hilary, 2004). She separated these barriers into several groups. Resources, understanding and perception, implementation, and attitude and company cultures are cited as four categories of internal barriers. Economics, institutional weakness, and support and guidance are cited as four categories of external barriers. Specifically, internal barriers may include doubts about ongoing effectiveness of EMSs to deliver objectives, management instability, resistance to change, lack of understanding of EMS, or negative views or experiences with ISO 9001 standards. Concrete external barriers may include insufficient motivators and benefits, uncertainty about the value of an EMS in the market place, absence of a central source of information on environmental legislation, lack of sector-specific implementation tools and examples, poor quality information, and receiving conflicting guidance (Hilary, 2000a; Hillary, 2004).

Other research studies have further identified barriers for implementing environmental management systems (McKeiver, C. & Gadenne, D., 2005; Pimenova & van der Vorst, 2004; Hitchens, 2003; Gerstenfeld & Roberts, 2000; Williams et al., 2000; NFS, 1996). Among the most common obstacles cited are lack of money and time to invest in EMSs, lack of practical information about EMS, and lack of motivation to initiate a change process. Other obstacles include missing connections among stakeholders, slow or no communication within the company, business specific barriers such as an unfavorable corporate culture, multifunctional staff easily distracted by other work, lack of an environmental champion and/or specialist staff, and external legal necessary requirements. A primary hindrance impeding the use of EMSs by small and medium sized enterprises is a false perception that small businesses are a smaller version of large businesses, and, therefore, they should follow the same EMS framework as large

businesses instead of an EMS framework designed with the special nature of SMEs in mind (Jenkins, 2004; Williamson et al., 2006).

7.1.4. EMS Implementation Guides

The faulty approach can be seen in the implementation guides for small and medium sized enterprises that have been produced over the past few years. These guides, along with other available tools and templates, are too rigid and formalized for successful use by SMEs. Some examples of these inflexible, complicated, time-consuming EMS guides which require extensive documentation are provided herein.

Starkey (2000) mentions that SMEs can use eco-balance records to establish environmental management systems. This practice is designed to enable businesses to evaluate a comprehensive record of a company's physical inputs, stock, and outputs and convert this information into relevant environmental indicators. Stapleton et al. (2001)'s EMS guide is based on the formal structure of the ISO 14001 standard and provides detailed guidance and a roadmap on how each element of an EMS could be designed and implemented. Halila (2007)'s study proposes an EMS model that can be used as a guideline for the adoption of an ISO 14001 EMS by SMEs collaborating in a network. It is based on Rogers' model of the innovation decision process (Rogers, 1995). The EMS model consists of four stages and distinguishes activities that handle issues that are similar for all the SMEs in the network and activities with specific issues that can be treated by each SME individually. Seiffert's (2008) research study offers a methodology for implementing ISO 14001 EMS in Brazilian small and medium sized enterprises. It applies an environmental impact evaluation method and recommends adopting a cooperative implementation model based on systems engineering theory. Zorpas (2010) offers a

visual tool, eco-mapping that is specially designed for SMEs. With this tool maps and plans of all of a company's operations are created and the learning process is shared among all employees.

Several research projects have developed frameworks for EMSs in particular industry sectors with a focus on small and medium sized enterprises. Burke and Gaughran (2007) focus on engineering and manufacturing EMSs. They develop a two step tool, which provides an incremental approach for moving EMSs from compliance to sustainability management. Seidel et al. (2009) offer several connected tools for overcoming barriers to implementing environmentally benign manufacturing practices in SMEs. This approach is based on a combination of stakeholder analysis, Strengths-Weaknesses-Opportunities-Threats analysis, basic life-cycle inventory and a ranking of environmental aspects.

Online research has revealed that some environmental consulting firms offer tools, guidelines, and checklists for helping small and medium sized enterprises to implement sustainable practices, claiming that their kits include features of the environmental management system. Because these sources are not freely available, our research team has limited access to them. However, we found an EMAS Tool Kit for Small Organizations developed by the International Network for Environmental Management, the world federation of nonprofit national business associations for environmental management (INEM, 2009). This toolkit for SMEs provides step-by-step help for implementing a formal EMS according to ISO 14001 and obtaining registration to EMAS.

Durham Technical Community College, Small Business Center, newly introduced a class on greening small business, which includes work related to the development of action plans for implementing a kind of environmental management system. Fayetteville Technical Community

College, Small Business Center, has not yet incorporated environmental topics into their offered classes.

Few references were found that address developing and implementing an informal EMS in SMEs. It could be that different entities are using different nomenclature or that such efforts are being incorporated into tools broadly addressing sustainable practices.

Our EMS implementation guide research has shown that there are only few existing useful strategies that adhere to a flexible and simple framework for developing and implementing EMSs appropriate to SMEs's needs. However, these guides still do not take into account a range of small businesses and their unique business abilities. SMEs need systems that are understandable and that do not require significant time, financial investment, or extensive development of documents.

This part of the project will provide recommendations for developing and implementing informal EMSs in SMEs as initial findings for incorporating informal EMSs into the next phase of the EPA research – feasibility of implementing informal EMSs in smaller businesses.

7.2. Field Research Process for Collecting EMS Data

EMS data was collected through round one surveys and interviews following the procedures detailed in the Methods section. Lessons learned from this part of the field research explain why small businesses may not be willing to implement an informal or a formal EMS. Small businesses that agreed to participate in our study offered many different rationales to describe their connection to environmental sustainability and summarize their decision to participate. See Table 2 for a summary of the reasons given by SMEs for participation.

Table 2. Summary of the Reasons Given by SMEs for Study Participation

Environmental awareness
Realize importance of sustainability
Seek support for their own environmental issues
Incorporate some sustainable practices
Be a good steward for the environment protection
Do not know what an EMSs is but are interested in the concept
Community involvement
Feel community responsibility
Education and research appreciation
Want to learn and improve
Want to know the study’s findings
Are willing participants in projects at NSOE and UNC
Appreciate Duke/UNC research
Are honored to participate
Business achievement
Are proud of their business practices
Want to share their experience

We also observed common characteristics of businesses that were not willing to participate. Those small businesses not willing to participate offered several rationales described in Table 3.

Table 3. Summary of the Reasons Given by SMEs for Not Participating in the Study

Lack of available staff
“We are short on staff right now.”
“I am sorry; she called in sick in the morning. You will have to reschedule your appointment.”
Cannot identify competent staff to discuss environmental issues
“I don’t know who I should transfer you to.”
Lack of time to discuss project
“We are in rush hour. Can you call after 5 pm?”
“I am in the meeting. Can you call later?”
“Mr./Ms. X is out today. Can you call tomorrow?”
“I am kind of busy right now. I’ll call you back.”
Lack of time to participate in an hour-long interview
“How long does it take? I am able to spend 20 minutes or less.”

“I am sorry but I don’t have time for an interview. One hour is a lot and I would have to do it in my day off.”
Are disorganized
“I thought the interview was supposed to be at 3 pm” – one interview was scheduled twice at 1 pm and both times the respondent did not show up.
Do not recognize their potential contribution to our study
“I believe that we don’t fit to your model since we are a nonprofit.”
Underestimate and/or do not control environmental aspects of running business
“We don’t pay for energy and water consumption.”
Are tired of being asked about their sustainable practices
“We are not interested. We are already a green certified business.”
Lack interest in environmental studies
“We appreciate that you think of us but we are not interested in your study.”
Focus primarily on survival in current slow economy
“We really appreciate you’re calling us but please, contact us when you do the next study.”
“I regret we must decline to participate at this time. I appreciate the opportunity.”
Are bothered by surveys in general
Hang up immediately
Are not interested in benefits of our study
“I am not interested in learning about benefits of your study.”
Prefer other forms of communication to e-mail
“We are giving up on technology. Can you send it by mail?”
“Could you stop by, bring a copy and tell me about your study?”
“Oh, we didn’t receive your e-mail.”
“Is it possible to fill out the survey during an interview?”
Are prejudiced against particular institutions of higher education
“You are from Duke? Oh, no thank you.”

7.3. Analysis of EMS Data

EMS data was analyzed using the NVivo software program using the process described in the Method section. EMS themes were manually created by researcher-generated codes for specific topics of interest such as EMS capabilities, EMS benefits, EMS obstacles, and organizational characteristics, strengths, and weaknesses. Moreover, several queries and models

were developed to complete the EMS analysis. Quotes incorporated in case studies were identified and attributed through the use of a “quote” code. Quote codes associated with analyzing three case studies - EMS beginners, intermediates and advanceds – were carefully chosen to demonstrate respondents’ authentic answers. For example, one of the EMS beginner’s quote associated with difficulties is, *“It’s [EMS’s] not useful. It’s not realistic for us” (D1)*. One of the EMS intermediate’s quotes associated with limited availability of time and money is, *“It [EMS] can’t be something that takes 6 months, you know, 5 people to be able to operate” (D8)*. One of the EMS advanced’s quotes associated with fewer concerns about EMS obstacles states, *“I am less worried about that because I think one of the things about sustainability is that it does save you a lot after you invest up front so ...” (D6)*.

7.4. Findings/Results/Observations

The findings are divided into the following sections: EMS capabilities, EMS benefits, EMS obstacles, and organizational characteristics, and reflect responses from the thirteen SMEs we interviewed during the initial fieldwork (round one surveys and interviews).

7.4.1. Interviewed Firms and Capabilities that Might Be Important when Implementing EMS

One objective of the EMS analysis was to determine if small businesses have the capabilities necessary to implement an EMS into day-to-day operations. Respondents were asked about 10 organizational capabilities identified through a review of literature. These capabilities are listed below in the Organizational Capabilities tables. Each respondent stated whether or not its organization was strong in or could be improved in listed capabilities. As

shown in Tables 4 and 5, common strong capabilities are health and safety requirements, internal communication, loyal customer base, marketing and branding, project management, recycling, and use of technology. Respondents commonly reported needing some improvement in employee training and outreach, environmental knowledge and experience, and written documentation, guidelines and procedures.

Table 4. Organizational Capabilities (vote counting: out of 13 firms)¹

Capabilities	Strong	Somewhere between	Can Be Improved
Employee training and outreach	5	2	6
Environmental knowledge and experience	4	3	6
Health and safety requirements	6	3	4
Internal communication	11	1	1
Loyal customer base	12	0	1
Marketing and branding	12	0	1
Project management	8	4	1
Recycling	13	0	0
Use of technology	8	2	3
Written documentation, guidelines, and procedures	4	3	5

Table 5. Summary of Organizational Capabilities

Strong Capabilities	Capabilities that Can Be Improved
Health and safety requirements	Employee training and outreach
Internal communication	Environmental knowledge and experience
Loyal customer base	Written documentation, guidelines, and procedures
Marketing and branding	
Project management	
Recycling	
Use of technology	

¹ Not all respondents answered all questions; therefore, some questions do not have 13 votes. In some cases, respondents selected more than one category; therefore some questions have more than 13 votes.

