

2019

Sustainability Report

DELIVERING MEASURABLE VALUE THROUGH SUSTAINABLE EFFORTS.

Table of Contents

CEO Letter	3	Our Initiatives	31
About Graham Packaging	4	U.S. Recycling Overview	32
Key Teams & Benchmarks	5	Recycled Content	33
Sustainability Council	5	Graham Recycling Operation	35
Sustainability Partnerships	7	Lightweighting	37
Year-Over-Year Results	8	Customer On-Site & Near-Site Locations	38
Sustainability Benchmarks	9	Our Operations	39
Our Beliefs	10	Health & Safety	40
Mission Statement	11	Environmental Management	42
Pillars of Responsibility	14	Materials	44
Core Values	15	Energy Usage	45
Our People	16	GHG Emissions	47
Human Resources Strategy	17	Water Consumption & Waste Management	49
Training & Development	19	Looking Ahead	51
Employee Programs	20	Sources	52
Community Involvement	22		
Our Products	23		
Plastic Packaging Overview	24		
Legislation Summary	25		
Types of Plastic	26		
Minimizing Food Waste	27		
ThermaSet® PET	28		
Ocean-Bound Plastic	29		
Advanced Barrier Technologies	30		

Graham Packaging CEO

Message From Mike King

Last year, we released our first annual sustainability report where we shared details about our operations and initiatives. We also outlined our vision of how Graham will help create a sustainable future through increasing our use of post-consumer recycled resin, improving recyclability in all categories and decreasing our carbon footprint.

This year's sustainability report focuses on a new message — progress. The goals and initiatives we began in 2018 have gained momentum, and our team is poised to use that momentum to create positive change throughout our company and our communities.

There are three key drivers behind the progress we've made this year. Our first and most important driver is customer satisfaction. At Graham, we hold to the core value, "Be the partner of choice," and with that in mind, we constantly ask ourselves how we can help our customers meet their sustainability goals.

Thus, we're working toward incorporating an average of 20% post-consumer resin (PCR) across all bottles by 2025 while maintaining our standard of 100% recyclability. We're also finding ways to make ocean-bound plastic and PCR broader options for a range of markets, from household and automotive lubricants to food and beverage.

Our second key driver is Graham benchmarks — internal goals we use to track our progress toward being a leader in sustainable packaging. We're ramping up our R&D efforts, developing innovative processes and leveraging technologies that empower employees at all levels of our business to share their ideas. We've also focused on tangible, day-to-day projects like reducing our energy use across our operations.

Our last key driver is new regulation. Due to increased demand from consumers for more sustainable packaging, federal and state governments have stepped in to propose legislation around the topic. We already work with many industry associations with whom we have a mutual commitment to bettering our planet. Through these partnerships and driving for continuous improvement in our business, we're well-positioned to adapt to changing regulations.

By considering these important factors, we've developed an aggressive roadmap that will solidify our place as a leader in sustainable packaging solutions. We have our sights set on 2025, and we know we'll be ready to meet the needs of the markets we serve. And in turn, we'll help our customers be ready, too.

We hope you'll join us on the road to 2025 — and to a more sustainable future.



A handwritten signature in black ink that reads "Michael J. King". The signature is written in a cursive, flowing style.

Mike King, Chief Executive Officer

About

Graham Packaging

As a leading plastic packaging manufacturer, we understand that creating the right packaging isn't just about choosing a color and defining a shape. It's about understanding a product across its entire life cycle.

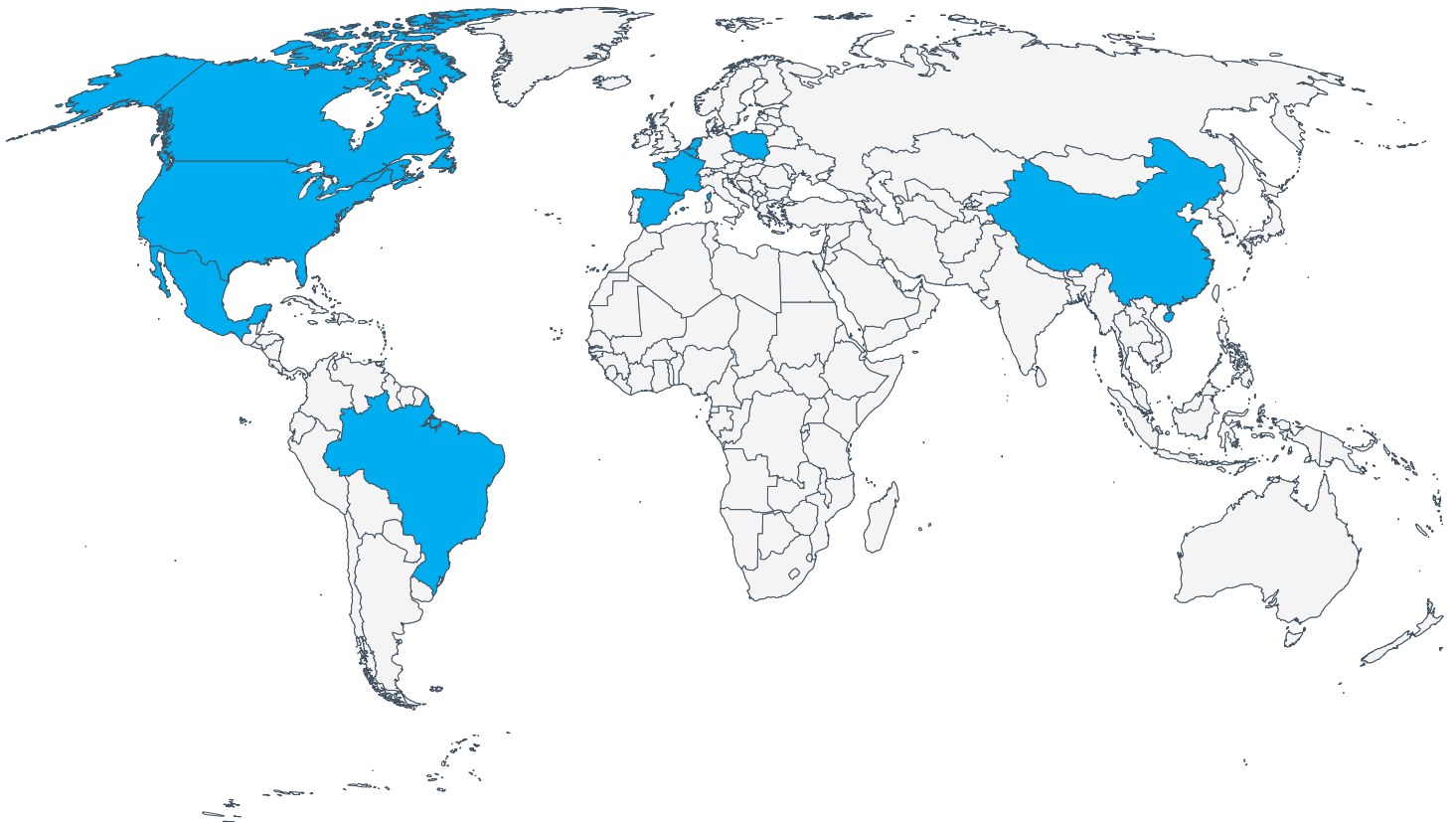
Our company was founded more than 50 years ago on the idea that there had to be a better way to store and use motor oil. Through innovation and a dash of imagination, we converted the metal oil can into a plastic bottle that made Gulf Oil's product safer, cleaner and lighter for sellers and consumers to use.

Since then, we've expanded our offering to deliver innovative, sustainable packaging to additional markets, including food, beverage, functional nutrition and household. And we've built a team of dedicated designers, engineers and other packaging professionals who are obsessed with solving each industry's biggest packaging challenges.

Our facilities across North America, Asia, Europe and South America produce more than 16 billion container units annually.

But despite the volume of bottles we produce, our focus is on creating tailor-made solutions through close collaboration with our customers. We explore new possibilities in packaging — from ocean-bound plastic to advanced barrier technologies — to help our customers reach their own sustainability goals.

We're headquartered in Lancaster, Pennsylvania, with our flagship manufacturing facility in nearby York, Pennsylvania, and other facilities located throughout the world. In 2011, we were acquired by Reynolds Group Holdings, a leading global manufacturer and supplier of consumer food and beverage packaging and storage products.



