



COLLABORATING FOR BETTER

2020 PROGRESS REPORT

Our Purpose:
Connecting the
vinyl value chain
to continuously
improve the
sustainability of
the industry.

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connect



DHRUV RAINA

Chair,
Vinyl Sustainability Council

Director of Product Stewardship
& Sustainability, Tarkett



JAY THOMAS

Executive Director,
Vinyl Sustainability Council

Message from the Chair and Executive Director

Collaborating for better outcomes is fundamental to the Vinyl Sustainability Council and the +Vantage Vinyl program. Collaboration across the industry and the globe with stakeholders and customers has allowed the program to benefit from great work and wisdom of people and organizations beyond our borders. Our partnership with the Vinyl Council of Australia is a case in point. Having blazed the path before us with their successful PVC Stewardship program, we are learning from their experience and applying their best practices to the +Vantage Vinyl program.

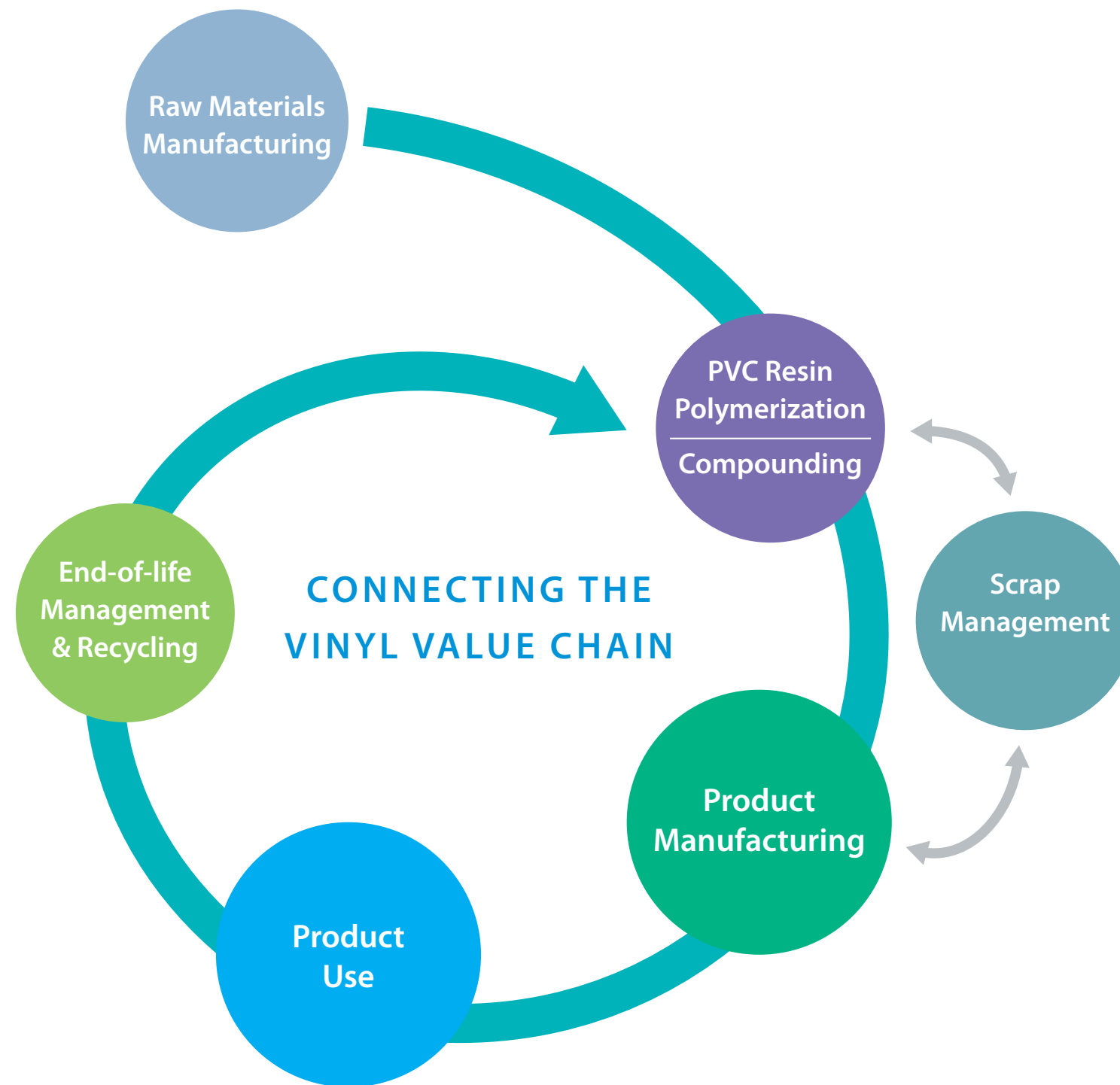
It is the inclusiveness of the Vinyl Sustainability Council (VSC), with membership across the entire vinyl value chain, that provides the platform for the industry to make progress on important sustainability issues.

2020 was a transformative year for us all. The vinyl industry found many creative and inspirational ways to provide assistance during the COVID-19 pandemic. Throughout the industry, there are examples of companies making donations of critical cleaning supplies, reconfiguring production lines to produce needed personal protective equipment and treating their workforces with dignity and compassion during these difficult times.

That same energy and innovation is being applied to tackling sustainability issues to continuously improve the performance of the industry. Examples of this from sustainability leaders appear throughout this report.

The strategy of the VSC and the +Vantage Vinyl program is to lead by example. The companies verifying to +Vantage Vinyl are sustainability leaders that are demonstrating their commitment through their actions and providing an example for other companies to follow. Establishing sustainability goals and the strategy for achievement provides an example of what is possible and sets a benchmark for the industry to follow. We hope you share our pride in our sustainability journey over the last year.