7.4.2. Interviewed Firms and EMS Benefits

The second objective of the EMS analysis was to identify which benefits small businesses considered when developing and implementing an EMS. The respondents were asked about two types of benefits: (1) those that benefited their company’s operations directly, and (2) those that accrued more generally in the marketplace through competitive advantage. These general internal and external benefits were further broken down into concrete examples listed in Table 6. The respondents indicated on a scale of high, medium, and low the motivational impetus of each benefit for their organization to implement an EMS. As seen in Tables 6 and 7, businesses overwhelmingly indicated that both internal and external benefits are considered high for small businesses. Enforcement of many federal, state, and local laws may focus on large enterprises; therefore, the small businesses community may not have a correct or complete knowledge or understanding of legal requirements with which they should comply. This seems to be a reason why five interviewed representatives assigned low value to assured legal compliance as one of the EMS benefits.

Table 6. EMS Benefits (vote counting: out of 13 firms)²

EMS benefits	High	Medium	Low
Internal: benefits to operations			
Cost savings and increased access to capital	10	1	1
Efficient production, processes, and operations	8	1	4
Improved employee morale, motivation, awareness, and qualifications	8	2	1
External: benefits associated with competitive advantage in market			
Assured legal compliance	3	2	5
Better company image among stakeholders	9	2	3

² Not all respondents answered all questions; therefore, some questions do not have 13 votes. In some cases, respondents selected more than one category; therefore some questions have more than 13 votes.

Customer loyalty	7	3	3
Expanded market	6	2	4
Improved cooperation and relationship with customers, regulators, administrative bodies, and other stakeholders	9	1	5
License to operate (ability to stay in business) due to triple bottom line successes	6	3	3
Product differentiation	5	4	3
Setting an example for other companies in the industry	8	2	2

Table 7. Summary of EMS Benefits

High EMS benefits	Low EMS benefits
Better company image among stakeholders	Assured legal compliance
Cost savings and increased access to capital	
Customer loyalty	
Efficient production, processes and operations	
Expanded market	
Improved cooperation and relationship with customers, regulators, administrative bodies, and other stakeholders	
Improved employee morale, motivation, awareness, and qualifications	
License to operate (ability to stay in business) due to triple bottom line successes	
Product differentiation	
Setting an example for other companies in the industry	

7.4.3. Interviewed Firms and EMS Obstacles

A third objective was to discover what obstacles would impede the development and implementation of EMSs by small enterprises. To determine these obstacles the respondents were asked to indicate their views about specific obstacles the research team listed as potential barriers for the organization to implement EMSs. The respondents were asked to assign

preferences based on a scale of high, medium, and low to each barrier. Tables 8 and 9 show that the highest ranked obstacles include financial sources, EMS knowledge, and available time. Firms report communication, corporate culture, legal regulations, motivation, and connection with stakeholder as low obstacles to developing and implementing environmental management systems.

Table 8. EMS Obstacles (vote counting: out of 13 firms)³

EMS obstacles	High	Medium	Low
Communication: slow or no communication			
Achieving thorough documentation	4	1	7
Bureaucracy and perception of it	1	1	7
Management staff disconnected from environmental management staff	3	1	7
Corporate culture: business specific barriers			
Difficulty achieving internal auditor independence	1	1	5
Interrupted and interruptible implementation process	7	3	3
Lack of environmental champion and/or specialist staff	4	2	5
Lack of training	4	3	5
Multifunctional staff easily distracted by other work	9	2	2
Physical office location: water and energy use, access to public transportation systems	4	1	5
Transient workforce	0	4	5
Unfavorable corporate culture	0	1	9
Finance: extra financial burden			
Cost of certification or validation	8	2	3
Cost of consultants	8	2	1
Cost of implementation and maintenance	8	3	2
Knowledge: lack of information about EMSs			
Employee experience	5	4	2

³ Not all respondents answered all questions; therefore, some questions do not have 13 votes. In some cases, respondents selected more than one category; therefore some questions have more than 13 votes.

Knowledge of environmental management requirements	9	1	1
Lack of awareness/understanding of benefits	4	3	2
Lack of knowledge of formalized system	6	2	2
Managers lack understanding of the specific actions that can be taken to improve environmental and financial sustainability	7	1	3
Technical knowledge and skills	8	2	1
Legal regulations: external necessary requirements			
Awareness of ALL relevant legislation affecting operations	2	1	5
Documentation requirements	1	0	6
Uncertainty/concern over possible deregistration/certification for minor breaches/deviations from legislation	1	0	6
Motivation: lack of motivation			
Difficulty of promoting the EMS concept within the organization	4	1	7
Fear of certification process because it opens performance up for public criticism	2	0	9
Identification of non-compliance: "Ignorance is bliss" if non-compliance is difficult to fix	4	0	8
Inability to see relevance of all requirements	2	1	8
Stakeholders: missing connections			
Belief that shareholders don't value an EMS	2	1	9
Inability to access supply chain alternatives or improvements	4	0	8
Lack of customer demand	3	2	6
Lack of public/widespread focus on issues	3	1	7
Lack of support and/or collaboration with government agencies or officials	7	2	4
Lack of support and/or collaboration with NGOs or other experts	6	2	5
Time: lack of time to devote			
Time for record keeping and oversight	9	0	2
Time to specify environmental management requirements	8	2	2
Time to train staff and management	9	0	4

Table 9. Summary of EMS Obstacles

High EMS obstacles	Low EMS obstacles
Finance: extra financial burden	Communication: slow or no communication
Knowledge: lack of information about EMSs	Corporate culture: business specific barriers
Time: lack of time to devote	Legal regulations: external necessary requirements
	Motivation: lack of motivation
	Stakeholders: missing connections

7.4.4. Interviewed Firms and Organization Characteristics

Organizational characteristics may influence an SME's ability and desire to adopt an EMS. Thus the organization assessment was performed to identify organization structure, general organization characteristics, organization partnerships, basic environmental characteristics, and sustainable practices. The results are shown in Table 10.

Table 10. Organization Assessment (vote counting: out of 13 firms)⁴

Organization assessment			
Organization structure	Type:		
	Flat	Inter-mediate	Top-down
Business structure	6	5	2
Organization characteristics	Created/Provided:		
	Yes	No	
Long-term business plan	6	7	
Environmental goals and indicators implemented in business plan	4	9	
Definition of sustainability	12	1	
Incorporate sustainable practices into mission (written/oral)	10	3	
Procedures for monitoring and measuring	4	3	
Procedures for keeping records	6	6	

⁴ Not all respondents answered all questions; therefore, some questions do not have 13 votes.

Procedures for emergency situations	3	3	
Addressing health and safety issues	12	0	
Procedures for identifying legal environmental requirements	2	11	
Other legislative requirements	5	0	
Procedures for governing audits	2	9	
Procedures for reporting audit results	3	5	
Good employees' receptiveness on change towards environmental concerns	12	1	
Organization partnerships	Occurred:		
	never/rarely	frequently/always	
Collaboration in place	3	10	
Mentoring in place	4	9	
Environmental characteristics	Experienced/created/implemented:		
	Yes	No	
Demand for green products	10	3	
Implemented environmental policy	3	10	
Identification of environmental impacts	8	2	
Somebody responsible for identifying environmental impacts	4	6	
Conducted analysis of environmental impacts	3	10	
Documented environmental objectives and targets	3	9	
Employee training about their environmental impacts	9	4	
Audited environmental impacts	7	6	
Implemented environmental management system	2	11	
Sustainable practices	Implemented:		
	Yes	No	Don't know
Alternate transportation assistance for employees	1	12	0
Energy efficiency initiatives	11	0	1
Locating in green or LEED buildings	4	7	0
Recycling	13	0	0
Waste reduction	12	1	0
Water efficiency initiatives	11	1	0
Other	7	6	0
Willingness to incorporate additional sustainable practices	13	0	0

7.4.5. Discussion

To achieve benefits, avoid obstacles, and effectively utilize organizational capabilities and characteristics different, levels of recommended activities and steps were developed for a range of small businesses to develop and implement EMSs. Therefore, three types of potential EMS-adopted firms were studied in greater depth: EMS beginners, EMS intermediates, and EMS advanced. In order to accomplish this, all organizations were separated into three groups.

The first group of small enterprises – EMS beginners – includes organizations that have the least available resources, understanding, and organizational ability to develop their own environmental management system. The second group – EMS intermediates – includes organizations that, although they lack time, money, and knowledge, are more able to use their strengths to establish their own environmental management systems. The third group of small businesses – EMS advanced – is in the process of implementing sustainable practices, as well as collaborating and partnering with other institutions to gain necessary environmental information. Participation in these activities greatly enhances the potential for success in building their own EMS. These three types of businesses present different conditions for implementation of an EMS and will be further described in a case studies section.

Table 11 summarizes the results of the research findings and observations. A three-star scale is used to show potential for developing and implementing EMS at the small businesses we studied.

Table 11. SMEs’s Potential for Developing and Implementing EMS

Categories/elements	EMS beginners	EMS intermediates	EMS advanceds
Behavior:			
Willingness to change	*	**	***
Resources:			
Available time	*	*	**
Available financial resources	*	*	**
People:			
Favorable attitudes and company culture	**	**	***
Management commitment	**	***	***
Employee involvement	*	**	**
Environmental champion	*	**	***
Good communication and feedback	*	**	**
Organization:			
Documented activities	*	**	***
Keep and report progress	*	**	***
Training	*	**	***
Follow-up	*	**	***
Environment:			
Environmental knowledge	*	**	***
Understanding EMS benefits	*	**	***
Willingness to overcome EMS barriers	*	**	***
Extra:			
Implemented sustainable practices	**	**	***
Involved in mentoring/collaboration	*	**	**

Legend:

Three-star scale used for separating small businesses for different level of EMS building		
Intensity	Definition	Explanation
*	Low	Companies struggle to address the mentioned element.
**	Moderate	Companies are on the way for incorporating this named element.
***	High	Companies most likely cover this designated element as best as they can.

7.5. Case studies

Descriptions of SMEs across the range of environmental management systems potential are elaborated in this section.

7.5.1. Case study of EMS Beginners

This type of small enterprise is very lean. These businesses do not have a lot of extra time or man-hours, which limits their ability to invest time in developing an EMS. They have just enough time to produce their products or provide their services. They are also missing a strong group or team of employees who would generate a favorable corporate culture for the adoption of an EMS. Most respondents from this type of businesses feel that their employees would not be in favor of developing an EMS. Employees would not see a direct relationship between spending resources on an EMS and an increase in salary or benefits to themselves. Generally, management and employees believe that the company would not gain much from developing and implementing an EMS. They feel that when they take environmental actions like recycling they are doing enough and they do not need to do more. However, they realize that they are missing knowledge resources that might help them understand how an EMS could be beneficial.

EMS beginners are facing one of the most challenging economies in recent history. Their focus on survival makes it more difficult to divert energy, time, or resources to other issues. Thus short term goals are preferred to the development of new initiatives such as an EMS. *“I don’t know any small businesses that are raking in money. We are making a living and right now that’s not as clear. So anything like that that doesn’t contribute immediately and powerfully to the bottom line is not going to be considered until things get better” (D1).*

EMS beginners we interviewed also tend to have multifunctional staff that performs multiple jobs, going back and forth among daily tasks. Written documentation of their tasks or goals is rarely if ever developed. *“It’s not useful. It’s not realistic for us” (D1)*. Moreover, they concede that if they were to develop an EMS it would need to be very brief since it would add to their already heavy workload. Simple EMS information at a reasonable cost (preferably free) would be very helpful for them. *“You know if there was sort of an environmental management system thing or checklist or guide or something that we could use to help implement these things it would be helpful. I have to say that the only way that I really feel like I could get my people to go along with it would be to say if we do this we’ll save money or we can be more efficient or we can ... And of course I care about improved employee morale, motivation and everything but I don’t think they care about it” (D3)*.