Sustainability Leadership at Graham

Our Sustainability Council, which is governed by Graham executive leadership, oversees our sustainability strategy and works to implement sustainability initiatives in our communities and at our facilities across the world. The council is made up of several key groups, including our Energy Council, Waste Council and Green Teams.

Key Functions of Sustainability Council Groups



Energy Council

To oversee the implementation of sustainable energy strategy across all Graham locations




Waste Council

To explore opportunities to reduce waste-into-landfill and drive our internal efficiency to decrease scrap



Green Teams

To develop plans, programs and metrics for individual business units while acting as ambassadors for community initiatives



“We see the adoption of sustainable packaging as both a challenge and an opportunity — one that must be faced openly and responsibly to meet the needs of consumers, our customers and the environment.”

Tracee Auld

Chief Sustainability Officer

Our Partnerships

We're members of several sustainability-focused organizations and together, we're working to promote environmentally responsible behavior and overcome the barriers that prevent us from living healthier, more sustainable lives.



We're one of the largest plastic manufacturing companies that have signed the Ellen MacArthur Foundation's New Plastics Economy Global Commitment. This commitment will bring together all our resources to reduce global waste and help our customers reach their sustainability goals by 2025.



The Recycling Partnership is an industry-funded, national nonprofit organization that leverages corporate funding to transform recycling in states, cities and communities. We work alongside them in the fight to keep plastic out of landfills.



The Sustainable Packaging Coalition® is a leading voice on sustainable packaging that focuses on end-to-end sustainability initiatives. As part of this organization, we will collaborate with other industry leaders and share knowledge to help everyone take more meaningful action toward packaging sustainability.



We sit on the APR PET and Olefin Technical committees. Our role in this partnership is focused on PET and HDPE plastics and how we can help support APR membership through the development of technical resources, technical studies and education.



The PRCC is committed to improving the quality of the environment and reducing solid waste through PET beverage container recycling. Our primary goals are to increase public awareness and recycling rates for PET beverage containers, ensure stable end-use markets for all PET collected in California and increase the value of PET while reducing collection costs.



We've made a commitment to partner with the Department of Energy to reduce our energy consumption by 25% over the next 10 years.

2019

A Year of Progress

Over the course of 2019, we took key steps toward the sustainability goals laid out in our 2018 Sustainability Report. These are just a few highlights from the initiatives you'll learn about in this report.

**56%**

Increase in the Use of rPET Content

**6%**

Overall Reduction in Energy Usage

**65.7 Million**

Pounds of HDPE PCR Content Consumed

**100%**Renewable Energy Used by
Two Graham Facilities in Brazil**375 Million**Containers Diverted From Landfills
by Graham Recycling Operation**19.4%**Combined Decrease in Scope 1 & 2
Greenhouse Gas Emissions**25%+**

Ocean-Bound PCR Content in a Single Bottle

**96%**Waste Reused or Recycled
by Lexington, KY, Plant

Sustainability Benchmarks

Using the momentum from our 2019 progress, we're continuing to work toward a number of targets.

We believe that 2020 will bring us new opportunities to meet both our qualitative and quantitative sustainability goals. These goals include:

- Reducing energy usage by up to 5% in 2020, as part of an overall 25% energy reduction by 2028
- Increasing our use of PCR, including ocean-bound plastic, by incorporating an average of 10% PCR in 2020
- Conducting more than 25 life-cycle assessments to help communicate the value of sustainability to our customers in 2020
- Innovating to provide product lightweighting, recyclability, durability and reusability
- Continuing to design for recyclability across all products

We're confident that by continuing to focus on these key sustainability benchmarks, as well as smaller community-based initiatives, we can help bring positive change in 2020 and beyond.

2020 Goals Summary



5%
energy reduction



10%
average PCR use



25+
life-cycle assessments



98%
recyclability

Our Beliefs

We are committed to minimizing the impact of our manufacturing by designing innovative products, creating operational and recycling efficiencies, empowering our employees to be informed stewards and leading the ongoing mission to preserve our planet for future generations.



A Vision for Sustainability

Delivering Measurable Value

We know it isn't enough to focus solely on our internal sustainability goals. To create meaningful change, we must reach out and create value for our customers at every touch point.

We do this by understanding customers' business needs and working with them to develop custom packaging solutions that have the lowest possible environmental impact — all without losing sight of the consumer. To formally demonstrate our commitment to sustainability, we've signed the Ellen MacArthur Foundation's New Plastics Economy Global Commitment, pledging to reduce waste and help our customers reach their sustainability goals by 2025.

In our drive for excellence, we've made sustainability a top priority, and we view everything we do through that lens. When developing a new product, it not only needs to be a world-class, profitable solution, it must also contribute to our vision of a circular economy. When building our team, we look for individuals who share our passion for sustainability and who are dedicated to delivering measurable value to our customers through partnership and expertise.

We believe that every one of us is part of something bigger — from our families and communities to wider society and the global environment in which we live. These relationships are interconnected, and any impact on the environment has the potential to affect each of us today, tomorrow and in the future.

So, as a packaging company — and more importantly, as human beings — we must consider our planet's future in everything we do, every day. Whether we're shaping a bottle, contracting with a customer, sourcing a new resin or hiring a new employee, we believe it's an investment in our future and the future of our planet.

“Our mission is to be an industry-leading solutions provider for sustainable packaging.”

Mission-Driven Solutions

Creating a Circular Economy

Our mission has always been to provide innovative, environmentally responsible packaging that protects and preserves our customers' products. Now, our company — and our industry — has the opportunity to be part of a broader solution that extends beyond products to protect our planet.

According to [a recent study published in the *Journal of Sustainability Research*](#), approximately 50% of the growth observed in the sampled consumer packaged goods companies came from sustainability-marketed products. These findings underscore the significance of our sustainability initiatives as they relate to our operations, our packaging solutions and our communities.

With every decision we make as a business, we work toward the ideal of a circular economy. We have embraced the idea that a responsible company must exist and grow in an environmentally, socially and economically sustainable way. Thus, we hold each of our business units accountable for bridging the gap between profitability and the ever-changing needs of our planet.

We believe the best way to meet these needs is to reuse valuable, finite resources like plastic. That's why our first — and most important — contribution to the circular economy is to collect and reuse plastics through vigorous recycling efforts. We're also currently using bio-based plastics, and in the future, we will use chemically recycled plastics to further preserve nonrenewable resources and to support a circular economy.

Another important part of our mission is to help educate the public on how we can work together to overcome barriers to recycling and push for solutions. Our progress toward long-term goals, like setting recycling quotas and eliminating waste to landfill, begins with taking small steps to help create an infrastructure that will support a circular economy. By educating others and advocating for meaningful change, we can help safeguard the future of our planet.



Design

Reduced environmental impact through innovative packaging solutions.




Recycling

Best-in-class repurposing efforts that work to help save our planet.



Manufacturing

Reduced carbon footprint thanks to everything from plant-wide operational solutions to an increased use of recycling.

The background of the page features a vibrant aurora borealis in shades of green and blue, dancing across a dark, starry sky. In the foreground, a dark, silty landscape is visible, with several large, dark, angular rocks scattered across the lower portion of the frame. A thin, light blue curved line arcs across the middle of the image, separating the sky from the land.

“While plastic has proven itself as essential for everyday life in so many ways, we must recognize that our planet’s resources are finite. It’s our responsibility to design innovative solutions, which minimize environmental impact and promote circularity.”

Tim Thompson
Chief Technical Officer

Pillars of Responsibility

Carrying Out Our Mission

Being informed stewards of the environment requires us to continually reexamine our mission and challenge ourselves to view our business holistically through the lens of the present moment. But despite our ever-changing industry, there are three fundamental pillars of responsibility that remain the foundation of our business: social, environmental and economic. When combined, these pillars underpin the very basis of a sustainable society and planet.



Social

SAFETY

Maintain and improve on our world-class safety record.

EMPLOYEE GROWTH

Support career development, advancement and work-life balance.

DIVERSITY

Promote inclusion and diversity in our team.

INTEGRITY

Comply with local laws and regulations, maintaining the highest ethical standards.

EDUCATION

Work to educate our customers, suppliers, employees and the public on the environmental benefits of plastics, and on product recyclability and how to recycle.



Environmental

RECYCLED CONTENT

Push the boundaries on recycled plastic content in our products.

ADVOCACY

Lead the ongoing environmental dialogue on plastic packaging and be a constant advocate to increase the recycling infrastructure.

PARTNERSHIP

Deliver on customers' sustainability goals, while helping customers and suppliers reduce their environmental footprint.

