CARE 2018 Annual Report
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Mission Statement

The mission of CARE is to advance market-based solutions that increase landfill diversion and recycling of post-consumer carpet, encourage design for recyclability and meet meaningful goals as approved by the CARE Board of Directors.

Vision

Post-consumer carpet diversion and recycling are economically, socially and environmentally sustainable for all stakeholders.

Core Values

We believe in:

- Market-Based solutions
- Entrepreneurship
- Hierarchy of Waste Management
- Sustainable practices (economic, social and environmental)
- Resource conservation
- Transparency
- Multi-stakeholder collaboration
- Professional ethics and integrity
- Anti-trust compliance
CARE 2018 Leaders

Sustainability Leaders

Aquafil USA
Engineered Floors
Interface
Masland Carpets
Milliken & Company
The Mohawk Group
Shaw Industries
Tarkett
Universal Fibers
Wellman Plastics

Friend of CARE

Polymers Center of Excellence

CARE Members

CARE now has 155 members - please go to www.carpetrecovery.org for a complete list of CARE members.
Message from the Chairman of the CARE Board of Directors

As I review the year 2018 for the Annual Report, I realize once again how significant this past year has been to make progress toward achieving the Mission of CARE:

The mission of CARE is to advance market-based solutions that increase landfill diversion and recycling of post-consumer carpet, encourage design for recyclability and meet meaningful goals as approved by the CARE Board of Directors.

2018 was, once again, filled with “interesting” developments, many advancements in recycling technologies, and challenges with the California Carpet Stewardship Program. All of this can be viewed and appreciated as supporting not only the CARE Mission, but, the Vision and Core Values of the organization as well!

I personally take my role as Chairman with a high level of responsibility and expend significant amounts of time and commitment to the operations and performance of CARE – including fiduciary status, adherence to the aforementioned Mission and Values, and the maintenance of high standards of ethical conduct.

Throughout the year, CARE’s Executive Director, Dr. Bob Peoples, has provided steady leadership for the organization and displayed remarkable resilience while facing these many complex issues this year. The CARE staff have also delivered top notch financial and operational support for Bob and the needs of the organization. I submit that the very positive and “clean” financial audits received for CARE’s activities in the core business, the California Product Stewardship Program, and the Voluntary Product Stewardship Program are testament to the well-run business functions.

Support from our membership and the leaders of CARE has continued to be outstanding also. Vice Chairman Joe Foye, Mohawk Industries, has been steadfast in his support, Treasurer Ron Greitzer has served with integrity and diligence, as have the various committees with their specific focus and contributions to our cause.

I continue to be very passionate about the sustainability objectives that we all share. I am also pragmatic about the direction of our organization and the opportunities that we have to promote all aspects of carpet sustainability. Successful outcomes for CARE, its members and its mission, will come from balanced and reasonable positions on our initiatives.

I want to express sincere appreciation for those legacy contributions, and, acknowledge the tremendous need for that to continue in this coming year and in the years to come!

Sincerely,

Joe W. Yarbrough
Chairman, Board of Directors
Message from the CARE Executive Director

Another year under our belts and CARE continues to expand, learn, and evolve. I take great pride in our organization and its members for their spirit of cooperation, dedication and perseverance. This level of commitment is what makes it possible to continue our efforts in the face of the many challenges we face daily. And I am pleased to say we are making progress.

Despite the ongoing challenges, California continues to be a bright spot in terms of our progress. Finally, with approval of the new 5-Year Plan, CARE was able to release grants that had been delayed by 15 months, preventing major investments in capacity expansion to facilitate growth. Those investments are now bearing fruit and have set the stage for major growth in 2019. With an incredibly talented California Team and with tenacious recyclers across the US, the program has made major strides.

The U.S. program continues to struggle to find markets for post-consumer carpet, and output from the Voluntary Product Stewardship Program (VPS) participants continues to fall. To counter these results, the VPS funding continued in 2018, was authorized for 2019 and recently approved to continue in 2020. A renewed focus on how to evolve VPS is now underway.

2019 brings a renewed promise of possibilities. This is being driven by China National Sword and the opportunity to retool recycling in the U.S., along with the new demand by brand owners to solve the plastic waste problem. Brand owners such as Coke, Pepsi, P&G and others want post-consumer content plastics. As a result, major chemical companies are stepping forward and looking to invest serious capital in depolymerization for polyester (PET), polypropylene (PP) and nylon 6. We anticipate initial demand for materials may begin in late 2019 and build into 2020. I believe we are at a turning point: the transition from a baby industry struggling to take first steps, to one that is entering an adolescent stage: a stage where a new professionalism, driven by big demand, will solidify what everyone has been working toward for the last 18 years. If this sound optimistic, it is, and I am excited to see the transition beginning to take shape.

CARE is fortunate to have a great board with members who are actively engaged in the challenges of carpet recycling. Backed by a talented team of professionals, CARE continues to tackle the challenges that face our industry. I want to personally thank each one for their energy, support and trust in me to lead this dynamic organization.

Sincerely,

Robert Peoples, Ph.D.
Executive Director
Key Results for CARE in 2018

Financial Report, 2018

CARE continues to manage three distinct operations: CA Carpet Stewardship Program, The Voluntary Product Stewardship Program (VPS), and CARE Core Operations.

The VPS program launched on January 1st, 2015. The program was renewed for 2018 with a budget of $4 Million. The program has now been operational for 4 years. Limited demand for certain polymer types has had a negative impact on results for 2018. Many macroeconomic factors have contributed to this. The report will go into greater detail about this in subsequent sections.

CARE continues to serve as the carpet stewardship organization (CSO) that manages and implements the California Stewardship Plan. On April 1, 2016, the assessment increased in California from 10 cents to 20 cents per square yard. On October 1 of 2017, the assessment increased to 25 cents per square yard. On January 1, 2019, the assessment increased to 35 cents per square yard. The CARE organization is responsible for administration of an approximately $35 million operational budget in its management of the 3 programs.

CARE underwent three independent financial audits in 2018. The first was an audit of CARE core operations. The second was an audit of our AB 2398 financials. The third audit was of the VPS financials. There were no material findings for CARE under any of the audits performed. CARE received a clean audit on all counts. Audits have now been performed in 2013, 2014, 2015, 2016, 2017 and 2018. Since CARE began routine audits in 2013, there have been no material findings. This is a testament to CARE’s financial structure and internal controls. Finally, we are waiting on completion of the mandatory performance audit as required by CalRecycle. The latter is an audit regarding the requirements of the AB2398 statute relating to reporting and accomplishments. At this time no findings are expected. That report will issue in late August once the draft CA Annual report is reviewed.

CARE Operations

The financial operations of CARE are managed separately from its other programs. The operations of CARE have a separate and distinct financial ledger, budget, income statement, and balance sheet as does the VPS and AB 2398 programs.
The 2018 Annual Report provides a complete financial statement and summary of operations for CARE only. Please see the separate 2018 California Annual Report for details on the CA Program which will be released to CalRecycle in September of 2019.

**CARE Operations Income and Expense Statement**

- Net Income (revenues minus expenses) through December 2018 was ($175,145).
- Expenses were slightly under budget (less than 1%). Revenue was under budget by 6%.
- The CARE Board approved a 90% reduction in the Entrepreneur’s membership dues for 2019. The difference between the reduced and normal rate for dues was reimbursed to CARE from the VPS program.

**CARE Operations Balance Sheet:**

- Cash balance at end of December 2018 was $407,774 vs. $611,920 at the end of 2017.
- Members’ equity as of 12/31/2018 was $654,484, down slightly from $679,075 at the end of December 2017.
- CARE maintains a minimum annual cash reserve of $300,000.