Handwritten signatures of Dhruv Raina and Jay Thomas in black ink.



Collaborating for Better

Vinyl is a versatile and valuable material that contributes in many ways to the health, safety, and comfort of our modern lives. And, like any material, its processing and manufacture into products has a range of environmental impacts.

Our vision is to continuously improve upon our sustainability footprint and product attributes. We are achieving this by collaborating across the vinyl value chain in the key areas of emissions, health and safety, and resource efficiency identified in our [2017 materiality assessment](#).

The [Vinyl Sustainability Council \(VSC\)](#) was initiated by the members of the Vinyl Institute in 2016 to provide focus for the industry's sustainability efforts. The VSC brings together the entire industry's supply chain for the purpose of advancing sustainability. Through this collaborative effort we have created the unique capacity to marshal the necessary resources to bring about change. Working together, we can accomplish so much more than we can separately. That is the promise and challenge of the VSC. And we are proud of our progress and many accomplishments.

+VANTAGE VINYL: 2020 PROGRESS REPORT

This 2020 report covers our progress in the following areas:

Strengthening +Vantage Vinyl™: Updates to the program's Guiding Principles enable better measurement and reporting on company and industry improvement across five pillars of sustainability and progress within our three impact categories. Among the lessons learned were the importance of collecting industry data as a benchmark to set industry goals and the need for increased transparency through measurement and reporting of company commitments.

Verifying Companies: Ten VSC members are demonstrating sustainability leadership through their voluntary commitments to the +Vantage Vinyl program requirements. You'll see examples of their sustainability commitments in this report. These +Vantage Vinyl verified companies set an example during our pilot phase for the industry to follow in our journey of continuous improvement.

Advancing Efforts in Three Impact Categories: Our sustainability initiatives are guided by a materiality assessment that identified six priority areas that are categorized into three impact categories: Resource Efficiency, Emissions, and Health and Safety. Task force groups within each impact category focus on setting performance benchmarks, developing guiding principles, and establishing industry goals.

Collaborating Globally: The VSC is engaged with domestic and international organizations to share best practices and multiply our collective efforts. Through collaboration on a variety of issues, such as recycling and reducing greenhouse gas emissions, we can benefit from lessons learned and accelerate the overall sustainability of the industry.



CONTRIBUTING TO A SUSTAINABLE FUTURE

Environmental performance.

Vinyl is a material that:

- Reduces CO₂ footprint → 57% of resin feedstock is derived from salt¹
- Reduces product transportation costs → light weight²
- Reduces energy use in buildings → thermal insulating and sunlight reflective properties³
- Reduces product replacement frequency → durable and non-corrosive⁴
- Reduces waste to the landfill → 1.1+ billion pounds recycled annually in the U.S. and Canada⁵

Our industry works hard to reduce our environmental impact and ensure the health and safety of our workers and our communities.

- **Superior Worker Health and Safety Track Record** → 33 resin manufacturing facilities with zero Occupational Safety & Health Administration (OSHA) recordable incidents in 2019 and 7 facilities with 5 or more consecutive years of zero OSHA recordable incidents.
- **Community Engagement** → Long-standing participation in community advisory panels and employee-led volunteer and donation initiatives at community centers, homeless shelters, food banks, and schools.
- **Frontline Support** → Many manufacturers donated supplies, increased production, and retooled to produce personal protective equipment (PPE) and other medical supplies needed during the COVID-19 pandemic.

Our industry provides well-paying jobs and supports communities where our employees live and work.

- **Jobs** → The U.S. vinyl industry comprises more than 2,900 facilities, employing more than 350,000 people, with an economic value of \$54 billion.
- **Cost Savings** → Long service life of durable vinyl products like roofing (35+ years), vinyl siding (50+ years), and PVC pipe (100+ years) means low lifecycle costs.

