

CARPET AMERICA RECOVERY EFFORT 2007 INDEPENDENT ASSESSMENT

FINAL REVIEW DRAFT
November 5, 2007



Zero Waste Alliance

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Executive Summary: The Year Five Independent Assessment

This report is the Independent Assessment of the work conducted by the Carpet America Recovery Effort over the past five years. CARE was formed in 2002 under a Memorandum of Understanding (MOU) crafted by a joint industry-government team, in order to increase diversion of waste carpet from disposal. The original MOU called for an **Independent Assessment to be conducted in Year Five to evaluate the progress and identify barriers** toward meeting the Negotiated Outcome Goals set out in the original MOU.

Independent Assessment Evaluation Criteria

CARE hired the Zero Waste Alliance (ZWA) in late summer 2007 to provide this Year Five Independent Assessment. The focus of the ZWA Independent Assessment was on gauging progress using the six evaluation criteria set forth in the MOU:

- (1) Quantitative assessment of diversion of post-consumer carpet (PCC)
- (2) Assessment of the economic results/benefits of PCC activity
- (3) Assessment of efforts by each of the parties to the MOU (CARE, CRI, carpet industry, government entities, and non-governmental organizations)
- (4) Thorough assessment of efforts and results to date, including recommendations for changes in strategies to reach the Negotiated Outcomes Goals
- (5) Assessment of planned efforts by each of the parties
- (6) Assessment of resources saved from diversion of PCC, including quantification of greenhouse gas and other environmental savings

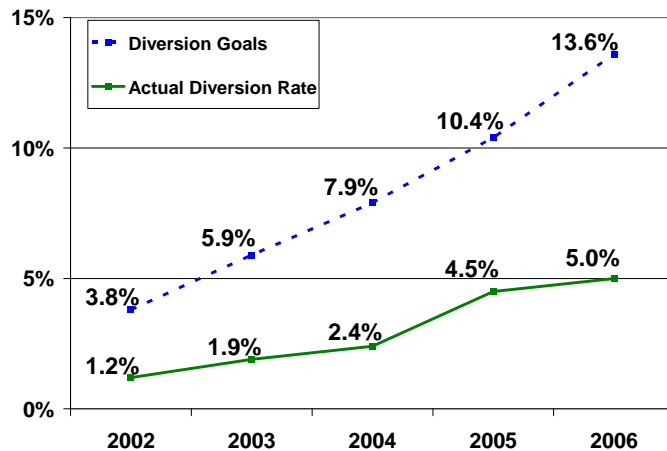
Methodology. ZWA conducted the research for this report in several ways. Primarily we conducted interviews with a total of 41 stakeholders in several groups: local, state and federal government, carpet recycling entrepreneurs, carpet industry, academics/non-profit or non-governmental organizations (NGOs), consultants, and “other.” Surveyees were asked for opinions and information in six major topic areas regarding carpet recovery, linked to the six criteria from the MOU (above), along with assessment of CARE itself. ZWA also conducted economic and environmental analyses, and researched other commodities’ recycling evolution and industries’ product stewardship efforts. Once all findings were gathered, we evaluated progress to date, identified barriers, and developed recommended strategies and actions for the future.

The resulting data provided a snapshot in time of the ‘group mind’ of CARE stakeholders.

Key Findings

Quantitative Findings.

CARE has conducted annual surveys to benchmark progress against the Negotiated Outcome Goals. The data presented in CARE’s Annual Reports indicate that **carpet diversion is not reaching the established goals.** In fact, the gap between actual reported pounds recycled and diverted and the established goal has been widening over the past five years – see chart following.



To reach the 40% 2012 target the present diversion rate will need to increase more than ten-fold (based on the estimated total annual discards for 2012 in the MOU).

Overwhelmingly, the **number one key barrier to increasing diversion rates is the lack of diverse end markets**. The other primary barriers are lack of sufficient education and outreach, and the economics and infrastructure of collection.

Findings Regarding Economic Benefits.

Carpet recycling has strong positive economic impacts. Economic analyses of carpet collection and preparation for recycling businesses (referencing recent recycling economic impact studies) showed that **for every 1,000 tons of carpet collected for recycling, about two jobs are created** locally; these two jobs stimulate an estimated two additional indirect jobs in the regional economy. As well, every \$1 million of capital invested in the carpet recycling industry stimulates about \$1-2 million in personal income at the state level. These benefits generate tax revenues at the state and local level, which of course is of great interest to policymakers.

These data should be used to encourage public investment in carpet recycling in the form of tax breaks, grant funds, economic development incentives, etc.

Findings Regarding Stakeholder Efforts.

Each of the major groups of stakeholders were interviewed regarding efforts to date, planned future efforts, and assessment of other stakeholder group efforts.

Efforts to date are quite significant. The top four successes or highlights are:

- Getting CARE up, running, and very visible in a number of markets and forums
- Development of carpet identification tools
- Diversion of end-of-life carpet
- Evolution of end markets, including the emergence of ‘new’ end markets that use PCC in making new products (carpet padding, building materials, civil engineering applications, etc.)

More generally, important efforts to date are highlighted below:

- Carpet manufacturers increasing purchase of PCC for use in new carpet and other purposes
- Investment in the development of specialized processing equipment, carpet identification tools, and PCC collection networks
- Participation in development of the NSF 140-2007 Sustainable Carpet Assessment;
- Re-building carpet recycling facilities after major setbacks (fire, closure)
- Mentoring, technical assistance, and support for new carpet recovery entrepreneurs
- Creation of new business models whereby old carpet takeback is included in new carpet purchase for certain customers

- Awards and recognition programs
- Active participation in the green building community in many ways

Planned future efforts by stakeholders are significant as well. These include plans ranging from ‘about to be implemented’ to ‘long-term visions.’

Noteworthy short-term (1-2 year) endeavors include:

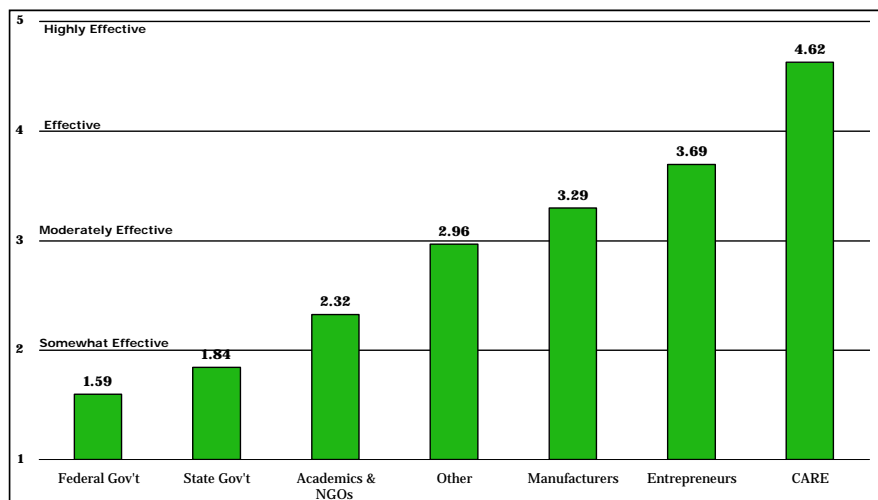
- Two different regional carpet “summits”
- Increased collection and use of PCC by carpet manufacturers
- Proprietary efforts to increase design and implementation of cradle-to-cradle recycling and use of PCC
- Broadening reclamation across face fiber types
- Plans to sell millions of pounds of PCC/year
- Development of non-US markets
- Development of new products using PCC
- Expand sales of equipment used in carpet recycling and
- Possible work on a Federal carpet procurement standard

Longer-term (3-5 year) plans that we expect to have positive impact include:

- Implementation of regional and national carpet recovery networks by several parties
- Expand usage of N6
- Sustainability-related goals (e.g., make carpet fibers highly recoverable)
- Develop new technology for backing and fiber
- Improve efficiencies in the reclamation chain and in processing operations – whether by vertical integration or other means
- Market the NSF 140 Standard
- Invention of new products using PCC
- Governmental support of local carpet recovery
- Expanding a carpet procurement standard to specify only PCC materials may be used to meet the 10% post-consumer recycled content requirement (not pop bottles)
- Embedding more aspects of carpet recovery into green building standards

Stakeholder Self/Other Assessment

All surveyees were asked to assess the effectiveness of each stakeholder groups’ efforts to date. The chart to the left depicts the findings of this effort. Clearly **CARE is deemed most effective and government stakeholders least effective.**



Findings Regarding

Environmental Benefits

Carpet recycling yields some of the strongest resources savings – especially in terms of net avoided greenhouse gas (GHG) emissions – of all the materials that can be currently recycled. A recent EPA study estimates that recycling carpet results in a net GHG emission of -1.96 metric tons of Carbon Equivalent per Ton of carpet (MTCE/Ton). This dramatic GHG impact is shown in comparison to a few other commonly recycled materials in the table below – only aluminum yields greater positive impacts. Shown in Metric Ton Carbon Equivalent per Short Ton Recycled.

Material Recycled	MTCE/ Ton Recycled
Aluminum cans	-3.70
Carpet	-1.96
Mixed metals	-1.43
Corrugated cardboard	-0.85
Dimensional lumber	-0.67
Tires (re-treading)	-0.50

Using CARE’s data on pounds of post-consumer carpet recycled from 2002-2006, the chart to the right shows the additive impact of actual greenhouse gas savings achieved to date, shown in both MTCE and CO₂ Metric Ton Equivalents (MTE). **Recycling nearly 700 million pounds of carpet to date has yielded a net reduction of about 650,000 Metric Ton Carbon Equivalents, and about 2.4 million Metric Ton Equivalents of CO₂.**

Year	Pounds of carpet recycled	Net GHG emissions in MTCE^[1]	CO₂ MTE^[2]
2002	46,200,000	-45,276	-166,012
2003	86,600,000	-84,868	-311,183
2004	98,400,000	-96,432	-353,584
2005	194,300,000	-190,414	-698,185
2006	239,500,000	-234,710	-860,603
TOTAL	665,000,000	-651,700	-2,389,567
[1] MTCE = Metric Ton Carbon Equivalent. See Sec. 5.1 for citation of source.			
[2] CO ₂ MTE = Carbon Dioxide Metric Ton Equivalent.			

These data should be used to motivate stakeholders to push for policies that incorporate price signals into waste management costs that measure and value the currently externalized impact of GHG emissions. This data also suggests CARE should push for pricing mechanisms in commodity sales that reflect the GHG costs of the production of recycled versus virgin commodities.

Findings Regarding Barriers

There are clearly impediments to increased carpet recycling. The study found the following barriers, listed in order of descending importance:

1 – Lack of sufficient end markets. There are simply not enough outlets at each point along the carpet recovery chain. There are not enough buyers in the right place at a competitive price for sorted, baled carpet; for commodity plastic made from recovered carpet; or for products made containing PCC. End markets that do exist have not matured sufficiently to use tools commonly found in other recycled material recovery chains: guaranteed floor/ceiling prices, long-term supply contracts, or commitment to closed-loop recycling (using old carpet to make new carpet) based on

market demand for such products. And, much greater demand for some old carpet grades over another deters the growth of well-balanced markets. This softness and immaturity in the market makes it difficult to attract capital investment that would enable the carpet recycling infrastructure to grow (from collection to end product); this is particularly daunting for small entrepreneurs interested in this market.

2 – Need to expand education, outreach, and communications. CARE and its stakeholders felt that additional outreach and education would be a cornerstone of creating increased demand for products made with PCC. Greater outreach to “second-tier” stakeholders such as retailers, waste haulers, and local governments would help to increase public awareness and in turn help spur demand. CARE needs more resources to expand its efforts to date.

3 – Collection economics and infrastructure. While problems with collection – not enough collection points or logjams at existing collection points – will likely work themselves out once there is more demand, many stakeholders felt the barriers to successful collection are amongst the most significant. These barriers include economics (generally much cheaper to dispose than recycle); infrastructure (need for more collection points and involvement from local government); logistics (keeping carpet dry, working with ever-changing crews, transportation costs); and problems unique to both residential and commercial collection.

4 – Additional miscellaneous but important barriers. We discovered a final set of miscellaneous barriers of import. These include:

4.1 – Design for recycling. Many structural impediments were cited by both recyclers and the carpet industry as to why designing carpets to be easily recycled has not progressed further.

4.2 – Processing. Recyclers cited the high-capital, complicated technology needed to break down PCC into a pure enough fiber to use in new carpet facing as a significant barrier. Efficient processing is hindered by contamination, sortation challenges, and the glue and backing contained in carpet by design.

4.3 – Policy and strategy. Especially of concern has been the lack of demand – or specifications – for buying new carpet containing PCC, coming from government and other institutional purchasers. Many understand that essentially, government-run waste collection subsidizing the disposal of old carpet to landfills competes directly with the development of carpet recycling as an economically viable alternative.

4.4 – Stakeholder relations. Inter-stakeholder dynamics reveal something of a pattern of mistrust among CARE’s stakeholder groups. Discussed more in Section 4.3.2.

Recommendations

To meet the worthy goals in the MOU – we find that now is the time to take strong and urgent action to kick-start faster growth. Based on the findings, the following recommendations were developed designed to address barriers and accelerate the development of carpet recovery:

- #1: Market development for products made from PCC must be the top priority
- #2: Enhancement of the flow of raw materials must accompany market development
- #3: Develop sustainable and robust financing system for CARE
- #4: CARE organizational structure and reporting
- #5: Additional tactical strategies

1.0 Purpose and Scope of the Independent Assessment

CARE hired the Zero Waste Alliance (ZWA) in late summer 2007 to provide the Year 5 Independent Assessment called for in the Memorandum of Understanding (MOU; see Section 2.1 for more background). As stated in the MOU, the purpose of this Independent Assessment is “to evaluate the progress and identify existing barriers toward meeting the Negotiated Outcomes Goals set forth in Section 2 of this Agreement and the Interim Management Goals. Focus of the assessment is analyzing CARE’s performance since inception (January 2002) and developing recommendations for future efforts.” (See item 4.a.(3) in the MOU.)

The emphasis of this assessment, through interviews with selected stakeholders, has been to identify barriers, evaluate progress to date, and develop recommended strategies and actions for the future. This assessment is not a detailed roadmap for the future. It is also worth noting that throughout the assessment we present opinions and information provided by stakeholders during the interview process. We cannot address whether the comments are true or accurate or not.

The following sections (Section 2 through 7 – except Section 6) are discussions of the six evaluation criteria contained in the MOU. Though not specifically called out as an evaluation criterion, Section 6 discusses the primary mandate of the Year 5 Independent Assessment: the barriers and successes in carpet recovery. At the beginning of each section the applicable evaluation criterion from the MOU is provided for context.