**Business Results, 2018**

- In 2018, CARE finished the year with 155 members.
- CARE successfully managed the California AB 2398 program as the Carpet Stewardship Organization.
- CARE successfully managed the fourth year of the Voluntary Product Stewardship Program in 2018.
- CARE conducted a successful 17th Annual Conference in Houston, Texas on May 1st.
- CARE continued to update its product catalog. Catalog can be found [here](#).
• Formed Market-Based Solutions Committee that focuses on potential end-markets for material and current products that use post-consumer carpet
• Issued the 2018 CA Product Portfolio. This highlights the innovative products that are being produced with post-consumer carpet

- CARE continued its work with NC State’s Non-Woven Institute. The research being conducted is working on developing outlets for post-consumer PET material
2018 CARE Annual Survey Results of the U.S. Carpet Recycling Industry

- Employment decreased from 997 in 2017 to 882 in 2018, a decrease of 13%.
  - Many CSEs have ceased operation or have significantly cut back their labor force
- Total post-consumer carpet discards, based on sales, were estimated at 3.2 billion pounds.
- Post-consumer carpet discards were estimated at 10 pounds per capita in 2018.
- Total gross collections were 281 million pounds, down 29% from 394 million pounds in 2017.
  - Changing demand in fiber types have caused many CSEs to be more selective of material that’s brought into their facility
  - End users have deselected post-consumer material in favor in favor of other raw materials
- Gross post-consumer carpet collection equated to 0.88 pounds per capita for 2018.
- Gross recycle ratio (gross collected/total discards) was 9%. This ratio decreased 2% from 11% in 2017.
- Total Materials flows were as follows:
  - Recycled Output (reuse plus recycle) was 52% of gross collections
  - Waste-to-Energy (WTE) represented 5%
  - CAAF and kiln output reported at 7%
  - 70% of recycled materials went to resin and molding applications, down from 86% in 2017
  - Carpet face fiber use was 2% of recycled output, up from 1% in 2017
  - Carpet backing use was 5%, up 4% from 2017
  - PC4, calcium carbonate extracted from post-consumer carpeted, use accounted for 11% of output
    - This is the first year for significant PC4 usage – which increases the recycling yield
    - Other applications represented 13% the of recycled uses.
- 99% of the post-consumer carpet collected was processed in the United States.
- 83% of respondents felt CARE is meeting their business needs
- Since it was founded in 2002, CARE members have diverted over 5.3 billion gross pounds of post-consumer carpet from landfills in the United States.
- Greenhouse gas equivalents saved was calculated to be 160,548 mTCO2E using the 2018 EPA WARM model: www.epa.gov/warm/versions-waste-reduction-model-warm#WARM Tool V14
  - Enough to take 34,087 cars off the road
  - Equivalent to 371,703 barrels of oil consumed
  - Could power 19,225 homes in a year

California AB2398 Results for 2018

The following figure, extracted from the 2018 CA annual report, shows the steady progress being made since Q3 2015. Please see the California 2018 Annual Report issued September 3, 2019 for full details.
**VPS Program**

The VPS Program began in January of 2015 and initially had a life expectancy of two years. The VPS Program is market-based, and Collector/Sorter Entrepreneurs (CSEs) participants agree to accept and manage all applicable post-consumer carpet, regardless of polymer type or primary materials or construction. VPS is funded by members of the Carpet and Rug Institute. The VPS program incentivizes sorters of post-consumer carpet who ship and sell material to processors in the United States and internationally. The program completed its fourth year of operation in 2018 with a budget of $4 million. CARE serves as the administrator of the VPS Program at the request of CRI.

As stated in the paragraph above, the VPS Program was initially approved for two years, but deteriorating market conditions have resulted in several extensions of the program. Macroeconomic conditions have contributed to a decreased demand for post-consumer carpet, mainly the price of oil. The price of oil did rebound at the beginning of 2018, but it fell sharply in Q3 of 2018. Market analyst contend that the price of oil will continue to decrease in 2019. CARE’s Economic Model indicates oil will remain in the $50-60/bbl. range in 2019.
Overall output of the VPS Program decreased in 2018. Limited market outlets have caused the collection network to be extremely sensitive to any change in the marketplace. These negative changes have resulted in attrition for the number of participating CSEs. Three CSEs went out of business, including a CSE that had been in the business for over 20 years. The increasing amount of polyester material, accompanied by a lack of viable market outlets for some nylon fiber, have put a tremendous amount of pressure on CSEs. Many other CSEs have stated that they would have to cease operations without VPS funding.

The VPS Program funds two types of output: Type 1 and Type 2. Material that is re-used, shipped internationally and shipped inside of the U.S. is considered Type 1 and is funded at $0.02 per pound of output. This is material that will be processed and included into a new product. Material that is sent to a waste to energy facility, a pyrolysis application, cement kiln, and CAAF is considered Type 2 and is funded at $0.01 per pound of output. Table 1 breaks the material down by type. Cells shaded green represent Type 2 output.

### Table 1: VPS Output Destinations

<table>
<thead>
<tr>
<th>Pounds of Output</th>
<th>Q1 2018</th>
<th>Q2 2018</th>
<th>Q3 2018</th>
<th>Q4 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadloom Re-Used ($.02)</td>
<td>23,693</td>
<td>56,467</td>
<td>68,144</td>
<td>66,707</td>
</tr>
<tr>
<td>Carpet Tile Re-used ($.02)</td>
<td>412,236</td>
<td>274,177</td>
<td>76,751</td>
<td>538,584</td>
</tr>
<tr>
<td>Shipped Internationally ($.02)</td>
<td>5,414,169</td>
<td>879,293</td>
<td>259,642</td>
<td>-</td>
</tr>
<tr>
<td>Shipped inside U.S. ($.02)</td>
<td>21,582,393</td>
<td>24,048,699</td>
<td>22,537,978</td>
<td>23,080,689</td>
</tr>
<tr>
<td>Waste-to-Energy ($.01)</td>
<td>3,132,066</td>
<td>4,837,375</td>
<td>1,620,618</td>
<td>494,636</td>
</tr>
<tr>
<td>Pyrolysis ($.01)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Cement Kiln ($.01)</td>
<td>1,199,224</td>
<td>454,062</td>
<td>130,322</td>
<td>570,459</td>
</tr>
<tr>
<td>CAAF ($.01)</td>
<td>956,104</td>
<td>1,203,756</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>32,719,885</td>
<td>31,753,829</td>
<td>24,693,455</td>
<td>24,751,075</td>
</tr>
</tbody>
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Table 2 breaks down the output by fiber type. CARE feels that this represents the demand for various fiber types in the marketplace. This does not reflect what is currently in the waste stream. Since there are fiber types that are in higher demand than others, many CSEs have been more selective of the material that’s entering their facility. Some CSEs posit that polyester carpet makes up as much as 50% of the waste stream in some geographic areas. This has resulted in many CSEs changing their business models and being more selective of materials.

The amount of Nylon 6 output increased in the second half of 2018. Because there are few viable Nylon outlets, the amounts can fluctuate from quarter to quarter. Polyester output decreased in the second half of 2018. This correlates with the decrease of material going into a waste-to-energy application seen in Table 1. Market outlets for PET material are extremely limited, making WTE and cement kilns a viable outlet in some geographic markets. At this point, CARE has not developed an accurate methodology for calculating the amount of material
in the waste stream by polymer type. A proxy for this data can be gleaned from face fiber sales of new carpet which run nominally 40% nylon 6, 40% PET/PTT, 10% Nylon 66, and 10% PP.

Table 2: Recycled Face Fiber Breakdown – Shipped and Sold

<table>
<thead>
<tr>
<th>Face Fiber Breakdown - Shipped and Sold</th>
<th>Q1 2018</th>
<th>Q2 2018</th>
<th>Q3 2018</th>
<th>Q4 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nylon 6</td>
<td>42%</td>
<td>44%</td>
<td>55%</td>
<td>58%</td>
</tr>
<tr>
<td>Nylon 6,6</td>
<td>28%</td>
<td>27%</td>
<td>25%</td>
<td>26%</td>
</tr>
<tr>
<td>Modular Carpet Tile</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>8%</td>
<td>3%</td>
<td>5%</td>
<td>3%</td>
</tr>
<tr>
<td>PET</td>
<td>17%</td>
<td>21%</td>
<td>12%</td>
<td>9%</td>
</tr>
<tr>
<td>Other/Mixed Fibers</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Figure 3 tracks the sorted output over time. The data starts with Q1 2015 and ends with Q4 2018, so this graph includes all the recycled output numbers since the VPS Program’s inception. The data presented in the graph includes both Type 1 and Type 2 outputs. The read can find more detailed information at www.carpetrecovery.org.