Sources: 1–4 2013 Role of PVC Resins in Sustainability ANTEC paper

5 2020 Tarnell Company Vinyl Recyclers Survey



Strengthening +Vantage Vinyl

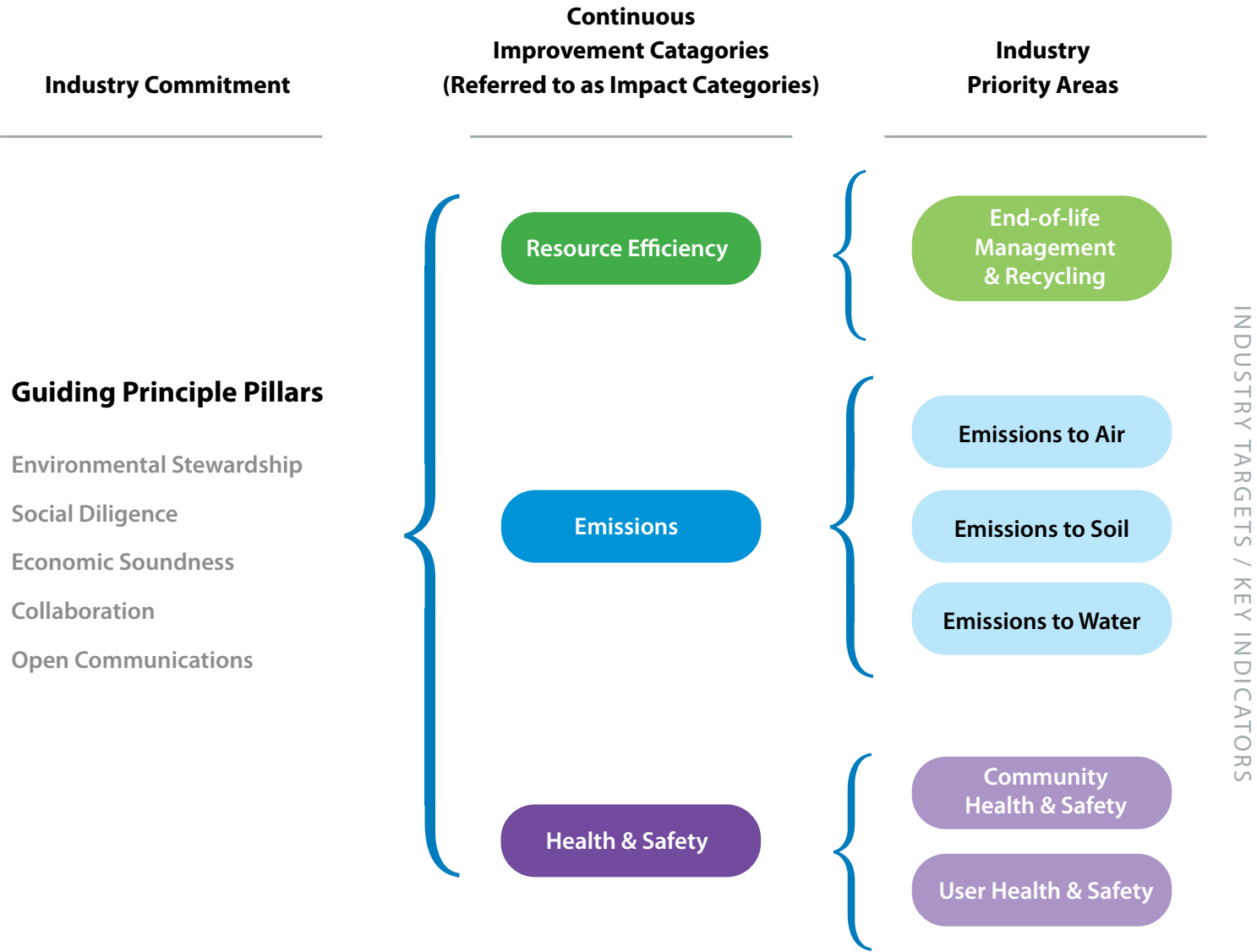
+Vantage Vinyl is a voluntary, independent, third-party sustainability verification program. The aim of +Vantage Vinyl is to encourage performance improvements by companies throughout the supply chain. We report on industry progress across five [Guiding Principles](#) of sustainable performance – environmental stewardship, social diligence, economic soundness, collaboration, and open communications.

Three impact categories identified in the VSC’s materiality assessment – resource efficiency, emissions reductions, and health and safety – informed the development of the program’s Guiding Principles. Company adherence to these principles drive improvement in each of the impact categories.

Individual company verification is performed by GreenCircle Certified, LLC, an independent third-party auditor that, since 2009, has issued over 2,000 certifications for sustainability. Achieving +Vantage Vinyl verification provides customers with assurances that a company is meeting the requirements of the program.

The +Vantage Vinyl program was implemented during a 2-year pilot project (2019-2020). The work conducted by each impact category task force, along with lessons learned from the verification process, have informed revisions to the Guiding Principles to include more transparency and improved measurement and reporting of company and industry commitments.

Starting in 2021, participating companies’ compliance will be verified against the updated Guiding Principles. Compliance will be reported at the industry aggregate level and annually measured for improvement.





Our Guiding Principles

+Vantage Vinyl's [Guiding Principles](#) set the direction and parameters for what companies strive to achieve over time. The Guiding Principles are organized within five pillars outlined below that serve as the guideposts for companies on their journey of continuous improvement.