1.1 Independent Assessment Methodology

To conduct this assessment, ZWA designed a study methodology with the following steps:

- Gather industry background information and review existing information in annual reports
- Design a survey to candidly elicit points of view from key stakeholders on issues identified in the MOU’s evaluation criteria, and related topics (discussed below)
- Work with CARE and others to identify a list of 45-60 stakeholders to interview
- Conduct the survey, interviewing over 40 key stakeholders, guaranteeing confidentiality of responses
- Analyze economic and environmental impacts of efforts to date
- Synthesize and analyze survey findings
- Write report and develop recommendations
- Assist in the stakeholder review process

1.2 Survey Methodology

The survey was the central piece of research conducted for this independent assessment. Surveyees were asked for opinions and information in six major topic areas regarding carpet recovery:

1. Individual stakeholder (or its organization) efforts to date
2. Barriers and successes in carpet recovery as a whole
3. Data confirmation and discussion
4. Carpet recovery stakeholder group efforts to date
5. CARE future efforts and strategies
6. Assessment of CARE’s organizational efforts

Findings from each of these topic areas are discussed throughout this report. The survey instrument is provided in Appendix A.

The ZWA team completed interviews with a total of 41 stakeholders in several groups: local, state and federal government, carpet recycling entrepreneurs, carpet industry, academics/non-profit or non-governmental organizations (NGOs), consultants, and “other.” CARE provided ZWA with an initial list of 46 primary candidates to interview, with an additional nine names as backup. Of the 46 primary candidates, two were removed from the list, and 37 were interviewed. Of the remaining initial seven who were not interviewed, all but one was from the academic/NGO/other category – and did not respond to repeated requests for interviews. We were able to interview all but 1 of the CARE Board of Directors.

Over the course of the project, we received suggestions of other key people to interview, thus adding more key stakeholders to the survey pool. The number of parties interviewed, by stakeholder group, is shown in Chart 1-1.

Chart 1-1: Summary of Stakeholders Interviewed

Stakeholder Group	Number Interviewed	Explanation
State & federal government	9	EPA; representatives of states that participated in the Negotiated Outcomes; 1 state purchasing official. Includes 3 CARE Board members.
Local government	2	One operator of a publicly-owned landfill taking carpet for diversion; one large city green purchasing employee working on carpet diversion & buying strategies.
Entrepreneurs	11	Carpet processors, recyclers, floor covering dealers & recyclers, companies buying post-consumer carpet (PCC) commodity for use in product manufacture. Includes 2 CARE Board members.
Carpet industry	11	Representatives of CRI, largest and medium-sized carpet industry manufacturers and suppliers, and carpet industry veterans. Includes 7 CARE Board members.
Academics, NGOs, Other	5	Representatives from academia, nonprofit/NGO, CARE, CARE grant recipient, and cement kiln industry. Includes 1 CARE Board member.
Consultants	3	Consultants specializing in carpet diversion work.
Total	41	

The only potential stakeholder group not interviewed was large carpet retailers. No stakeholder in the carpet recovery process suggested any contacts or liaison with large retailers like Home Depot; the absence of this stakeholder group is discussed in Sections 6.0 and 7.0. It is noted that large carpet retailers have not identified themselves as stakeholders in carpet recovery.

All survey responses were aggregated together in order to keep confidentiality and to support analysis.

2.0 Quantitative Findings (Evaluation Criterion #1)

Evaluation Criterion #1: A quantitative assessment of the amount of post-consumer carpet diverted to reuse, recycling, cement kilns, waste-to-energy, and incineration. This assessment should indicate progress toward meeting the Negotiated Outcomes Goals.

2.1 Background on CARE and the Negotiated Outcome Goals

This section is presented for the reader less familiar with CARE, the history of its establishment, and the Negotiated Outcome Goals, and to serve as a reference.

CARE was formed as a joint industry-government effort to increase recycling and reuse of post-consumer carpet and reduce the amount of waste carpet going to landfills, after a two-year negotiation process. A Memorandum of Understanding ([MOU for Carpet Stewardship](#)) resulted in January 2002. The original stakeholders in the negotiation process agreed on outcome goals to be reached over a ten year process, shown below in Chart 2-1.

Chart 2-1: Summary of the Negotiated Outcome Goals for Carpet Recovery

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total Discards*	4,678	4,828	4,537	5,038	5,261	5,590	5,642	5,887	6,020	6,605	6,772
<i>Targets by year in millions of pounds</i>											
Reuse	0			25			113		211		203-339
Recycling	180			353			620		903		1,693
WTE	-	48	45	50	53	56	56	59	60	66	68
Cement Kilns	-			100			300		200		200
Landfill	4,498			4,510			4,552		4,646		4,812
<i>Targets by year in percent recycled or diverted</i>											
Recycling Rate	3.80%			7%			11%		15%		20-25%
Diversion Rate	3.80%			10%			19%		23%		27-34%

*all quantities in Millions of pounds (M lbs)

Source: A Memorandum of Understanding for Carpet Stewardship, January 2002, Appendix A.

CARE's mission is to foster market-based solutions for recovering value from discarded carpet to meet the Negotiated Outcome Goals. It was established as an independent 501(c)3 non-profit organization, and is primarily funded and administered by the Carpet & Rug Institute. The carpet industry has agreed to use CARE to:

- Enhance the collection infrastructure for post-consumer carpet.
- Serve as a resource for technical, economic and market development opportunities for recovered carpet.
- Develop and perform quantitative measurement and reporting on progress toward the national goals for carpet recovery.

- Work collectively to seek and provide funding opportunities for activities to support the national goals for carpet recovery.

2.2 Progress Toward Meeting the Negotiated Outcome Goals

CARE has conducted annual surveys to benchmark progress against the Negotiated Outcome Goals. Extensive data and analyses of carpet diversion and recycling activity are presented in the Annual Reports (available at <http://www.carpetrecovery.org/reading.php>), showing progress.

The data presented in the Annual Reports indicate that carpet diversion is not reaching the established goals. Findings to date are summarized below in Chart 2-2.

Chart 2-2: Summary of Carpet Diversion

Year	Recycled		Diverted	
	Goal	Actual	Goal	Actual
2002	3.8%	1.0%	3.8%	1.2%
2003	4.9%	1.8%	5.9%	1.9%
2004	5.9%	2.2%	7.9%	2.4%
2005	7.0%	2.9%	10.4%	4.5%
2006	8.4%	4.6%	13.6%	5.0%

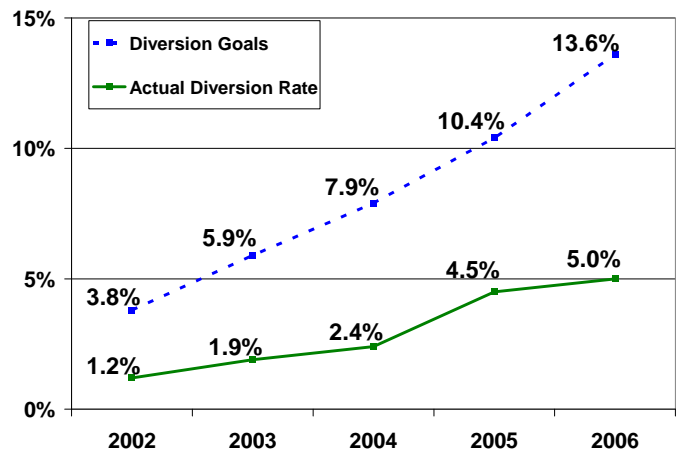
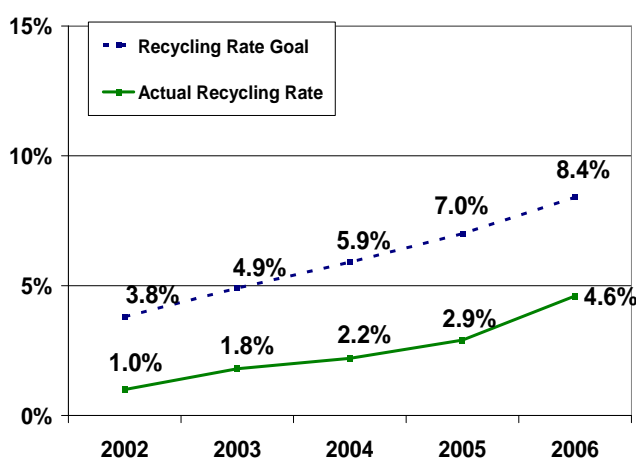
Source: *Carpet America Recovery Effort 2006 Annual Report*, amended on May 17, 2007, page 11.

The gap between actual reported pounds recycled and diverted and the established goal has been widening over the past five years, such that:

- Pounds recycled: from a difference of -2.8% in 2002 to -3.8% in 2006
- Pounds diverted: from a difference of -2.6% in 2002 to -8.6% in 2006
-

Chart 2-3 show the gaps in a graphic format.

Chart 2-3 Comparison of Recycling and Diversion Goals to Actual Rates, 2002-2006



This gap, and the reasons for it, forms the core of what was explored and researched in this study.

When gauging progress toward meeting the goals, carpet stakeholders have referenced an additional tool in the past two years – the Bass Model of Innovation. This model posits that the growth of a new market occurs in an “S Curve,” rather than in a linear fashion (as the goals were mapped originally). This model, when applied to carpet recovery, suggests that ramp-up of the carpet diversion industry will occur with slow growth in early years and steeper growth happening very soon. See the 2005 and 2006 Annual Reports for more discussion.

While use of the S curve shows the development of the carpet recycling industry as being more or less “on track” for 2006, many stakeholders are concerned that recovery is not on track to reach either the S-curve or the MOU goals in the next 2-3 years. To reach the 40% target (and using the estimated total annual discards for 2012 in the MOU), **the diversion rate will need to increase more than ten-fold.**

To meet these worthy goals – now is the time to take strong and urgent action to kick-start faster growth. The accelerated growth required to stay on the S curve, or to catch up to the linear curve, will not occur through a continuation of the current approaches. New strategies are needed to accelerate growth of recovery. Recommendations are discussed in Section 7.0.

2.3 Survey Findings Regarding Diversion Data and Goals

The interviewees were asked their opinions on the:

1. General accuracy of the 2006 Annual Report diversion of post-consumer carpet breakdown estimates
2. Quantitative data CARE provides in the annual reports
3. Negotiated Outcome Goals

The basis for asking this question was not to verify the accuracy of the data but rather to probe to find out if stakeholders understand the numbers and to find out their perceptions of the this data – to enable CARE to enhance communications on this subject if necessary. Responses are summarized below.

Diversion breakdown estimates. Of the 41 parties surveyed, 28 provided responses when asked about the general accuracy of the 2006 Annual Report’s breakdown of PCC diversion (92% recycling, 8% waste-to-energy and about 0.1% cement kilns). Seventy-five percent said “yes – the breakdown is generally accurate” and 25% said “no” – and comments on this subject were lively. Those who did not respond either were not informed enough to comment, or indicated that they didn’t know how to evaluate if the numbers are accurate or not. Note that we are not commenting on the accuracy of perceptions reported here.

Those who said “no, they do not think this data is accurate,” offered the following perceptions and concerns that the numbers:

- Do not differentiate between closed-loop recycling (N6 getting made into new carpet) from open-loop recycling (also sometimes called downcycling), where PCC moves into lower grade applications
- Do not account for PCC in storage

- May be low in terms of quantities going to waste-to-energy and cement kilns, especially N6,6
- Do not account for quantities going to reuse

Quantitative data CARE provides in the annual reports. The surveyees were asked for general comments on the quantitative data CARE provides. Observations and suggestions from stakeholders were generally supportive, offering both positive and constructive comments as follows:

- Acknowledged and understand the difficulty of getting accurate quantitative data from the survey process
- Think the methodology used is fine
- Appreciate and value this information
- Think CARE should call waste-to-energy (WTE) use of carpet ‘carpet-derived fuel’ – as WTE is defined as garbage disposal in some locales
- Data on “recycled” pounds should not include material stored
- Concerns about double-counting were expressed, and capturing all pounds recycled in the data (“2006 was under-reported” one person said)
- More carpet may be going to cement kilns than is reported

Negotiated Outcome Goals. As part of discussions about data, a number of survey participants volunteered observations on the Negotiated Outcome Goals, the S-curve, and the reality of reaching the 40% goal by 2012. Highlights and commonly heard comments from government, some industry, and recyclers/entrepreneurs include:

- “When we set the 40% goal we really didn’t understand what we’d have to do to get there; no one had any idea how to do anything.”
- “The 40% goal is great; we really want to reach that by 2012; it’s better to have aggressive goals and miss them than not have goals that stimulate the market.”
- “Goals are do-able with a bit more tweaking: landfill bans, education, pressure on and from manufacturers...”

Carpet manufacturers, on the other hand, expressed concerns that the initial goals were set too high, that reaching 40% would be “tough,” and that hitting 25% diversion in the ten-year time frame would be more realistic. These experienced business people also observed “nothing ever goes as smoothly as you want,” and that CARE stakeholders should focus on the positive.

This opens the question of should CARE re-evaluate its goals and re-negotiate the targets? We did not put this question directly to participants – but we did not hear any suggestions that this should be done. The targets are important to the stakeholders – even while they candidly admit that they may not be met, no one advocated for lowering them. To open a discussion about changing the goals would at this point be counter-productive and possibly contentious.

Recommendations with regard to data, the goals, and communicating about these topics are provided in Section 7.0, Recommendation #4.

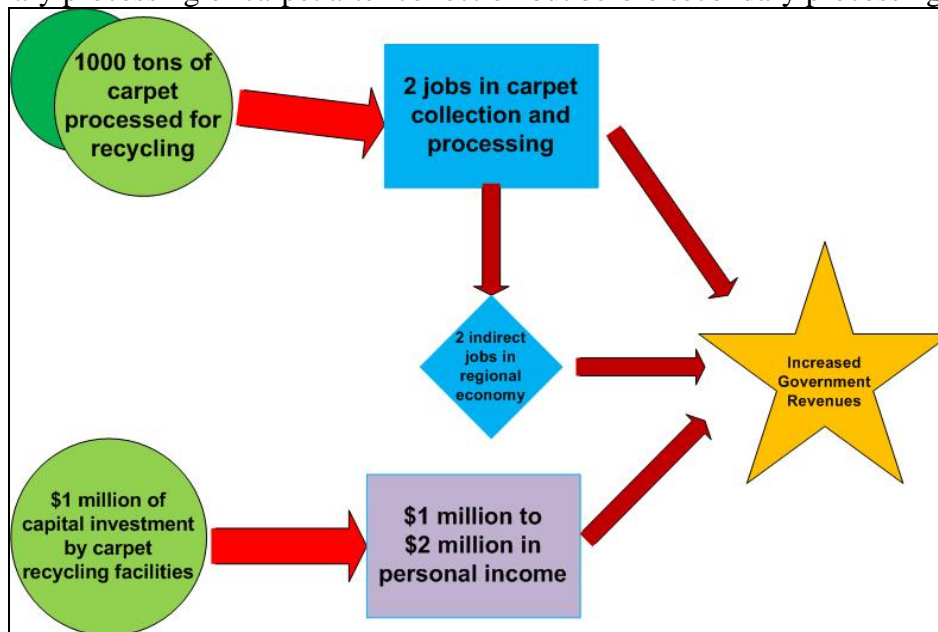
3. Economic Impacts (Evaluation Criterion #2)

Evaluation Criterion #2: An assessment of the economic results/benefits of post-consumer carpet economic activity, such as the number of reuse and recycling establishments, employment, annual payroll, estimated receipts, and throughput of recyclable materials.