REDUCED CARBON FOOTPRINT

Work across our organization to minimize our energy and water usage, and to achieve zero waste to landfill.



Economic

DESIGN FOR RECYCLABILITY

Use shapes, process technology and design technology to promote recyclability, advocate lightweighting and create functional features that minimize the environmental impact of our packaging.

INNOVATION

Explore new technologies to reduce or eliminate barriers to recyclability, chemically recycled plastics and bio-based plastics.

EFFICIENCY

Continuously improve our operations by reducing our carbon footprint, while developing operational initiatives that promote more efficient and environmentally responsible outcomes.

FREIGHT SOLUTIONS

Explore freight initiatives that limit greenhouse gases by reducing the number of trucks and trains needed to move our products and material.

Core Values

While our sustainability vision sets a target, our core values will help us reach it. We've identified four central principles that guide how we do business both internally and externally, and they reflect our passion for integrity, innovation and strong working relationships.



Value Our People

Create a safe environment for our team above all. Build our organization around a diverse group of innovative people who want to make a positive difference and create value for their customers. Identify, promote, invest in and reward those who do.



Honor Our Commitments

Act with integrity. Earn the trust of our partners both inside and outside the company. Do what we say we will do and deliver what we commit to deliver.



Be the Partner of Choice

Strive to be a "destination company" where people want to work and with whom customers and suppliers want to do business. Be proud, contributing members of the communities where we operate.



Drive for Excellence

Hold ourselves to the highest standards and never be complacent. Strive for continuous improvement, learning from our mistakes and the mistakes of others. Add value in everything we do.

Our People

Collaborative. Creative. Committed. Our organization is made up of a diverse group of people who leverage these key attributes to make a positive difference in the workplace and in their communities. By building strong relationships and creating value for our customers through years of experience, our people embody the innovative spirit that's inherent to Graham Packaging.



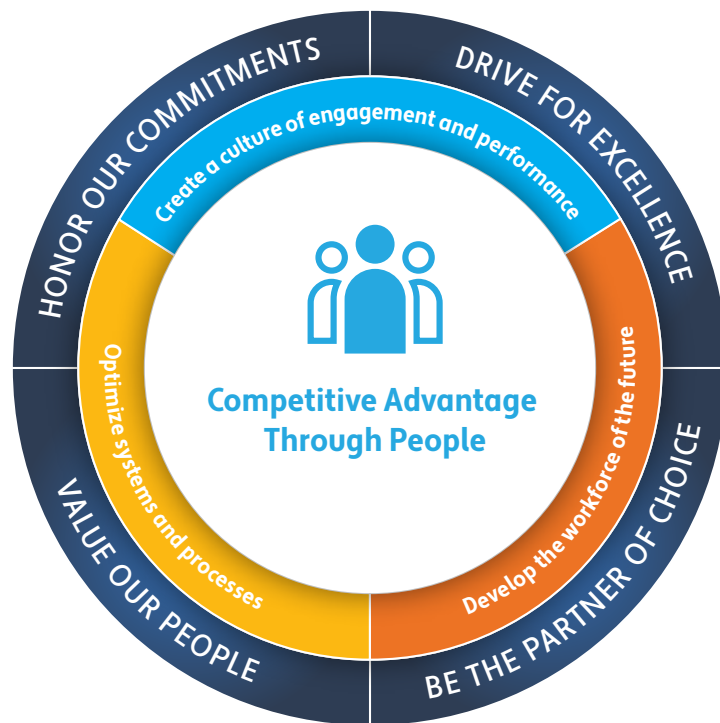
Engagement & Performance

Harnessing Human Potential

We believe that by hiring and developing talented employees, we can achieve a competitive advantage through our people.

In 2019, we welcomed Lisa Santin to our executive team as our vice president of human resources. She has helped us refine our approach to employee engagement and implement several strategic initiatives across our company.

Our human resources strategy emphasizes three key pillars that are built on the foundation of our core values. While each of these pillars is backed by a set of ongoing projects, we've focused our efforts on achieving a few crucial milestones in 2019 that will pave the way for an aggressive roadmap in 2020. These key milestones include increasing our investment in training, defining and rolling out an updated Graham Competency Model and developing Employee Resource Groups (ERGs).



Ethics & Compliance

We have a well-developed Ethics & Compliance Program embedded in our company culture and supported by our Litmos e-learning platform. We use both Litmos and in-person training to train all relevant employees on our code of conduct, fraud policies and other specific training topics, like anti-corruption, anti-bribery, antitrust and privacy.

By offering this standardized training, we can be sure every employee receives the same information. We take ethics and compliance violations seriously, and we strive to handle any breach of conduct with the utmost care and professionalism.



“We focus on culture and professional development not just as a way to retain talent, but as a way to attract people from outside our organization. This allows us to build high-performing teams who deliver on our commitments to employees and customers.”

Lisa Santin

VP of Human Resources

Training & Development

Fostering Employee Growth

To attract and retain the best talent, it's essential for us to create opportunities for our employees to grow their skills. Whether an employee holds a leadership position or works in an hourly role, they are an important part of the Graham team. That's why we're committed to identifying, promoting and investing in employees who step up.

Pay-for-Skills PROGRAM

Pay-for-Skills Program

In some of our facilities, we have Pay-for-Skills programs for our hourly employees. The benefits of this type of program are twofold. For our employees, it allows them to take their career development into their own hands. They are rewarded for their motivation to complete training and acquire/validate their skills. For our company, it fosters an environment of engaged management and helps us further develop our talented employees. This program also gives us a competitive advantage when recruiting new talent at our many locations.

SAP Litmos

Litmos Learning Management System

In 2019, we continued to implement the use of the Litmos Learning Management System (LMS) across our company. Already, our team has completed over 40,000 learning events on about more than 1,200 separate topics. Litmos helps us maximize engagement and retention, satisfy facility safety initiatives and ensure legal and regulatory compliance. Plus, it allows our employees around the world to take courses in their preferred language.

FrontLine LEADERSHIP

FrontLine Leadership Development and Fundamentals

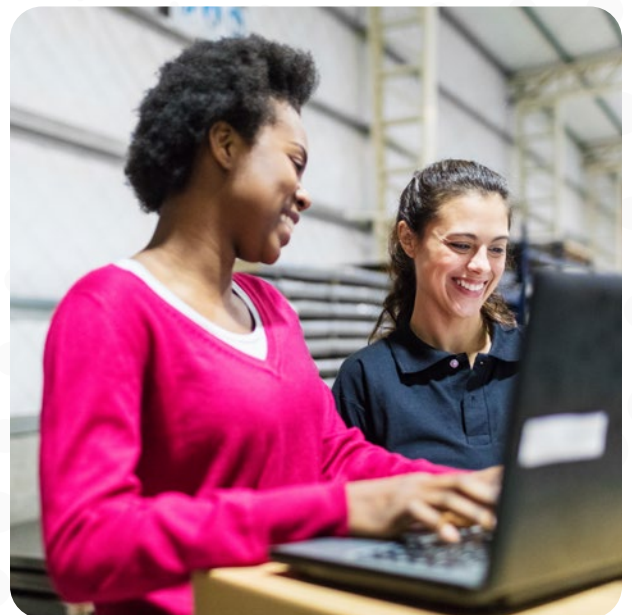
Our FrontLine Leadership program is a formal education program consisting of an instructor-led course or a three-day session with subject matter experts within our organization. This program provides all plant leaders who are new to their role or new to Graham with the opportunity to develop a deeper understanding of their role, including how to drive standardization, reduce cost, build trust and encourage involvement at all levels of our business.

Graham Competencies Reinforcing Our Core Values

To ensure every employee at Graham understands and works toward our core values, we've identified competencies that — when demonstrated — make our team members successful.

We leveraged the world-class Korn Ferry competency library to outline the common behaviors, attributes and skills that turn our core values into action. From there, we defined the competencies team members should aspire to at each level of the organization.

In 2019, these competencies were incorporated into the performance assessment and evaluation process in North America. Over the course of 2020, we will add them in multiple languages across the 16 countries where Graham employees live and work. These competencies have become an integral part of our roadmap for employee development and success.



Employee Resource Groups

Promoting Diversity & Inclusivity

In 2019, we began a new program to help provide support, contribute to the professional growth and enhance the career development of our employees. Employee Resource Groups (ERGs) are voluntary, employee-led groups designed to engage our team in ways that tie into our mission and business goals.