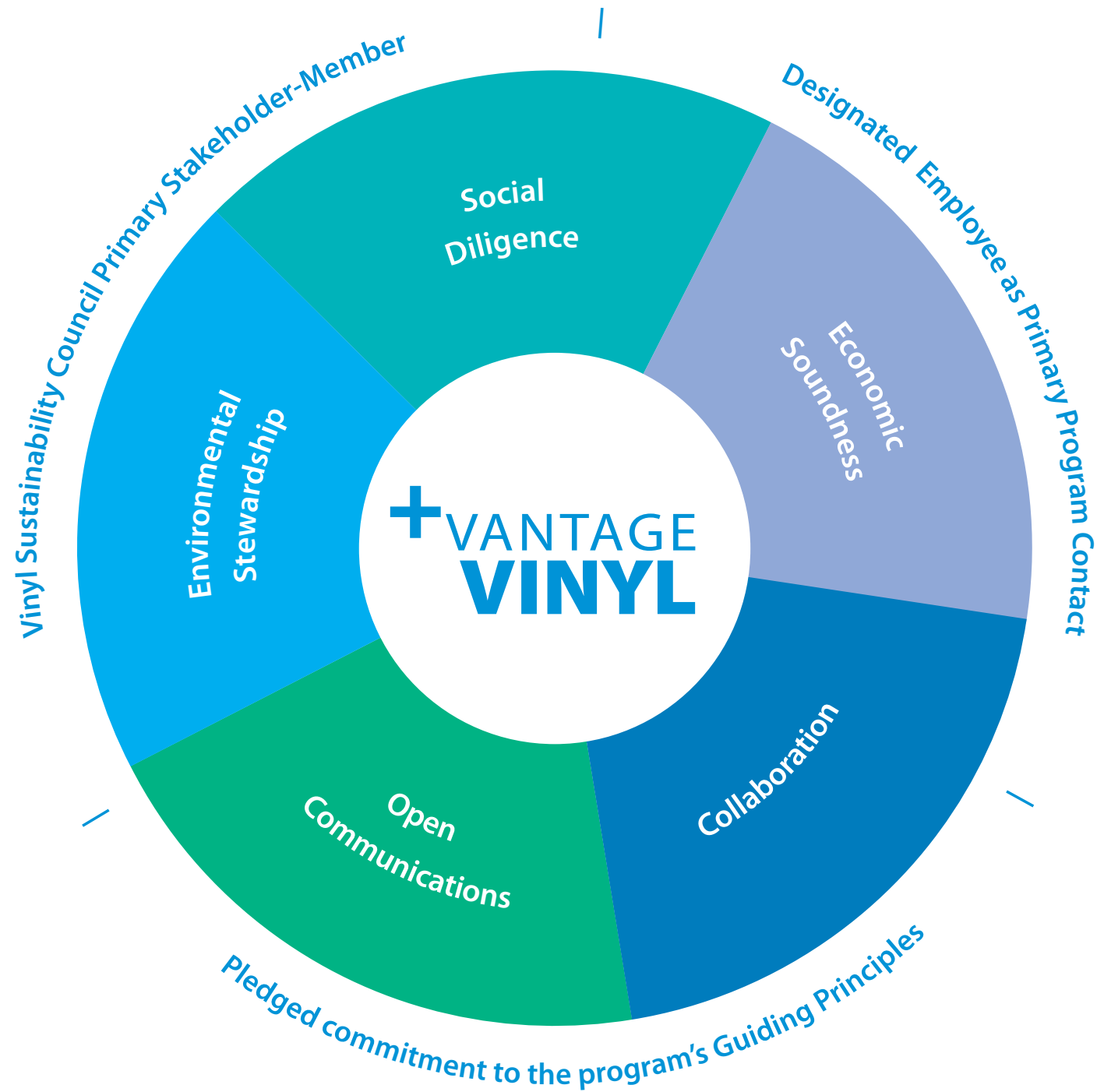
Environmental Stewardship: We strive to protect our natural environment, biodiversity, and ecosystems.

Social Diligence: We aim to manufacture safe and user-friendly products while taking care of our employees and communities.

Economic Soundness: We promote open and fair competition, support sustainability education and research, and integrate resource conservation and efficiency into business planning.

Collaboration: We work within the industry to find solutions and with external stakeholders to ensure we are on the right track.

Open Communications: We value transparency and use data to communicate our progress when promoting the +Vantage Vinyl program.



Program Participation

Starting at the individual company level, the aim of the +Vantage Vinyl program is to verify the sustainable operations along a product's entire value chain.

Participation in the program is open to any company in the vinyl value chain that operates in the United States and meets the following requirements:

- Is a Vinyl Sustainability Council primary stakeholder-member.
- Has designated as primary program contact an employee with sustainability responsibilities.
- Has pledged commitment to the program's Guiding Principles.

Our Industry Sustainability Leaders

The +Vantage Vinyl verified companies for 2020 – The AZEK Company, OXO Global Business Unit of ExxonMobil Chemical Company, Formosa Plastics Corporation USA, GEON Performance Solutions, Lubrizol Advanced Materials, Inc.—TempRite® Engineered Polymers, Occidental Chemical Corporation, Shintech Incorporated, Sika Corporation – Roofing, Vestolit, and Westlake Chemical Corporation—all demonstrated sustainability leadership through their commitment to the program requirements. Their actions set an example for the industry to follow in its journey of continuous improvement.

+Vantage Vinyl verification was performed by GreenCircle Certified, LLC, an independent third-party auditor. Verified companies received a verification certificate and are awarded the right to use the +Vantage Vinyl royalty-free trademark. The trademark verifies a company's commitment to operating sustainably and producing more sustainable products.





SPOTLIGHT

Westlake Chemical Corporation

“The WoW affinity group allows us to come together, learn from each other, and create space within the industry.” —**Renee Havrilla**, VP, Global Compounds, Westlake

For the Women of Westlake, Affinity Wins

For Renee Havrilla, the chemical industry is home.

A chemist by training, Havrilla has spent over 30 years in the industry and today runs a global division for Westlake Chemical Corporation as VP of Compounds. Westlake produces innovative rigid and flexible vinyl compounds for the automotive, healthcare, consumer and building and construction industries. However, when she first joined the industry in the early 1990s, there were few women to count in the executive ranks. As she made her way up the ladder over the next couple of decades, she realized one thing quickly: that women could be more successful if they supported each other.

At Westlake, one of the first things she noticed was that there wasn't a forum for women to interact with each other. So, in the fall of 2018, she decided to invite all the women who worked at the Houston, Texas campus, at the supervisory levels and up, to join her for an informal meet and greet. Women of Westlake (WoW) soon morphed into peer-to-peer coaching, informal mentorships, and the mission to create opportunities for the women of Westlake to strengthen business relationships, grow professionally and personally, and build successful careers at Westlake.

Today, the group has around 50 members and conducts monthly meetings, with a pre-decided agenda, a mix of TED talks or guest speakers, and always some time for open floor. Despite the virtual

component, the group maintains its intimacy with many of the women reaching out to each other for advice and camaraderie on a regular basis. Havrilla's colleague Julie Hildebrand, a chemical engineer with over twenty years of experience in the chemicals industry, and a business manager at the Houston office, agrees. "Westlake has done a great job of recognizing that they could do more to build upon diversity as an asset. WoW has elevated the platform to support professional growth for women in the organization," she says.