Quarters 3 and 4 of 2018 represent the lowest output since the VPS Program began. As stated earlier, macroeconomic factors have had a big impact on the demand for post-consumer carpet materials. Until new markets emerge, or demand increases in already established markets, CARE does not anticipate improvements to this downward trend in 2019.

Figure 2: 2015 - 2018 CSE Output
Figure 4 represents the inventory levels of CSEs that participate in the VPS Program. The inventory levels rose dramatically in 2017, but they began to taper off in 2018. Many CSEs were choosing to store Nylon 6 material in hopes of increased market demand in the future. Inventory levels decreased due to continued material selectivity. Business models and collection strategies are continuing to evolve because of the increase in PET material in the waste stream.

Figure 3: 2015-2018 CSE Inventory Levels

CARE 2018 Annual Survey Results

Each year, as required by the CARE Bylaws, CARE prepares an Annual Survey to report on carpet diversion and recycling results achieved by CARE members. All information from the respondents is confidential. The collected information is aggregated and analyzed for the Annual Report by CARE Dr. Robert Peoples, Anthony Cline, and Dr. Matthew Realff of Georgia Institute of Technology.
2018 Carpet Recycling Industry Landscape

CARE weathered another challenging year in 2018. Various macroeconomic issues continued to thwart our efforts in increasing the amount of material that’s diverted from landfills. CARE is the designated carpet stewardship organization for the AB 2398 and AB 1158 carpet recycling laws in the State of California and the Voluntary Product Stewardship Program funded by the Carpet and Rug Institute. CARE also operates on a day-to-day basis as it continues its search for market-based solutions. CARE is responsible for over $35 million between the three programs.

The data represented includes material from all the programs that CARE manages. California and VPS numbers are presented independently in the earlier sections of this report.

As mentioned earlier, decreased demand for recycled post-consumer carpet material due to lack of end markets has negatively impacted all in the supply chain. Lower oil prices have made virgin products more cost-effective than recycled materials. China’s Green Fence and National Sword has also had a tremendous impact on many recycling markets, not just carpet. Combine that with a global oversupply of caprolactam (basic building block of nylon 6) and rising logistics costs throughout the country, and it’s easy to see why many in the industry are struggling.

Annual Survey Methodology

To form a complete picture of the national Carpet Recycling Industry, respondents were asked questions regarding the following issues on the Annual Survey:

- Recycled output pounds
- Recycling versus other end-uses for the material diverted (i.e. reuse, end-product manufacturing, carpet as alternative fuel (CAAF), cement kiln, waste-to-energy, PC4 and landfill)
- Types and amounts of carpets recycled by fiber type
- End products manufactured from recycled materials
- Steps in the recycling process performed by the respondent
- Geographical locations and employment information
- International versus domestic customers (outlets)
- Employment data

In addition to the quantitative information sought, CARE also requested input on the organization’s performance and the value of CARE to respondents. This information is used to improve CARE’s overall operations, program structures and resource allocation. CARE continues to refine its reporting and data analysis.
For the 2018 survey, CARE used the same method instituted in 2016. CARE developed two surveys targeted at different parts of the supply chain. CARE had collected data throughout the year in its management of the Voluntary Product Stewardship and AB 2398 programs. The surveys were designed to account for missing information in the mass balance analysis.

The first survey was sent to Collectors and Sorters. Almost all the CSEs in the United States participate in the Voluntary Product Stewardship and now report their numbers on a monthly basis, so CARE already had most of the information required. The survey was sent to 46 CSEs; 20 completed the survey for a response rate of 43%.

The second survey was directed to companies that process the carpet and/or use post-consumer carpet material in a product. This survey was sent to 10 processors and manufacturers across the US. All recipients of the survey responded.

A copy of both 2018 surveys are attached at the end of the Annual Report in Appendix 1.

CARE assessed the responses received and followed up as needed with individual companies to maximize participation and to ensure that it minimized double-counting wherever possible. By doing so, the reported data is more accurate and reflects a truer picture of the amount of carpet diverted and recycled in 2018. CARE wishes to acknowledge the support of Dr. Matthew Realff of the Georgia Institute of Technology for his assistance in evaluating the data.

CARE makes no warranty as to the accuracy of this data and assumes no responsibility or liability for how this information is used by individuals or companies and makes no warranties for its use.

**Evaluation of Progress in 2018**

**Carpet Discard Methodology**

In 2011, the CARE Board of Directors adopted a formula for calculating carpet discards, which accurately tracks actual sales and calculates carpet discards in the United States. CARE believes the formula provides a more accurate picture of both gross collections and recycling rates for annual reports. In the fall of 2012, CalRecycle agreed to the use of this formula for calculations involving post-consumer recycling in California. A discards study is currently underway in CA and results are expected in late 2019.

The purpose of the methodology is to update the discards on an annual basis, using actual sales data, and upgraded by factors that influence the calculation. Those factors include changes in imports/exports, percent of the market that is replacement, average face weight, deselection, and demolition rate. CARE methodology uses a mass balance approach. Since operators know with great accuracy the pounds of material shipped out of a facility (the shipper is either being paid by the pound by a customer or is paying by the pound for landfilling
or energy conversion), CARE simply collects all output data and back calculates what must have come in to support the reported outputs.

**Formula for Calculating Carpet Discards**

The approved formula for calculation of discards is:

\[
\text{Discards} = \left( \left( \text{Sales} \times R \times P \right) + D + DS \right)
\]

The factors used to calculate the amount of carpet available for diversion include:

- **S** = Carpet Sales in the US for the reporting period (square yards)
  - Sales Data comes from Market Insights, an independent market research firm, who is collecting the confidential sales data from carpet manufacturers doing business in the US.

- **R** = Percent of carpet that is replacement, or carpet replacing existing carpet.
  - Replacement carpet is the carpet destined for the landfill. The carpet industry has worked with Market Insights to quantify the replacement rate to be 74% currently. The rate is somewhat higher in CA.

- **P** = Average weight of carpet per square yard.
  - A carpet weight analysis was conducted in 2018. (Raw data was supplied by the industry and analyzed by CARE. Weighted averages of carpet weights of broadloom and tile used in the commercial and residential sectors were calculated.) The average weight used is now 4.5 lb./yd².

- **D** = Pounds of carpet from demolition projects not replaced.
  - In 2017, the weighted demolition rate (87% residential and 13% commercial) was estimated at 0.56%, (estimate provided by Market Insights). D is converted to pounds by multiplying Sales x R x P.

- **DS** = Deselection pounds resulting from a decision to rip out old carpet and not replace it with new carpet. The overall deselection estimate is ca. 0.75% per year.

Note that the term demolition represents the teardown of a building. There is no easy way to know the actual square yards of carpet coming out of such a process. By assuming the actual demolition rate based on ft² obtained from Marketing Insights, we are likely overestimating the total volume of carpet sent to landfill via this parameter. However, this is a tiny fraction (<1%) of the overall amount and does not significantly alter the flow.
Deselection is a separate element of the PCC flow to landfill. CARE has always assumed this parameter to be very small (<1%). CARE worked to develop a more quantitative estimate of deselection in 2016. Based on an analysis of historical data back to 1975, in 5-year increments, it is estimated that deselection represents <0.75% per year. Based on 2018, total estimated discards of 3.20 billion pounds, deselection equates to an estimated 25 million pounds.

It should be noted that both demolition and deselection estimates are well within the error associated which our discard and recycle estimates.