Based on survey results and recent state and federal economic impact studies, we found that the carpet recycling industry has some very strong positive economic impacts on local, regional and state economies.

These findings were based on obtaining jobs, payroll, and capital investment figures from a number of entrepreneurs engaged in recycling (collecting, sorting, and preparing carpet for shipping to processors). While this is just one slice of the numerous parties engaged in carpet recovery, it provides a preliminary snapshot of the economic benefits of this particular diversion industry. Chart 3-1 below illustrates the flow of economic benefits in a regional economy.

Chart 3-1: Conceptual Overview of Economic Benefits of Front-End Carpet Recycling
(primary processing of carpet after collection but before secondary processing)



In summary:

- For every 1,000 tons of carpet collected for recycling, there are about two jobs created.
- These two jobs stimulate an estimated two additional indirect jobs in the regional economy.

- Every \$1 million of capital invested in the carpet recycling industry stimulates \$1 million to \$2 million in personal income at the state level.¹
- The revenue, jobs, and personal income generated by carpet recycling facilities increase state and local government revenues. These additional revenues can be useful in motivating the interest of local, state, or federal policymakers to secure tax breaks, grant funds, economic development incentives, or other public-sector support for the carpet recovery industry.

¹ Northeast Recycling Council. *Recycling Economic Information Study*. RW Beck, June 2000, www.epa.gov/jtr/econ/rei-rw/pdf/nerc.pdf; Florida Dept. of Environmental Protection. *Florida Recycling Economic Information Study*. RW Beck, www.epa.gov/jtr/econ/rei-rw/pdf/fl_report.pdf; Indiana Dept. of Commerce, “*Recycling is Working in Indiana*.” www.CommerceRecycles.in.gov.

4.0 Stakeholder Efforts (Evaluation Criteria #3 and #5)

Evaluation Criterion #3: An assessment of the efforts that have been undertaken by each of the parties identified in Section 3 of this Agreement toward meeting the Negotiated Outcomes Goals.

Evaluation Criterion #5: An assessment of planned efforts by each of the parties as identified in Section 3 of the Agreement for the upcoming year.

4.1 Stakeholder Past Efforts Toward Meeting Goals

As part of the survey, stakeholders interviewed were asked to describe their organization's efforts over the past 5 years in carpet recovery. Based on the responses, stakeholders have made significant efforts toward meeting the Negotiated Outcome Goals.

Note that the **efforts listed below are self-declared** and Section 4.3 describes interviewees' perceptions of the efforts of each stakeholder group. Presented by group (in alphabetical order), efforts include:

Academics, NGOs, and "Other"

- Fostering recovery of carpet for reuse purposes in building material reuse centers and for recycling in deconstruction
- Academic research and development helpful to carpet recycling
- Movement toward including PCC carpet recovery and new carpet with PCC in green building efforts

Carpet Manufacturers

- Founding CARE in partnership with state and federal government
- Serving on CARE's Board of Directors
- Funding – at the highest level – of CARE, including extensive and high-level support from the Carpet & Rug Institute (CRI)
- Participating willingly since the beginning in the carpet recovery effort
- Buying and using an increasing amount of PCC in making new carpet and other purposes
- Growing industry-specific recycling and takeback programs
- Developing products using PCC
- Major investments in processing equipment, identification tools, training of collectors, support for logistics and buying material.
- Participated in the ANSI consensus Joint Committee to create the NSF 140-2007 Sustainable Carpet Assessment Standard which supports attainment of CARE goals.

Entrepreneurs

- Serving on CARE's Board of Directors
- Establishing carpet recycling operations long before CARE came along, laying a valuable foundation for other entrepreneurs to come – done by a few pioneers
- Hanging in there with a vision of carpet recycling as a viable business after the Evergreen fire at the beginning of this decade – a laudable accomplishment
- Serving as educators on the practicality of carpet recycling for many other stakeholders
- Building collection network from just 5 to over 50 or more collection points nationally

- Working with equipment suppliers to tailor sortation, baling, identification, processing and other equipment to help strongly enable industry growth and make carpet recycling work
- Selling that equipment
- Developing functional networks to capture old carpet from installers, retailers, MRFs, landfills, etc. – whatever it takes to ensure a reliable supply of clean, dry material
- Inventing and refining new uses for PCC material – such as barrier products for construction industry, wastewater treatment, and other civil engineering applications
- Establishing market-viable retail operations that recycle old carpet upon new installation
- Developing relationships with growing numbers of end markets

State, Local, and Federal Government

- Founding CARE in partnership with carpet manufacturers
- Serving on CARE's Board of Directors
- Making minor financial contributions to CARE (~\$57,500 over 6 years, \$50,000 of which was EPA)
- Establishing some carpet collection programs at the local government level
- Offering financial and technical support to in-state carpet recycling entrepreneurs, through grants, loans, business assistance, etc. (we learned of programs in CA, MN, FL, NC, and MA though there may be others)
- Working to establish procurement standards (California; EPA's Environmentally Preferable Purchasing (EPP); etc.) and other policy related to carpet diversion
- Running awards and recognition programs that honor organizations that use PCC carpet and recycled old carpet
- Greening new and remodel construction efforts for publicly owned facilities
- Participated in the ANSI consensus Joint Committee to create the NSF 140-2007 Sustainable Carpet Assessment Standard which supports attainment of CARE goals.

4.2 Stakeholder Future Planned Efforts Toward Meeting Goals

4.2.1 Inventory of Planned Efforts

Stakeholders were asked to describe both their immediate (1-2 year) and long-term (3-5 year) efforts planned for meeting the Negotiated Outcome Goals.

Because these groups do not plan organizational-level efforts together with other parties in each stakeholder group, the lists of planned efforts are not intended to imply a focused effort by the stakeholder group, but rather a compilation of individual organization actions. Presented by group (in alphabetical order), and timeframe, listed goals include:

Chart 4-1: Compilation of Individual Organizations Planned Future Efforts, by Group

Group	Planned Future Efforts	
	Short-term (1-2 years)	Long-term (3-5 years)
Academics, NGOs, Others	<ul style="list-style-type: none"> ▪ Use grant from government to expand infrastructure and increase waste carpet throughput ▪ Convene a regional carpet summit attended by recyclers, carpet manufacturers, and state agencies (regional NGO effort) 	<ul style="list-style-type: none"> ▪ Hope to facilitate the development of private (not government) regional carpet recovery infrastructure ▪ Because this aspect of business is small relative to its entire operation, for one respondent, plans haven't been developed beyond short term – actions are all dependant on funding ▪ Others couldn't answer because their budgetary concerns do not stretch that far into the future, or due to lack of resources
Carpet Manufacturers	<ul style="list-style-type: none"> ▪ Collect PCC ▪ Build up infrastructure ▪ Take steps to further cradle-to-cradle recycling ▪ Focus efforts on carpet recovery ▪ Increase reclamation ▪ Secure supply of material across face fiber types 	<ul style="list-style-type: none"> ▪ Expand N6 PC usage ▪ Expand new ways to use carpet beyond backing recovery ▪ Explore ways to make more sustainable carpet ▪ Create new technology for backing and fiber ▪ Grow infrastructure ▪ Establish contracts and agreements with recyclers ▪ Search for local collection alternatives in local areas ▪ Improve efficiency in both front-end reclamation and back-end recycling ▪ Market Sustainable Carpet Assessment Standard (NSF 140 Standard), promoting reclamation and recycling ▪ Improve processing efficiencies and operations
Entrepreneurs	<ul style="list-style-type: none"> ▪ Sell xx million pounds of PCC/year [<i>number removed to protect anonymity</i>] ▪ Face challenges with storage capacity ▪ Diversify domestic and/or international outlets; watch overseas markets ▪ Expand and support the mills ▪ Grow into Canada ▪ Sell to non-fiber alternative markets with less stringent purity requirements ▪ Continue growth of products; growth plans ▪ Work with dealers on collection logistics ▪ Encourage local government to specify carpet recycling in contracts ▪ Build customer base ▪ Increase amount of carpet collected, sorted and baled ▪ Continue speaking at CARE conferences ▪ Sell equipment to help others recycle carpet and fiber waste 	<ul style="list-style-type: none"> ▪ Build national network, expand into new regions ▪ Continue to grow and look for ways to process carpet and vertically integrate ▪ Work with large institution to develop products using PCC

Group	Planned Future Efforts	
	Short-term (1-2 years)	Long-term (3-5 years)
State, Local, and Federal Government	<ul style="list-style-type: none"> ▪ Discontinue making grants or loans ▪ Focus on market development work ▪ Presenting the findings of CARE’s 2006 Annual Report to supervisors ▪ Plans for the next few years are entirely dependant on funding levels ▪ Nothing, carpet recovery not a short-term priority ▪ Participate in the development of the NSF standards ▪ May develop a Federal procurement standard ▪ Convene a regional carpet summit and ongoing working group for recyclers, carpet manufacturers, and local/state agencies (local government initiative) 	<ul style="list-style-type: none"> ▪ Many described this time frame as quite uncertain – depending on legislation and other product stewardship initiatives, policies and priorities may change. ▪ Support local carpet recovery ▪ Wait for more pull from the market ▪ Working on a new standard with 10% PCC requirement that specifies which materials can constitute the recycled content ▪ Carpet recovery may possibly resurface as a focus in the future, but not certain ▪ Working to get carpet more embedded in other green building standards with EPA assistance ▪ Many respondents provided no long-term goals

As the comments above illustrate, there is general uncertainty regarding the future of end markets for post-consumer carpet waste. Many respondents mentioned a desire to develop the infrastructure to address their concerns that there are simply not enough outlets. Both entrepreneurs and manufacturers expressed a need for the development of more products, technologies, and processing systems to increase carpet recovery, while others seem prepared to wait on policy actions.

Government in particular appears to be waiting on market indicators, product stewardship efforts, or legislative movement to initiate long-term efforts. This wait-and-see stance – while not universal, appears to be widespread – puts the carpet recovery effort into a bit of a chicken-and-egg situation. We see quite a few stakeholders waiting for another group to make a big move that will finally dramatically accelerate the development of the recovery infrastructure in a way that will benefit everyone.

4.3 Perspectives on Effectiveness and Involvement of Stakeholder Efforts

Interviewees were asked to describe the effectiveness of each of the following stakeholder groups in furthering CARE’s goals:

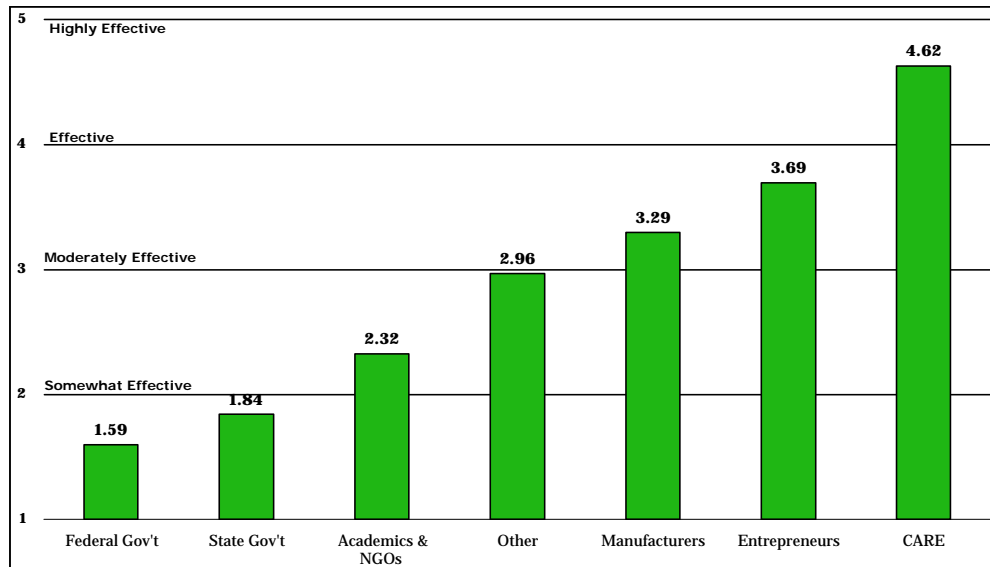
- State government
- Federal government
- Carpet recycling entrepreneurs
- Carpet manufacturers
- Academics/NGOs
- CARE
- Other – including equipment manufacturers, investors, architect/design community, etc.

4.3.1 Survey Findings on Stakeholder Effectiveness

Between 27 and 32 interviewees responded to each of the questions on their perspectives regarding the effectiveness of stakeholder groups. Answers were provided as numerical values between 1 and 5 for all groups (with 1 being ineffective and 5 being highly effective). Provided

below is a summary of findings. More detailed findings on each stakeholder group are provided in Appendix B. The scores for the stakeholder groups were averaged and are shown on Chart 4-1.

Chart 4-2: Comparison of Average Effectiveness Ratings for Each Stakeholder Group



Federal and state governments were perceived as the least effective, garnering an average score of 1.59, and 1.84, respectively. The academic/NGO group is seen as somewhat effective by respondents, scoring 2.32. The “other”, manufacturer, and entrepreneur groups were perceived as moderately effective to effective. CARE itself received the highest scores, as effective to highly effective. The following observations were gleaned from the input received from interviewees in this topic.