So far, Graham has sponsored the launch of two ERGs: Women in Business and Young Professionals. ERGs can be started by any employee at Graham and are encouraged to focus on one of three key areas.

1



Employee Development

Providing networking opportunities, leadership roles, managerial support and career development

2



Community Outreach

Working to enhance and strengthen community involvement where we live and operate through the leadership of volunteer initiatives

3



Workforce Development

Assisting with recruitment, retention and talent development by sharing knowledge and improving Graham's cultural competence

Each ERG leadership team, which is made up of an executive sponsor, ERG chairperson, ERG cochair and human resources advisor, must develop a charter that clearly outlines its purpose, goals and objectives. Upon approval of the charter, the leadership team engages employees and encourages them to become actively involved with the group.

By offering organizational support to ERGs that exemplify our company mission and enhance the employee experience, we're building a solid foundation of engaged employees across our global locations.

Community Involvement

Making a Local Impact

As a global company, we're fortunate to be able to make a difference in communities around the world. Each Graham location participates in a range of charitable giving and volunteer initiatives throughout the year. By volunteering our time and resources, we promote sustainable living, encourage community partnerships and help better the lives of those in need. See what our teams have been up to in their local communities.



788 LBS. OF TRASH
Collected During Coastal Cleanup Days



\$11,342
Raised for United Way



300 STOCKINGS
Stuffed for Deployed Soldiers and Veterans in Need



164 ITEMS
Donated to Veterans Through Mr. Sandy's Veteran Drive



2,110 TOYS
Gathered for Toys for Tots & Shriners
Children's Hospital



120 COATS
Collected for Coat-A-Kid



340 LBS. OF PET FOOD
Collected for Presents for Pets

Our Products

The packaging we make helps popular brands deliver their goods in a safe, convenient way. From highly creative designs to innovative childproofing options and everything in between, our team will envision and produce a customized solution that exceeds expectations.



Plastic Packaging

Focusing on Responsible Use

When used responsibly, plastic packaging has the power to reduce pollution, decrease energy use and lead to a smaller carbon footprint — especially when compared to other forms of packaging available today.

These benefits are possible, but only if we work together to change the way we manufacture and dispose of this valuable, finite resource. Today, consumers are calling for more sustainable packaging. Companies like us are exploring revolutionary new resins and manufacturing processes. And some countries have instituted bans or taxes on certain types of plastics to help combat ocean pollution and to promote recyclable alternatives.

While these actions call needed attention to growing environmental concerns, they can also have unanticipated side effects, like increased costs for retailers, manufacturers and even consumers. As a plastic packaging manufacturer, we must work to overcome these challenges through sound problem-solving and creative thinking.

Plastic alternatives can also present their own set of challenges. Glass, for example, is considered by some to be more eco-friendly but breakage can lead to increased waste and an increased carbon footprint. Likewise, the energy involved in producing glass, as well as the freight and fuel costs of shipping this heavy material, add to a company's overall carbon footprint.

On the other hand, plastic packaging brings many end-to-end benefits, including more convenience, a reduced carbon footprint and lower prices. PET and HDPE are common, easily recycled plastics. Both are lightweight, durable and offer design flexibility not found in other materials. Plus, because of their reduced weight and size, PET and HDPE products can be transported in higher volumes on fewer trucks.

Plastic packaging has the potential to be the most sustainable solution on the market — one that helps create a circular economy where valuable resources are conserved rather than wasted. We believe that through continuing innovation, designing for recyclability and fostering better recycling habits, we can contribute to bringing this vision to life.

New Legislation

Establishing a Path Forward

With increased demand from all quarters for better recycling infrastructure and more sustainable packaging, federal and state governments are wrestling with how to address key concerns.

Globally, there has been a lot of legislative activity around waste management and recycling. In the U.S., many laws focused on materials that are more difficult to recycle — like plastic bags, polystyrene and plastic straws — have passed at the state, county and city levels. Several states and even the federal government have also attempted to address some of the broader recycling infrastructure issues. While many of these bills have concentrated on plastic packaging, others have had a wider focus on all packaging.

Two common themes running through the various legislation are recyclability and recycled content, or PCR. At a high level, the proposed recyclability laws set a minimum percentage of packaging that must be recyclable, or capable of being recycled. In some cases, this legislation seeks to require proof that a certain amount of the packaging is being recycled. The proposed recycled content laws generally impose a minimum percentage of PCR that must be included in packaging in the future.

Most of the draft bills are framework in nature and leave many finer details to future regulations. However, one aspect that appears in nearly every piece of legislation is the development of producer responsibility organizations (PROs). These organizations are authorized and/or financed by a group of producers — or brands — to take on the responsibility of collecting and managing product waste for the producers within the group.

Another concept that shows up in the bills is a call for extended producer responsibility (EPR) programs. This type of program helps contribute to a circular economy by requiring producers to be responsible for the treatment or disposal of post-consumer products rather than relying on consumers to dispose of products properly.

At the time this report was written, many of these bills were gaining traction and some were even passed, only to be vetoed later. In the current COVID-19 environment, the bills that are now up for debate may not pass as our government, businesses and communities focus on the immediate pandemic. Despite this delay, it's expected that these bills and others will return next year.

At Graham, we are well-positioned to help our customers meet any new or evolving legislative requirements. Most of our packaging portfolio is already fully recyclable, and we can include high amounts of PCR in our containers. From our perspective, we welcome the challenge to make our packaging as sustainable as possible, and we're committed to meeting new regulations as they come up.

Our Capabilities

Producing Innovative, Sustainable Packaging

In 2019, we processed more than 450 million pounds of PET resin and more than 600 million pounds of HDPE resin across our global facilities. We also experimented with innovative new resins made from potato starch, sugarcane and other bio-based materials.

Polyethylene Terephthalate (PET)

PET is widely used for packaging foods, beverages and cleaning products. It's also an approved material for use in pharmaceutical applications because it's resistant to the growth of microorganisms and biological degradation. This strong, clear, lightweight material reduces shipping costs, increases energy efficiency and nearly eliminates the danger of breakage. Bottle-grade PET is one of the common plastics we use, and in 2019, we processed more than 450 million pounds of PET resin across our global facilities.

Biodegradable Resins

Biodegradable resin is plastic that is actively metabolized by microorganisms like bacteria when left in the natural environment. Potato starch containers are one example. Although we've experimented with biodegradable resins and will continue to do so, biodegradable resins are not yet a viable alternative. As such, our preference is to enable virgin polymers to be used as many times as possible via recycling and through the management of our internal scrap, whether the polymer is from fossil fuels (nonrenewable) or bio-based materials (renewable).

High-Density Polyethylene (HDPE)

HDPE is used for a range of packaging, from gallons of milk to jugs of laundry detergent. Thanks to its high strength-to-density ratio, HDPE is ideal for packaging heavy liquids while keeping transportation costs low. HDPE can be sterilized by boiling, and it naturally resists mold, microorganisms, acids and even chemicals. This material is also highly malleable for more design flexibility. Bottle-grade HDPE is another common plastic we use, and in 2019, we processed more than 600 million pounds of HDPE resin across our global facilities.

Bio-Based Resins

Bio-based resins are derived either partially or completely from renewable raw materials that undergo a chemical reaction to create a new synthetic material. They take the place of traditional resins, like polyester, epoxy and polyurethane. We're continuing to research and experiment with bio-based resins that do not compete with the food chain and have used them in some of our operations in the past.

High Impact

Reducing Food Waste With Plastic Packaging

Every year, approximately one-third of all food produced in the world for human consumption is lost or wasted. In fact, if food waste were its own country, it would be the third largest emitting country in the world.

The U.S. economy alone loses more than \$200 billion every year to food waste. This large volume of waste affects not just the world's food supply, but also the supply of critical resources. Making and distributing food requires so many natural resources, including water, land and fuel. When that food is wasted, all the resources that went into its production and distribution are wasted as well.

While food waste may seem like a problem independent of plastic packaging, these two key issues are closely intertwined. Plastic packaging helps mitigate food waste by preserving perishable foods, lengthening their shelf life and reducing product loss due to breakage. This helps not only consumers and the average household to save money and waste less, but retail and food-service businesses as well. In fact, the American Chemistry Council (ACC) estimates that a 10-20% reduction in food waste would save retail business and U.S. households a combined \$20 million annually.

Did you know throughout its life cycle, food production emits nearly 13% of greenhouse gases (GHGs) in the U.S.? Additionally, when food takes up space in a landfill, it releases methane as it decomposes, which is 21 times more potent than CO₂.