Even though EMS beginners have the least potential for incorporating an environmental management system into their operations, they were willing to participate in our research. Their participation indicates that they may understand importance of sustainability and are willing to learn and improve. *“How small you are ... you want to do stuff right” (D5)*.

EMS beginners need EMSs that could be embedded in their day-to-day operations since they are not particularly good at doing things once every little while. They need a quick and easy resource that is trustworthy and useful.

7.5.2. Case Study of EMS Intermediates

The EMS intermediates are open to new things. These small organizations very often employ long-term employees who have institutional knowledge related to their own jobs as well as they know how the larger organization is run. Training of employees is performed as needed,

although some interviewees concede this need is sometimes not obvious until the actual work is in progress or some work difficulties arise. Some EMS intermediates have periodic staff training; however, they are not doing significant training on environmental issues. Some EMS intermediates feel that since they do not have many employees, their informal training is adequate. Others provide off-site training for their employees. EMS intermediates' written documentation is strong on their core business activities, but weaker on other components.

EMS intermediates' perception is that developing an EMS is going to slow them down, more than anything, just because it will involve implementing something new. However, they believe that once they establish the company's guidelines and a routine, EMS will become easier. *"I think right now we are still on that learning curve so that ... right now it's sort of a hindrance but I am sure in long-term it's going to be a good thing" (F1).*

EMS intermediates have been fairly enthusiastic about environmental stewardship and have already incorporated some basic environmentally sustainable practices. They are willing to do more because it is good for the planet, but they may lack formalized environmental knowledge or experience. EMS intermediates need to increase their environmental knowledge, but most indicate they are working on it. They are aware of some helpful online resources but have not utilized them much. They are aware of environmental issues but they do not have specific EMS knowledge. EMS intermediates often have an environmental champion who is working to promote environmental interests in the organization. An EMS would present a moderate interruption to the daily routine of EMS intermediates.

Much like EMS beginners, EMS intermediates have limited time and money to devote to sustainable practices. *"It can't be something that takes 6 months, you know, 5 people to be able*

to operate” (D8). Nevertheless, they state if they find achievable goals, they will mobilize the resources to develop and implement an EMS.

EMS intermediates are further along in terms of environmental sustainability than EMS beginners because their primary EMS obstacle is determining where to obtain the information they need to develop an EMS. Some of them would rather see a detailed, step-by-step guide without unnecessary explanations. *“I think if it was simplified for small business because we are ... we wear so many hats. If there was something that would make it just one sentence ... you don’t need to explain it to me why I should turn off the lights just tell me turn them off”* (F3). On the other hand, some small enterprises emphasize that an explanation for the development of a certain step in an EMS is essential for them to know in order for them to proceed with an EMS.

EMS intermediates need an EMS that would be embedded into their business’s philosophy, goals, and thinking. Since EMS intermediates do not seem to have difficulties using online resources to find information, an online interactive approach might be appropriate.

7.5.3. Case Study of EMS Advanceds

EMS advanceds are small businesses that have an internal philosophy and culture that supports developing and implementing an EMS. In several cases, EMS advanceds stated that they would like to implement an EMS but would need to fit its development and implementation into their busy schedule. EMS advanceds are pioneers or leaders in certain environmentally sustainable activities, and they have been talking or piloting environmental activities before other firms in the same sector have even heard of these environmental activities. They want to be an example for other firms. Thanks to their early adopter approach, EMS advanceds attract others - such as business owners, customers, and regulators - that appreciate their efforts. This

encourages EMS advanceds to continue to do more. *“It’s not like just we are talking to ourselves anymore so I think that makes it more inspiring for us” (D7)*. They see communication as one of the strengths that they use for reporting their achievements, *“... communicating because we are good at that, we can communicate about sustainability” (D6)*.

EMS advanceds focus more than the other groups on long-term goals. They have a strategic business plan that, in most cases, includes environmental objectives or targets. Training is periodic and thorough, and it is mostly about the implications of employees’ actions. Their corporate culture is extremely positive regarding environmental sustainability. EMS advanceds possess strong core values that are, in many cases, tied to sustainability. They are involved in environmental tasks because it makes them feel good. Furthermore, they feel obligated to show that they are responsible toward the environment. Perhaps as a consequence, these businesses employ people that inherently value environmental stewardship.

EMS advanceds seem to have mastered the “basic” sustainability tasks. Their environmental questions are more specific and advanced. They are also involved in a variety of partnerships, including mentoring. These small businesses have a strong community presence that makes it easier to get other organizations to partner with them. EMS advanceds also want to be good citizens of their communities and see themselves as proxies for their employees and customers; they are making better environmental citizens of individuals and making the world a better place in which to live.

EMS advanceds are extremely good at written programs and view that as one of their strengths. *“We have a Work Structure Breakdown for everything including how to answer the phone” (D6)*. They have just never taken this strength and produce environmental documents.

Although they mention time and money as things to be aware of, they are less concerned about these obstacles than EMS beginners or intermediates. *“I am less worried about that because I think one of the things about sustainability is that it does save you a lot after you invest up front ...” (D6).*

EMS advanceds seem to need help on a different level. They have specific EMS or environmental questions which might be easier to get answered from professionals in their business sector. Mentoring programs might help them to utilize their environmental knowledge and pave the way for them to build an EMS.

7.6. EMS Template/Tool/Guideline⁵

The EMS guide that has been developed is loosely based on the international standard ISO 14001 model and its elements. This EMS tool is a structured plan for addressing the impacts of small organizations on the environment. By planning, implementing, checking, reviewing by management, and continually improving, small enterprises can become more effective and efficient in the management of their activities and the impacts of those activities on the environment. The five main components of the ISO 14001 standard; environmental policy, planning, implementation and operation, checking and corrective action, and management review; are configured in this EMS tool in a way that best suits small enterprises.

Tinsley presented the nine steps to a successful environmental management plan that are, to the certain degree, applicable to the small businesses (Tinsley, 2001). The following steps are used in the EMS guide as appropriate: define what has to be done, form the basis for the plan,

⁵ The drafted “EMS Guide for SME” is provided in an Appendix 1.

obtain management agreement, assemble a working group, seek employee feedback, set deadlines, communicate, provide visible signs of progress, and see people as shades of green.

SMEs should not use common formalized guidelines since they are more appropriate for large firms which neither have the same needs nor operate under the same social and economic constraints. Furthermore, SMEs should have an approach tailored to their level of EMS potential. Bearing this in mind, three different approaches for drafting EMS templates/guides/tools were incorporated into our “EMS Guide for SME: Small Steps towards Continuing Organizational Improvement through Developing and Implementing an Informal Environmental Management System.”

7.6.1. Initial Categorizing of the Businesses

To facilitate the EMS development process in SMEs, the EMS tool we developed contains an initial categorization followed by 3 sections, each of which corresponds to an EMS type: beginner, intermediate, advanced. The tool’s initial categorization contains a set of review questions that should be used to make further EMS development easier and more tailored to the organization. The review questions correspond to the categories offered in Table 11: behavior, people, organization, environment, and other. Time and financial resources are the main obstacles for EMS development in small businesses; therefore this tool includes simple steps that require a reasonable amount of time to complete and involve few expenses.

The three following sections serve as templates that can be used by small businesses to start building informal EMSs.

7.6.2. EMS Beginners

For EMS beginners, the major challenge in building an EMS is to alter their employees' and managers' behavior. They have to realize that addressing their environmental impacts more responsibly can benefit not only their small business but also can be seen as benefiting the individual, the industry, and the wider environment. EMS beginners need to accept that an EMS is a positive change towards more proactive environmental behavior, and is also a key to success. The simplest and easiest way is to develop an environmental statement that sets out their commitment to protect the environment, prevent pollution, and continuously improve company environmental performance. This statement will indicate that small businesses are serious about their commitment to the environment. Small businesses should consider their already-established business values and integrate environmental commitment within them. This statement should be drafted by management with help from an environmental champion, if applicable. This statement should be explained to, and discussed with, the employees. Employees should be encouraged to provide comments and feedback. Finally, the statement should be signed by management and posted. After management and employees are familiar and satisfied with the environmental commitment, they should review the organization's activities and processes to identify and list those areas of the business's operations that may harm the environment as well as the ways in which their processes benefit the environment.

For EMS beginners seeking to change environmental behavior, a 3-part framework described in Chip Heath and Dan Heath's book, Switch: How to Change Things when Change Is Hard can be used as reference (Heath & Heath, 2010). The first part, "Direct the Rider" discusses the importance of providing perfectly clear directions, such as, in this case: 1) drafting an environmental statement and involving employees into the entire process of creating

environmental statement, 2) having management sign this statement and publicize it, and 3) tracking the business's activities that may have impacts on the environment. The second part of Switch is called "Motivate the Elephant," and it discusses how to engage people emotionally. Small businesses owners should realize that an EMS is a positive change. They already know the facts about environmental degradation of our planet but they must feel that they have an impact on the environmental quality of the planet and that their business needs to change. Small business owners must acknowledge social and moral obligations that their organization has real effects and also understand that they have the power to make change. Importantly they must set small achievable steps toward building one's own EMS that lead to feelings of accomplishment and opportunities to successfully manage their environmental impacts. Employees, customers, suppliers, and competitors will sense this change and will be attracted to it, contributing to the feeling of accomplishing something important not only for their own business but also for our planet. In general it means that adopting environmental management systems will improve corporate environmental performance and therefore also improve the global environment. The third part of Switch, "Shape the Path," explains that it is necessary to pioneer the way forward. For this project, we created a one-page step-by-step guideline directing small businesses on how to initiate EMS, shaping a path for those who have motivation but lack direction.

Further elaboration of SMEs's motivations for implementing sustainable practices in general can be found in the Part A of this report.

7.6.3. EMS Intermediates

EMS intermediates have a running start in EMS development, but they need help getting to the next level. They are not afraid of change and are willing to search for necessary

information to get started. Setting up an action plan that includes environmental goals and indicators seems to be the most effective approach for them. To assure that environmental goals will be carried out, the action plan must be carefully developed based on the input of employees in each “department” who will be doing the work involved in the EMS. Establishing clear time frames and assigning personnel to specific tasks is essential to the success of this process.

EMS intermediates seem to be open to interactive approaches available through literature or online sources. Therefore, it might be appropriate for intermediates to rely on examples for establishing environmental goals, determining necessary actions, and monitoring their progress against their action plan. *Documenting Your Environmental Management Plan: A Workbook for Small Business* (EPA Small Business Division, 2003) is a useful resource as it provides a worksheet for setting goals and lists example goals. Moreover, its standard operating procedure worksheet could help small businesses set up their own action plan. Also, the worksheet for performance monitoring would help them with monitoring and measuring progress.

7.6.4. EMS Advanceds

EMS advanceds have several environmental activities in place. They need to gather all these actions, as well as written or oral environmental guidance, together in one place for examination and prioritization. By evaluating their current efforts, these businesses can then determine their current environmental questions and begin developing a more sophisticated EMS. EMS advanceds can also seek out environmental management assistance through communicating with their peer-organizations, contacting small business centers, attending small business classes, browsing EMS online sources, and reviewing other EMS resources.