So much so that there are now several other informal women groups in process across Westlake. And that's invaluable. [Read more about Westlake's efforts.](#)

"Westlake has done a great job of recognizing that they could do more to build upon diversity as an asset. WoW has elevated the platform to support professional growth for women in the organization."—**Renee Havrilla**, VP, Global Compounds, Westlake



SPOTLIGHT

Lubrizol Advanced Materials –
TempRite® Engineered Polymers

When Sustainability Becomes a Part of the Company Culture

As a decades-old specialty chemical company, the team at Lubrizol knows a thing or two about teamwork. The world leader in CPVC resins and compounds was the first to pioneer chlorinated polyvinyl chloride (CPVC) used in piping systems in 1959. Today, it continues to lead the industry with brands such as BlazeMaster®, Corzan®, and FlowGuard Gold®, manufacturing its resins and compounds across four facilities globally.



In 2019, Kalli Stull, the Resin Area Leader for the company's Louisville, KY plant, which employs about 150 people today, had the opportunity to spend a week in Lubrizol's resin plant in Delfzijl, Netherlands along with five other team members. The objective: to exchange best practices on energy and water efficiencies and learn about any process improvements that could be duplicated in the U.S. Over the course of one week, they went on multiple field trips and took lots of notes.

Upon returning, the team went hunting, coming up with a list of potential projects they could explore for cost and energy efficiencies. Their initial list stood at just north of 100 possible ideas. According to Stull, the initial motivation was twofold: identify opportunities for cost efficiencies and/or environmental improvements. Once the team began rolling out the projects, the returns became evident quickly.

Given its focus on water reduction efforts, the team paid particular attention to how the Netherlands plant was using a variety of strategies to reduce their dependence on fresh water. As part of their own due diligence, they began examining the lifecycle of their water use for opportunities to reduce, recycle or reuse better. One example: could they recycle their neutralized waste stream during the waste treatment process to reduce the amount of fresh water used every time?

"Sustainability is best played together. It's validating to see what we started and see it grow first across the other teams in our plant, and eventually across Lubrizol."

—**Kalli Stull**, Resin Area Leader,
Louisville, KY Lubrizol





The answer was yes, and that change alone is expected to help the plant reduce its water use by almost 10% year over year. Other projects implemented in 2020–2021 included:

- Identifying where and how much freshwater could be eliminated across the manufacturing process,
- Trialing changes to the water treatment process,
- Identifying the lines where recycled water could be introduced, and
- Determining where to introduce reuse of process water instead of freshwater.

Altogether, these projects have helped the Louisville team achieve a 16.7% reduction in its water use year over year. These efforts also helped the plant win the American Chemistry Council (ACC) Energy Efficiency & Waste Minimization, Reuse, and Recycling Award in 2020. For Stull, this experience has underlined the importance of having the whole team on board. [Read more about Lubrizol's efforts.](#)

Advancing Efforts in Three Impact Categories

The VSC is focused on making industry advancements in three impact categories identified in a 2017 industry-wide materiality assessment: resource efficiency, emissions, and health and safety.

Resource Efficiency addresses the priority areas of end-of-life disposition, landfill avoidance, and recycling.

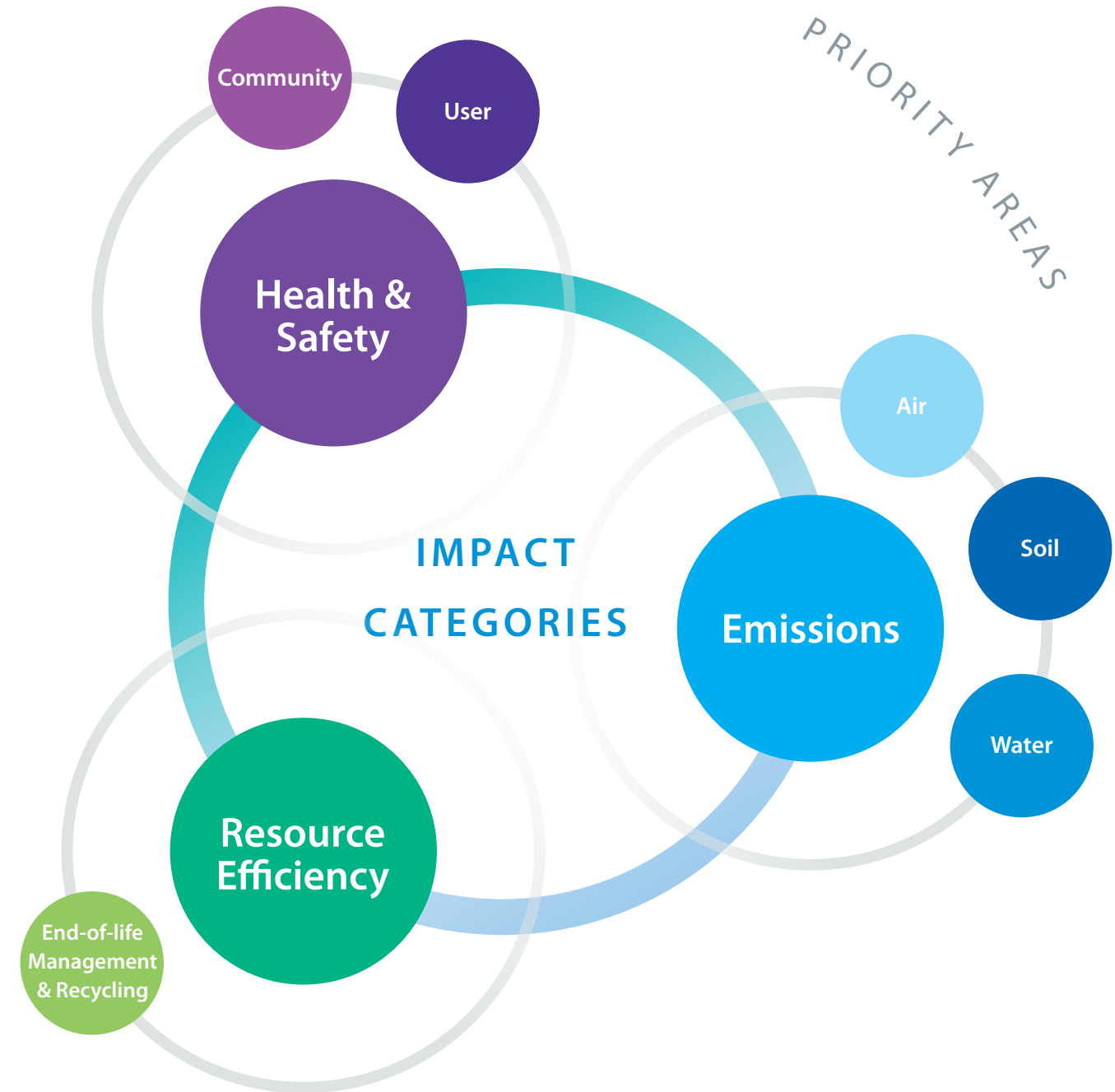
Emissions addresses the priority areas of emissions to air, water, and soil, emphasizing climate and biodiversity impacts.