New Possibilities in Packaging

PET as an Alternative to Glass

Glass has traditionally been used to package food and beverage items that must undergo high-heat sterilization techniques, like pickles, tomato sauce and fresh juice. However, advancements in PET technology have helped plastic emerge not only as a more sustainable replacement for glass but also as a benefit-rich solution.

Like glass, PET promotes longer shelf life and offers a clear view of the product packaged within it. It also works with metal lug, metal CT closures, can ends and plastic closures, making it a drop-in solution for most fill lines. When used and disposed of responsibly, PET packaging can also lead to reduced pollution and lower energy usage than other forms of packaging available today.

At Graham, we've developed ThermoSet® PET, which can be used in place of glass in challenging hot fill, retort and pasteurized applications. We conducted a life-cycle assessment of this material, comparing our 28-oz. PET pasta sauce jar with a 28-oz. glass jar.

This life-cycle assessment found that PET offered the following benefits over glass:

- Virtually eliminated breakage, which reduced production downtime and product loss
- Reduced shipping weight by up to 30% for freight savings
- Used less energy from production through to end-of-life disposal
- Allowed more design flexibility without impacting recyclability

This peer-reviewed study also calculated the environmental impact of manufacturing the jars, caps and packaging materials, shipping the jars to their filling locations, filling the jars with pasta sauce, shipping the filled jars to grocery stores and disposing of unrecycled jars in landfills. It found that over multiple environmental impact categories, ThermoSet PET jars had a lower impact on the environment than glass jars.

Quantifying the Sustainability of ThermoSet PET With Life-Cycle Assessment*



16%
less energy



93%
fewer air particulates



55%
reduction in smog emissions



38%
smaller carbon footprint

*Results from critically reviewed, ISO 14044 LCA Study comparing ThermoSet PET jars to glass jars.

New Possibilities in Packaging

Collecting and Reusing Ocean-Bound Plastic

Ocean-bound plastic is plastic waste that is at risk of polluting our oceans. It's usually collected along waterways, like rivers and lakes, from at-risk zones near the coastline. This recycled raw material can be integrated into a range of product packaging.



It's estimated that **8 million metric tons of plastic** goes into the ocean every year, but by collecting and reusing ocean-bound plastic, we can help drastically reduce that number and contribute to a cleaner, healthier planet.

As of 2019, we have the capability to source and produce ocean-bound plastic at the Graham Recycling Operation, and we have sampled bottles using 25% ocean-bound PCR. We offer food-grade and non-food-grade packaging solutions that incorporate ocean-bound PCR, and to help maximize its value to our customers, we're exploring blending options that combine regular PCR with ocean-bound PCR. We can run ocean-bound plastic PCR in both single-layer and multilayer bottles today.

“Any of our production lines that use standard PCR today have the capability to use ocean-bound PCR, too.”



Advanced Barrier Technologies

Traditionally, materials like glass and aluminum have been used to package products that need extra protection from oxygen exposure to maintain their optimal shelf life. However, as preferences continue to shift toward the use of more sustainable packaging, these traditional materials are less desirable due to their increased production cost, potential for breakage and high carbon footprint.

Emerging technologies, specifically barrier technologies that prevent gases from permeating a material, have made plastic a viable replacement in these applications. Many large brands now use plastic packaging with passive or active oxygen barrier technology. This ensures products like meat, juice, wine and other sensitive foods are protected for the duration of their accepted shelf life.

By using plastic packaging with a barrier technology, brands reap the benefits of plastic — such as convenience, lower costs, less breakage, reduced packaging weight — without compromising the safety of their products.



Barrier Technology at Graham

There are several solutions available for our customers that enhance the light, moisture, CO₂ and oxygen barrier properties in every type of plastic container we make. The first solution is an oxygen scavenger for mono-barrier containers, including containers made with recycled PET. This type of barrier plays a pivotal role in increasing the lifespan of products, while preventing rancidity in oils and fats, inhibiting discoloration and preserving taste.

We also offer a multilayer PET option that meets the Association of Plastic Recyclers' critical guidelines. This advanced barrier technology has several benefits, including:

- Suitability for cold-fill and hot-fill products
- Glass-like clarity
- Excellent gas barrier properties, such as O₂, CO₂ and water vapor

Another solution available to our customers that meets the Association of Plastic Recyclers' critical guidelines is our multilayer EVOH polyolefin. Not only is this solution resistant to chemicals, oils and vapors, but it's also safe for use in recyclable and recoverable products to help companies reduce waste. In addition, it meets FDA and USDA requirements for use with meat and poultry products.

Using advanced barrier technologies, we provide our customers with plastic packaging options that safeguard quality and shelf life. As our industry evolves, we will continue to develop new solutions designed to keep products safe.

Our Initiatives

For us, sustainability is about thinking globally and acting locally. We constantly ask ourselves what we can do to make things better for our customers, our community and the world. It's clear that it will take a collective effort to preserve our planet for future generations, and we'll continue to support that effort in every way possible.



US Recycling: Working Together on a Pathway to Change

Recycling is a large-scale undertaking that requires buy-in from a range of participants, from the government and large brands to waste management facilities and U.S. households. Over the past 30 years, the modern U.S. curbside recycling system has collected millions of recyclables throughout the nation, helping to protect the environment, lower the nation's carbon footprint and create thousands of jobs.

But despite these positive benefits, there are still many challenges facing the system. First, the cost of processing recyclables has increased dramatically in the past few years, with many local communities paying more to recycle their waste than they would to send it to a landfill. Lack of equal access to recycling is another challenge. Just half of the American public has access to recycling, and of those who do, many choose to participate only sometimes or not at all.

Material contamination is also a concern because it makes processing recycled items more difficult and costly. In its [State of Curbside Recycling report](#), The Recycling Partnership found that the average rate of inbound contamination across all types of recycling programs studied was 16.9%, a number that shows there's room for improvement to ensure the waste stream provides the biggest return on investment.

The last challenge the recycling system faces is a lack of centralized data and decision-making. With stakeholders at the federal, state, local and even consumer level, recycling program data is seldom consistently captured and reported. These entities must all work together to measure and improve these programs for meaningful change to occur.

Room for Growth in the US Recycling System

- Just **32%** of available recyclables from single-family homes are collected.
- Only **50%** of the public has guaranteed access to curbside recycling.
- Recycling is **more expensive** than landfilling trash in some communities.
- An average of **16.9%** of inbound recycling material is contaminated.
- **Coordinated efforts** among the government, large companies and consumers are required.

Although these challenges may be difficult to overcome in the short term, there are many organizations, brands and communities already taking steps to mitigate them. The U.S. recycling system, when realized to its fullest potential, can deliver a myriad of environmental and economic benefits beyond the collection and reuse of valuable materials.

According to The Recycling Partnership, if all 37.4 million tons of single-family recyclables were recycled rather than landfilled, it would result in:

- A reduction in U.S. greenhouse gas emissions by 96 million metric tons of carbon dioxide equivalent
- The conservation of an annual energy equivalent of 154 million barrels of oil
- The creation of 370,000 full-time equivalent jobs
- The elimination of the equivalent of 20 million cars off U.S. highways

With these benefits in mind, it's clear that we must work together toward the creation and widespread use of a more robust recycling system. The challenges we're facing are not insurmountable, and by working together toward a better recycling system today, we're taking steps toward the vision of a circular economy for the future.

Recycled Content

Reusing Valuable Resources

One of the best ways to keep plastic out of landfills and out of the oceans is to recycle it so it can be used to create another plastic product.

Plus, many shoppers today feel a personal responsibility to prevent plastics from negatively impacting the environment. This leads them to buy products labeled as "recyclable," "made from recycled materials" and "easier to recycle."

However, to make packaging that can truly claim it's "made from recycled materials," manufacturers need access to large volumes of recycled content. This can be difficult to find when much of the plastic produced today ends up in landfills rather than at a recycling center. That's where the circular economy comes in — as consumer recycling rates climb, so does the amount of recycled content available to manufacturers, who can then use it to make new products for consumers.

2017 Management Pathways for Plastic Containers & Packaging in the US (PET & HDPE)*

70%
Landfilled



13%
Recycled



17%
Combusted With Energy Recovery

Recycled Content at Graham Packaging

We have advanced technologies that allow us to make bottles with various percentages of recycled content. Our development team works with customers to determine the best way to meet their needs for recycled content. We have supplied customers with packaging containing anywhere from 10% to 100% recycled materials, including ocean-bound recycled materials. Plus, most packages we produce have some level of post-industrial recycled content that comes from our in-plant regrind material.