Mentoring can provide non-threatening, low-risk, low-cost, and effective means of introducing EMS advanced to new concepts and implementations of EMS to achieve better environmental results. Our guide strongly recommends that EMS advanced develop a mentoring relationship with a business leader that has already implemented an EMS. The mentors would most likely be larger companies, academic institutions, or environmental nonprofit organizations interested in sharing their environmental management knowledge. This type of mentoring would require some degree of direct interaction for assisting in building an EMS and could be done directly or with a group of companies in the same business sector. These mentoring programs could be targeted around specific environmental issues related to small businesses environmental management plan as a part of the EMS or directly focused on drafting an environmental management system (Tunnessen, 2000). Further elaboration of mentoring is discussed in Part C of this report.

7.6.5. Discussion

The drafted guidelines, in the form of a word document, were emailed to all small and medium sized enterprises in Durham and Fayetteville interviewed during round one. They were asked to answer the following questions:

1. How did you answer the initial-business categorization questions? What was your score?
2. Did you find the section you were directed to helpful, understandable, and feasible?
3. Would you prefer other two sections for developing the EMS?
4. Overall, how would you evaluate your satisfaction with this EMS tool?

Seven out of thirteen SMEs (54%) gave us feedback and comments. Their scores to the initial business categorization questions confirmed our expected categorization. SMEs perceived

as EMS beginners scored as EMS beginners, SMEs perceived as EMS intermediates received scores as EMS intermediates (except one that reached the final score as an EMS advanced), and SMEs perceived as EMS advanced fell in the group of EMS advanced. All SMEs found the section related to their EMS potential clear, appropriate, helpful and understandable. They highly appreciated having the three sections, no matter what stage they fit into, for developing the EMS. Overall the respondents were very satisfied with the tool. In the respondents' own words: *"I think it is a good mix of easy to understand and implement with specific recommendations and goals"* (D3), *"A Good tool. Straightforward"* (D6), and *"I think this is a helpful step"* (D7).

Two respondents (both EMS advanced) would appreciate adding some examples, success stories, further explanations of the EMS systems, samples EMSs for a specific type of small business, and other ways to direct their movement forward. The current form of the tool is not appropriate for adding these inputs. Transforming the "EMS Guide for SME" tool into a web-interface format would allow adding links to meet these requirements. However, including those examples, links, and samples would make the tool less concise, straightforward and more time-consuming. That might discourage EMS beginners and intermediates from using this EMS tool.

The "EMS Guide for SME" tool tries to make small businesses eco-optimists rather than environmental protection perfectionists. As eco-optimists the small businesses should have high environmental protection standards but should also be comfortable with achieving small steps and accept the fact that sometimes their efforts will be less successful than planned. However, if they fail, they should be able to reincorporate this information into their EMS and redirect their efforts into more successful environmental initiatives.

7.7. Conclusion

Is it feasible for small and medium sized enterprises to incorporate environmental management systems into their business practices to enhance their sustainability? Yes, the EMS part of this study concludes that it is feasible through the development and implementation of a simplified EMS that is appropriate for the needs of SMEs.

EMSs focus on how an organization manages its environmental risk and opportunities. The implementation of an EMS can help a company address its overall impacts on the environment and provide an appropriate process and organizational structure for the organization's efforts to become and remain environmentally sustainable. The EMS has been primarily utilized by large companies, but it can be used by small and medium sized enterprises as well.

Specifically, several conclusions can be drawn from this research. First, this EMS research confirms the notion that even though small businesses struggle with barriers and obstacles in the implementation of sustainable practices into their daily operations, they realize as members of business community they must continually improve their environmental performance. Second, small businesses value internal and external benefits that EMSs can provide. Third, they view time constraint, lack of financial resources, and low environmental knowledge as the main obstacles that hinder them from considering developing an EMS.

Based on these initial observations we have discovered that small businesses need tailored technical tools for implementing an EMS. In recent history, overcoming EMS barriers and enhancing EMS benefits have been emphasized in tools and guides that have been tried for implementing EMSs. However, these guides appear to be too rigid and too formalized for

successful use by small business. In order to help small businesses find appropriate EMS templates, small businesses must be approached sensitively, individually, and exclusively.

Ultimately, comments from interviewed respondents and findings from EMS literature review were used to produce a usable template with guidelines specifically applicable to the opportunities and obstacles faced by small businesses in the development and implementation of EMSs. The guide contains an initial categorizing of businesses, followed by 3 sections, each of which corresponds to an EMS business type. Each section is comprised of three simple steps for initiating (EMS beginners), developing (EMS intermediates), and enhancing (EMS advanced) the EMS in small and medium sized enterprises. The final step encourages all SMEs to improve their environmental performance continuously.

Small and medium sized enterprises have to remember that small changes can reap big benefits for both their business and the planet. An informal environmental management system is one sustainable practice that can assist SMEs in their efforts to be good environmental stewards.

8. Part C: Implementing Environmentally Sustainable Practices at Small and Medium Enterprises: Mentoring

A discussion of environmental peer-to-peer mentoring and its applicability in North Carolina follows.

8.1. Mentoring Scope

In particular, this section of the report examines the feasibility of and rationale for participation in a SME mentoring program and works to identify criteria for establishing a successful program. The following research questions are examined in order to enhance the overall success of the project.

1. Can mentoring and knowledge-sharing relationships facilitate small business efforts to become environmentally sustainable; if so, how?
2. Why would organizations choose to be involved in a mentoring relationship?
3. How should an EPA-sponsored environmental peer-to-peer mentoring system be structured?

Background research and surveys of small business representatives were performed to determine four main things: 1) SME perspectives on the advantages and disadvantages of mentoring as a strategy for disseminating environmental sustainability information, 2) motivations and barriers to participating in a mentoring program, 3) prerequisites to successful mentoring relationships, and 4) mentoring guidelines for our project. This work provides a better

understanding of SMEs's perceived benefit from sustainability-focused partnerships, training, and technical assistance from researchers and mentors.

By looking at whether people view mentoring as beneficial and whether organizations have prior experience with mentoring, we determine that there is interest in the program among both potential mentor and mentee organizations. Furthermore, by finding out what small businesses identify as barriers to participating in a mentoring program and specifically asking for advice, we have established initial guidelines for the structure our peer-to-peer mentoring program.

8.2. Mentoring Literature Review

Environmental peer-to-peer mentoring is a strategy that the EPA believes may help SMEs more successfully learn about and implement environmental sustainability practices. Mentoring is “the art of facilitating the professional and personal development of another” and it may occur in short moments or via the establishment of long-term, trusting relationships; the hope is that mentors will be able to share their experience and knowledge in a way that helps others to move ahead faster or in a better way (Canfield, 2009). Environmental mentoring is “the use of expertise to help another entity improve its environmental management and performance” (Tunnessen, 2000). Peer-to-peer mentoring is a form of mentoring in which a network of individuals or companies share information and counsel each other (Pollution Prevention Program, 2002).

Ultimately, the EPA would like to determine the feasibility of establishing a network in the southeastern US of SME professionals interested in the environment. Professionals would meet periodically to share their ideas and experiences and learn from each other. This work

identifies initial recommendations for the structure of such a program. Using mentoring to engage SMEs in environmental discussions is relatively recent, but is perceived to be a fairly low-cost, low-risk approach for regulatory agencies to increase compliance with environmental regulations and assist the development of environmental leaders by introducing small companies and strategies for achieving better environmental results (Tunnessen, 2000).

8.2.1. Functions of Mentoring

There are four main functions of environmental peer-to-peer mentoring. They are: 1) information sharing, 2) compliance assistance, 3) environmental management assistance, and 4) training and enhancing technical and managerial skills (Tunnessen, 2000; Pollution Prevention Program, 2002). SME mentor pairs may learn about each other's environmentally sustainable practices and explore options and ideas together (Tunnessen, 2000). According to Barrett (2006), the purpose of mentoring relationships is for participants to learn from each other's experiences, not to provide business advice or propose solutions to business issues. The role of a mentor is to help their mentee (in this case, the SME employee) explore options and ideas that can be used to solve business issues (Tunnessen, 2000; Barrett, 2006; Pollution Prevention Program, 2002). Mentoring relationships may also help SMEs identify business inputs and outputs and get a handle on their environmental impacts before the SMEs establish environmental goals and targets.

According to Tunnessen (2000), the main goal of environmental mentoring is to provide help so that SMEs may achieve and maintain minimum compliance with environmental regulations and/or exceed these requirements to establish best management practices. To achieve this, a mentor may help a mentee create a "compliance drawer" by permit or application

so the mentee has a record-keeping system, or help deal with licenses/fees, compliance reporting, compliance plans, and other documentation. Depending on the degree of trust, mentors may help mentees create compliance schedules or share strategies for organizing a safety and environmental team to help identify pollution prevention opportunities.

Keeping up with technological innovation and environmental best practices can be a major challenge for corporate managers and small business owners. Mentoring can be a means of training (Burgoyne & Hodgson, 1983) that can enhance a small business's technical and managerial skills (Robertson, 2003). According to Kaye and Jacobson (1996) as cited in Tunnessen (2000), mentors facilitate intentional learning through instruction, coaching, modeling, and advising in order to help mentees develop their skills, and may possibly persuade the mentees that having good environmental management programs is important. In terms of providing environmental management assistance, mentoring may help change SME perceptions to show that an EMS is important to economic performance, develop strategies for creating performance plans, and/or develop ways to integrate training into employees' schedules (Tunnessen, 2000). Explaining environmental ideas and concepts is a critical technical task that mentors can perform, although mentoring benefits are not limited to improved environmental stewardship.

According to Tunnessen (2000), most mentoring activities can be categorized by function into one of three types – information sharing, compliance assistance, and environmental management assistance – and the ultimate form of a mentoring relationship depends on the reasons the relationship was established and its sponsorship. Information sharing strategies may involve newsletters, workshops, guidebooks, websites, and/or listservs. Compliance assistance may require site visits, audits and reviews, telephone counseling, training, and/or corrective

actions for compliance issues. Environmental management assistance may require help creating management systems and/or identifying pollution prevention and process change opportunities.

8.2.2. Peer-to-Peer Mentoring Structure

The sponsorship of a mentoring program influences how the program is perceived and who is willing to participate. Sponsorship describes who organizes, supports, and provides the mentors with materials and direction for the program. In the US, many SMEs are suspicious of government agency-sponsored mentoring and technical assistance programs because they fear that participation in the programs may expose them to increased inspections and enforcement (Tunnessen, 2000). Furthermore, government and university-based mentors might be seen by some businesses as lacking an adequate commercial experience so mentees may be hesitant to work with them even though these mentors may have more resources to dedicate toward addressing technical issues. Alternately, under a business-to-business mentoring relationship, smaller companies may benefit from larger companies' greater access to resources and experience in creating environmental management strategies (Tunnessen, 2000), but may fear competition from partners acting in poor faith or being perceived as somehow inferior for needing assistance (Pollution Prevention Program, 2002).

Periodic learning groups around specific topics may be established. There may be a dedicated third-party facilitator (such as the EPA) or mentors and mentees may have to establish their relationship independently. Mentors and their support systems may either be paid or volunteer. Mentees may rely on several individuals, books, inspirational quotes, or other information as available mentoring resources (Uncommon Individual Foundation, 2009). Regardless, the mentor network provides collective expertise around an issue and helps an SME

develop the tools necessary to implement an idea, such as a business plan or marketing strategy.