Application of the formula to generate discards is shown in the following example using actual U.S. data from 2018 and rounded for clarity.

\[
\text{Discards} = (((\text{Sales} \times R) \times P) + D + DS)
\]

Sales 2018: 950 Million square yards

\[
\text{Discards} = (950 \times 0.74) \times 4.5 = 3,164 \text{ million pounds} + D + DS
\]

Where \( D = 3,164 \times 0.0056 = 18 \text{ million pounds} \)

Where \( DS = 3,164 \times 0.0075 = 25 \text{ million pounds} \)

Thus, \( \text{Discards} = 3,164 + 18 + 25 = 3,207 \text{ million pounds} \)

**Post-Consumer Carpet Collection and Recycling: Quantitative Results for 2018**

CARE continues to work to quantify metrics necessary to understand the marketplace for carpet recycling in the United States. It is important to recognize that CARE discloses and works with the data as received. These numbers have been voluntarily given to CARE by the independent post-consumer carpet sorters and processors that are members of CARE. CARE has not audited the numbers nor does CARE guarantee the accuracy of the numbers submitted. However, it should be noted that all VPS and CA program participants are subject to an independent Agreed Upon Procedure protocol that works to verify and validate data submitted. Key results include:

- 281 million pounds of gross collected post-consumer carpet in 2018 = Diversion Rate of 9%
- 155 million pounds of post-consumer carpet was recycled in 2018, a recycling rate of 5%
- Recycled output yield was 55% (Output/gross collection)
• Over 5.3 billion Pounds of cumulative diversion since 2002
• 98 million pounds were sent back to landfill in 2018
• Inventory decreased by 9 million pounds
• 99% of all reported recycled lbs. were processed in the United States
• Engineered Resins made up 70% of end market outlets

Table 3 shows a comparison by pounds and percentage of the quantity of post-consumer carpet recycled and diverted from landfill since program inception in 2002 through 2018. CARE began using the new methodology for measuring carpet discards and a mass balance calculation of input based on measured pounds of outputs in 2013. CARE continues to refine this method each year. CARE members have now diverted over 5.3 billion lbs. of carpet from landfills in the United States since 2002. The amount of recycled output decreased by 22 million lbs. in 2018. The amount of material sent back to landfill in 2018 dropped by 9 million lbs. This is consistent with the lower number of discards estimated and recycled output reported by processors. The yield (recycled output/gross collections) is higher this year. CARE believes that this is due to CSEs being more selective about the material that they’re bringing into their facilities. For example, if a CSE is currently collecting from an area that produces a large amount of PET and Nylon 6 material, then the CSE may chose not to offer the collection service in that area. In addition, there have been markets created for some of the PC4 liberated during processing, thus increasing the recycling yield. With rising inventory levels and decreasing demand for certain fiber types, this is happening frequently in the marketplace and is a survival tactic by many CSEs. This has, however, resulted in a more efficient recycling supply chain.
Table 3: Post-Consumer Carpet Recycling and Diversion Statistics, 2007-2018

<table>
<thead>
<tr>
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<th></th>
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<tbody>
<tr>
<td>Reuse</td>
<td>0</td>
<td>4</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>12</td>
<td>2</td>
<td>13</td>
<td>3</td>
<td>2</td>
<td>3</td>
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<tr>
<td>Recycled Output</td>
<td>250</td>
<td>294</td>
<td>185</td>
<td>114</td>
<td>170</td>
<td>167</td>
<td>178</td>
<td>185</td>
<td>155</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Int’l Recycle Yield (55%)</td>
<td>10</td>
<td>7</td>
<td>4</td>
<td>5</td>
<td>2.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Recycled</td>
<td>275</td>
<td>243</td>
<td>246</td>
<td>271</td>
<td>250</td>
<td>294</td>
<td>185</td>
<td>124</td>
<td>177</td>
<td>171</td>
<td>183</td>
<td>157</td>
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<tr>
<td>Total Reuse + Recycle</td>
<td>275</td>
<td>247</td>
<td>258</td>
<td>273</td>
<td>251</td>
<td>299</td>
<td>197</td>
<td>126</td>
<td>190</td>
<td>174</td>
<td>185</td>
<td>160</td>
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<td>Waste-to-Energy</td>
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<td>47</td>
<td>38</td>
<td>46</td>
<td>52</td>
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<td>41</td>
<td>68</td>
<td>55</td>
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<td>13</td>
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<td>CAAF or Cement Kiln</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>26</td>
<td>36</td>
<td>11</td>
<td>23</td>
<td>113</td>
<td>120</td>
<td>89</td>
<td>44</td>
<td>20</td>
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<tr>
<td>Int’l Ship (Gross-Yield)</td>
<td>31</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Other Internal Use</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sent back to Landfill</td>
<td>224</td>
<td>191</td>
<td>174</td>
<td>107</td>
<td>49</td>
<td>55</td>
<td>49</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross Diversion*</td>
<td>296</td>
<td>290</td>
<td>317</td>
<td>337</td>
<td>333</td>
<td>352</td>
<td>378</td>
<td>609</td>
<td>575</td>
<td>496</td>
<td>387</td>
<td>296</td>
</tr>
<tr>
<td>Net Diversion</td>
<td>385</td>
<td>384</td>
<td>322</td>
<td>322</td>
<td>322</td>
<td>322</td>
<td>322</td>
<td>322</td>
<td>322</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recycling Rate</td>
<td>6%</td>
<td>6%</td>
<td>7%</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
<td>5%</td>
<td>4%</td>
<td>6%</td>
<td>5%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Gross Diversion Rate</td>
<td>6%</td>
<td>7%</td>
<td>9%</td>
<td>10%</td>
<td>9%</td>
<td>10%</td>
<td>8%</td>
<td>18%</td>
<td>17%</td>
<td>13%</td>
<td>11%</td>
<td>9%</td>
</tr>
</tbody>
</table>

The mass balance of outputs method in Figure 5 assumes the sorters and processors accurately know their weight of goods sold and shipped to customers, landfill, WtE or kilns since there are profits or costs associated with the shipments. Reported pounds received on the front end are considered gross estimates since most loads are NOT weighed. Therefore, by adding everything that goes out, one can, with better accuracy, measure what came in. CARE has closed the gap between directly reported gross collections and using the mass balance approach to within approximately 10%. CARE manages two programs that accumulate data from all three parts of the supply chain. The VPS program collects data from the National collection network, and AB 2398 collects data from collectors, processors and manufacturers in the State of California, so CARE feels confident in the veracity of this data.

Due to the increasing selectivity of material, the product of eroding market conditions alluded to earlier, gross collections were down significantly in 2018 at 281 million pounds, compared to 394 million pounds in 2017. CAAF/Kiln dropped significantly as well. Rising transportation costs and inaccessibility to these facilities have caused this decline. The collection network has experienced attrition as a result. This attrition is expected to continue unless market conditions change drastically.
Figure 4: Mass Balance Approach to Estimating Gross Collection in 2018

- Gross Collections: 281 M lbs.
- Reporting Boundary Drop in Inventory: 9 M lbs.
- Recycled + Reuse: 155 M lbs. (55% yield)

- Landfill: 98 M lbs.
- WtE: 13 M lbs.
- CAAF/Kiln: 20 M lbs.

International:
- 4 M lbs.
- 2.2 M lbs. recycled
- 1.8 M lbs. to LF

Gross Collections = Landfill + WtE + Kiln + International + Inventory Change = 155 + 98 + 13 + 20 + 4 + 9 = 281 M lbs.

Figure 6 represents the historical trend of gross pounds of post-consumer carpet collected each year since 2002. Using the mass balance approach, gross collection for 2018 is calculated to be 281 million pounds. This is a decrease of 113 million lbs. from 2017, and it is mainly due to the adverse macroeconomic issues that persist in the marketplace and the increased selectivity of fiber entering sorting facilities. This did not come as a surprise given economic conditions, particularly in the VPS Program. As represented graphically earlier in the report, the amount of output for CSEs continued to decline each quarter, and the output totals are now a quarter of what they were when the VPS program started 4 years ago.

Please note that CARE began using the mass balance methodology in 2013. This explains the large jump from 2012 to 2013. CARE continues to make improvements to its reporting annually. Cumulative diversion from landfill since CARE’s inception totals 5.3 billion pounds.
Figure 5: Historical Post-Consumer Carpet Diversion, 2003-2018

Figure 7 represents the next step in the supply chain. Once the post-consumer carpet is brought into the sorting facility, it is then separated and shipped to the next stage of the supply chain. Of the material that brought in to sorting facilities, 52% went to a recycling application, 34% was sent back to landfill, and 7% and 5% were sent to CAAF/Kiln and waste-to-energy respectively.

In 2018, the percentage of material sent to a recycling application was 47%, 5% lower than 2018; however, the amount of material sent to landfill increased by 4%. CAAF/Kiln and WTE both dropped significantly in 2018. CAAF/Kiln decreased from 12% in 2017 to 7% in 2018. Waste-to-energy also decreased from 10% of output in 2017 to only 5% of output in 2018.