Recycled Polyethylene Terephthalate (rPET)

Bottle-grade PET is a popular and valuable recycled material. The cost of post-consumer recycled PET (rPET) can vary widely depending on where in the process the content is sourced. It may come from scrapped bottles, flake or even reprocessed pellets, but the more consistent the color and performance of the PET, the higher the cost.

In 2019, we consumed roughly 11.9 million pounds of recycled PET, and we expect that number to increase significantly by 2025. Our goal is that 100% of our packaging be recycled back into bottles or recovered for use in other plastic products.

Recycled High-Density Polyethylene (rHDPE)

HDPE is also a popular and valuable recycled material. We can incorporate a significant amount of recycled HDPE (rHDPE) into any bottle we make. In 2019, we used approximately 65.7 million pounds of HDPE post-consumer resin. Of that total, roughly 41.9 million pounds were sourced from our Graham Recycling Operation. In addition, our plants were able to reuse 17.2 million pounds of regrind which are rejected parts that we can reclaim.

“Nearly every package we produce contains some level of recycled content.”

Recycling Goals



100%
of our packaging recyclable
or recovered



20%
average PCR incorporated
across all products by 2025

Graham Recycling Operation

Reusing Valuable Materials

In 2019, the Graham Recycling Operation processed roughly 41.1 million pounds of post-consumer material using our best-in-class recycling methods. We also reused 17.2 million pounds of post-industrial bottle flake across all segments within our company.



The Graham Recycling Operation, which recycles #2 HDPE bottles into PCR, is one of the largest plastic recycling facilities in the northeastern U.S. The benefits of having our own recycling operation are twofold. Not only has it helped the packaging side of our business become one of the largest suppliers of bottle-grade recycled plastic containers in North America, but it's also enabled our facility to be more sustainable. By diverting plastic from landfills, our recycling facility helps us save energy and natural resources, as well as substantially reduce greenhouse gas emissions.



2019 Recycling Operation Efforts



41.1 Million Pounds
post-consumer material processed



17.2 Million Pounds
post-industrial bottle flake reused

In addition to our own recycling operation, we use a network of recyclers to meet the needs of our customers. This network enables us to adapt to fluctuations in customer and consumer demands, as well as prevent material shortages if severe weather occurs. Annually, this network enables us to use an additional 24.5 million pounds of recycled content and helps us minimize the impact of transportation.



“In 2019, the efforts at the Graham Recycling Operation resulted in approximately 375 million plastic containers being kept out of landfills.”

Keith Strohschein

Director of Operations, Materials

Lightweighting

Reducing Fuel and Material Costs

Through our lightweighting initiatives, we've delivered up to a 35% decrease in the weight of a plastic container — without impacting its performance.

When our customers come to us with concerns about warehousing and shipping heavy products, our team gets to work. Our designers and production engineers collaborate closely to find ways to help our customers meet their goals without sacrificing the performance and quality of their packaging over its life cycle.

In recent years, we've lightweighted both PET and HDPE packaging to help offset the monetary and environmental costs our customers face, including fuel consumption, raw material use, water consumption and energy usage. Lightweighting products also lowers the carbon footprint of organizations across the entire supply chain.

While many may think of lightweighting as taking an existing plastic container and redesigning it to reduce the overall weight of the packaged item, it can also mean replacing other packaging materials with plastic. One example of an advancement that enables replacement lightweighting is ThermaSet®, which allows PET containers to replace glass in challenging hot fill, pasteurized and retort processes. A product like ThermaSet PET significantly reduces a packaged product's weight, lowering transportation costs and fuel usage while remaining fully recyclable.

SPOTLIGHT ON

Oil Bottle Lightweighting

When a major motor oil company came to us with the goal of reducing the weight of their packaging, we accepted the challenge. Lightweighting efforts like this one can lead to overall cost reductions, energy savings and improved sustainability.

Our team proposed a plan to reduce the weight of their existing HDPE container by 10%. This 10% reduction in weight saves them nearly eight million KWh of electricity annually, a number equivalent to 888 homes' electricity usage for a year.



10%
weight reduction



8 Million KWh
electricity saved

On-Site & Near-Site Locations

Benefiting Our Customers and the Environment

Customer on-site or near-site locations provide value through freight savings, operational efficiency, flexible technologies and other benefits. It also allows us to reduce our carbon footprint and the carbon footprints of our customers.

One out of every three Graham plants is strategically positioned near or inside our customers' filling facilities.



Benefits of Close Operation

- Freight Savings
- Reduced Inventory
- Operational Efficiency
- Energy Savings
- Recycling Opportunities
- Flexible Technologies
- Lower Carbon Footprint
- Increased Production

Our Operations

Accountability isn't just something we talk about at Graham Packaging. It's something we practice every day. As a plastic packaging manufacturer, we have a responsibility to constantly find new ways to reduce the environmental impact of our facilities. It starts with keeping people safe. It continues when those same people believe in our mission and carry it beyond the workplace into their everyday lives.

Health & Safety

Protecting Our Greatest Asset

We believe that everything we do, every day, should be built on the foundations of safe working conditions, healthy habits and sustainable operation. That's why our strategic plan puts our team's welfare above all other metrics, including cost and productivity.

To become a world leader in environmental health, safety and sustainability, we know we must bring safety into conversations across all levels of our organization. Our leaders empower their teams to stay engaged, holding themselves and others accountable for proactively staying safe on the job. As a team, we continually monitor behaviors and assess potential risks, while also taking time to celebrate when we achieve important safety milestones.

Health & Safety Goals

World-class environmental health and safety programs like ours do more than keep people safe. They also drive operational efficiencies, differentiate us from competitors, reduce costs and boost morale. Thus, we've identified six key areas of focus that will help us remain a leader in this area through 2020 and beyond.

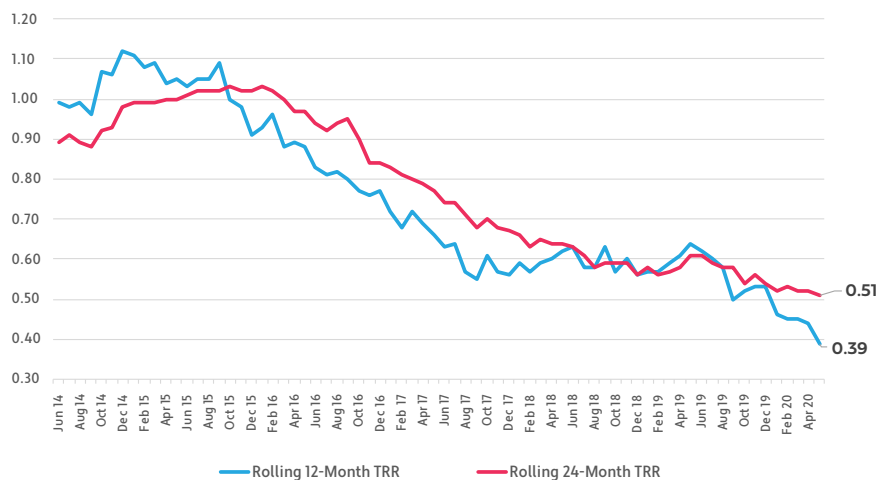
- Reduce injuries and avoid high-risk tasks by focusing on key safety must-haves
- Develop structured problem-solving skills, including root cause analysis and corrective actions
- Focus on behavior-based safety programs to improve awareness and accountability
- Ensure environmental compliance through updated policies, training and initiatives
- Deploy return-to-work strategies after extended employee absences
- Enhance contractor safety through scope-of-work reviews, audits and performance evaluations



Safety by the Numbers at Graham

Our total recordable incident rate has seen a significant drop since 2014. As of May 2020, our rolling 12-month total recordable incident rate was 0.39 and our rolling 24-month total recordable incident rate was 0.51. This dropping incident rate reflects our core values and demonstrates that we've made safety a top priority. By continuing to build on our safety culture, we can keep employees safe, mitigate risk and boost morale.

TOTAL RECORDABLE INCIDENT RATE



SPOTLIGHT ON

Peer-to-Peer Accountability

Employee engagement is one of the biggest factors in our safety success, so we developed the peer-to-peer accountability program. This program trains our employees to recognize risk and start a conversation anytime they witness an unsafe behavior or condition. Because these conversations can be had anonymously, this program allows our employees to be completely transparent without fear of repercussions.