- There is considerable awareness of and respect for the activities CARE undertakes to promote PCC recycling, particularly how CARE constantly facilitates communication between involved stakeholders.
- All stakeholders except CARE were encouraged to increase their support and involvement. It is well understood that CARE simply cannot do anymore than it presently does without more resources.
- Most comments regarding CARE note that funding and resources available to the organization should be increased.
- State and federal governments were both criticized for their lack of efforts to date, specifically with regard to the absence of using institutional purchasing tools to create demand for PCC-containing carpet and other products.
- Although manufacturers are credited for their financial input, there is room for more transparency in their carpet diversion-related activities – particularly in showing how much PCC is used in new carpet manufacture.
- Some stakeholders indicated that manufacturers could be using more PCC
- Other stakeholders have called upon academics, NGOs, and others to become more actively involved and raise their profile. Large retailers such as Home Depot were singled out as absentees.
- There is distrust or lack of respect/understanding between stakeholder groups that should be addressed to ensure it does not impede further progress.

4.3.2 Observations on Stakeholder Dynamics

While there are optimists in the group of interviewees (see quote to right), and supportive comments were expressed for all groups, the survey responses indicate a pattern of a lack of trust, respect, and/or understanding between stakeholder groups. We heard accusatory observations about other groups along the lines of ‘they’re not doing enough.’ We feel it is important for this independent assessment to shed light on these dynamics, with the hopes that the group as a whole can work beyond misperceptions towards stronger mutual understanding and positive regard. Such understanding can form a more solid foundation for constructive inter-stakeholder carpet diversion efforts.

“Everyone’s come to the table with good will and attempting to do what they can do” -- an original MOU signatory

Note that in the following summaries of what led to this observation of mistrust, we are simply presenting information we heard in interviews. These perceptions have shaped interactions between groups. **We cannot address whether comments are true or accurate or not.**

Carpet Manufacturers – We heard that some stakeholders were uncertain they could trust the carpet and rug manufacturers to work at a level beyond simple fiscal self-interest. Some said the carpet industry could be using a great deal more PCC and is simply not interested in really doing so. Those who have invested in collection and processing facilities recalled being disappointed by manufacturers when they failed to follow through on specific promises, which left these businesses less willing to stay involved in carpet recovery. Some felt the industry should provide more data regarding its capital investment in carpet recovery in order to document its commitment – without this information, others find it difficult to gauge industry’s true contributions. And, the industry was accused of advertising its carpet recycling efforts while concurrently fighting policies that would include PCC in procurement or processing standards.

State and Federal Government – A significant number of stakeholders expressed disappointment about the lack of movement from governmental parties. Government was expected to have established clear purchasing standards by now that would help create demand for PCC-containing carpet and other products. The lack of more involvement from states and the federal government was commented on by many parties. Government’s failure to drive more carpet diversion with its policy tools was the driving force behind their low scores, and broad disappointment at government’s perceived ineffectiveness and lack of engagement.

NGOs – This group received some criticism as raising problems but others noted that they haven’t been part of CARE much. It was noted that more NGOs and non-profits need to become involved.

In summary, it appears that expectations have been high for both government and the carpet industry in particular over the past five years, and those expectations have not been met. We think the ensuing disappointment derives from the lack of a detailed understanding of the drivers, motivators, and constraints impacting each stakeholder group in the both the marketplace and in the context of the world in which it operates. To move beyond this place of mistrust, all parties need to better understand one another’s situation, perhaps through enhanced communication efforts – in order to achieve maximum effectiveness.

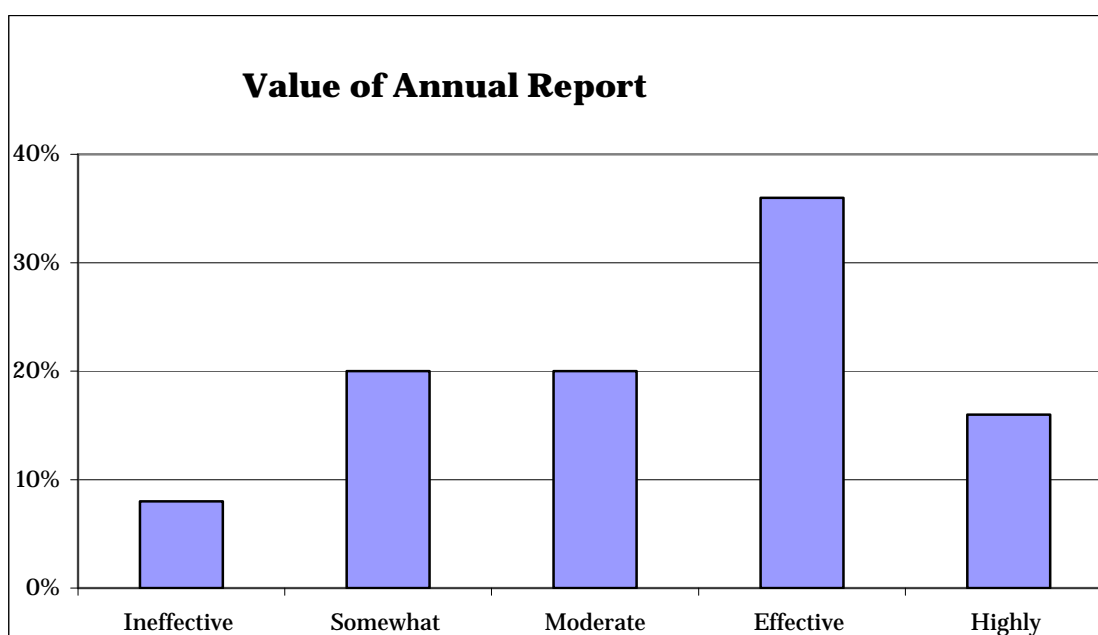
4.4 Assessment of CARE’s Organizational Efforts

In questions 10 and 11 of the survey (see Appendix A), respondents were asked specific questions regarding CARE’s annual survey, annual report, and both conferences it hosts.

4.4.1 Value of CARE Annual Report

When asked whether they read the CARE Annual Reports (and its survey data), 26 of the 32 interviewees who responded to this section indicated that they did, resulting in a readership of 81%. These readers were asked to rank the value of the Annual Report (to them and their organization) using the scale of 1 (ineffective) to 5 (highly effective). Results are shown in Chart 4-2.

Chart 4-2: Assessment of CARE’s Annual Report



If an average score were applied to the Annual Report, CARE’s annual publication would receive 3.32 out of 5, which translates roughly to “moderately effective” to “effective.”

Surveyees mentioned recycling rate information in the Annual Report as being particularly useful. The report is found to be valuable on a more general basis, as it is a strong tool to raise awareness and knowledge of carpet recycling efforts. It serves as an important touchstone to measure progress against goals, and perhaps as an inspiration to readers to improve diversion efforts. On the whole, the Annual Report serves as a good and useful documentation of CARE’s and its stakeholders’ efforts.

Improving the Annual Report. Respondents felt a number of items should be added to the report’s content in the future. As noted above, some questioned the validity of the diversion rates, with specific concerns about the potential of double counting and about stored material being counted as diverted. It should be pointed out that the issue of storage impacting diversion numbers has not been a factor in any report to date. The first year inventories may be a concern will be the

2007 report, to be issued in May 2008. The storage-counting issue is the subject of debate among CARE stakeholders at this time.

In particular, one interviewee said he would like for the capital investment levels from survey participants to be released, in an aggregated format. This way, even if the recycling rates are low, he can understand that it wasn't for lack of effort. It can also be used to forecast future achievements with more confidence.

It should be pointed out the Executive Director presented this data during the 2007 State of CARE address at the May 2007 conference. The estimated investment by the carpet industry is \$350,000,000 in the last 10 years with an estimated 65%+ of that occurring in the last 5 years. It is likely the person making that comment simply wasn't at the conference.

Specific requests include:

- Closer inspection and greater reporting on PCC sales, use, and demand levels – in both raw and processed forms
- Increased reporting of efforts towards developing end markets
- Inclusion of international efforts
- Enhanced efforts to improve data quality and/or credibility
- Listing of carpet recovery programs, listed by state and/or municipality

Note also that CARE has actively endeavored to enhance the accuracy and scope of reporting each year based on feedback, including double counting. As competition continues to expand collectors are becoming more recalcitrant to share what they consider to be proprietary business information.

4.4.2 Value of the CARE Conferences

Respondents were also asked whether they valued the Annual Conference and Entrepreneur's Meeting.

Almost unanimously people reported they felt these are highly valuable, and the reasons included the value of the conferences as a place to communicate with other stakeholders, to network with individuals from other regions, and to get inspired. They also appreciated the opportunities to learn about new technologies and policies.

4.4.3 CARE's Impact on Stakeholders

Respondents also indicated whether CARE contributes to the success of their organization.

Twenty-five of 29 respondents who answered this question indicated that CARE has contributed to their success, reflecting a generally positive response. When asked to comment, respondents provided the following:

- CARE has made it possible for some regions to have carpet recovery (North Carolina mentioned this)
- It serves as a facilitator for communication between stakeholders
- It provides valuable data and updates to stakeholders who don't actively follow progress

- CARE provides recognition and press coverage for smaller companies, which increases access to new clients and customers

In summary, the following conclusions can be drawn from the comments discussed above:

- CARE's annual reports and meetings are highly valued and attended by many stakeholders
- CARE's efforts have directly contributed to the success of many stakeholders, via raised profile, information sharing, and its role as facilitator

5.0 Environmental Benefits (Evaluation Criterion #6)

Evaluation Criterion #6: When feasible, an assessment will be performed of the resources saved as a result of diverting post-consumer carpet from landfills or incineration and a quantification of greenhouse gas and other environmental savings achieved by diverting recovered carpet from landfills.

5.1 Resource & Greenhouse Gas Savings

Carpet recycling yields some of the strongest resources savings – especially in terms of net avoided greenhouse gas (GHG) emissions – of all the materials that can be currently recycled. In the latest life cycle assessment of solid waste management and greenhouse gases² from the U.S. EPA, carpet was added to the calculations. (Unless noted otherwise, data in this section is from that source.) According to US EPA 2005 waste composition data, carpet comprises 1.2% of U.S. generation of municipal solid waste (2.98 million Tons), and 1.8% of total discarded municipal solid waste in 2005 (2.92 million Tons)³ – and is therefore not an insignificant fraction of the waste stream that contributes to global warming and waste management challenges.

The EPA study estimates that recycling carpet results in a net GHG emission of -1.96 metric tons of Carbon Equivalent per Ton of carpet (MTCE/Ton). This is a dramatic GHG impact – Chart 5-1 shows the net GHG emissions from recycling several other common materials – only aluminum yields greater positive impacts.

Chart 5-1: Net GHG Emissions from Recycling

(in Metric Ton Carbon Equivalent per Short Ton Recycled)

Material Recycled	MTCE/ Ton Recycled
Aluminum cans	-3.70
Carpet	-1.96
Mixed metals	-1.43
Copper wire	-1.34
Mixed paper	-0.96
Corrugated cardboard	-0.85
Dimensional lumber	-0.67
Personal computers	-0.62
Steel cans	-0.49
Tires (re-treading)	-0.50

² *SOLID WASTE MANAGEMENT AND GREENHOUSE GASES: A Life-Cycle Assessment of Emissions and Sinks*, 3rd Edition, September 2006, US EPA, available at <http://epa.gov/climatechange/wycd/waste/SWMSGHGreport.html>.

³ *Municipal Solid Waste in the United States: 2005 Facts & Figures*, from Table 12 “Products Generated in the Municipal Waste Stream, 1960 to 2005”, p. 68. and from Table 14 “Products Discarded in the Municipal Waste Stream, 1960 to 2005,” p. 70, United States Environmental Protection Agency, Office of Solid Waste (5306P) EPA530-R-06-011, October 2006; available at www.epa.gov/garbage/pubs/mswchar05.pdf.

Using CARE’s data on pounds of post-consumer carpet recycled from 2002-2006, Chart 5-2 documents actual greenhouse gas savings achieved to date, shown in both MTCE and CO₂ Metric Ton Equivalents (MTE). Equivalencies in commonly understood metrics are included also.

Chart 5-2: Net GHG Emissions and Equivalent Metrics for Carpet Recycling (2002-2006)

Year	Pounds of carpet recycled	Net GHG emissions in MTCE ^[1]	CO ₂ MTE ^[2]	Equivalencies ^[3]				
				Barrels of oil not burned	Passenger cars not driven for 1 year	Number of tree seedlings grown for 10 years	Acres of pine storing C for 1 year	Railcars of coal not burned
2002	46,200,000	-45,276	-166,012	386,074	35,933	4,256,718	138,343	844
2003	86,600,000	-84,868	-311,183	723,681	67,356	7,979,043	259,319	1,581
2004	98,400,000	-96,432	-353,584	822,288	76,533	9,066,256	294,653	1,797
2005	194,300,000	-190,414	-698,185	1,623,685	151,122	17,902,171	581,821	5,723
2006	239,500,000	-234,710	-860,603	2,001,403	186,278	22,066,752	717,169	4,373
TOTAL	665,000,000	-651,700	-2,389,567	5,557,131	517,222	61,270,940	1,991,305	14,318

[1] MTCE = Metric ton Carbon Equivalent. From EPA’s SOLID WASTE MANAGEMENT AND GREENHOUSE GASES: A Life-Cycle Assessment of Emissions and Sinks, 3rd Edition, September 2006. Exhibit ES-4: Net GHG Emissions from Source Reduction and MSW Management Options

[2] CO₂ MTE = Carbon Dioxide Metric Ton Equivalent. Conversion This conversion used the U.S. Climate Technology Cooperation Gateway, Greenhouse Gas Equivalencies Calculator, from /www.usctcgateway.net/tool

[3] Conversions used the U.S. Climate Technology Cooperation Gateway, Greenhouse Gas Equivalencies Calculator, from /www.usctcgateway.net/tool

Note that combustion (through WTE) of post-consumer carpet yields a net GHG emission of 0.11 MTCE/T – and is therefore still contributing to greenhouse gases. These calculations have not been added to the benefits of recycling shown above, but could be to yield net GHG emissions as a result of all carpet diversion efforts. As an example, 2006 data showed 21.4 million pounds of carpet was combusted in either cement kilns or waste-to-energy facilities. This equals 1,177 MTCE net GHG emissions, which reduces the total net GHG emissions for 2006’s diversion to -233,533 MTCE.

5.2 Carpet Recycling’s Green Footprint

As noted at the 2007 Entrepreneur’s Meeting, attention to accelerating climate change is increasing rapidly, with diverse media outlets covering the subject in some fashion. This subject of increasing concern to citizens, scientists, government, and industry is likely to result in several macro trends – along the lines of carbon cap-and-trade systems, carbon footprint benefits calculated as part of life-cycle analyses in purchase decisions, etc. – which present opportunities for the carpet recovery industry. Because of the outstanding environmental benefits resulting from recycling carpet (recycling carpet yields about 3 times the GHG emissions savings as recycling dimensional lumber, for example), this should be an area of intense interest among diverse stakeholder groups engaged in both recycling and carpet.