Over half of the output from CSEs is now being sent to a recycling application. One can argue that the recycling system itself is becoming more efficient. This is mainly due to the evolution of collection models. CSEs are altering collection models to bring higher value material into their facilities. This allows the CSEs to decrease costs.

For historical data, the reader is encouraged to visit https://carpetrecovery.org/newsblog/reading-room/.
End Products Manufactured from Post-Consumer Carpet

Respondents reported that 70% of recycled post-consumer carpet is manufactured into engineered resins. Carpet backing and fiber make up 7% of end-market uses. This 7% represents true cradle-to-cradle innovation within the carpet recycling industry. Given the composition of carpet, CARE feels that this is a great technical achievement.

PC4 is a term coined by CARE that means post-consumer carpet calcium carbonate. Because of a large subsidy in California, manufacturers have found ways to incorporate this material into their products. This is the first year that CARE has reported PC4, but there are hopes that this amount will increase in the coming years.

The “other” category on the chart includes a myriad of products. Because CARE does not wish to divulge sensitive business information, it will not break out these products. There is continued innovation occurring in the industry, and there are new technologies and outlets that CARE anticipates will come to fruition in the next few years, especially including chemical recycling.
In 2018, the US managed 99% of the post-consumer carpet material collected. This was down 1% from 2017. 4 million pounds were shipped internationally in 2018. It is estimated that of the 4 million pounds sent to international destinations, 2.2 million pounds of material was recycled. Since it is impossible to get this exact number, CARE took the 4 million international pounds that was shipped and sold by CSEs and used the average 55% yield that was calculated for US recycling in the mass balance in Figure 5. It is assumed that the remaining 1.8 million pounds went back to the landfill.

China’s Green Fence and National Sword initiatives along with excess plastic production capacity throughout the world have contributed to a decline in international output in recent years. Global virgin material prices have continued to decrease because of the excess supply, especially regarding Nylon 6 fiber. It doesn’t appear that this trend will change very soon, so the recycling community will have to continue to adapt.
Nylon 6 Sorted Output Increased; Nylon 6,6 Decreased from 2017-2018

Nylon 6 output increased from 2017-2018 by 3%. The demand for Nylon 6 has fluctuated greatly over the past few years. Uncertainty in oil markets, international trade, and excess global caprolactam production capacity have contributed to the demand fluctuations. Recycled nylon output is not expected to increase heavily in 2018, but it’s difficult to make any type of forecast with any degree of confidence at this time.

Nylon 6,6 enjoyed heavy demand for 2018, but the amount of output decreased by 2%. Many CSEs claim that there is currently less Nylon 6,6 in the waste stream. While it is a highly sought-after fiber, there’s simply not enough material in the waste stream to satisfy demand. Many CSEs have expressed interest in expanding their collection efforts to collect more Nylon 6,6 material, but the extra collection would be too costly. Nylon 6,6 demand has been spurred with more than a dozen force majeure events limiting virgin material in 2018.

Polyester output grew for the second straight year. This is mostly attributed to the California AB 2398 Program. Non-nylon material is heavily subsidized, allowing many CSEs in the state to compete economically with substitute materials. As for the rest of the United States, most of this material is being sent to a CAAF/Kiln or waste-to-energy application. If the subsidies continue in California, it’s a reasonable assumption that the amount of PET will continue to increase.

Figure 9 shows the split based on face fiber type in terms of collections as reported by the CSEs. It should be noted that such data is biased due to different and selective collection models and thus may not reflect the actual distribution of face fiber in the collection stream.
NOTE: N66=Nylon 6,6; N6=Nylon 6; PP=Polypropylene; PET=Polyethylene terephthalate

For historical perspectives, Figure 10 shows the shift in carpet face fiber from 2008-2018. Remember that the percentages are based on what is reported. As noted above, due to fiber selectivity, this is not an accurate depiction of what’s in the waste stream.
CARE Carpet Recycling Survey Respondents Employed an estimated 997 People in Local Communities across the U.S. in 2018

The respondents to the CARE Annual Survey employed 882 people in local communities in 2018, a decrease of 115 people or 11% versus 2017. Some companies ceased operations in 2018; others reduced forces significantly due to market difficulties. Based on discussions with the State of South Carolina, it is expected that for each direct job there are 3-5 indirect jobs created.
Collection of Carpet by Region

Figure 12 distinguishes the reporting regions used in the Annual Survey. Because of the carpet stewardship law in California, the data from this state is broken out specifically.
Figure 11: Reporting Regions in the U.S.

Figure 13 shows that post-consumer carpet collection is highest in the California (39%), followed by the Southeast (27%), the Southwest (30%), Northeast (1%), the Midwest (3%), then zero for the Northwest. However, on a single state basis, CA is clearly the state with the largest volume. This is only possible due to the large subsidy program in the State of California.

Figure 12: Collection of Carpet by Region, 2018
Figure 13 depicts the geographic distribution of carpet collection for 2018. Table 4 compares 2017 to 2018 and tracks the fluctuations by both percentage points and pounds. All regions decreased the amount of material collected. Overall, the market for post-consumer carpet has contracted greatly. While California did see a decrease in the material collected in 2018, it still collected more than the entire regions of the Southeast and the Southwest respectively.

### California Results vs. National Results

In 2011, California signed AB 2398 into law. This became the first carpet-specific legislation to pass in the United States. Carpet America Recovery Effort was designated the Carpet Stewardship Organization to oversee the program. The program began by incentivizing processors with the intent of creating a push-pull situation in the marketplace. With subsidies being awarded to processors, the processors would, in turn, demand more post-consumer carpet from the collectors and increase the amount of processed material to manufacturers. The AB 2398 program did start offering subsidy payments to collectors in 2018.

The VPS Program began in 2015 and offered subsidy payments to those collectors outside of the State of California. Prior to 2015, there was not a program in place for members outside of California.

The following graphs will use two metrics to compare California and the United States: recycling rate and pounds of recycled output. Please note that California data has been removed from the national data to prevent double counting.

Figure 14 compares the recycling rates from California and the rest of the United States. Since 2012, the recycling rate in California has been more than double the recycling rate in the rest of the country, and more than triple the amount in the last two years. The number for California is expected to grow in 2019 with new
market outlets coming online. There is now growing confidence that new market outlets will surface for the rest of the United States as a result of demand for post-consumer content by the big brands to solve the global plastics waste problem.

Figure 13: California vs. National Recycling Rate

Figure 15 looks at the recycled output contribution from CA vs rest of U.S. This is material that was processed and is ready for incorporation into a finished product. Keep in mind that the orange portion of the bars represents only California, while the blue portion of the bars represent the other 49 states. Of the 155 million pounds of recycled output for the United States, California represented 37 million pounds or 24% of all output.
Qualitative Feedback from CARE 2017 Survey Respondents

In the 2018 survey, 83% of respondents (n=29) said CARE was meeting their needs. This has decreased from 2017’s result of 92%. CARE will continue to look for ways to increase value and support for its members.

Figure 15: Survey respondents’ view of whether CARE is meeting their needs
Summary

• CARE used the mass balance approach for the sixth consecutive year. Refinements are continuing to be made to both the Annual Survey and the reporting forms for the programs that CARE manages.

• Challenges persist in the marketplace. Many collectors and sorters outside of California are struggling in current economic conditions. Collectors are adjusting their business models to remain in operation. Nylon 6,6 is currently in heavy demand, but the amount of material that’s available in the waste stream continues to decline. Nylon 6 material is in demand, but the glut of supply in marketplace has contributed to depressed pricing. There are limited market outlets for PET material outside of California, where heavy subsidies assist recyclers in finding market outlets.

• Engineered resins outlets represents of 70% of recycled output for 2018.

• “Closed loop recycle” remained constant at 7% for 2018.

• International activity continued to decrease due to drop in demand in Asia.

• Overall collections were down significantly. All regions of the United States reported decreased collections; however, the State of California still collects more material than any other region in the United States. The Southeast region of the United States continues to collect a significant amount, but limited market outlets nationwide can cause that volume to fluctuate greatly.

• 83% percent of all respondents from the Annual Survey feel that CARE is meeting their needs.