Our leadership team then turns these peer-to-peer reported incidents into training topics that can help workers across our organization learn from each other's mistakes. Through this program, we encourage every Graham employee to learn something new while being accountable to themselves, to each other and to our company.

Environmental Management

Operating for a More Sustainable Future

In 2018, we reported our baseline — a starting point on our journey to more sustainable operations. This year, we're not only reporting on the progress we've made, but also identifying our goals for 2020 and beyond. Our focus remains on lowering our energy, water and material usage, further reducing our waste to landfill and increasing our use of PCR. In the pages that follow, you'll see specific examples of how we're working toward these goals across all our facilities.

Sustainable Manufacturing Goals



Design for Recyclability

Enable 100% of our bottles to be recycled or reused



Reduce Energy Usage

Cut our energy consumption by at least 5% in 2020




Increase the Use of PCR

Incorporate an average of 20% PCR across all products by 2025



Communicate Our Value

Complete 25+ life-cycle assessments that focus on sustainability



“We strive to create and implement manufacturing methods by using a process that focuses on consistency. Our process — called the Graham Operating System — standardizes the way we manufacture our products, measure plant performance, drive accountability and reduce waste throughout our entire supply chain.”

Herm Koch

VP of Global Operations

Materials

KEY BENCHMARKS			
TYPE OF RESIN	2018	2019	% INCREASE
HDPE PCR of Total HDPE	12.09%	12.61%	4.3%
PET PCR of Total PET & EPET	2.22%	3.62%	56%

In 2019, the total volume of primary resins used globally at Graham was over 1 billion pounds. More than 90% of this resin was consumed in North America. We also used more PCR content across our North American facilities over the past year. Between 2018 and 2019, we increased our use of HDPE PCR by 4.3% and our use of PET PCR by 56%. This increase has allowed us to create more sustainable packaging for our customers.

Measurable Results in Materials

NEW SOLUTIONS IN OCEAN-BOUND PLASTIC

As of 2019, we've sampled bottles at higher percentages of ocean-bound PCR, and any line in our facilities that is currently able to handle standard PCR can also use ocean-bound PCR. We can run single-layer and multilayer bottles using this material, and we offer both food-grade and non-food-grade packaging solutions that incorporate it. To help maximize the value of ocean-bound PCR to our customers, we're continuing to explore blending options that combine regular PCR with ocean-bound PCR.

INCREASED USE OF PCR

We're committed to the use of PCR — both standard and ocean-bound — in our products. It's our goal that by 2025, an average of 20% PCR content will be incorporated across the bottles we make. We've also continued to explore chemical recycling and other emerging technologies that will help us create more sustainable packaging solutions using this valuable resource.





Energy Usage

KEY BENCHMARKS			
	2018	2019	% REDUCTION
Absolute Energy Consumed	1,234,859 MWh	1,160,482 MWh	6%
Energy Consumption per One Pound of Bottle Produced	1.19 KWh	1.08 KWh	9.2%

We track three main sources of energy within our operation: electrical power, natural gas and propane. In 2019, electrical power accounted for 90% of our energy use, with the combination of natural gas and propane making up the other 10%. The total amount of energy consumed that came from nonrenewable sources equaled 1.6 billion MWh.

ENERGY (MWh)	NORTH AMERICA	EUROPE	SOUTH AMERICA	TOTAL
Electricity	945,077.07	54,048.56	39,358.63	1,038,484.26
Natural Gas	91,727.48	2,393.80	–	94,121.28
Propane	27,876.56	–	–	27,876.56

Energy intensity is considered the amount of energy consumption divided by the total pounds of product produced. When taking all our facilities into account in North America, Europe, South America and Asia, we use 1.08 KWh of energy for every one pound of bottle we produce.

SPOTLIGHT ON

The Better Plants Program

Last year, we joined the U.S. Department of Energy's Better Plants Program and committed to reducing our energy usage by 25% over 10 years. From 2018 to 2019, we saw a 6% reduction in our energy usage in North America. We plan to reduce our energy usage by another 5% in 2020.

In December 2019, our Evansville, IN, and Tolleson, AZ, plants also participated in an energy treasure hunt as part of this program. An energy treasure hunt brings together a cross-functional team to identify low-cost and no-cost actions to reduce energy consumption. Through this event, our teams found efficiencies that will reduce our energy usage by 8.1 million KWh per year.



Measurable Results in Energy

REDUCTION IN AIR LEAKS

Compressed air is a vital component of most factory environments, and leaks can cause major setbacks to industrial plants. In fact, when an air compressor leaks, it can waste as much as 20% to 30% of its output. If a leak goes undetected, it can lead to high repair costs and less productivity. It takes eight horsepower of electricity to produce one horsepower worth of work with compressed air. It's one of the most expensive utility items in a manufacturing environment, and unfortunately, leaks are common.

To address this, we've implemented an air leak program with engineers working to identify and remedy leaks before they become a larger issue. In 2019, this program identified 23 million KWh's worth of wasted energy due to air leaks. When these air leaks were corrected, we saw an energy savings of 14 million KWh.

LIGHTING AND ELECTRICITY EFFICIENCIES

Our Racine, WI, plant is working to decrease their overall energy usage through several initiatives. First, they've installed new LED lighting throughout the production floor, warehouse, office and outdoor spaces. These lights feature smart controls to take advantage of natural light during daylight hours. They can also be controlled via timers and organized into groups so larger light banks are controlled together.

In addition to lighting and HVAC upgrades, this facility now staggers its line start times after a weekend to reduce the strain on the electrical grid and alleviate peak demand charges. They've also updated their conveyors on each of their eight production lines to shut down automatically when they aren't moving bottles.

RENEWABLE ENERGY USE

Since 2018, two of our plants in Brazil have operated using power from 100% renewable sources like wind energy. Our Duque de Caxias plant that supplies a large motor oil company saw a 670-ton reduction in greenhouse gas emissions, while our Poços de Caldas plant that works with a large food manufacturer saw a 764-ton reduction in greenhouse gas emissions. By changing our energy sources and reducing our emissions output, we're contributing to cleaner, healthier air.

Greenhouse Gas Emissions (GHG)

KEY BENCHMARKS			
	2018	2019	% REDUCTION
MT OF CO ₂ e IN SCOPE 1 EMISSIONS	26,022.37	22,591.12	13.2%
MT OF CO ₂ e IN SCOPE 2 EMISSIONS	489,684	459,477	6.2%

In 2019, our scope 1 emissions totaled 22,591 MT of CO₂e, while our scope 2 emissions totaled 459,477 MT of CO₂e. This is a reduction of 13.2% and 6.2%, respectively, between 2018 and 2019.

We recognize that climate change is real, and as the global community begins to think strategically about how to combat this complex issue, we're taking steps to measure and report on a big contributing factor: greenhouse gas emissions.

Gases like carbon dioxide, methane, nitrous oxide and fluorinated gases are called greenhouse gases because they trap heat in Earth's atmosphere.

Larger concentrations of these gases in the atmosphere are the result of larger emissions, often from manufacturing facilities.

Carbon dioxide is the most common greenhouse gas, making up 81.3% of all CO₂ emissions in 2018. It enters the atmosphere primarily through the burning of fossil fuels but also through certain chemical reactions.

The Greenhouse Gas Protocol regulates the release of these gases by providing standards, guidance and training to help businesses manage their GHG emissions. They've classified these emissions into three main types: scopes 1, 2 and 3.