It should be noted that while carpet recycling has an outstanding GHG net emission, the burning of carpet is a contributor to GHG.

CARE and its stakeholders have been concerned about burning carpet as part of the overall carpet recovery effort. A look at the GHG impacts raises the question of whether, for the non-recyclable fraction of carpet (too dirty, unidentifiable, etc.) of whether it is better to (a) bury what can not be

recycled or (b) burn with energy recovery and reduce the mass by 90% (acknowledging it is at worst equal to coal in terms of emissions, and noting that carpet is less than 1% of all the coal burned to produce energy)? Chart 5-3 compares the benefits of various waste management options in terms of net GHG emissions, and clearly shows less adverse GHG impacts for landfilling as compared to combustion.

Chart 5-3: Net GHG Emissions from Source Reduction and MSW Management Options for Carpet (MTCE/Ton)

Source Reduction	Recycling	Composting	Combustion	Landfilling
-1.09	-1.96	NA	0.11	0.01

It is likely that the answer to ‘how should non-recyclable carpet be managed?’ will generally be driven by the local economics facing a carpet recycler. Put simply, it’s likely the carpet recycler will dispose of the non-recyclable fraction in the cheapest way.

Were the costs of GHG impacts to be factored into tip fees, combustion likely would be a much more costly disposal option – and recycling, in turn, would be the least expensive option.

We can see that recycling of carpet is strongly argued for by the environmental data. We recommend that all stakeholders – and especially the recycling industry that may benefit financially once carbon trading systems are in place – use this data to increase its support of and investment in all aspects of carpet diversion and recovery. CARE and its stakeholders clearly have a strong motivation to push for policies that incorporate price signals into waste management costs that measure and value the currently externalized impact of GHG emissions. Finally, this data also suggests CARE should push for pricing mechanisms in commodity sales that reflect the GHG costs of the production of recycled versus virgin commodities.

6.0 Barriers & Successes in the First Five Years

“In year five (2007), an independent study ... shall be commissioned to evaluate the progress and identify existing barriers toward meeting the Negotiated Outcomes Goals...” – from the MOU

A look at existing barriers would not be complete without a discussion of the successes to date.

6.1 Successes

Interviewees were asked what they felt were the most notable successes in carpet recovery overall in the last five years and what was CARE’s role in those successes. Thirty-five of the 41 parties surveyed responded to this question. The responses are as follows:

- **Formation of CARE:** Over 25% of the respondents (9 of 35 surveyees responded to this section) indicated that the most notable success of the last five years was the formation of CARE, including the development of a partnership and the collaboration it has fostered within the industry. Many more informally expressed high levels of respect for CARE and its accomplishments.
- **Improved identification techniques:** Six of the 35 surveyees that responded to this section indicated that an improved identification technique was the most notable success.
- **Diversion of end of life carpet:** Six of the 35 surveyees responding to this section felt that although the MOU goal had not been met, diversion to date is nonetheless a notable success. The increase in carpet recycling over the past 5 years and diversion of a significant quantity of carpet from landfilling was noted.
- **Evolution of end markets:** Four of the 35 surveyees that responded to this section indicated that end markets have evolved over the past 5 years and that was a significant success, though more development of markets is needed.

The remaining comments on most notable successes included that manufacturers were working together to close the loop on carpet, the number of collection sites has grown from 5 to 54, there has been an increase in the awareness and pressure to recycle carpet, the development of the NSF standard, the growth in attendance of the Annual Entrepreneurs Meeting, and the development of procurement language for public entities.

Overall, stakeholders indicated that CARE played a central role in these successes in facilitating dialogue by providing a venue for diverse stakeholders, convening events, disseminating information and increasing awareness. It was noted, however, that CARE has very limited resources and could do more for the industry if more financial support were available.

6.2 Barriers

The survey included a number of questions about barriers that may have inhibited the carpet diversion rate from reaching the 13.6% goal for 2006 – the actual rate was approximately 5%. Again, please note that the following is the ranking of barriers (with related commentary) as provided by survey respondents – not ranking provided by ZWA.

Overwhelmingly, the #1 key barrier to increasing diversion rates was identified as the lack of diverse end markets. The other primary barriers identified by interviewees were #2 – lack of sufficient education and outreach, and #3 – the economics and infrastructure of collection. These, and other barriers identified, are discussed below in order of importance as identified by stakeholders during the survey.

#1 Barrier – End Markets: Overwhelmingly, the key barrier to increasing diversion rates was identified as the lack of diverse end markets. The term ‘end market’ is used broadly and means different things to different parties in the carpet recovery chain – but overall, respondents are very concerned that there are simply not enough outlets to take all grades of recovered carpets for recycling, nor enough outlets for plastic commodities made from PCC. Nearly half the interviewees indicated that the lack of diverse and robust end markets was the “most significant barrier” and most interviewees mentioned lack of end markets as a concern. Specifically, the following end market barriers were identified:

- Insufficient market demand for products containing post-consumer carpet (PCC), particularly high-value products, including carpet with post-consumer recycled content. Such demand would in turn spur manufacturing with PCC.
- Not enough closed-loop carpet-to-carpet recycling.
- Lack of diversity in the end markets; there are only a few outlets for some carpet grades and no outlets for recycle uses of other grades of PCC material.
- Insecurity over long-term consistent outlets for collected carpet.
- High capital investment, and lack of funding, hampers small entrepreneurs from entering into both collection and processing ventures.

“Most significant barrier – end markets. If there was more demand for post-consumer carpet, for more varied end uses, the collection system would evolve to meet that need.”

“The biggest overall barrier is the inability to secure long-term (end market) commitments.”

#2 Barrier – Communications (Education and Outreach): Communication was mentioned by several stakeholders as the “most significant barrier.” second to end markets. Although a few interviewees felt that communication, at its current level was adequate, the majority of interviewees expressed that additional outreach and education was needed to increase demand for products with post-consumer carpet content. The following communication barriers were identified:

- Insufficient outreach to all constituencies such as communities, retailers, waste haulers and end users. Need to increase public awareness about carpet recovery.
- Concern that governments lack awareness about carpet recovery opportunities and the importance of purchasing carpet, and other products, with PCC recycled content.
- CARE is overloaded and needs more resources to expand education and outreach efforts.
- Retailers are not engaged, and would be instrumental in outreach to the public.

“Carpet recycling is not a market that folks know much about. I would guess that not a lot of people, even in the green building industry, have even heard of CARE.”

#3 Barrier – Collection economics and infrastructure: Although the collection infrastructure has grown significantly the past few years, with at least 54 collection sites, several stakeholders identified collection as the “most significant barrier.”

Throughout the interviews the economic challenges associated with collection was a dominant theme we heard from interviewees. However, many we spoke to acknowledged that collection barriers, particularly the economics of collection, will be mitigated once the end market demand grows.

These comments are broken into subsections:

Collection Economic Barriers:

- It is less costly to dispose of carpet than reclaim it
- Carpet disposal is subsidized by government as part of its solid waste system; carpet is picked up at curbside for disposal in some areas
- Low landfill costs
- Storage and transportation costs
- Clients do not want to pay a premium for reclamation
- More reclamation centers on a local or regional scale would reduce collection costs

As long as it's more economical to toss it, people will do so. One of the things government does best is when the private market system isn't functioning because of externalities, it can make adjustments to avoid or mitigate those externalities. That is the situation now with it being cheaper to dispose than recycle. Carpet disposal is subsidized by government now. We create the externalities ourselves. – an MOU signatory from the government sector.

Collection Infrastructure Barriers:

- Inadequate geographic coverage for collection.
- Absence of partnering with local governments for local collection programs.
- Need for more decentralized local collection, storage and processing in the communities that generate waste carpet.

Collection Logistics Barriers:

- It can take time to accumulate a full load of carpet, and it must be stored indoors or in enclosed dumpsters – kept clean and dry
- In big cities, often ‘gypsy’ crews who install and remove carpet are motivated by speed and expediency – and haven’t taken the time to move up a learning curve and change practices to sort and store used carpet
- Language and cultural differences with such crews were also cited as a barrier
- Transportation costs were also identified as a barrier; both the cost to bring collected carpet to a processor and the cost to transport the material from the processor to the end user

Residential Collection Barriers:

- Ability to cost-effectively consolidate collection of small residential jobs; these collection costs are too high
- Lack of engagement with retailers of residential carpet (both independent carpet dealers and big box stores) – e.g., the absence of the ‘Home Depots of the world’ at CARE meetings was noted

“One barrier is universal: every community or state that allows curbside trash collection of carpet is automatically losing out on a recycling collection opportunity.”

Commercial Collection Barriers:

- Logistics of collection during projects – space restrictions, staging, elevator space, keeping carpet dry and clean, etc...
- Commercial buyers do not pay a visible fee for landfilling old carpet, therefore unwilling to pay for reclamation

- Commercial carpet is easier to collect than residential carpet, but more challenging to process

#4 – Additional Barriers:

#4.1 Design for Recycling: Several interviewees discussed the need for redesigning carpet to be more readily recyclable. The barriers identified included:

- Lack of two-way communication between recycler and manufacturer for improving design for recycling
- Many manufacturing technologies and formulas are proprietary which makes separating and processing very challenging for the recyclers
- Carpets generally not designed for the disassembly required to recycle
- Lack of recycling compatibility of face fibers and carpet backing
- The structured backing of commercial carpet is difficult to process
- Adhesives required for installation makes commercial carpet very difficult to recycle
- Production of carpet that cannot be recycled into high-quality products

“We need manufacturers to design carpet with recycling in mind. Why aren’t the backing materials and face fibers compatible?”

“Manufacturers must share the technologies they’re using to make carpet – so folks recycling & separating it know what they’re dealing with. We know a lot of formulas are proprietary – but these could be shared with a 3rd party under the right agreements to better enable complete recycling & separation. There isn’t good two-way communication between recyclers and manufacturers – they could help us eliminate problems we have.

#4.2 Processing: Only one stakeholder indicated that processing is the most significant barrier – specifically the economics of processing and the high capital investment needed. Many stakeholders, however, provided thoughtful input on a variety of barriers associated with processing. Several also mentioned that the identification technology has improved significantly over the past few years (see Section 6.1 on successes). Processing barriers identified included:

- Complicated technology is needed to make recovered carpet (nylon 6 and nylon 6,6) into a sufficiently pure fiber to use in new carpet facing.
- High capital cost to enter carpet processing market; difficult to be economically viable.
- Contamination of the carpet – tack strips, glue, construction and demolition debris and/or moisture – create difficulties in processing.
- The glue and structured backing of commercial carpet makes it difficult to process – installation adhesives make commercial carpet very difficult to recycle – gums up machines.
- Need technology breakthrough for cost-effective separation techniques.
- Lack of recycling compatibility of face fibers and backing.
- Lack of local processing infrastructure in some regions.
- Sorting material is too labor intensive. Carpet-to-carpet recycling is more difficult and costly than carpet-to-plastic pellets.

“Processing requires a large capital investment and continuous outlets, which has been a struggle.”

“Carpet is challenging to deconstruct – it’s like a peanut butter and jelly sandwich where you need to get the jelly out – very costly.”

#4.3 Policy and Strategy: Policy and strategy issues were not identified by any of the stakeholders interviewed as a “most significant barrier” to increasing carpet recovery rate. That said, many of the interviewees had thoughts on barriers in the policy and strategy arena.

The primary concern was linked to end markets – the need for government and other institutional purchasers to specify products containing post-consumer content carpet to create the necessary market demand. Other barriers identified included:

- Lack of engagement with government (local, state and federal) purchasers and policy makers.
- Recognition that the absence of a carpet landfill ban makes carpet recovery more challenging, though there was not much interest in a landfill ban.
- Carpet disposal is subsidized by government as part of the solid waste system. In some areas carpet is picked up at curbside for disposal.

“States and local governments can help by issuing specifications that mandate carpet reclamation and by requiring the purchase of products containing post-consumer carpet content.”

#4.4 Stakeholder Relations: Although interviewees were not asked specifically about stakeholders relations within the carpet recovery industry, it became clear that an additional barrier exists based on various stakeholders holding others accountable for the failure to meet MOU goals at this point. While there are optimists in the group of interviewees, and supportive comments were expressed for all groups, the survey responses indicate a pattern of a lack of trust between stakeholder groups. This is discussed in more detail in Section 4.3.2 .

Recommendations on addressing barriers can be found in Section 7.0.

7.0 Assessment and Recommendations (Evaluation Criterion #4)

Evaluation Criteria #4: A thorough assessment of the efforts and results to date, including recommendations for changes in strategies and additional efforts to reach Negotiated Outcomes Goals.

“In year five (2007), an independent study ... shall be commissioned to evaluate the progress and identify existing barriers toward meeting the Negotiated Outcomes Goals...” – from the MOU

7.1 Assessment of Progress Toward Reaching the CARE MOU Goals: Observations

7.1.1 Zero Waste Alliance Observations

In forming our assessment of the situation and progress to date, the ZWA team took into account data obtained in the survey, data about carpet recycling from other sources, and our knowledge of the development and maturity of a variety of recycle commodity markets. The observations by ZWA that shape recommendations are documented here – and are intended to help readers build a common base of understanding.

Near-term growth. Presently CARE, the carpet industry, and the community of recycling entrepreneurs are achieving impressive year-by-year growth in carpet recycling. Stakeholders are overcoming substantial technical and logistical challenges to incorporate post-consumer carpet (PCC) in new carpet and other products. Based on confidential but unsubstantiated data obtained in interviews, it is possible that significant additional growth will be shown in the next year or two based on the excellent developmental groundwork of the first five years.

Goals. However, ZWA believes there are considerable challenges facing CARE and the industry in meeting the MOU targets in the years to come, as evidenced by examining the measures of progress used to date. The 2006 carpet recovery rate very nearly meets an S-curve model of growth. However, that curve projects a substantially accelerated growth in recovery over the next few years, and the actual growth has been more closely tracking on a linear curve. Using a linear growth curve that is used for the CARE MOU goals, the 2006 recovery rate lags significantly behind the target. To reach the 40% target (and using the estimated total annual discards for 2012 in the MOU), the diversion rate will need to increase more than 10-fold.

The CARE recovery goals have established a level of expectation that all stakeholders must – and we note are willing to – strive to achieve. Clearly, the CARE goals are ambitious, possibly overly optimistic. It may be practical to revisit them – at some time in the future, but not now. In order for a re-negotiation of goals to be credible, however, all parties to the MOU must visibly demonstrate to all stakeholders a strong and effective effort to increase diversion as much as practical.