Survey Methodology

In developing a survey methodology to establish quantitative estimates of recycling of a particular waste stream, two key factors must be taken into account: 1) participation and 2) double-counting. Participation is essential in any surveying process, and even more so in this type of survey, where there is no logical or reliable way to extrapolate results from respondents to the general population. This means that respondents’ survey responses will represent the complete and total results. Thus, every effort must be made to maximize participation.

In a limited system, with increasing participation comes another potential problem: double-counting. Since a given pound of used carpet may pass through several different entities on its way from the point of generation to its ultimate disposition (reuse, recycling or disposal), and, since these different types of entities (collectors, sorting facilities, processors and manufacturers) are included in the survey, the chance exists that a pound of carpet could be counted more than once. As participation increases, the likelihood of double-counting increases, since there is a greater chance that more than one company may be reporting on their handling of the same material. Design and analysis of the survey data are built to help minimize this concern.
Several features were built into the surveying process to address these two key issues:

Confidentiality of data is often the key to participation, and all aspects of the survey were designed to preserve confidentiality. A web-based surveying tool was again used to allow respondents to provide data completely anonymously, if they desired. In addition, all written and verbal communication with potential survey respondents stressed the confidentiality of data.

Simplicity and ease of response was also a key to participation rates. The survey questions were streamlined to the maximum extent possible so that only the most critical data were included, based upon the philosophy that it is much better to have the basic data from many respondents than detailed information from a few (particularly since there is no basis for extrapolation).

Participation rates can also be boosted through the application of multiple means of contact, as well as repeated contact. Thus, extensive e-mail and telephone communications were used to contact survey respondents. Every effort was made to include new participants, as they became known to CARE.

To reduce the chances of double counting, survey respondents were asked to identify the geographic sources of their material to the extent they were known. If there is information from two or more companies that might reflect handling of the same material, the geographic sources of these companies could be reviewed to determine if that was likely.

In another attempt to reduce the chances for double counting, survey respondents were asked about the type of companies that received the material their company shipped out. This information not only allows for identification of possible double counting, but also serves to provide a more complete picture of the overall flow of post-consumer carpet through the collection and recycling process. In some cases, receiving companies are contacted to verify numbers.

With those basic principles in mind, the surveying process was implemented, using the steps outlined below, which are described in general chronological order:

1. The survey used in 2018 was updated based on respondents’ feedback from last year. The 2018 survey form is shown in Appendix 1.

2. The survey was web-based, and the results were password protected and available solely to two CARE staff members to preserve confidentiality.

3. Based upon past experiences with this survey process, the survey was focused on those companies for which specific individuals have been identified as points of contact.

4. Companies with specific contacts and e-mail addresses were notified via e-mail and were provided the survey URL so that they could respond electronically. A total of about 50 different companies were sent e-mail notifications of the survey (more than one individual was contacted from an individual firm in several instances). The e-mail notification stressed the confidentiality of the information they were asked to provide.
5. Approximately two weeks after the initial e-mail was sent, follow-up activities were initiated. These included e-mails to those companies that had not responded, as well as telephone calls to prompt responses and answer questions some potential respondents had raised.

6. All survey responses were reviewed for any inconsistencies or unclear responses. The survey responses were also reviewed to determine if there were any questionable responses (e.g. data that appeared to be off by orders of magnitude with regards to company size). Where there was some question about the responses provided and the respondents had provided their names (respondents can choose to respond anonymously), follow-up was attempted to clarify the responses. In most cases these efforts were successful. In a few cases site visits were conducted for clarity.

7. Data were transferred to a spreadsheet-based database. This database contains all the quantitative responses, as well as summaries of any descriptive information provided by the companies.

8. Data to eliminate potential double counting was received and appropriate adjustments made to the data compilations where/when necessary.

9. The data were compiled and analyzed to produce the results described herein. CARE acknowledges Dr. Matthew Realff for his assistance in the logistics analysis and mass balance calculations.

10. Efforts to maintain consistency year to year are considered important to plot trends and look for patterns.

**Assessment of Survey Approach and Results**

As noted previously, there are three key factors that led to the conclusion that this year’s survey results are high in quality (i.e. believed to be more representative of real-world conditions):

1. Response rate was again very high, meaning that a greater proportion of the total number of companies involved in post-consumer carpet recycling responded by submitting survey results.
2. CARE had already possessed a large part of the data through the management of the Voluntary Product Stewardship and AB 2398 Programs.
3. Manufacturers who use the material within their own manufacturing process, handled a significant portion of the post-consumer carpet. This eliminated the possibility for double counting of this material.

For these reasons, double counting does not appear to be a significant issue with the data presented in the 2018 CARE Annual Report.
CARE Outreach Results, 2018

16th Annual CARE Conference

In 2018, members and colleagues of CARE gathered at its 16th Annual Conference, in Orlando, FL, in early May. The conference format included a one-day event. The venue provided great opportunities for business interactions, including with vendors/exhibitors. This edition of the Annual Conference was a little different. The CARE Conference took place during the NPE Plastics Show, in partnership with ReFocus. This format allowed for an unusually robust interaction between CARE members, customers and potential customers and equipment suppliers. While the program was considered a success, CARE returned to its own stand-alone event in 2019.

The following awards were given:

2017 Recycler of the Year – CarpetCycle

CarpetCycle was named CARE’s 2017 Recycler of the Year. Lead by CARE Board Member Sean Ragiel, the New Jersey-based company began recycling carpet in 2009. Since its inception, CarpetCycle has diverted more than 200 million pounds of carpet from U.S. landfills. The company services the Eastern United States from Washington D.C. to Maine.

In 2017, CarpetCycle introduced Quiet Tech, a new and innovative product made with post-consumer carpet. Quiet-Tech is a recycled acoustic insulation product that is made up of 85-90% recycled materials (post-consumer carpet and blue jean materials).
2017 CARE Person of the Year – Mike Tinney

Mike Tinney was recognized as CARE 2017 Person of the Year. Working as a consultant for CARE in California, Mike brought a wealth of experience in market development for recycled materials. He was instrumental in assisting CARE with developing products that utilize post-consumer carpet in California.
CARE Website Traffic

The following charts provide a general overview of website activities for 2018. There were 29,999 visits to the CARE website in 2018. California visits accounted for 32% (9,493 visits) of all traffic. 10 states made up 90% of all web traffic for the CARE site. Table 5 examines the top 10 states that visited the CARE site in 2018.
Table 5: CARE Website Visits by State 2018

<table>
<thead>
<tr>
<th>State</th>
<th>Visits</th>
<th>% of Total</th>
</tr>
</thead>
<tbody>
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<td>California</td>
<td>9,493</td>
<td>(34.75%)</td>
</tr>
<tr>
<td>Georgia</td>
<td>1,481</td>
<td>(5.42%)</td>
</tr>
<tr>
<td>New York</td>
<td>1,135</td>
<td>(4.15%)</td>
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<tr>
<td>Texas</td>
<td>1,069</td>
<td>(3.91%)</td>
</tr>
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<td>Illinois</td>
<td>1,064</td>
<td>(3.89%)</td>
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<tr>
<td>Washington</td>
<td>1,036</td>
<td>(3.79%)</td>
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<td>Virginia</td>
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<td>(2.45%)</td>
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<tr>
<td>Florida</td>
<td>917</td>
<td>(3.36%)</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>766</td>
<td>(2.80%)</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>684</td>
<td>(2.50%)</td>
</tr>
</tbody>
</table>
Figure 16: CARE Website Visits 2018

Figure 17: CARE Collection Map Webpage Visits, 2018
Figure 18: CARE AB 2398 Webpage Visits, 2018

![Bar chart showing monthly visits for CARE AB 2398 webpage in 2018.]

Figure 19: New vs. Returning Webpage Visitors, 2018

![Pie chart showing percentages of new and returning visitors for CARE AB 2398 webpage in 2018. 87% are new visitors, 13% are returning visitors.]
Appendix 1
Carpet America Recover Effort (CARE) Survey 2018

2018 CARE Annual Survey

Dear CARE Carpet Reclamation and Recycling Partner,

Thank you for taking the time to complete the 2018 Carpet America Recovery Effort (CARE) Annual Survey. Your complete answers to this survey will allow us to perform quantitative analysis on the carpet recycling stream and create a detailed Annual Report for the stakeholders of CARE.