8.2.3. Benefits of Mentoring

Benefits of mentoring depend on many factors, including the type of mentoring, the structure of the relationship, and which participants we are discussing. While much work has been done examining mentoring on an individual level and in larger firms, there is still a lack of useful strategies and research regarding the general and practical implementation of mentoring between different small businesses and mentoring across sectors on a particular set of issues (Peel, 2004). By establishing relationships built on trust, a few main mutual benefits from mentoring develop: 1) knowledge acquisition, 2) information distribution, 3) information interpretation, and 4) organizational memory (Tunnessen, 2000; Huber, 1991).

Environmental mentoring is intended to help an SME achieve environmental improvements; benefits may include greater efficiency in achieving solutions to environmental problems, networking, and enhanced public image (Pollution Prevention Program, 2002). Mentors may: 1) explain technical issues; 2) provide insight into environmental management issues; 3) explain control technology; and 4) help enable process changes, effective use of consultants, and management of reporting paperwork (Tunnessen, 2000).

8.2.3.1. Benefits for Mentees

Benefits for mentees include access to a wide knowledge base and range of experiences from the mentors. By gaining access to mentors' environmental expertise, mentees may benefit from general or specific advice and suggestions and cost saving ideas. Furthermore, if the relationship is between supply chain organizations, it may help to ensure an SME's inclusion in

the supply chain. Additionally, the mentees may be able to build stronger relationships with customers as a result of their improved environmental practices. For further elaboration of these benefits, see Tunnessen (2000).

8.2.3.2 Benefits for Mentors

The benefits that a mentor may receive depend on the specific type of mentor we are talking about, and may thus be related to the sponsorship issue. If the mentor is another business – either large or small – that organization may be recognized as an environmental leader by the public and regulators. This may provide them with improved community trust, an enhanced public image and a stronger brand name due to demonstrable environmental excellence (Tunnessen, 2000; Pollution Prevention Program, 2002). Benefits may also include improved employee satisfaction if environmental stewardship is an integrated part of the corporate culture (Tunnessen, 2000). By working with other organizations, the mentor may develop an increased knowledge of EMSs and/or identify important changes for their own facilities/operations. Mentors may develop better relationships with their supply chain and learn more about their suppliers and strengthen the supplier-customer relationship. They may increase their strategic positioning in development of more environmentally friendly products (Tunnessen, 2000).

If the mentor is a government agency, the agency may benefit from ensured compliance and improved environmental performance through a relatively cheap and low risk strategy. Through establishing a long-term relationship, mentoring may facilitate trust building between agencies, the regulated community, and the public. Agencies may be able to maintain and lure companies to their jurisdictions via these active partnerships. Importantly, government agency

mentors may gain greater understanding of SME issues and use that knowledge to inform policy, rule-making, and enforcement decisions (Tunnessen, 2000).

8.2.4. Barriers to Mentoring

While mentoring relationships have many potential benefits, there are barriers to their successful development. Barriers may include: 1) concerns over liability, 2) competition, 3) resource constraints, and 4) the perception that being a mentee and requiring assistance means that you are a less successful organization or have environmental problems that will bring you to the attention of government regulators (Pollution Prevention Program, 2002). In terms of resource constraints, time, staff, and money are listed as the major concerns. Additionally, the term “Mentor” itself may have a negative connotation, conjuring up concerns over liability and excessive resource use and the perception of hierarchy or leadership (Pollution Prevention Program, 2002). Simply defining the program differently – partnering or networking – may minimize this barrier.

8.2.5. Effective Mentoring Agreements

Many mentoring relationships begin as a result of an active leader taking initiative for addressing a particular passion or problem. They are most likely to succeed when organized around a common theme, with an active facilitator, credible participants, and a flexible framework (Pollution Prevention Program, 2002). For formal mentoring to be effective, an agreed upon framework and mentoring procedure must be established and followed (Barrett, 2006). Many factors influence the potential success of mentoring relationships, including how

well mentors relate in terms of their individual attitudes, knowledge, and interpersonal skills (Kram, 1985), cognitive style or similarity (Armstrong et al., 2002), and their general ability to get along (Broome, 1996). The proactivity of the mentee is also crucial to mentoring success (Ensher and Murphy, 2005). Organizational behavior, imperatives, and culture must be factored into the development of any coaching or mentoring strategy for the efforts to be appropriate for the specific company's context (Peel, 2004). To succeed, relationships must have specified time commitments to reduce the burden on volunteers and mentors must have expertise that relates to the function and goals of the mentoring program, be willing to share knowledge, have strong communication skills, and, if a company, be in compliance with environmental regulations themselves (Tunnessen, 2000).

8.3. Field Research Process for Collecting Mentoring Data

The five mentoring and collaboration questions in the round one interviews were:

1. How would you describe your efforts to collaborate or partner with other organizations to address environmental impacts?
2. How often does collaboration occur between organizations in your industry and those potential partners in the following list (same sector firms, government agencies, non-governmental organizations, academic institutions, and other)? Has your organization had experience with collaborations that have been environmentally related? If so, please describe them.
3. Do you see any potential benefits of collaboration and/or mentoring in efforts to become more sustainable? If yes, please describe them.

4. What benefits of collaboration might your company receive that would serve as motivation to become more environmentally sustainable (e.g. financial, consumer demand)? Why?
5. Do you see any potential barriers of collaboration and/or mentoring in efforts to become more sustainable? If yes, please describe them.

During the round two interviews we asked the same questions as in the round one interviews, but we expanded the discussion on mentoring and were less structured. Since the round two respondents were identified as being from more environmentally-minded organizations that may serve as mentors in an EPA program, we asked them to describe their collaborative experiences in detail. We asked respondents to describe their relationships with particular people or groups who have been most helpful in terms of information and idea sharing for them. We asked about the process of getting environmental certifications and the SME-certifier relationship. We asked about the impacts of these relationships on the SMEs and what sorts of positive and negative expectations they have for involvement in a mentoring program. We asked respondents to identify types of assistance that would be most beneficial in future efforts to mentor/be mentored by other organizations.

8.4. Mentoring Analysis

Information related to the feasibility of establishing mentoring relationships, mentoring structure, previous mentoring experience, and rationale for project involvement was identified in the transcripts. The four main topics addressed in the interview data include: 1) motivations for participation in mentoring project, 2) barriers to participation in mentoring project, 3) existing

mentoring relationships, and 4) suggestions for a mentoring project structure. Environmental mentoring was determined to be feasible in NC because both round one and round two respondents identified more motivational factors than barriers to establishing mentoring relationships. This indicates that there is support from both potential mentee (round one) and potential mentor (round two) organizations to participate in a pilot project.

Due to time constraints, round two interviews were not completely transcribed. Rather, relevant quotes were transcribed that addressed topics of concern or gaps in understanding identified in the analysis of the round one interviews. These quotes were used to enhance our understanding of key issues related to mentoring and provide additional guidance for the establishment of our own peer-to-peer mentoring project.

8.5. Mentoring Results

We asked SMEs to identify those benefits of mentoring or collaboration that would motivate them to become more environmentally sustainable. For SMEs that are trying to implement sustainability practices, we assume that these benefits would also motivate them to be part of a mentoring program. The investigators identified six major types of motivators based on the round one surveys:

1. Knowledge and information exchange,
2. Financial benefits,
3. Marketing and branding,
4. The lack of personnel or other resources (and thus the need for additional assistance),

5. Dealing with similar issues (and thus forming a network which may be able to provide counsel and technical assistance for particular problems and stop the SME from reinventing the wheel or feeling too isolated), and
6. Achieving a green certification of some kind.

Seven respondents mentioned knowledge and information sharing as a motivation for becoming more environmentally sustainable; 4 mentioned financial benefits, 3 marketing and branding, 2 a lack of personnel or other resources, and 1 each for dealing with similar issues and certification.

Regarding mentoring, respondent D6 said simply, *“I can’t think of any downside.”* The enthusiasm for gaining knowledge and information exchange was clear. Respondent D5 elaborates, *“[I]t betters policy to yourselves by collaborating ... then you get to know what others are doing.”* Respondent D1 positively viewed the potential for having a mentor serve as a leader saying, *“Yes, I could see that as being a big help, having somebody come in and take charge of... make that happen, it’s a lot easier.”* Respondent D7 thought that it was valuable to have networking opportunities in order to *“recognize you are not alone; you are not on an island. There are tons of small businesses struggling with the exact same issues that you have.”*

Respondent M1 believes that the primary benefits of his organization’s existing informal partnerships are the sharing of knowledge and material and the exchanging of advice on sustainability practice developed through the research and practical experience of each partner. Respondent M3 benefits from recognition as an environmental leader from serving on environmental panels and having won awards; he believes that many patrons choose to support his enterprise because his SME’s environmental efforts help the community and the community members recognize and respect that. For respondent M4, the main benefits were financial, but

the ability for managers and staff to live their principles was so important that it prompted the organization to move into a Leadership in Energy and Environmental Design (LEED) certified building – which is an expensive and time consuming endeavor.

Table 12 shows how the benefits associated with mentoring from the literature review compare to those identified from this project. As you can see, respondents perceive more benefits to mentoring than the literature discusses, but both sources focus on the benefits of shared knowledge as well as improved organizational memory and management. Interviewees provided more detailed, specific benefits of mentoring. Note that strengthening community values and connections is mentioned as a specific benefit of mentoring, thereby supporting the conclusion from Part A that community connectedness is a motivator for sustainability projects.

Table 12. Summary Table of Benefits of Mentoring Relationships

Benefits of Mentoring from the Literature	Benefits of Mentoring from the Respondents
Knowledge acquisition and information distribution	Knowledge and information sharing
Information interpretation	Deal with similar issues
Organizational memory	Organizational memory and management improvements
Increased efficiency in solving environmental problems	Account for/compensate lack of personnel or other resources
Networking	Consumer demand
Enhanced public image	Marketing and branding, certification
	Strengthen community values and connections
	Financial benefits

Conversely, we assume the barriers of collaboration and/or mentoring in efforts to become more sustainable might disincentivize participation in a mentoring program, i.e. make participation less desirable by making participation more difficult. Four major barriers were identified from analysis of the round one surveys. Two respondents believed that there were none. The major barriers were:

1. Competition,
2. Time,
3. Finances, and
4. Sector tensions.

Location was described as important, but not as a barrier per se, and will be discussed separately. Four respondents, all located in Durham, mentioned competition as a barrier to mentoring. Time was mentioned by three round one respondents, while finances and sector tensions were each mentioned by one. To illustrate the potential problem posed by competition, respondent D4 said, *“People in our industry when we go to shop ... [with] each other [to] share information, people get real resistant to let you know too much because they think that you are going to be able to steal their ... whatever they just got.”*

Interestingly, there was a divide among the round one respondents who reported barriers to mentoring. Organizations with mentoring experiences discuss barriers to mentoring projects less frequently than those without the experience. Two out of 4 respondents with mentoring experience mentioned barriers; of the two, one said that there were no barriers and the other mentioned finances. Six out of 8 respondents without formal experience in mentoring relationships mentioned potential barriers to mentoring, listing competition, time, and sector tension.