Market maturity. A mature market for a recycled commodity is one where the secondary material is recovered from a diverse set of post-consumer sources (many generator types, many grades, etc.). Once processed into a marketable commodity form, the commodity is sold into a variety of uses across an array of markets for the commodity. A mature recycling infrastructure features a diversity of independent, value-adding actors, operating along the complex post-consumer material supply chain, who channel commodities to their highest use based on economic

value. E.g., PET is used in bottles, clothing, automotive applications, etc. and metals are sourced from automotive, electronics, containers, etc. – and once processed, resold back into those markets and more. This keeps each commodity market strong and able to ride out market vagaries (as well as creating stable jobs).

Value in secondary material supply chains comes from two sources (a) the value of new products created and (b) the infusion of support (a public or private subsidy) generally made at the collection step (as is done with public-sector residential recycling collection, in which haulers' *recycling* collection is generally paid through fees on *trash*). An excellent private sector example, the Rechargeable Battery Recycling Corporation (RBRC), is supported by industry membership fees that pay for the collection and delivery of spent rechargeable batteries to a processor. Revenues from processing the batteries into metals (which are sold as scrap metal) are shared between the processor and RBRC. Without the subsidy of collection, rechargeable batteries would be recycled at a far lower rate, and, incidentally, they would be heavily regulated.

End markets for a recovered commodity mature on two levels: (1) demand for the commodity itself, and (2) demand for products containing post-consumer content, with differing market forces at each level. The exercise of spurring end-market development must target each level, though different techniques are used. We observe that the carpet recycling industry is in its very early stages in becoming diversified in both sourcing and selling commodity, and in its understanding how to create market pull at both levels.

Collection. The great successes in developing the U.S. recycling infrastructure taken as a whole – which has gone from a 9% national recovery rate about 30 years ago to approaching 30% today, with the best communities exceeding 60% – has been driven by establishment of collection infrastructures. Local and state governments have driven the collection effort, but *their* efforts at market development and even improving processing technologies have been paltry. Government built a collection infrastructure for commodities that potentially had market demand, and private industry invested and built the processing and new product development infrastructure, knowing it could sell recycled commodities and products made from those commodities. Then, government started including specifications in its purchasing for, e.g., paper with post-consumer content. This model has application to the need to increase carpet diversion.

Green Purchasing. Certain survey respondents conveyed an expectation that government would take up the green purchasing cause on its own. Government often has too many priorities and too few resources. Moreover, purchasing agents are, by nature, highly cautious and conservative – they must be to survive. They must be given the confidence to make purchases of products with recycled content. CARE must market PCC-containing products so that they become a recognized environmental preference that can be trusted to serve functional purposes, while meeting cost and environmental goals.

The market response to these efforts for non-carpet products will inevitably be slow. Because the carpet industry can directly influence the availability of PCC-containing carpet products, it can effect more rapid adoption, and thereby more rapid increase in recovery. For other diverse types of products, e.g., plastic lumber, it will be a mid- to long-term strategy, and not one that will

accelerate short-term demand for PCC-containing products. Purchasers – and government purchasers especially – change slowly.

Product stewardship. The carpet industry is one of many industries that, by the nature of its products, is operating within an expanding producer responsibility or product stewardship expectation. These expectations come from many stakeholders: environmental advocates, green purchasers, large institutional purchasers, waste managers at all levels – even other non-competing industries. Environmental impacts at end-of-life will no longer be, by default, the responsibility of product owners or local government/private disposal facility operators. The costs (and benefits) of responsible end-of-life management will increasingly rest with the beneficiaries along the products' chain of commerce, but foremost with the producer. (For a brief discussion of the product stewardship context and considerations, and why certain products get 'singled out' for product stewardship initiatives, see Appendix C.)

And, based on ZWA's familiarity with product stewardship and recycle industry examples in other sectors (e.g., tires, electronics, paint, batteries – even paper), we note that the best way for the carpet recycling and carpet manufacturing industries to avoid regulatory initiatives sooner or later will be to greatly expand the current recovery effort in a way that challenges and engages all parties, while meeting or exceeding stakeholder expectations.

Environmental impacts. Carbon intensity of the carpet product is a key area of vulnerability to increasing stakeholder pressures. (GHG and environmental impacts are discussed in Section 5) However, the tremendous GHG benefits yielded from recycling carpet represent one of the key opportunity to engage the cooperation – and funding – of other stakeholders, such as government, to aid in meeting the CARE goals.

Efforts to date. The dynamics now in play, as led by CARE and the carpet recovery industry, are generally the right ones to drive the acceleration needed. However, they must increase in magnitude and visibility. The present organizational structures and types of initiatives are the right ones, but they must be substantially enhanced. Addressing counterproductive misunderstandings between stakeholders, as discussed in Section 4.3.2, will help further support the growth of the carpet recycling industry and CARE.

In summary. Considering these observations, we find that it is imperative that CARE, the carpet industry, and government – and all stakeholders – begin now to implement a positive and aggressive push to increase carpet recovery on multiple fronts. This is essential if the MOU goals (whether measured in a linear or S-curve fashion) are to be met in future years.

7.1.2 Observations Based on Survey Findings

To differentiate from our own observations, we document very important observations we heard in the survey about the most significant barriers that must be addressed in order to move carpet recovery forward. These follow:

End markets. CARE and the carpet diversion industry are facing a crucial test in the next very few years. To reach stated goals, recovery rates, by either a linear or an S-curve model, must show substantial acceleration. Lack of diverse and consistent end markets (especially for N6,6,

PET, and PP) was identified as the number one barrier to carpet recycling and recovery by stakeholders. Thus, market development to create demand for both the commodity end markets for various PCC grades, and for products made from all PCC grades must be the top priority.

Efficiency in carpet recovery. A dominant theme amongst stakeholders interviewed was economic challenges associated with collection and transportation of reclaimed carpet. Enhancement of the flow of raw materials must accompany market development. An example is the development of regional processing facilities that upgrade clean recovered carpet into plastic commodity streams with market value – thus combining collection and processing in one locale, and dramatically cutting transportation costs. This can be referred to as efficiencies of scale.

CARE’s resources. The majority of interviewees indicated that while CARE is doing a very good – even excellent – job at facilitating dialogue, sharing information, organizing valued events, and offering technical support, it could achieve much more with additional funding and resources. CARE is the stakeholder group identified as being most highly effective. It makes sense to invest more funding in what is widely regarded as working extremely well.

Education and outreach. The majority of interviewees expressed that additional outreach and education was essential to increase demand for products with post-consumer carpet content.

Design for Recycling. Several interviewees discussed the need for redesigning carpet to be more readily recyclable and create two-way communication between recycler and manufacturer for improving design for recycling.

7.2 Recommended Strategies and Actions

The recommendations offered below are based on observations made by the ZWA team and by the stakeholders. ZWA wishes to acknowledge that, by all accounts, CARE to date has functioned as a well-run organization, learning as it goes along and responding to marketplace dynamics. Its present focus on creating more marketplace “pull” for PCC is timely and appropriate. We note that many aspects of these recommendations are already a part of how CARE functions in the marketplace and seeks to further carpet recovery. Specifically, recommendations #1 and #2 are meant to underscore the need for CARE to have strategies on both ends of the system – collection and end markets.

Therefore, these recommendations were structured to bring a sense of urgency and to prioritize strategies that we believe will address the barriers to carpet recovery in a focused and well-resourced fashion – and ***to engage higher levels of action and involvement from all stakeholders.***

Each action should entail the development of a detailed work plan, and some may necessitate additional study. Such detail is beyond the scope of this study, but will be an essential step for the actions that CARE and its industry partners intend to undertake.

Recommended strategies and actions are described and prioritized below.

Recommendation #1: Market development for products made from PCC must be the top priority

The first key is to increase the supply, variety, quality, and price-competitiveness of products that incorporate PCC. The world is ready for green purchasing, and the economics of the globalized economy will favor, over the long run, less resource-consumptive products. But first producers must put top-quality, cost-competitive, PCC-containing products on the market, and market them aggressively.

This challenge comes in three parts:

- 1.1) Increase production and sales of carpet that contains PCC
- 1.2) Foster development and production of a diverse set of products, made by diverse manufacturers, that incorporate PCC materials
- 1.3) Increase marketing of products containing PCC, carpet as well as other products

1.1 Increase production of carpet that contains PCC

This is within the control of the carpet industry. Many initiatives are afoot, and stakeholders, including CARE, have indicated that interesting initiatives are about to emerge. These must be hastened, with as much transparency as the normal competitive marketplace permits. This is about both end market levels discussed above under “market maturity.” We advise:

- a. Industry members prioritize the development and introduction of PCC-containing carpet products, thus buying much more PCC commodity.
 - (1) When introducing lines of PCC-containing carpet, engage the marketing and sales force, with special attention to sales incentives for this product category.
 - (2) Sales of PCC-containing carpet should include some type of arrangement or incentive for the purchaser to ensure recycling of carpet being replaced. Consider this transaction a market opportunity to further develop customer loyalty.⁴
- b. Carpet-making industries using PCC commodities as input to carpet evolve their sourcing strategies so that they don't simply buy from their own suppliers, but also buy from independent sellers outside industry-owned sourcing networks, using long-term supply contracts. And, they consider purchasing commodity on the “spot market” as it matures. This type of competition in securing PCC-commodity source supply can help keep prices down in the long term.
- c. Carpet manufacturers should report more visibly their investments in projects using and processing PCC – using aggregated metrics or other tools to avoid anti-trust or competitive disclosure.
- d. CARE should reward manufacturers using PCC in new carpet (see Recommendation #3).
- e. CARE should continue its ongoing support the new NSF 140 standard as it gains traction in the marketplace. Once the standard is “opened” again, work to assure that credit is given for use of measurable amounts of PCC-containing carpet.

⁴ Dell's program to takeback and recycle old computers of any make from a purchaser of a new Dell has been quite successful.

- f. Create a forum, clearinghouse, or web-based tool bringing carpet designers together with recycling processors, to further refine design-for-recycling. E.g., manufacturers need feedback from recyclers if they are selling bio-based fibers and backing as “green” products which actually can’t be recycled if it contaminates the recovery process.

1.2 Foster development of diverse products made with PCC materials, made by diverse manufacturers

- a. CARE should make matching grants available for research and development related to facilitating the usage of PCC in products not currently using it, should funding permit (see Recommendation #3 for funding strategies).
 - (1) Create tool for prioritizing R&D grants, first reviewing “lessons learned” from CARE’s earlier grant programs and from other successful R&D grant programs
 - (2) Engage with academic institutions on research opportunities, as appropriate
 - (3) Consider developing an “annual product development challenge” and give awards at an industry forum such as the Annual Meeting or industry-specific trade shows

1.3 Increase marketing of products containing PCC, carpet as well as other products

Purchasing officials must be aggressively pursued by individuals who have the most to gain – the representatives of CARE and the carpet industry.

- a. CARE should more aggressively promote the incorporation of PCC-containing products through seeking to impact green purchasing.
 - (1) Target government purchasers first. MOU government signatories are called out first to increase efforts at policy, rule, and everyday levels to buy greener products containing PCC, for reasons including life cycle cost savings, greening of purchasing, and greenhouse gas (GHG) reductions – and to make these efforts known to purchasing constituents. We note that given the low effectiveness ratings government received (see Chart 4-2), this task should be prioritized by government stakeholders. The Federal Electronics Challenge⁵ and the Northeast State Electronics Challenge⁶ are examples of green purchasing programs making a difference. Following closely should be outreach to all state purchasing officials (www.naspo.org), including exploring getting PCC-containing carpet and products on large national purchasing contracts such as WSCA and NASPO.
 - (2) The second target should be private purchasers with a structural market for green products, such as that created by the US Green Building Council’s LEED standards. Success with those targets will open possibilities to address other markets, such as consumers.
 - (3) CARE should intensify and accelerate its efforts to develop product specifications for PCC-containing products. Disseminate these specifications widely.

⁵ <http://www.federalelectronicchallenge.net/>

⁶ <http://www.stateelectronicschallenge.net/>

- (4) CARE should promote green purchasing of PCC-containing products through extensive outreach to the procurement community, especially public purchasers, through professional organizations and conferences.
- (5) CARE should reach out to and educate organizations, agencies and individuals that are dedicated to environmentally preferable purchasing. This includes the EcoLogo Program, the Center for a New American Dream, and others.⁷
- (6) CARE should develop and promote – in cooperation with other well-established green purchasing efforts – legislation, ordinances, and regulations at the local and state levels that promote PCC-containing products.
- (7) CARE should consider the development of a market distinguisher, such as the EPEAT program for electronics products – including both environmental standards and a registry of qualified products – that would apply only to carpet.⁸

Recommendation #2: Enhancement of the flow of raw materials must accompany market development

As discussed above, the PCC market must mature on two levels – demand for the commodity itself and demand for products with the post-consumer content. Recommendation #2 targets the first level – demand for a commodity that competes in the marketplace against virgin commodity.

It includes addressing the need to increase supply once demand grows.

2.1 Build a detailed and shared understanding of PCC market dynamics

- a. CARE should conduct an economic analysis of the emerging economy of PCC material flow, from collection to processing through manufacturing, to understand precisely where the barriers and opportunities are. Our survey findings on barriers are an initial step but more in-depth economic and logistics analyses are needed to deeply explore opportunities and barriers. This economic analysis should:
 - (1) Explore all potential viable market demands for PCC-generated materials and how they can be supplied.
 - (2) Include development of model supply contracts with floor/ceiling prices or other similar tools that would be helpful to entrepreneurs.
 - (3) Calibrate economies of scale for different processing options – as linked to an understanding of regional demands.
 - (4) Analyze costs/benefits of establishing regional capacity for processing PCC into commodity grades.
 - (5) Provide information on costs, ownership and financing options for facilities producing various plastic grades.

⁷ EcoLogo - www.environmentalchoice.com/English/Home, Center for New American Dream - www.newdream.org,

⁸ See www.epeat.net

- b. CARE should make grants or other investments of its resources to provide targeted capital investment in projects that can help enhance a reliable flow of raw materials to diverse industry players, in targeted regions, based on findings of this study. (See Recommendation #3 regarding funding strategy.) Grants could be given for:
 - (1) Regional analyses of processing needs and benefits, bringing together investors, entrepreneurs, and economic development agencies with the goal of developing increased regional processing infrastructure.

2.2 Aid the growth of the collection infrastructure, as processing infrastructure expands

- a. CARE and its stakeholders should work with local communities (both government and NGOs) to develop strategies to develop local collection infrastructure, such as:
 - (1) Prohibitions on curbside collection
 - (2) Enhancements at local materials recovery facilities (MRFs) to take carpet
 - (3) Coordination with local C&D diversion programs, etc.
- b. Government members should consider bans on landfilling carpet as a way to kickstart or rapidly grow collection infrastructure.
- c. CARE, carpet industry, and appropriate entrepreneurs should conduct outreach to installers (and retailers controlling installation) to provide training, technical support, etc. to help overcome barriers to carpet recovery at point of installation. Large chain retailers in particular should be engaged if at all possible – once sufficient outlets for processed PCC have developed.