Please report only the quantity of post-consumer carpet managed through your business. For purposes of the CARE Annual Report, we will NOT include information on post-industrial carpet, ONLY POST-CONSUMER CARPET.

The survey should take less than 20 minutes to complete. To minimize the amount of time spent on completing the survey, we recommend that you read through the survey and have your data available before completing the survey.

If you need any assistance or have questions while completing this survey, please contact Anthony Cline, CARE’s Operations Director, at acline@carpetrecovery.org or 706-429-2127.

Due to the time sensitive nature of this survey, please complete the survey by close of business on Thursday, January 31, 2019.

Note - All Company information and answers to this survey will be CONFIDENTIAL, and will only be seen and used by CARE’s Executive Director and Operations Director.

All data collected will be reported in the aggregate, thus removing any references to individual companies.

Thank you.

Bob Peoples
Executive Director, Carpet America Recovery Effort (CARE)

1. Of your total employees, how many are specifically associated with the diversion/recycling of post-consumer carpet?

<table>
<thead>
<tr>
<th>Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

2. Please select the type of company from the list below, based upon the descriptions provided. If your company performs more than one function, check all boxes that apply.

- [ ] Collector - A company that consolidates and temporarily stores recovered commercial and/or residential carpet.
- [ ] Sorting Facility – A facility that segregates collected carpet into the various backing types (PVC, SBR Latex, etc.) and/or fiber types (e.g., Nylon 6, Nylon 6.6, Polypropylene and Polyester).
- [ ] Processor - A company or facility that receives post-consumer carpeting (whether handled by a sorting facility or brought directly by a collector) and processes it for use as a feedstock in a manufacturing facility.
- [ ] Manufacturer - A company or facility that utilizes processed carpeting materials and transforms them into other products, or uses them as raw materials in a manufacturing process.
Included is a flow chart that represents the various stages of the carpet recycling process. This will be used throughout the survey.

Definitions

Carpet as Alternative Fuel (CAAF): Fuel that has been produced from source-separated carpet and processed, including (1) extraction of components if at all possible, (2) size reduction, shredding, and/or blending with coal fines, etc.

Cement Kiln: Cement production facility that may utilize CAAF as a source of energy and/or as an additive for cement production.

Landfilling: Landfilling includes the placement of post-consumer carpet and/or the residuals from a post-consumer carpet management method into a landfill disposal facility.

Reuse: Reconditioning and donating/selling recovered carpet back into the market for its original intended use. The reuse of recovered carpet retains the original properties and performance characteristics of the carpet.

Waste-to-Energy: Process of recovering thermal energy from MSW through combustion.

Example: A recycling business person collects 1 million lbs of carpet. The recycler sorts and shears this material and sends it to a processor. Along the way, some of the post-consumer carpet is reused, and some is not able to be recycled for various reasons, and is either sent to a CAAF or a cement kiln facility, waste-to-energy, or the landfill. The recycler tracks the amount of material as it progresses through the process. For this example, the recycler would answer the next questions as follows:
3. Please use the Processor Flow Chart to answer this question.
   *Do not use commas

Example:

a. Lbs. received from sorter
b. Lbs of starting inventory material
   a. Pounds received from sorter
   b. Pounds of Starting Inventory
   c. Pounds to Landfill
   d. Pounds to International
   e. Pounds of Ending Inventory
   f. Pounds Reused
   g. Pounds to CAAF
   h. Pounds of Processed Fiber
   i. Pounds of Filler
   j. Pounds to Cement Kiln
   k. Pounds to WTE

4. How are you handling the PET carpet you receive (outlets or landfill)?

5. How are you handling the Nylon 6 carpet you receive (outlets or landfill)?
6. Please use the Manufacturer Flow Chart for this question.
* Do not use commas

Example:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Lbs. received from processor</td>
</tr>
<tr>
<td>b</td>
<td>Lbs. of starting inventory material</td>
</tr>
<tr>
<td></td>
<td>Pounds Received from Processor</td>
</tr>
<tr>
<td></td>
<td>Pounds of Starting Inventory</td>
</tr>
<tr>
<td></td>
<td>Pounds to Landfill</td>
</tr>
<tr>
<td></td>
<td>Pounds to International</td>
</tr>
<tr>
<td></td>
<td>Pounds of Ending Inventory</td>
</tr>
<tr>
<td></td>
<td>Pounds Reused</td>
</tr>
<tr>
<td></td>
<td>Pounds to CAAF</td>
</tr>
<tr>
<td></td>
<td>Pounds Sent to Other Manufacturer</td>
</tr>
<tr>
<td></td>
<td>Pounds Used by Your Product</td>
</tr>
<tr>
<td></td>
<td>Pounds to Cement Kilns</td>
</tr>
<tr>
<td></td>
<td>Pounds to WTE</td>
</tr>
</tbody>
</table>
Manufactured Products Output

a. __________ Lbs. your products

b. __________ Lbs. Engineered Resin

c. __________ Lbs. Molded/Extruded

d. __________ Lbs. Carpet Fiber

e. __________ Lbs. Carpet Backing

f. __________ Lbs. Carpet Cushion

g. __________ Lbs of ________

h. __________ Lbs. Filler
7. This question is inquiring about the products that are manufactured using post-consumer carpet. The first blank, ‘a’, asks for the total lbs. of material that are included in manufactured products. The entries on the right-hand side are requesting the specific numbers on the type of product was manufactured with the material.

*Do not use commas

a. Pounds of Material Used
   Overall

b. Pounds to Engineered Resin

c. Pounds: Melted/Extruded

d. Pounds for Carpet Fiber

e. Pounds for Carpet Backing

f. Pounds for Carpet Cushion

g. Miscellaneous

h. Pounds for Filter

US Regional Map

- Northwest (inc AK HI) 
  \( \_\_\_\_\% \) 

- California 
  \( \_\_\_\_\% \) 

- Midwest 
  \( \_\_\_\% \) 

- Northeast 
  \( \_\_\_\% \) 

- Southwest 
  \( \_\_\_\% \) 

- Southeast 
  \( \_\_\_\% \)
8. To the extent known, identify what percent of the material received came from each geographic area:

Note - Totals must equal 100%

a. California
b. Northwest
c. Midwest
d. Northeast
e. Southeast
f. Southwest

9. Overall, is CARE meeting your and your business's needs?

☐ Yes
☐ No

10. If you answered no to the previous question, please specify where CARE can provide more support for your business.


11. I affirm that the answers provided in this survey are accurate and complete to the best of my knowledge.

Print Name:
<table>
<thead>
<tr>
<th></th>
<th>12. Company and Contact Information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name:</td>
</tr>
<tr>
<td></td>
<td>Company:</td>
</tr>
<tr>
<td></td>
<td>Address:</td>
</tr>
<tr>
<td></td>
<td>Address 2:</td>
</tr>
<tr>
<td></td>
<td>City/Town:</td>
</tr>
<tr>
<td></td>
<td>State:</td>
</tr>
<tr>
<td></td>
<td>ZIP:</td>
</tr>
<tr>
<td></td>
<td>Country:</td>
</tr>
<tr>
<td></td>
<td>Email Address:</td>
</tr>
<tr>
<td></td>
<td>Phone Number:</td>
</tr>
</tbody>
</table>
Dear CARE Carpet Reclamation and Recycling Partner,

Thank you for taking the time to complete the 2018 Carpet America Recovery Effort (CARE) Annual Survey. Your complete answers to this survey will allow us to perform quantitative analysis on the carpet recycling stream and create a detailed Annual Report for the stakeholders of CARE.

Please report only the quantity of post-consumer carpet managed through your business. For purposes of the CARE Annual Report, we will NOT include information on post-industrial carpet, ONLY POST-CONSUMER CARPET.

The survey should take less than 20 minutes to complete. To minimize the amount of time spent on completing the survey, we recommend that you read through the survey and have your data available before completing the survey.

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Note - All Company information and answers to this survey will be CONFIDENTIAL, and will only be seen and used by CARE’s Executive Director and Operations Director.

All data collected will be reported in the aggregate, thus removing any references to individual companies.