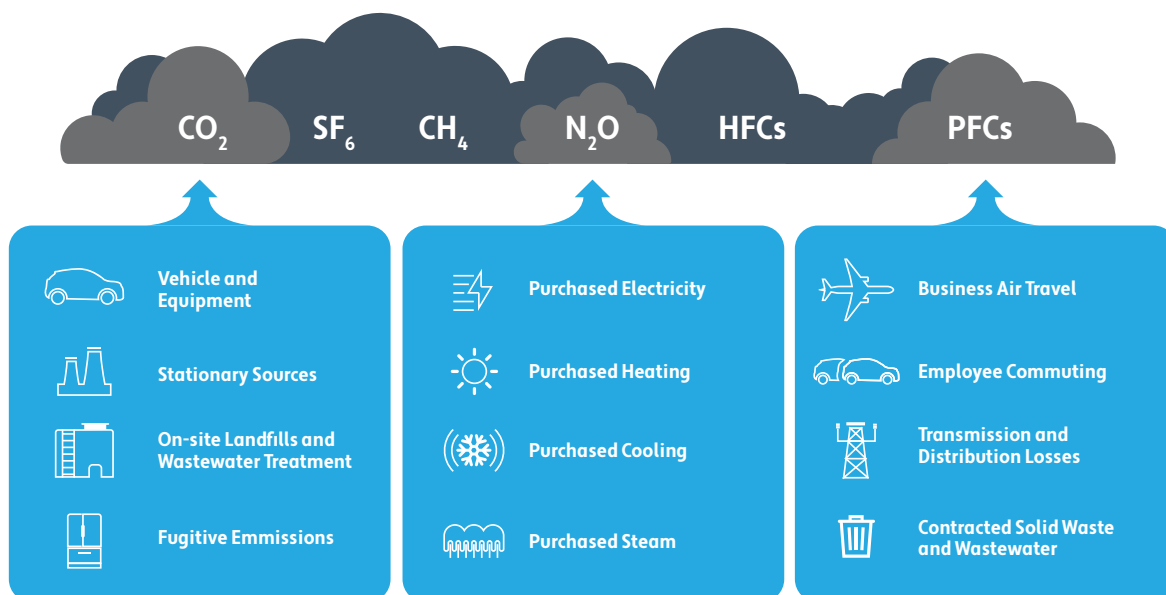
THREE SCOPES OF GHG EMISSIONS

Scope 1: Direct emissions from owned or controlled sources

Scope 2: Indirect emissions from the generation of purchased energy

Scope 3: All indirect emissions present in the value chain of the company

Common Sources of Greenhouse Gas Emissions



Measurable Results in Greenhouse Gas Emissions

LIGHTWEIGHTING

Projects like lightweighting allow more product to be shipped in one truck, reducing the number of trucks needed to transport the same amount of product and thus lowering GHG emissions from the burning of fuel.

DIVERTING PLASTICS FROM LANDFILLS

Our Graham Recycling Operation recycles #2 HDPE bottles into post-consumer resin. This facility used approximately 41 million pounds of recycled material in 2019, diverting approximately 375 million plastic containers from landfills.

DEVELOPING LESS CARBON-INTENSIVE PRODUCTS

Our ThermoSet® heat-set process allows PET containers to be used in hot fill, pasteurized and retort processes in place of glass containers. When comparing the end-to-end production of ThermoSet PET jars versus glass jars, PET jars had a 210-kg CO₂e reduction in carbon footprint.

CUSTOMER ON-SITE AND NEAR-SITE LOCATION

Operating on or near customer locations takes the transportation factor out altogether, allowing us to improve collaboration with our customers while saving valuable resources.

REDUCED ENERGY USAGE

In 2019, we reduced our energy usage by 6%, with plans to reduce that metric by an additional 5% in 2020. This is all part of our commitment to lowering our energy usage by 25% over the next 10 years as part of the U.S. Department of Energy's Better Plants Program.

How do the GHG emissions of PET bottles compare to other materials?*



50%
less than aluminum cans



75%
less than glass bottles

*Based on 2009 report comparing three single-serve soft drink containers.

OPERATIONAL WATER CONSUMPTION AND WASTE MANAGEMENT

KEY BENCHMARKS			
	2018	2019	% REDUCTION
Megaliters of Surface Water Used	1,470	1,465	0.34%

Operational waste and water consumption are two other important factors in the overall sustainability of our manufacturing facilities. As part of our 2020 goals, we're working toward reducing our landfill waste, while our water conservation efforts are mostly centered around reusing wastewater as part of our cooling processes.



SPOTLIGHT ON

Reduced Waste to Landfill

Our food packaging vertical business unit assessed its waste management strategies and completed a "Dumpster Dive" activity to help reduce waste across their plants in 2019. They identified new chances for waste reduction by developing a stratified list of waste types and opportunities to recycle.

Across the plants, they averaged a 53.7% diversion rate, with the Lexington, KY, plant achieving a 96% diversion rate and sending just 4% of their waste to landfill. In 2020, this team hopes to continue these efforts by improving their diversion rate gaps by 25% and raising waste types that are below 50% recovery to meet or exceed the 50% target.



Measurable Results in Waste & Water

INCREASED AIR AND WATER MANAGEMENT

In our Florence, KY, facility, we produce millions of preforms and bottles per year for the food and beverage market. This plant presented an opportunity for us to reduce our carbon footprint and lower our energy costs through proper air and water management. We accomplished this through:

- Automating air production and water production, which enables us to run equipment only when needed
- Using a new magnetic bearing chiller to reduce the cost of chill water production during the winter months
- Installing variable frequency drives on pumps and towers to give us better control over air and water flow

With these changes, we have been able to reduce the cost of KWh per pound produced by an average of 18% compared to 2018. Our engineers are also able to monitor this system remotely 24/7, 365 days a year, and they have access to additional equipment data that helps them refine the new system to increase savings in the future.

REDUCED SCRAP TO LANDFILL

In 2019, we challenged our team in Hammond, LA, to significantly reduce the amount of scrap HDPE they were sending to landfill. With some exploration, they identified an opportunity to convert scrap material into usable regrind. Through the efforts of a cross-functional team, behavioral and process changes were implemented. They also purchased a small grinder to handle internal scrap. As a result, they diverted 780,000 pounds of HDPE scrap from landfill and rerouted it back into the manufacturing process.

FRESHWATER CONSERVATION INITIATIVES

We're taking steps to reduce our freshwater use at the Graham Recycling Operation. Since 2014, we've reduced our use of process water by over 100 million gallons through the ongoing efforts of our team. Some of the ways they're lowering our water usage are:

- Replacing undersized hydroscreens and worn disco strainers to promote efficient filtration of wastewater
- Allowing properly filtered wastewater to be used in place of freshwater in some applications
- Installing flow reducers, automatic water refill valves and other ways to control water levels more accurately
- Taking daily water readings and documenting these to ensure water is being used efficiently

Looking Ahead

This year, we've made progress on several key initiatives that deliver measurable value to our customers and our facilities. We've embraced sustainable manufacturing practices, increased our use of recycled materials and focused on creating change in our local communities. But as we look toward 2020 and beyond, we know there's still work to be done.

We're committed to broadening our influence and establishing ourselves as a leader in sustainability over the upcoming years. We promise to work tirelessly to find new, comprehensive solutions, starting with the goals we laid out in the beginning of this report. Over the next five to 10 years, we commit to:

- Reducing energy usage by up to 5% in 2020, as part of an overall 25% energy reduction by 2028
- Increasing our use of PCR, including ocean-bound plastic, by incorporating an average of 20% PCR across all bottles by 2025
- Conducting more than 25 life-cycle assessments to help communicate the value of sustainability to our customers in 2020
- Innovating to provide product lightweighting, durability and reusability
- Continuing to design for recyclability across all products to achieve our goal of 100% recyclability by 2025

As a plastic packaging manufacturer, we have a unique opportunity to work with our customers, manufacturing partners, industry associations and communities to affect meaningful change. If you have questions about the goals and information included in this report, or if you want to start a conversation with us about your own sustainability goals, you can reach out to us at www.grahampackaging.com/contact.

Sources

Page 12 https://sustainability.hapres.com/htmls/JSR_1204_Detail.html

Page 25 <https://www.oecd.org/env/tools-evaluation/extendedproducerresponsibility.htm>

Page 27 <http://www.fao.org/3/a-bb144e.pdf>

<https://www.businesswire.com/news/home/20171212005320/en/U.S.-Food-Waste-Topping-200-Billion-Year>

<https://www.incpen.org/incpen-evidence-to-food-waste-inquiry-explains-how-packaging-prevents-waste>

<https://www.plasticpackagingfacts.org/?s=food+waste>

Page 29 <https://ourworldindata.org/plastic-pollution>

Page 32 <https://recyclingpartnership.org/stateofcurbside/>

Page 33 <https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/containers-and-packaging-product-specific-data#PlasticC&P>

Page 41 https://www.bls.gov/iif/oshwc/osh/os/summ1_00_2017.htm

Page 46 <https://www.compressedairchallenge.org/data/sites/1/media/library/factsheets/factsheet07.pdf>

Page 47 <https://www.epa.gov/sites/production/files/2020-04/documents/us-ghg-inventory-2020-main-text.pdf>

Page 48 <http://www.petresin.org/pdf/FranklinLCISodaContainers2009.pdf>



www.grahampackaging.com