Recommendation #3: Develop sustainable and robust financing system for CARE

3.1 Provide secure funding for CARE

- a. CARE's scope of services should be expanded to provide the following:
 - (1) A full-time Executive Director plus a couple staff or contract employees to provide technical support and further education and outreach efforts.
 - (2) Grants to entrepreneurs, researchers, etc. to develop end-market products, to attract more investment capital, and for more basic research and development. (See recommendation 1.2.a, above.)
 - (3) Grants and ongoing support for communities, organizations, and private businesses working to develop collection infrastructure. (See recommendation 2.2.a, above.)
- b. To go beyond the current level of work CARE has been able to accomplish, it should meet its funding needs through an industry membership fee program, the specifics of which must be developed cooperatively.⁹ Many stakeholders we interviewed expressed support

⁹ Discussions with an attorney familiar with industry fee systems implemented through third-party organizations indicated that the TPO must not share individual company competitive information (pricing, sales projections, etc.) with members. To the extent that this information is collected, it can be shared in aggregate form.

for the concept of a “\$.01/square yard”-type surcharge. The following are ideas to begin that process:

- (1) The membership model could be similar to the RBRC voluntary licensee program: a licensee (or membership) fee is paid in proportion to carpet sold – a rate of \$.01/square yard has been frequently mentioned though this could be adjusted once the dollar amount is established that equates to truly secure funding for CARE
- (2) Other commitments should be met for industry membership, for example:
 - Developing and marketing not less than $x\%$ of new carpet products made from PCC.
 - Designing not less than $x\%$ new carpet that is fully and economically recyclable.
 - Sharing information about how carpet is constructed to aid in recycling and separation. Proprietary formulas can be protected by sharing with a 3rd-party organization with the right agreements.
 - Meeting other design-for-environment standards or requirements.
- (3) The fee should be structured to reward manufacturers that utilize PCC in new carpet products and meet or exceed suggestions in 3.1.b(2). The following is provided as an example of how the fee could be structured: example:
 - Each manufacturer would report – to an independent third party that can hold proprietary data anonymously – its annual consumption of PCC that is incorporated into new products.
 - The need for additional PCC consumption from the industry, by weight of carpet diverted into recycling, would be annually determined based on recovery rates and performance as measured against the negotiated outcomes goals.
 - Each company’s proportional contribution to the total annual need would be calculated.
 - The following year’s fees for each company would be reduced in proportion to their contribution to the previous year’s need for PCC consumption.

Recommendation #4: CARE organizational structure and communications

4.1 Various strategies related to communications on data and goals

- a. Establish clear, consistent nomenclature used from year to year in the Annual Reports and other CARE communications. The methodology does this somewhat but could move further. A glossary in each Annual Report might be helpful.
- b. Related to the annual survey:
 - (1) Seek to break out within the recycling fraction the following: (1) re-use as a specific end use; (2) closed-loop recycling; and (3) open-loop recycling.

- (2) Ensure methodology factors out pounds stored in a given year, and pounds disposed.¹⁰
 - (3) Make the survey shorter/easier and less intrusive while still generating needed data; especially make it easier for small operations.
 - (4) As the recycling industry for PCC evolves and becomes more complex, seek reporting methodology that can capture useful data accurately depicting the flow of PCC through collection, pre-processing, processing, and use as a commodity.
 - (5) Continue to communicate external macroeconomic forces outside CARE's control to enable Annual Report readers, etc. to understand context: e.g., residential sector slowdown, drop in US auto sales, Columbia fire, rising fuel prices, etc.
- c. Establish commonly agreed-upon environmental metrics that stakeholders and interested parties can use to measure carbon offsets, for marketing advantage, in data for green communications, etc.
 - (1) Use these metrics to create a communication piece specifically addressing the importance of carpet recycling, life cycle costing/benefits, and GHG emissions. ("Climate change work is the bullet train right now," one stakeholder said.)
 - d. Once the Board feels confident that everything that can be done to stimulate growth in demand for PCC and products made from it – in the carpet industry, government purchasing, and beyond – then it should consider a possible re-negotiation of the goals.

4.2 Structure and functionality of CARE organization and Board

- a. The Board should become more balanced between stakeholder groups, starting immediately. To our knowledge, the Board right now has representative as follows: 7 carpet industry, 2 entrepreneurs/recyclers, 1 carpet seller/ collector, 2 state & 1 federal government. More balanced representation from all stakeholders would aid in reaching goals. "We need to be a chameleon, we need to change and reflect the carpet recovery itself," said one current Board member.
- b. Once a sustainable funding model is implemented (see recommendation 3.1), consider restructuring CARE as an independent organization from the carpet industry – still closely tied but able to represent a broader group of stakeholder interests with deeper credibility.
 - (1) Migrate to this over a 2-3 year period.
 - (2) Plan benchmarks for the migration.

Recommendation #5 – Additional tactical ideas

A miscellaneous list of tactical, longer-term, or lower-priority recommendations is included here for your consideration.

¹⁰ Note that in public sector measurement of recycling, such as done by states of Oregon or California and by the EPA, stored recyclables are not counted as recycled until shipped to an end market, even if they've been baled, crushed, or otherwise processed.

- a. Seek ways to influence policy at Federal and state levels (e.g., RISE legislation) in ways that are favorable to CARE's goals.
- b. Continue to build upon and expand relationships with private sector players (green builders, NAHB, design/architectural, grassroots (GRRN), C&D recycle trade association & players, etc.) to further support their various roles in creating market pull.
- c. As markets mature, work with ISRI to explore pro's/con's of getting scrap carpet specs set up for commodity trading.
- d. Greater involvement, identification, and interaction with the plastics recycling industry. First encouraging steps in this direction happened recently with SPI inviting Peoples to meet with their executives, giving him message "we need to green up, can you help?"
- e. As resources permit, network with the other TPOs/product stewardship folks to learn more regarding what's worked/hasn't worked with RBRC, paint, tires, electronics, etc.
- f. Follow development of cap-and-trade and other market instruments related to carbon and GHG reductions. Position the carpet recycling industry to take maximum advantage of emerging opportunities and seek to influence policy positions favorable to CARE's goals.

APPENDIX A – Survey Instrument

CARE 2007 INDEPENDENT ASSESSMENT SURVEY

INTRODUCTION. Zero Waste Alliance is conducting the 2007 Independent Assessment of the Carpet America Recovery Effort. This is the year 5 assessment called for in the original MOU, and the purpose of the assessment is to evaluate CARE's progress and to identify existing barriers to carpet recycling. Your participation is important to help gather the many points of view needed to objectively assess all stakeholders' effort to date.

Attribution of all information we receive will be held in confidence by ZWA, and not be passed to CARE, including the notes taken in interviews. And, you'll have a chance to review the final report in draft form during a public comment period in November.

Basic Organization Information

Individual Name _____
Phone number: _____
Email address: _____
Current title: _____
Current organization: _____
City: _____ State _____ Zip _____

Role in carpet recovery effort. Please check all that apply:

State or local government _____
Regulatory _____
Entrepreneur (recycler, etc.) _____
Carpet industry _____
Academic _____
NGO _____
Other _____

I. ABOUT YOUR EFFORTS

Let's start with talking about what you and your organization have been doing in carpet recovery.

1.a. Please tell me more about your business and role in this effort: _____

1.b. Are there others in your organization working on carpet recovery? Please tell me a little bit about what they do: _____

2.a. Please tell me about your organization's efforts in the past five years to increase scrap carpet recovery: _____

2.b. And how have you been involved with the CARE organization:

Financial supporter Serve on Committees Participate in Survey

Attend, sponsor, speak and/or exhibit at Annual Conference

Attend, sponsor, speak and/or exhibit at Entrepreneur's Meeting

Other _____

3. Future efforts related to carpet recovery:

3.a. What do you have planned **for the short-term** (next 1-2 years) _____

Expected outcomes? _____

3.b. What is planned **for the long-term** (3-5 year-plus horizon)? _____

Expected outcomes? _____

II. BARRIERS & SUCCESSES

4.a. What **successes in carpet recovery as a whole** stand out from the past 5 years? _____

4.b. What do you see as CARE's role in those successes? _____

5. The current diversion of post-consumer carpet in the US is at about 5% for 2006; in contrast, the MOU goal was to reach about 14% diversion in '06.

What have been the **barriers** in the past 5 years that have kept us from reaching that goal?

5.a. Do you have any thoughts on **collection barriers**? (how post-consumer carpet materials are collected)

5.a.1. What do you see as the key barriers for residential post-consumer carpet collection? _____

5.a.2. What do you see as the key barriers for commercial post-consumer carpet collection? _____

5.b. Do you have any thoughts on **processing barriers**? _____

5.c. Do you have any thoughts on **end markets barriers**? _____

5.d. Do you have any thoughts on **policy & strategy barriers**? _____

5.e. Do you have any thoughts on **communications barriers**? (related to outreach & education) _____

5.f. Overall

In sum, what do you see as the main or most significant barriers to increased carpet recycling? _____

III. DATA CONFIRMATION

CARE's 2006 Annual Report shows the following breakdown of 2006 diversion of post-consumer carpet:

Recycling	92%
Waste-to-Energy	8%
Cement Kilns	about 0.1%

6. Does this seem accurate to you, generally speaking?

Yes No

If no, please describe: _____

7. Do you have any other comments on the quantitative data CARE provides about the carpet recovery work? Comments: _____

IV. STAKEHOLDER EFFORTS TO DATE

8. How would you describe the effectiveness of each of the stakeholder groups in furthering CARE’s goals? Effective is defined here as meaning ‘doing things that make positive progress toward reaching CARE’s goals.’

Effectiveness of each of the stakeholder groups in furthering CARE’s goals	Effectiveness				
	1 Ineffective	2 Somewhat Effective	3 Moderately Effective	4 Effective	5 Highly Effective
8.a. State government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.b. Federal government	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.c. Entrepreneurs – carpet recyclers and reusers, downstream markets (reclaimers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.d. Other: <i>equipment manufacturers, investors, architect & design community (influential in carpet purchase)</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.e. Carpet & rug manufacturers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.f. Academics & NGOs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8.g. CARE itself	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8.h. Comments _____

V. CARE EFFORTS GOING FORWARD

9. Please describe what you believe are the most important future strategies and/or activities of CARE. _____

VI. ASSESSMENT OF CARE ORGANIZATIONAL EFFORTS

10. CARE conducts an annual survey, produces an annual report, and holds annual conferences.

10.a. Do you read the CARE Annual Reports and the survey data it reports about carpet recovery?
Yes No (if no, skip rest of #11)

10.b. How would you describe the value to you and your organization, as a stakeholder, of the survey and the annual report (ineffective to highly effective)? _____

10.c. Is there any information coming from CARE or in the Annual Report that is particularly useful to you and your organization? _____

10.d. Are there other areas you think should be covered in the Annual Report or other data that should be gathered in the annual survey? _____

10.e. Value of the CARE conferences (Annual Conference, Entrepreneur's Meeting) to you: _____

11. Does the CARE organization contribute to the success of your business/organization?

Yes No

If yes, how? _____

How can your organization help CARE advance its goals? _____

OPTIONAL 12. CARE's central goal is to increase the diversion of carpet from landfill. If CARE accomplished that goal, how would that contribute to your business/organization?

VII. WRAP-UP

13. Any final comments? _____

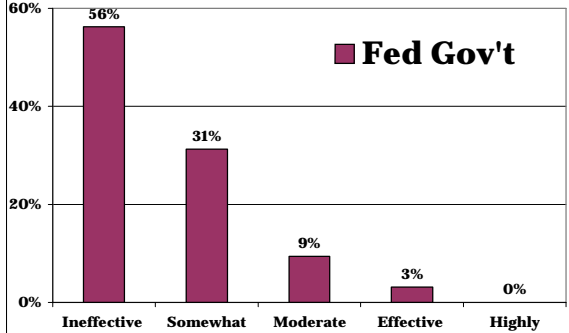
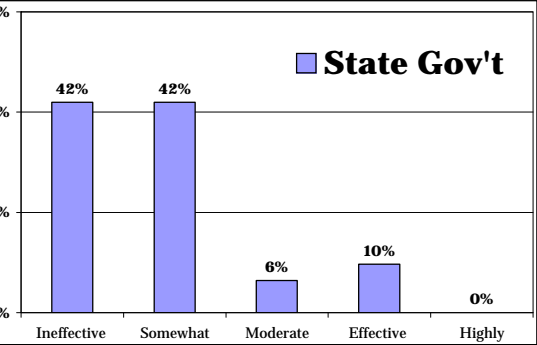
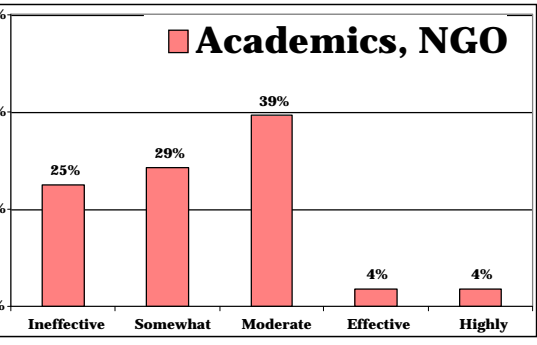
Anyone else to interview? _____

Thank you. After I review my notes, may I contact you again if I need further clarification?