Thank you

Bob Peoples

Executive Director, Carpet America Recovery Effort (CARE)

* 1. For every square yard of Nylon carpet you collect in the waste stream, how many square yards of PET carpet do you see?
2. For every square yard of Nylon 6.6 carpet you collect in the waste stream, how much Nylon 6 carpet do you see?

3. Please indicate (in percentages) all regions that your sorted output (material for processing or WTE) was shipped to.

   Note - Totals must equal 100%
   California
   Northwest
   Midwest
   Northeast
   Southeast
   Southwest
   International

4. Overall, is CARE meeting your and your business's needs?
   ○ Yes
   ○ No

5. If you answered no to the previous question, please specify where CARE can provide more support for your business.

6. What was your ending inventory as of December 31, 2018?

7. I affirm that the answers provided in this survey are accurate and complete to the best of my knowledge.
<table>
<thead>
<tr>
<th><strong>8. Contact info</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Name</strong></td>
</tr>
<tr>
<td><strong>Company</strong></td>
</tr>
<tr>
<td><strong>Address</strong></td>
</tr>
<tr>
<td><strong>Address 2</strong></td>
</tr>
<tr>
<td><strong>City/Town</strong></td>
</tr>
<tr>
<td><strong>State/Province</strong></td>
</tr>
<tr>
<td><strong>ZIP/Postal Code</strong></td>
</tr>
<tr>
<td><strong>Country</strong></td>
</tr>
<tr>
<td><strong>Email Address</strong></td>
</tr>
<tr>
<td><strong>Phone Number</strong></td>
</tr>
</tbody>
</table>
Appendix 2
Definitions Used in the CARE 2018 Annual Report

**Carpet:** A manufactured article that is used in commercial or residential flooring applications as a decorative or functional feature and that is primarily constructed of a top visible surface of synthetic or natural face fibers or yarns or tufts attached to a backing system derived from synthetic or natural materials. “Carpet” includes, but is not limited to, a commercial or a residential broadloom carpet or carpet tiles. “Carpet” does not include a rug, pad, cushion, or underlayment used in conjunction with, or separately from, a carpet.

**Carpet as Alternative Fuel (CAAF):** Fuel that has been produced from source-separated, and sorted post-consumer carpet and processed, including (1) extraction of component for recycling if at all possible; and (2) size reduction, shredding, and/or blending with coal fines, etc.

**Carpet America Recovery Effort (CARE):** A nationwide, 501(c)(3) non-profit organization whose focus is on post-consumer carpet stewardship.

**Carpet Industry:** The universe of participants involved in the production of carpet, including carpet manufacturers, fiber manufacturers, material suppliers, etc. It includes and is not limited to members of the Carpet and Rug Institute (CRI).

**Cement Kiln:** Cement production facility that may use CAAF as a source of energy and/or as an additive for cement production.

**Collection:** Any method of consolidating and temporarily storing recovered commercial and/or residential carpet.

**Disposal Diversion:** Carpet removed from the waste stream that was destined for the landfill or incineration, for the purpose of reuse, recycling, CAAF or waste-to-energy (WtE).

**Disposal Facility:** Facilities that are licensed and permitted to provide final disposal for the specific wastes they accept, including waste-to-energy, incineration, and landfilling.

**Entrepreneur:** Individual or privately-held company who is not a carpet manufacturer, and who actively, collects, sorts, processes or manufactures products made from post-consumer carpet.

**Filler:** Materials such as calcium carbonate, etc. used in the production of carpet backing.

**Higher Value Recycling Material:** Output of the materials with the most benefits to manufacturers of finished products. Examples of higher value recycling materials include post-consumer carpet fiber, post-consumer carpet backing, engineered resins and material for carpet cushion.
**Incineration:** Complete burning of material to ashes, with no energy recovery, to reduce waste volume. 
Input: The post-consumer carpet that is collected, sorted and readied for processing.

**Landfilling:** Landfilling includes the placement of post-consumer carpet and/or the residuals from a post-consumer carpet management method into a landfill disposal facility.

**Lower Value Recycling Material:** Output of the materials with benefit to manufacturers of finished products, but a lower value than higher value recycling materials. Examples of lower value recycling materials include carpet filler and non-functional filler.

**Memorandum of Understanding (MOU) for Carpet Stewardship:** An agreement entered into by multi-stakeholders, including carpet industry, entrepreneurs, government entities and non-governmental organizations.

**Output:** The material that results from the processing (shredding, shearing, hammer milling) of post-consumer carpet from the processor. Examples of output are: fiber, shredded carpet tile, depolymerized chemical components, and carpet filler.

**Recycled Content:** Also known as recovered material content, the percentage of material, by weight, a product is made from that has been recovered from consumers in the municipal solid waste stream (post-consumer content) plus any industrial materials salvaged for reuse (pre-consumer/post-industrial content).

**Post-Consumer Recycled Carpet Content:** The amount or percent of carpet, by weight, that is no longer used for or has served its manufactured purpose, that is incorporated into the manufacturing process of the same or a different product.

**Post-Industrial/Pre-Consumer Recycled Carpet Content:** The amount or percent of carpet material, by weight, generated by manufacturers or product converters, such as trimming, overruns, and products returned to the mills, that are incorporated back into the manufacturing process of the same or a different product.

**Post-Consumer Carpet Materials:** Carpet that has completed its life cycle as a consumer item or is no longer used for its manufactured purpose.

**Post-Industrial/Pre-Consumer Carpet Material:** Carpet materials generated in manufacturing and conversion processes, including, but not limited to manufacturing scrap and trimmings/cuttings.

**Processing:** Preparing carpet material for reuse, recycling, CAAF, WTE, or disposal.

**Recycling:** Transforming or remanufacturing discarded carpet materials into usable or marketable materials, rather than for landfill disposal, incineration, WTE, CAAF, or reuse.

**Reuse:** Refurbishing and donating/selling recovered carpet back into the market for its original intended use. The reuse of recovered carpet retains the original purpose and performance characteristics of the carpet.
**Rug:** A loose laid (not installed or attached at wall base soft floor covering manufactured from natural or synthetic fiber, including carpet cut into room or area dimensions that is not intended to cover the entire floor.

**Sorting:** The method used for segregating collected carpet into the various backing types (PVC, SBR Latex, etc.) and/or fiber types (e.g., Nylon 6, Nylon 6.6, Polypropylene and Polyester)

**Source Reduction:** The result of using less product or material in manufacturing and use of carpet, and/or reducing the amount of discarded carpet generated.

**Source Separation:** The process by which carpet is separated/segregated from all other materials at the end of its useful life (or when discarded).

**Waste-to-Energy:** Process of recovering thermal energy from solid waste through combustion.
Appendix 3

CARE Board of Directors, 2018

Ranae Anderson – Universal Fiber Systems LLC
Russell Bennett – Tarkett
Fred Williamson – Starnet Worldwide Commercial and Flooring Partnership
Don Dolan – Masland Contract
Russ Delozier – Engineered Floors, Secretary of CARE
Joe Foye – Mohawk Group Inc., Vice-Chair of CARE
Ron Greitzer – L.A. Fiber Company Inc., Treasurer of CARE
Philip Ivey – Milliken & Company
Anna DeLage – South Carolina Department of Commerce
Jim Lindsey – Aquafil USA
Eric Nelson – Interface
Bob Peoples – CARE, Executive Director
Sean Ragiel – CarpetCycle, LLC
Louis Renbaum – Wellman Plastics Recycling
Wyatt Rollins – Shaw Industries Inc.
Kasey Wakefield – Kruse Carpet Recycling
Joe Yarbrough – The Carpet and Rug Institute, Chairman of CARE

CARE Board Advisors

Frank Endrenyi – Consultant
Dennis Hayford - Consultant
Glenn Odom – Consultant
Rachel Palopoli – A1 Planet Recycling
Dr. Matthew Realff - Georgia Institute of Technology

About CARE

Established in 2002, CARE is a 501 (C) 3 non-profit organization. Carpet America Recovery Effort (CARE) is a joint industry-government effort to increase the amount of recycling and reuse of post-consumer carpet and reduce the amount of waste carpet going to landfills. www.carpetrecovery.org