Health & Safety addresses the priority areas of community health and safety and user health and safety.

Task forces within the VSC membership have focused since 2018 on advancing the industry in these three impact categories. We have been guided in our work by the needs identified in the priority areas and the United Nations Sustainable Development Goals (UN SDGs). Targets and indicators are established based on the +Vantage Vinyl Guiding Principles and industry goals.

Starting in 2021, continuous improvement will be measured against compliance with the Guiding Principles—and reported on annually. Progress toward Guiding Principle goals will be measured through annual surveys of the industry. As a result, the updated +Vantage Vinyl program will measure and report on company and industry compliance with the Guiding Principles and progress in the three impact categories.

Progress against the industry recycling goal will be measured every three years through an independent survey of the industry.



Resource Efficiency

An efficient use of resources reduces the quantity of inputs needed to produce a unit of output, often referred to as doing more with less. Less material input reduces the demand on resources and the amount of production byproducts, including waste and greenhouse gases per unit of product. The resource efficiency impact category is focused on two priority areas: end of life disposition (landfill avoidance) and recycling.

The Resource Efficiency Task Force, referred to as V-cycle, has focused its efforts in collecting data to establish an industry goal to divert more post-consumer vinyl materials from the landfill into recycled vinyl materials.

More than 1.1 billion pounds—958 million pounds pre-consumer vinyl, 142 million pounds post-consumer vinyl—was recycled in the U.S. and Canada in 2019¹. Overall, PVC recycling volume has increased 7% since 2016. To put this in perspective, about 1.4 billion pounds of vinyl, representing just 0.7% of all material, ends up in municipal solid waste. However, the amount of post-consumer recycled material has remained steady at approximately 140 million pounds.

Pre-consumer vinyl scrap generated at vinyl production plants is commonly placed back into the production process. This material is readily available. It is a valuable raw material, offsetting the use of virgin materials.

Post-consumer recycling, however, involves the additional burdens and complexities of material collection, sorting and cleaning, as well as the costs of labor and transportation. These hurdles have proven challenging, requiring a coordinated industry response.

1. Source: 2020 Tarnell Company Vinyl Recyclers Survey.



Growing Recycling

Goal: Increase post-consumer vinyl recycling by 15 million pounds by 2025.

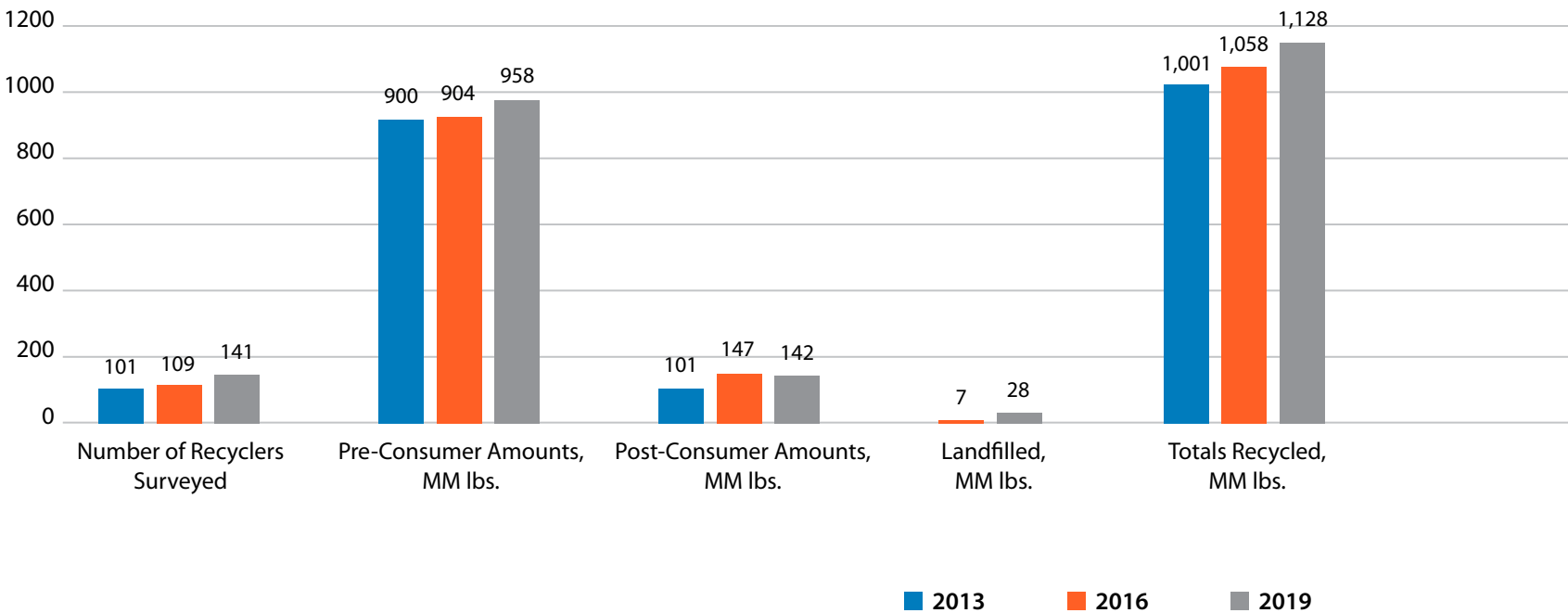
The V-cycle Task Force has set a goal to increase post-consumer recycling to 160 million pounds annually by 2025, representing a 10% increase over 2016 levels.