The organizations from Fayetteville are all involved with Sustainable Sandhills (a formal mentoring program with the goal of green certification), while most Durham firms did not have formal mentoring, particularly related to environmental concerns. Now that Green Plus (a nonprofit organization that certifies businesses as sustainable) in Durham is becoming more established, there are more organizations that are directly comparable in terms of progress made

towards environmental goals. For now, the comparison is useful because the Durham respondents tell us more about the barriers to mentoring relationships than the Fayetteville ones do. The fact that Fayetteville and Durham organizations both talk about information and marketing as benefits suggest that these benefits are motivators and outcomes on which our peer-to-peer mentoring project should focus.

Round two responses were similar to those from round one. Respondent M1 discussed how the time involved even in informal information exchange could be extensive and how it was difficult to meet with more than a few partners in a meaningful way. Respondent M4 emphasized how some obstacles to environmental stewardship were county specific. For example, in Cumberland County there are very limited recycling services offered by the government. He also highlighted the importance of establishing buy-in from both management and staff through an example of a mentoring relationship that soured. He was helping an SME evaluate its environmental impacts in order for them to get a green certification, and the organization had a very enthusiastic internal champion, but the senior management had not bought in to the importance of the certification and so the whole effort failed.

Table 13 shows how the barriers to mentoring identified in the literature compare to those identified from this project. As you can see, competition and resource constraints were barriers common to the literature and our respondents. Interestingly, liability concerns and concerns about outsiders' perceptions of the mentee did not come up in our discussions. Liability concerns may not have arisen because liability concerns likely become more apparent when specific advice is being given and documents signed. Also, the SMEs we interviewed are probably less likely to worry about perceived inferiority because, just by meeting with us, they indicated a willingness to get help.

Table 13. Summary Table of Barriers to Mentoring Relationships

Barriers to Mentoring from the Literature	Barriers to Mentoring from the Respondents
Competition	Competition
Concerns over liability	Time
Resource constraints	Finances, Adequate Compensation for Work
Perception of inferiority for mentee	Sector tension

8.6. Structure of Mentoring Project

Based on the responses to the round one semi-structured interviews, two recommendations for the structure of the proposed EPA mentoring project have been identified. Organizations located near each other should be paired together and mentees should, at least initially, go to the mentors. These concerns relate to the time and resource expenditure of people potentially involved in the project. This supports our background research that suggests that the most successful mentoring projects are those where the mentees are proactive, know what they want to get out of the relationship, and are respectful of the mentor.

The importance of a critical mass of interested parties and their proximate location was mentioned by respondent D7 as a facilitating condition for a mentoring relationship, saying,

“I wouldn’t say it’s a barrier but I don’t think that’s ... we talked about the critical mass you want to transform the neighborhood. ... It’s much easier for people to get comfortable if they know there is a bunch of other people. You know you are not standing on island and I think, I don’t know, I wouldn’t necessary describe it as barrier, but having higher density of people interested in those issues certainly makes the flow of information ideas so much better.”

The respondent continues,

“If you want something really to take off ... having higher density and closer proximity allows for more collaboration... I think in particular when it comes to sustainability, especially with regards to small businesses, because by March small businesses their efforts to save money, grow ... again themselves tend to be located in ... out of their house or that sort of thing. They tend to be spread out; they in general tend to have harder access to kind of networking opportunities stuff like that...”

As for having mentees go to mentors, respondent F2 said,

“Having people come to visit a business, I would be more than happy to make that arrangement. But as far as maybe us going to another business, that would be a ... time. Oh, I mean if it's done to the point if we'd get good things and it'd very helpful I am sure we can arrange it. But I think it would more helpful if they come to us at the first place.”

For respondent M1, local face-to-face relationships are actually more important than relationships with other SMEs further away which maybe more aligned professionally because it is easier to maintain the relationship.

Additional recommendations for the environmental mentoring project arose from the round two interviews. When asked whether general dialogue or technical assistance would be preferred in peer-to-peer mentoring relationships, respondent M2 chose general dialogue without a doubt. As he said, *“...There's so many more people doing so many different things that we get a lot more from that.”* He stated that *“the biggest thing I help people with is connecting with other people,”* showing how important relationship-building is to help SMEs. Respondent M2 believes that the specific SMEs are the technical experts in their fields and will ultimately have the best ability to make decisions about their production/goods, but believes that participating in

environmental debates helps SME leaders know the factors to consider for their operations and products. Learning about options that other organizations have used from general discussion is vital to making business decisions. For respondent M2, idea sharing, not learning technical skills would be most important. Focusing on general or cross-industry topics has the added benefit of enabling companies to benefit from environmental improvements without jeopardizing an organizations competitive edge regarding specific technologies, processes, or trade secrets (Pollution Prevention Program, 2002).

Interestingly, respondent M4 (an experienced environmental mentoring and certifying SME) stated that some of the most beneficial assistance they could receive from the EPA would be money to help support the mentoring program, publicity to encourage engagement from the community, and especially assistance developing the technical environmental expertise to share with mentees. It is not always easy to take time to be a mentor and provide green technology and services to cash strapped mentees. Not only do you rarely get paid for your services, but it takes away time from doing work that would pay you. This suggests that the EPA should consider some sort of compensation, either in terms of environmental training or financial benefits to SMEs that do take on the role of mentors.

Respondent M3 believes that establishing a network of SMEs with knowledge and willingness to share would be most useful. According to him, enabling people to connect with each other via events, such as conferences and panel discussions, is a good way to bring people together and build a local network of environmentally minded business professionals. We recommend the establishment of annual roundtables such as the one we hosted in spring 2009 at the Chapel Hill Carrboro Chamber of Commerce. This would provide a reliable, non-threatening event at which interested parties might make contact with one another and thus, serve to foster

both foundation-building and maintenance of peer-to-peer relationships. The round table was viewed positively by most participants and expanding upon it in the future seems like a viable way to foster general sustainability debate in a region.

Respondent M3 just wants a way for mentee SMEs to get in contact with them; *“I mean, really more than anything a network for establishing contacts so if they wanted to ask us...I mean, we’re proud of what we’ve done, I’ll talk to anybody, so you know, it’s just having a way for them to get in touch with me.”* From experience, however, he believes that *“They have to have some sort of a touchstone [event or commonality] there to want to approach me.”*

Respondent M3 believes that direct communication with practitioners of environmental stewardship is crucial to the successful implementation of environmental practices for other SMEs; *“If they could talk to someone who has done those practices it would be a very beneficial thing”*. “No matter how the peer-to-peer mentoring program is designed, respondent M3 states, *“I don’t think there is any program you can implement that is going to change it [the traditional business culture] until people really want to change [to incorporate concepts of sustainability]”*.

Access to resources is critical for the success of a mentoring project. With so many resources available and the difficulty in sifting through available information as discussed in the motivations for research section, it is important to understand where SMEs go for information and where they would prefer to go for information. Respondent M1 said that his organization primarily gets its information from the internet or local partners. When asked to compare the value of electronic resources to person-to-person contact, respondent M3 stated that electronic resources were a good way to reach a large audience. While mentoring is useful in the ideal, M3 was not convinced that building intensive relationships among professionals is practical on a large scale. In determining the final formal of the peer-to-peer network, the EPA must consider

the size of the project it hopes to oversee and be sure to target its mechanism for delivery of environmental advice appropriately.

One recommendation might be to partner with local chambers of commerce. These chambers already have infrastructure in place to disseminate information and host networking events that, with collaboration, could be used to build substance into the green business community momentum by adding environmental information to the general business advice chambers already provide. As mentioned, the chambers of commerce would also be an accessible location for the annual roundtable events.

From a UK study done by Smith, Kemp, and Duff cited by Hillary 2000, respondents ranked the usefulness of certain forms of environmental help and training, listing printed information like checklists and guidelines as most helpful, followed by free telephone help-line, advice from regulators, printed information like newsletters and updates on new technology, on-site advice from local consultants or advisers, local seminars and workshops, videos, the Internet, and lastly national conferences. According to Smith, Kemp, and Duff (2000), “SMEs generally agree that they require external assistance to meet their environmental responsibilities, but this assistance should be locally accessible and include best-practice case studies relevant to the size and sector of the company.”

Existing mentoring among SMEs of all levels of environmental competency includes informal mentoring moments, but it seems only organizations actively pursuing external certification have a formal information sharing structure – this structure is arguably a mentoring and arguably a regulatory one. Everyone was receptive to receiving additional help, but the help they requested differed. One specific suggestion, from respondent D3, was to have the EPA help SMEs establish a purchasing cooperative so they could work together to get more competitive

pricing for their goods. Respondent M1 said that his organization would need financial assistance; their “*biggest issue is cost of implementing [environmental practices and educational programs]... financial cost that organization can handle at this time.*”

The EPA, Duke University, and UNC-Chapel Hill are the sponsors of the proposed peer-to-peer mentoring system. Because of the perceived deterrents to sponsorship by these types of organizations i.e. the regulatory role of the EPA and the lack of real world experience on the part of academia, efforts must be made to ensure SMEs that they will not be penalized for participation in the program. Furthermore, by ensuring that other businesses will be the primary mentors, SME leaders can be confident that people with the day-to-day experience of managing a business can provide a real world perspective on their efforts. This will enable SMEs to utilize the resources of the government and academia with fewer perceived limitations, and will hopefully enhance participation in a mentoring program.

It is important that the EPA define its scope of advice, level of competence and knowledge, and identify the extent to which outside competence is required (Pedersen, 2000). Additionally, Pollution Prevention Program (2002) suggests that any small business mentoring program developed by the EPA should include a letter template to be modified, agreed upon, and signed by both mentor and mentee outlining the commitment and roles of both parties in the mentoring relationship. This letter should include specific project objectives to be addressed, as well as any liability and confidentiality agreements. (The mentee shouldn't be liable for problems that arise as a result of their advice.) It further suggests that an evaluation of baseline knowledge (similar to that of our EMS templates) should be the first step in the process to match mentor skill sets with the mentee's staff and that projects should be designed to consider both organizations' capabilities. This would allow for realistic expectations for the mentoring

relationship. It is important to find a balance of roles and responsibilities that will encourage maximum participation in the program without unduly burdening the EPA, mentors, or mentees (Pedersen, 2000). A summary of recommendations organized by topic, rather than source, can be found in Appendix 2.

A major challenge for mentoring relationships is determining how to evaluate their effectiveness. The EPA must be able to point to successes or explain failures of the project in order to justify funding and support. However, while mentoring focused on information sharing is usually the least expensive, its effectiveness is difficult to measure and is at least partially depended on the way information is shared (Tunnessen, 2000). One way to address this, and convince SMEs that participation is an effective use of their resources, might be to establish goals for success and criteria to measure progress (Pollution Prevention Program, 2002). It might benefit the EPA to partner with the Institute for Corporate Environmental Mentoring (ICEM), which developed “A Guide to Environmental Mentoring for Companies, Nonprofits, and Regulators” in 2000, in order to establish a structure for a peer-to-peer network in North Carolina (Makower, J. (2000).