Yes No

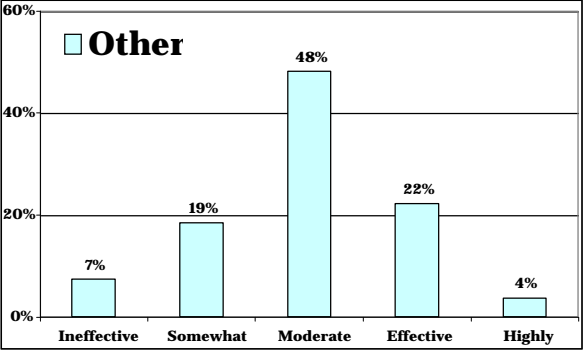
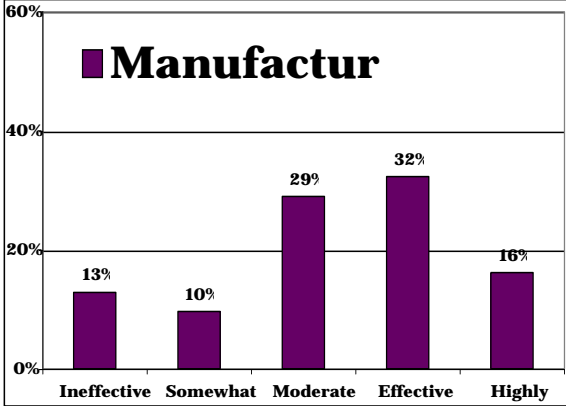
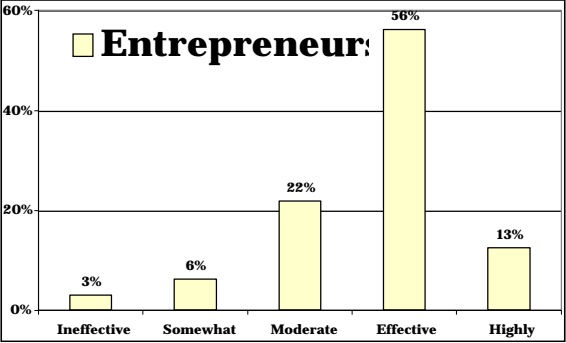
Questions or comments about this survey process? Contact Anne Peters, annep@indra.com
303.494.4934.

APPENDIX B – Detailed Findings & Comments on Stakeholder Effectiveness

Stakeholder-Specific Responses	Selected Representative Comments												
 <p>Fed Gov't</p> <table border="1"> <tr><th>Effectiveness</th><th>Percentage</th></tr> <tr><td>Ineffective</td><td>56%</td></tr> <tr><td>Somewhat</td><td>31%</td></tr> <tr><td>Moderate</td><td>9%</td></tr> <tr><td>Effective</td><td>3%</td></tr> <tr><td>Highly</td><td>0%</td></tr> </table>	Effectiveness	Percentage	Ineffective	56%	Somewhat	31%	Moderate	9%	Effective	3%	Highly	0%	<ul style="list-style-type: none"> Described as not paying much attention to carpet recovery Disappointment due to lack of active support Failure to establish comprehensive procurement guidelines, due in large part to lobbying by manufacturers, has limited their effectiveness and potential for future status as strong partner for CARE.
Effectiveness	Percentage												
Ineffective	56%												
Somewhat	31%												
Moderate	9%												
Effective	3%												
Highly	0%												
 <p>State Gov't</p> <table border="1"> <tr><th>Effectiveness</th><th>Percentage</th></tr> <tr><td>Ineffective</td><td>42%</td></tr> <tr><td>Somewhat</td><td>42%</td></tr> <tr><td>Moderate</td><td>6%</td></tr> <tr><td>Effective</td><td>10%</td></tr> <tr><td>Highly</td><td>0%</td></tr> </table>	Effectiveness	Percentage	Ineffective	42%	Somewhat	42%	Moderate	6%	Effective	10%	Highly	0%	<ul style="list-style-type: none"> If states were successful in legislation encouraging more PCC recycling and diversion, it would force other groups to redouble their efforts. Not meeting expectations for procurement specifications, or other policies. “Only 8 states were involved in MOU, only 2 were on the Board of Directors, and 5 to 6 attended annual meetings regularly – shouldn’t more states be involved?”
Effectiveness	Percentage												
Ineffective	42%												
Somewhat	42%												
Moderate	6%												
Effective	10%												
Highly	0%												
 <p>Academics, NGO</p> <table border="1"> <tr><th>Effectiveness</th><th>Percentage</th></tr> <tr><td>Ineffective</td><td>25%</td></tr> <tr><td>Somewhat</td><td>29%</td></tr> <tr><td>Moderate</td><td>39%</td></tr> <tr><td>Effective</td><td>4%</td></tr> <tr><td>Highly</td><td>4%</td></tr> </table>	Effectiveness	Percentage	Ineffective	25%	Somewhat	29%	Moderate	39%	Effective	4%	Highly	4%	<ul style="list-style-type: none"> Academics were praised for quality of research, and potential for future contributions. Even respondents who noted their low profile added that not much was expected from this group. NGOs were noted for involvement in the MOU process, but criticized for absence since. Concern that NGOs stir things up but don’t stay engaged; though value of NGOs putting pressure on carpet industry was noted.
Effectiveness	Percentage												
Ineffective	25%												
Somewhat	29%												
Moderate	39%												
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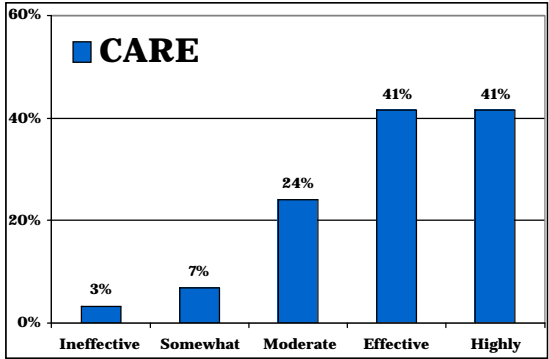
CARPET AMERICA RECOVERY EFFORT: 2007 INDEPENDENT ASSESSMENT

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Stakeholder-Specific Responses	Selected Representative Comments												
 <p>Other</p> <table border="1"> <thead> <tr> <th>Rating</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Ineffective</td> <td>7%</td> </tr> <tr> <td>Somewhat</td> <td>19%</td> </tr> <tr> <td>Moderate</td> <td>48%</td> </tr> <tr> <td>Effective</td> <td>22%</td> </tr> <tr> <td>Highly</td> <td>4%</td> </tr> </tbody> </table>	Rating	Percentage	Ineffective	7%	Somewhat	19%	Moderate	48%	Effective	22%	Highly	4%	<ul style="list-style-type: none"> Concern expressed about the lack of involvement by Home Depot and other large box retailers. For the most part, this group received very limited comments.
Rating	Percentage												
Ineffective	7%												
Somewhat	19%												
Moderate	48%												
Effective	22%												
Highly	4%												
 <p>Manufactur</p> <table border="1"> <thead> <tr> <th>Rating</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Ineffective</td> <td>13%</td> </tr> <tr> <td>Somewhat</td> <td>10%</td> </tr> <tr> <td>Moderate</td> <td>29%</td> </tr> <tr> <td>Effective</td> <td>32%</td> </tr> <tr> <td>Highly</td> <td>16%</td> </tr> </tbody> </table>	Rating	Percentage	Ineffective	13%	Somewhat	10%	Moderate	29%	Effective	32%	Highly	16%	<ul style="list-style-type: none"> “Mills have made stuff happen” and are aggressively trying to grow carpet recycling. Manufacturers were criticized for not having played as integral a part as they could in growing end markets. Provide majority of funding to CARE, as well as “sweat equity”. Some felt manufacturers are too eager to give themselves credit for limited efforts, while not buying and using PCC. Others said manufacturers have resisted policies that would force them to do even more.
Rating	Percentage												
Ineffective	13%												
Somewhat	10%												
Moderate	29%												
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Highly	16%												
 <p>Entrepreneur</p> <table border="1"> <thead> <tr> <th>Rating</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Ineffective</td> <td>3%</td> </tr> <tr> <td>Somewhat</td> <td>6%</td> </tr> <tr> <td>Moderate</td> <td>22%</td> </tr> <tr> <td>Effective</td> <td>56%</td> </tr> <tr> <td>Highly</td> <td>13%</td> </tr> </tbody> </table>	Rating	Percentage	Ineffective	3%	Somewhat	6%	Moderate	22%	Effective	56%	Highly	13%	<ul style="list-style-type: none"> The guys with “boots on the ground making market-based solutions work”. Credited for bringing a “moderate” presence to CARE, but some critique for not doing more, such as developing coding systems. Regarded as successful and constructive part of CARE community. For the most part, interviewees seemed satisfied with their actions to date, and had limited direct comments.
Rating	Percentage												
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Highly	13%												

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Stakeholder-Specific Responses	Selected Representative Comments												
 <table border="1"><caption>Stakeholder-Specific Responses to CARE</caption><thead><tr><th>Response Category</th><th>Percentage</th></tr></thead><tbody><tr><td>Ineffective</td><td>3%</td></tr><tr><td>Somewhat</td><td>7%</td></tr><tr><td>Moderate</td><td>24%</td></tr><tr><td>Effective</td><td>41%</td></tr><tr><td>Highly</td><td>41%</td></tr></tbody></table>	Response Category	Percentage	Ineffective	3%	Somewhat	7%	Moderate	24%	Effective	41%	Highly	41%	<ul style="list-style-type: none">▪ CARE commended across the board, by almost all.▪ It was noted that despite Bob Peoples' incredible level of effort and notable progress over the past 5 years, he still lacks the appropriate resources to achieve CARE's stated goals.▪ CARE needs more resources.▪ Some perceive pressure on CARE to align with industry, based on its relationship with the Carpet and Rug Institute.
Response Category	Percentage												
Ineffective	3%												
Somewhat	7%												
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Effective	41%												
Highly	41%												

APPENDIX C – Product Stewardship Discussion

This report recommends accelerated action by CARE and the carpet industry to increase recycling rates. The main rationale is that such industry-led action will go a long way to preventing legislative and governmental action that could generate a considerably less favorable business environment for the industry.

The main driver that leads the team to this recommendation is the growing action in the U.S. toward Product Stewardship or Extended Producer Responsibility (EPR). EPR came out of Europe and has resulted in a growing body of legislation there as well as in Asia and Canada. In the U.S. EPR is more commonly called product stewardship.

The core principle of product stewardship is that all beneficiaries of the product chain of commerce, but especially manufacturers, take responsibility for the environmental impacts of the products, especially at end-of-life. In particular, this is intended to shift the costs of end-of-life management off of local communities (that typically pay for waste management) and onto the producer.

Of course, the carpet industry is familiar with these principles because CARE is one of the leadership industry product stewardship organizations.

The downside of no action. The electronics industry is a case example of the downside when an industry does not step forward to take effective action to recycle their products. The electronics industry tried to do so, and they were willing to do so. But they failed to reach agreement amongst themselves and no national action could be taken.¹¹ The result is now nine different state laws mandating a variety of programs (and more on the way), with diverse requirements that are very costly for the industry.¹²

The recommendations in this report are intended to prevent such an outcome by placing industry in a leadership position that makes legislative action unnecessary.

Why the carpet industry? Product Stewardship initiatives have generally to this date focused on products that are perceived to have toxic characteristics, creating environmental problems upon disposal, such as electronics, batteries, paint and pesticides, mercury-containing products, etc. So why would carpet attract the attention of stakeholders and especially of local governments and environmental NGOs?

¹¹ The effort referenced here was a multi-stakeholder negotiation that occurred from 2001 - 2004 called the National Electronic Product Stewardship Initiative (NEPSI) that ended in failure due to the inability of industry stakeholders to agree amongst themselves. One member of this ZWA project team served as a NEPSI negotiator.

¹² Other members of this ZWA team provide compliance assistance to electronics manufacturers and can document the considerable costs of compliance in annual fees, staff time, consulting time, and legislative tracking of 50 states – not to mention internationally.

The answer is the increasing focus on climate change. And the carbon intensity of carpet. Based on an EPA life-cycle analysis (LCA) of the greenhouse gas impacts of waste management techniques on a material-by-material basis, carpet ranks second (to aluminum) amongst the 28 materials studied in reduction of carbon emissions through recycling.¹³ For every pound of carpet that is recycled rather than landfilled, nearly two pounds of carbon equivalent are kept out of the atmosphere. The benefits of recycling are even greater when compared to incineration, which puts much of the carbon into the atmosphere. This is, of course, a net impact from evaluating the entire product life cycle.

Interesting that this has surfaced 2x in your analysis and I have never heard of this report. If it is true and such a high impact, why has no one said hey, look at this? It could be used as part of the initiative.

Moreover, the carpet industry is structurally well suited for product stewardship at the most proactive levels. It has:

- a manageable number of producers who share a history of high-level cooperation and a commitment to sustainability,
- a product that can be readily captured from the waste stream, and
- a product that actually is recyclable.

From the perspective of a proponent of product stewardship, the carpet industry – along with its interested stakeholders – is a prime example of an industry that can benefit tremendously from taking far-reaching responsibility for recycling and responsible management of its products at end-of-life.

¹³ *SOLID WASTE MANAGEMENT AND GREENHOUSE GASES: A Life-Cycle Assessment of Emissions and Sinks*, 3rd Edition, September 2006, US EPA, available at <http://epa.gov/climatechange/wycd/waste/SWMGHGreport.html>

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ZERO WASTE ALLIANCE

CARPET AMERICA RECOVERY EFFORT: 2007 INDEPENDENT ASSESSMENT

BOARD REVIEW DRAFT October 22, 2007

ZERO WASTE ALLIANCE



Zero Waste Alliance

One World Trade Center, 121 SW Salmon St, Suite 210, Portland, OR 97204

Tel: 503-279-9383, Fax: 503-279-9381

FIRST REVIEW DRAFT October 11, 2007

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BOARD REVIEW DRAFT October 22, 2007

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“The biggest overall barrier is the inability to secure long-term (end market) commitments.”

“Most significant barrier – end markets. If there was more demand for post-consumer carpet, for more varied end uses, the collection system would evolve to meet that need.”

“Carpet recycling is not a market that folks know much about. I would guess that not a lot of people, even in the green building industry, have even heard of CARE.”

“Processing requires a large capital investment and continuous outlets, which has been a struggle.”

“Carpet is challenging to deconstruct – it’s like a peanut butter and jelly sandwich where you need to get the jelly out – very costly.”

ZERO WASTE ALLIANCE

51

“States and local governments can help by issuing specifications that mandate carpet reclamation and by requiring the purchase of products containing post-consumer carpet content.”

As long as it's more economical to toss it, people will do so. One of the things government does best is when the private market system isn't functioning because of externalities, it can make adjustments to avoid or mitigate those externalities. That is the situation now with it being cheaper to dispose than recycle. Carpet disposal is subsidized by government now. We create the externalities ourselves. – an MOU signatory from the government sector.

“One barrier is universal: every community or state that allows curbside trash collection of carpet is automatically losing out on a recycling collection opportunity.”

“We need manufacturers to design carpet with recycling in mind. Why aren't the backing materials and face fibers compatible?”

“Manufacturers must share the technologies they're using to make carpet – so folks recycling & separating it know what they're dealing with. We know a lot of formulas are proprietary – but these could be shared with a 3rd party under the right agreements to better enable complete recycling & separation. There isn't good two-way communication between recyclers and manufacturers – they could help us eliminate problems we have.

“Everyone's come to the table with good will and attempting to do what they can do” -- an original MOU signatory

ZERO WASTE ALLIANCE

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53

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