To accomplish this goal, the task force has developed a path forward that includes driving technological innovation, increasing investments in infrastructure, collaborating with recyclers and product producers, and celebrating successes.



Tarnell Survey Comparisons:

2013, 2016, 2019 U.S. & Canada Vinyl Recycling Summary



Source: Tarnell Company Vinyl Recycler Surveys

Celebrating Success

2020 Vinyl Recycling Award Recipients

The Vinyl Recycling Award recognizes the efforts of recyclers and product manufacturers with operations in the U.S. that find new solutions, new markets for reclaimed PVC materials, increase the use of recycled content in their products, and/or engage in takeback programs.

In 2020, the VSC recognized two companies that demonstrated their use of recycled materials as a core component of how they do business.

The AZEK Company

The AZEK Company, a leading building product manufacturer, received the award for rigid vinyl recycling for their commitment to increasing the use of recycled materials in their decking products. Through their efforts, the company was able to increase the recycled material composition of total board weight from 30% to 63%. Of that, 47% was sourced from external post-industrial and post-consumer materials.

Sika Sarnafil

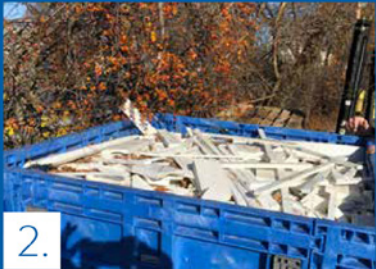
Sika Sarnafil, a prominent vinyl roofing manufacturer, received the award for flexible vinyl recycling for their commitment to post-consumer roof recycling. When the Rogers Centre in Toronto needed a roof repair, the company was able to completely recycle the 460,000-square-foot vinyl roof membrane back into new Sika vinyl roofing products.



The PVC Scrap Collection Process



1. AZEK and your local distribution partnership reusable and collapsible recycle collection bins to your lumberyard or dealer location.



2. Local dealers serve as collection points for scrap PVC material. Collection bins are easily transportable to local job sites if needed.



3. Once collection bins are full of PVC scrap at your dealer location, contact AZEK to set-up bin return and transportation.



4. AZEK will work with distribution partners to coordinate pick-up of filled bins. Transportation will take the scrap PVC material back to AZEK to be recycled into new products.

A Zero Waste Roof: A Behind the Scenes Look

In cities like Toronto, Canada, where winters can be harshly icy and the elements unpredictable on any given day, a baseball stadium stands for so much more than just the game at play. For the iconic Rogers Centre, home to the Toronto Blue Jays, its 30 year-old vinyl roof was still performing admirably protecting the fans underneath despite its advancing age. That came to an end in 2018 when a giant chunk of falling ice from the 1,800-ft tall CN Tower punctured the steel deck and caused significant structural damage to the stadium. Taking advantage of the construction window to repair the stadium, the owner decided to replace the entire roof.

Rogers Centre's zero waste roof:

- 460,000 square feet
- Sitting at a height of 282 feet
- Installed over 10 months
- Made out of **vinyl membrane** containing UL-certified 10% recycled content





“It is satisfying to see a 30-year-old Sarnafil roof come back full circle and get a new life as a roof membrane that will protect another building for years to come. Sustainability can begin right with product design by looking ahead 30, 40, or 50 years and ensuring we’re constructing products that keep us and our planet safe.”
—**Bill Bellico**, Vice President of Marketing

It was time to look for a solution that would be durable for the next 30 years and sustainable in all respects.

For one, the roof must be durable enough to stand up to harsh winter conditions. It must withstand the avalanches of snow and resulting pressure of up to 20 feet of snow accumulation. And the new roof could not come at a tremendous environmental cost given the Centre’s commitment to sustainability.

A zero-waste roof

The ask then: build a new roof with three core sustainability principles in mind—sending as little waste as possible to landfill, incorporating the use of recycled materials and focus on resilience. That is why vinyl, a polymer well known for its recyclability especially in the construction sector, and Sika Sarnafil, the original roof manufacturer, became the clear choice for the building owner. For Sika Sarnafil, this was déjà vu. It was time to reclaim the original roof and turn it into new, durable membrane for the Centre.

In 1989, when the original roof was constructed as the first fully retractable motorized roof arena to allow games to continue irrespective of the weather, Sika Sarnafil’s membrane was chosen to protect the roof. This membrane was made of 48 mil vinyl and fully recyclable. Now 30 years later, when it came time to dismantle the whole roof, the initial investment and design decisions paid off: Sika Sarnafil was not only able to avoid sending all that material to landfill, but it was also able to convert it into useful raw material to construct new roofing membrane.