All round two respondents insist that business benefits are great, but the primary motivation for their organizations to be environmental stewards is ethics – to help improve (or at least degrade more slowly) the environment for the benefit of present and future generations. This directly supports the analysis of motivations for sustainability presented in Section 6. Part A. Motivations and Driving Forces, which found ethical motives to be a much larger driver for the implementation of sustainable practices than anticipated. Unless SMEs care about the environment, it won't matter what sort of program is established because people will not take advantage of it. We have determined that there is interest in the environment and local

communities on behalf of SMEs, and thus, that there is interest tools that could help SMEs become better environmental stewards.

8.7. Mentoring Conclusion

In the mentoring literature, successful mentoring relationships are those involving mentees who are proactive, know what they want to get out of the relationship, and are respectful of the mentor (Canfield 2009) and those where both partners benefit (Kram 1985, Ensher and Murphy 2005). This means that a program designed and implemented by the EPA must pay attention to participant selection and motivation. Furthermore, such a program must consider the time and resource expenditure concerns of project participants. The EPA must find enthusiastic mentors and mentees who will take advantage of the program and have clear eligibility criteria. While organizations listed potential competition and time as the main reasons not to be involved in a mentoring project, preliminary analysis suggests that some organizations with experience in a sustainability mentoring partnership do not view those to be major obstacles. Importantly, organizations have many individual reasons to be involved in a mentoring project. In particular, knowledge acquisition and information sharing, and financial benefits seem to be most motivational. Strengthening community ties is also a motivator. This suggests that mentoring may be a viable tool for assisting in environmental sustainability - as long as the program is structured appropriately and is considerate of small business needs.

9. Research Limitations

This study was designed to be exploratory – to discern what is happening at ground level to inform a more in-depth study in the future. Data on SMEs is difficult to collect and there are many unknowns related to SMEs and sustainability; thus, this research was performed in order to address research questions related to the motivations of SMEs for adopting sustainable practices, the feasibility of EMSs for small and medium enterprises, and the usefulness of mentoring for environmental stewardship. Data are limited due to the small sample size and the limited discussion of each topic of interest during our pre-survey and interviews. As a result, we cannot discuss trends related to specific industries, location of operation, or many other defining characteristics of SMEs and respondents (i.e. the attribute data) in a statistically significant manner. Furthermore, surveys may be limited methodologically by the fact that data rely on statements by respondents. In some cases, respondents may intentionally or unintentionally falsify responses, or choose not to disclose certain pieces of information. It is difficult to discern where this occurs in a data set, and whether the responses are intentional or reveal gaps in education or understanding of the questions.

Generalization of our findings is only meaningful and useful in the terms of small and medium-sized business with 5-25 employees in NC. Our sample mostly includes businesses with between 5-25 employees; thus, it is possible that SMEs with fewer or more employees than our respondents have different needs. Generalization related to location and business sector would not be accurate and could be misleading since we have few respondents from Fayetteville and few respondents from overlapping sectors. Future research should explore companies not only in different business sectors but also in the same sectors in different locations to better understand how to help SMEs in their efforts to be sustainable. This will enable meaningful

generalizations and representative theory about motivations for sustainable behavior, and using environmental management systems and peer-to-peer mentoring for implementing sustainable practices in other SMEs.

The round two interviews were less structured than the round one interviews and focused more heavily on mentoring as an area of inquiry. The SMEs interviewed during round two had environmental expertise and experience with mentoring relationships, while those interviewed during round one had a range of experience and expertise. The questions for the additional interviews were partially identified by gaps in the data observed from the round one analysis. However, this information was not always forthcoming – possibly because of unclear questions, possibly because of hesitancy or lack of knowledge on the respondents' part to address the issue.

For instance, more information on existing partnerships, collaborations, and mentoring relationships that organizations currently have would be valuable. This information would enable a better understanding of what works for small organizations, and how best to design a mentoring program. Information on the formality of the relationship, the desired number of people, the means for contact to be made between individuals, the sorts of assistance/support provided by the relationship (ex. technical guidance, specific products, or a forum for discussion, among other possibilities), and how useful the relationship is viewed to be by both mentee and mentor organizations is needed. Differences between process-oriented and outcome-oriented collaborations or mentoring programs may affect an organization's perspective on future mentoring projects; thus, it may be important to know the focus of existing collaborations to gain insights into the recommendations the SMEs provided. Furthermore, elaboration of the barriers and motivations to mentoring would help identify ways to incentivize participation in an EPA-sponsored mentoring program. How do the barriers and motivations for EMS participation

compare to those for mentoring participation in terms of relative importance? For example, will financial restraints be more likely to prevent development of an EMS or participation in a mentoring program?

10. Conclusion

Many small and medium-sized businesses realize they must continually improve their environmental performance to remain competitive in the marketplace, though they struggle to implement sustainable practices into their daily operations. Small businesses will need tailored technical tools for implementing sustainable practices and our research helps to generate specific recommendations on which these tools may be based.

SMEs in our sample are motivated to implement sustainable practices for five main reasons: cost savings, strategy, community, personal interest, and ethics. To motivate firms to implement sustainable practices, provincial norms and industry norms should be used. Data collection and information sharing networks provide a means for firms to compare their own performance to the performance of both industry peers and fellow community members. Two tools that can be used to facilitate the data collection and information sharing goals are EMSs and peer-to-peer mentoring.

EMS research confirms that even though small businesses struggle with barriers and obstacles in the implementation of sustainable practices into their daily operations, they value both the internal and external benefits that EMSs can provide. Overcoming EMS barriers and enhancing EMS benefits have been emphasized in tools and guides that have been tried for implementing EMSs. However, these guides appear to be too rigid and too formalized for successful use by small business. In order to help small businesses find appropriate EMS templates, small businesses must be approached sensitively, individually, and exclusively.

Successful mentoring relationships are those involving mentees who are proactive, know what they want to get out of the relationship, and respectful of the mentor (Canfield 2009) and those where both partners benefit (Kram 1985, Ensher and Murphy 2005). This means that

mentoring programs must be designed with participant selection and motivation in mind. Furthermore, such a program must consider the time and resource expenditure concerns of project participants. Organizations have many individual reasons to be involved in a mentoring project. In particular, knowledge acquisition and information sharing, and financial benefits seem to be most motivational. Mentoring is likely a viable tool for assisting in environmental sustainability - as long as the program is structured appropriately and is considerate of small business needs

Our observations and findings confirmed that small and medium-sized enterprises are capable of addressing and managing their effects on the environment. The organizations that we interviewed have been implementing sustainable practices with varying degrees of success as a result of constraints upon their time, resources, and knowledge. Due to this preliminary research, the EPA has a starting point with which to continue the construction of tools suitable for SMEs looking to improve their environmental performance.

Appendix 1: EMS Guide for SME



EMS Guide for SME

**Small Steps towards Continuing Organizational Improvement
through Developing and Implementing an
Informal Environmental Management System**

EMS *environmental management system, a plan for addressing the impacts of enterprises on the environment*

SME *small and medium-sized enterprises*

Initial-Business Categorization

Please answer the following questions based on your best knowledge about your facility:

1. Are you ready to build your own informal environmental management system?	Yes No Not Sure
2. Does your facility have an environmental statement?	Yes No Not Sure
3. Has your facility identified business activities (products or services) that can interact with the environment?	Yes No Not Sure
4. Will your management commit to EMS development?	Yes No Not Sure
5. Will your employees support EMS development?	Yes No Not Sure
6. Does your facility have a formal communication process?	Yes No Not Sure
7. Is any training provided in your facility?	Yes No Not Sure
8. Is your facility willing to prepare a project plan for building an EMS?	Yes No Not Sure
9. Does your facility have a formal documentation process?	Yes No Not Sure
10. Does your facility implement two or more these sustainable practices: recycling, using compact fluorescent light bulbs, having water sensors or light sensors, buying recycled office supplies or other environmentally-friendly products?	Yes No Not Sure



Score table:

Answers	Score
Yes (Y)	+ 1 point
Not sure (NS)	0 point
No (N)	- 1 point



Results:

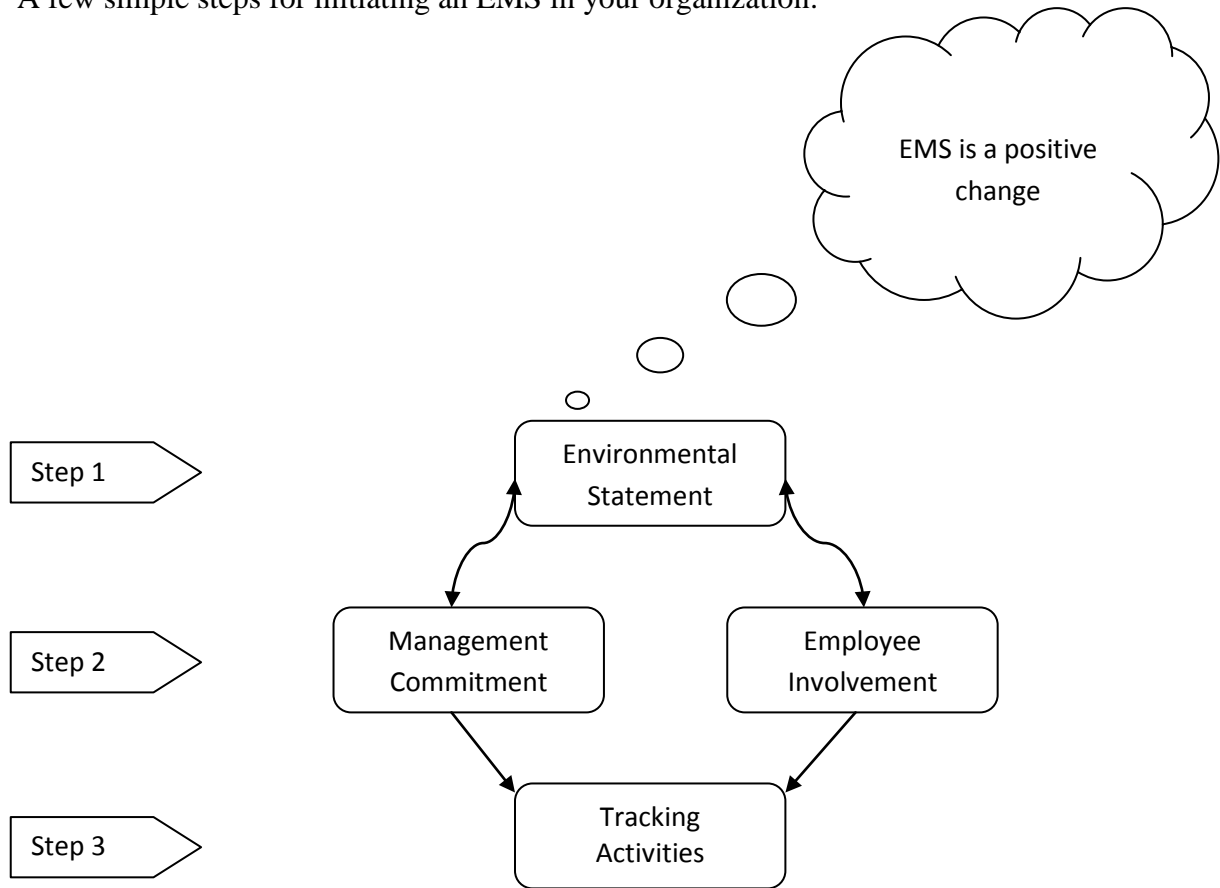
If the final score is between -10 and 0	Your facility is considered an EMS Beginner .
If the final score is between 1 and 5	Your facility is considered an EMS Intermediate .
If the final score is 6 or above	Your facility is considered an EMS Advanced .

Based on the final results, please, move to the following section:

- A. for an EMS Beginner
- B. for an EMS Intermediate
- C. for an EMS Advanced

A. EMS Beginner

A few simple steps for initiating an EMS in your organization:



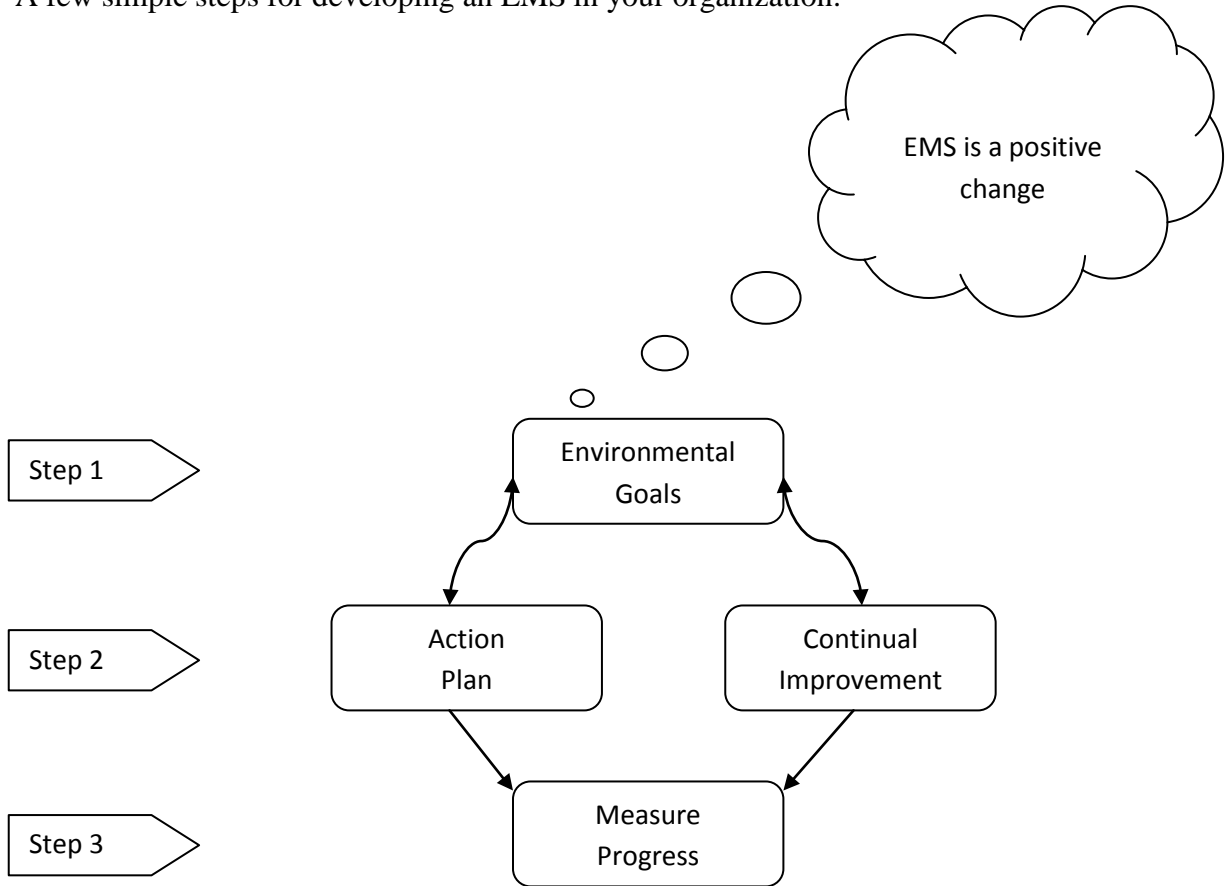
Instructions:

Step 1	Step 2	Step 2	Step 3
Environmental Statement	Management Commitment	Employee Involvement	Tracking Activities
Write a short environmental statement of just a few sentences and post it in a visible place.	Have management sign, publicly endorse, and actively promote the environmental statement.	Have employees read and provide feedback on the environmental statement.	Make a list of the facility's activities that may impact the environment.

* If you have already fulfilled all steps move on to the steps for EMS intermediates.

B. EMS Intermediate

A few simple steps for developing an EMS in your organization:



Instructions:

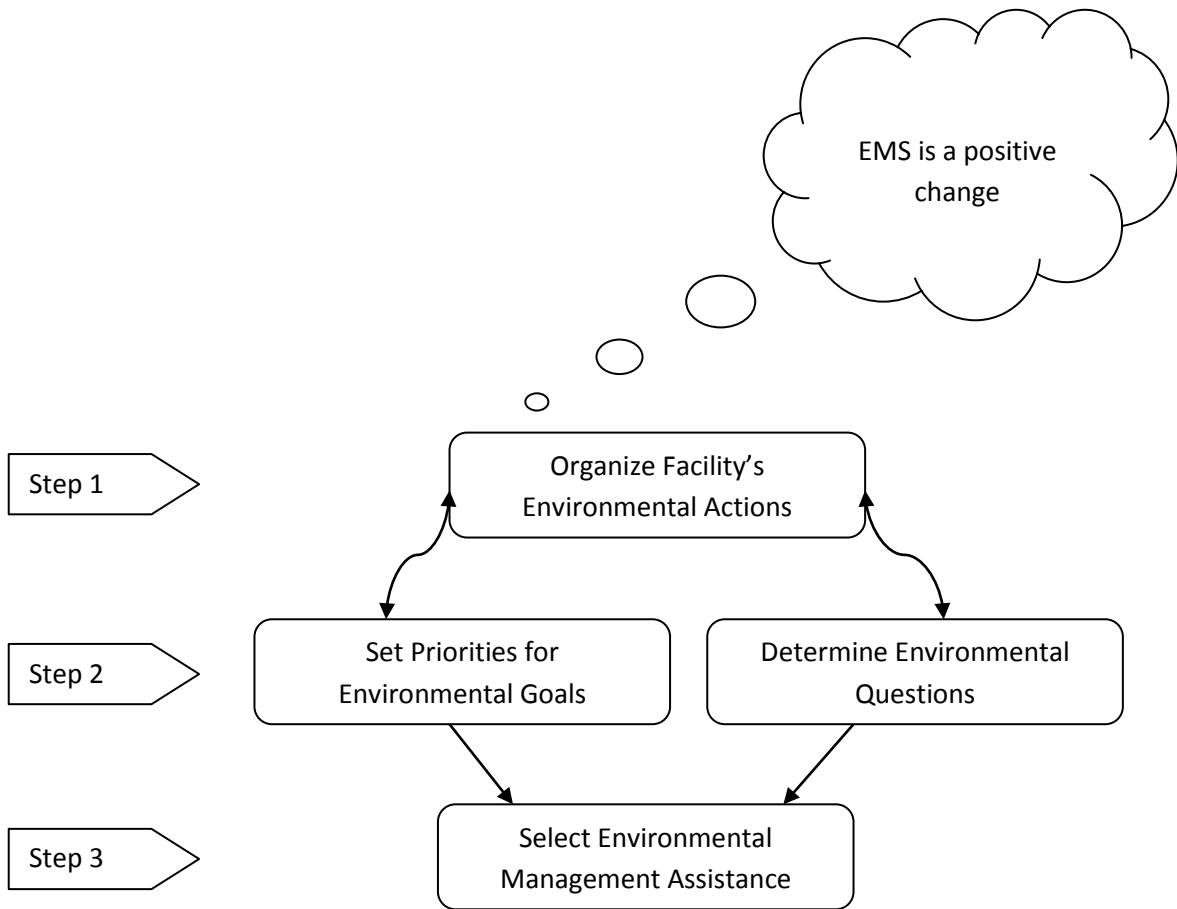
Step 1	Step 2	Step 2	Step 3
Environmental Goals	Action Plan	Continual Improvement	Measure Progress
Establish goals to address your facility's activities impacts on the environment.	Determine actions necessary to achieve environmental goals.	Update environmental goals to ensure continual improvement.	Regularly measure and monitor progress against the action plan.

* If you are missing an environmental statement, management commitment, employee involvement, or procedures to track your facility's activities, start with steps for EMS beginners. Or, if you have already fulfilled all steps for EMS intermediate, move on to the steps for EMS advanced.

Recommended workbook website:
http://www.smallbiz-enviroweb.org/Resources/smallbizfiles/Documenting_EMP.pdf

C. EMS Advanced

A few simple steps for enhancing the EMS in your organization:



Instructions:

Step 1	Step 2	Step 2	Step 3
Organize Facility's Environmental Actions	Set Priorities for Facility's Environmental Goals	Determine Facility's Environmental Questions	Select Environmental Management Assistance
Create a tray of all of the SME's actions that have an environmental impact.	Sort the goals by type and determine which are most important to the SME.	Determine remaining questions the SME has about the environmental actions, goals, or the EMS.	Select the best-suited environmental management assistance.

* If you feel that your environmental actions, goals, and questions are not sufficient, read over the EMS beginner and EMS intermediate guides to determine if it is more appropriate for your SME to begin with those processes.

Recommended environmental management assistance:
Mentoring

Last step

**Improve your environmental performance
CONTINUOUSLY!**

GOOD LUCK!

Small changes can reap **big benefits**
for your business and for your planet.



Appendix 2: Summary of Recommendations for Environmental Peer-to-Peer Network

1. Build a local network of environmentally minded business professionals.
 - a. Delineate a clear, fair process for participation in the program.
 - i. Find enthusiastic mentors and mentees.
 - b. Ensure SMEs that they will not be penalized for participation in the program.
 - c. Ensure SMEs that other businesses will be the primary mentors.
 - d. Define the EPA's scope of advice, level of competence and knowledge, and identify the extent to which outside competence is required.
 - e. Evaluate baseline knowledge to match mentor skill sets with that of the mentee.
 - i. Consider the time and resource expenditure concerns of project participants.
 1. Organizations located near each other should be paired together.
 2. Mentees should, at least initially, go to the mentors.
 - f. Organize the program around a common theme.
 - g. Focus on general dialogue and relationship-building.
 - h. Provide reliable, non-threatening events at which interested parties might make contact with one another.
 - i. Establish annual roundtables, local seminars and workshops.
2. Consider compensation for mentors in terms of financial benefits, publicity assistance within the community, and/or environmental training and assistance developing technical expertise.
3. Consider the ideal size of the project and target mechanism for delivery of environmental advice appropriately.
 - a. Value both electronic (Internet-based) and person-to-person contact.
 - b. Prepare printed information like checklists and guidelines.
 - i. Develop a letter template outlining the commitment and roles of both parties in the mentoring relationship, describing specific project objectives, and establishing any liability and confidentiality agreements.
 - ii. Allow for flexibility of program.
 - c. Consider establishing a free telephone help-line, newsletters and/or updates on new technologies, and videos.
 - d. Consider partnerships with local organizations like chambers of commerce.
 - e. Consider a partnership with the Institute for Corporate Environmental Mentoring (ICEM).
4. Support programs to aid SMEs in their sustainability efforts.
 - a. Help establish a purchasing cooperative so SMEs could qualify for more competitive pricing for their goods.

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