In the end, the new Sarnafil roof, installed over 10 months and sitting at a staggering height of 282 feet, was made out of **vinyl membrane** containing UL-certified 10% recycled content.



Long-term decision making endures

Sustainability investments often carry long payback periods, but for Sika Sarnafil, these have been critical to their growth strategy, especially as the urgency of climate change grows along with pressure on companies to develop products that at the very least, reduce their impact on the environment and at best, can be carbon neutral with a net zero impact. Eliminating waste sent to landfill then becomes a key element in the impact calculation along with the product design itself, built for durability and eventual recyclability.

As developers of the first NSF-347 certified platinum-rated roof membrane, the team at Sika Sarnafil knows a thing or two about making their products last—without paying a premium in environmental costs. In the end, the dismantling of the original roof managed to avoid sending **460,000 square feet** of roofing membrane to a landfill.

Since inception in the early 1990s, Sarnafil’s Roof Recycling Program has processed **80 million pounds** of recycled material and converted more than 98% of its vinyl raw materials from manufacturing into new roofing and waterproofing membranes. Once collected, used membrane is packaged, consolidated and shipped to a facility where it is processed into a form that can be reintroduced into the new product manufacturing stream. With vinyl’s ability to be fully recyclable, Sika Sarnafil’s roof membrane is an opportune cradle to cradle product to help reduce the greenhouse gas emissions associated with new construction.

In 2020, Sika Sarnafil won the 2020 Vinyl Recycling Award from The Vinyl Sustainability Council for the Roger Centre roof, capping a successful year of innovation for the company. [Read more about Sika Sarnafil's efforts.](#)

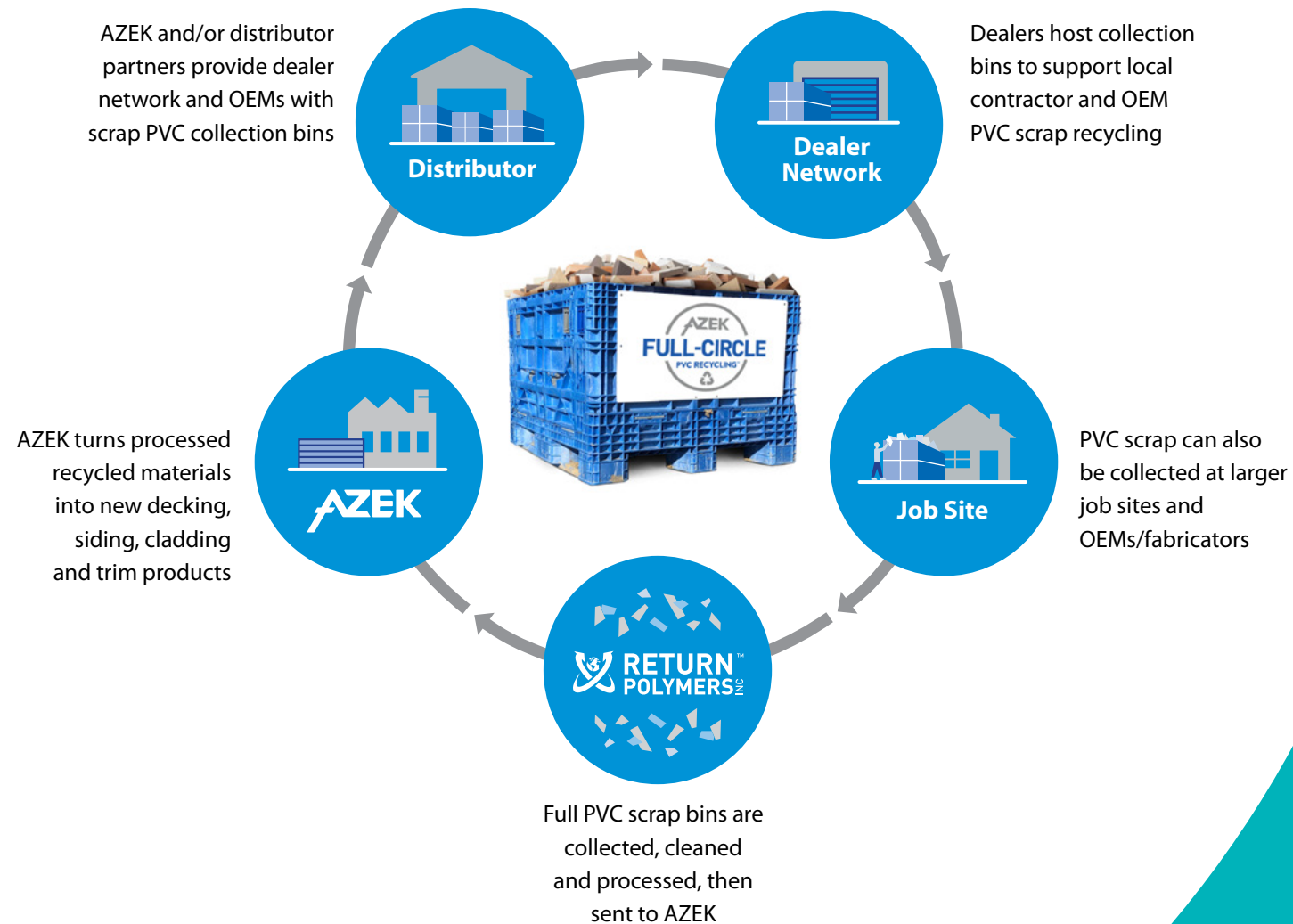


SPOTLIGHT The AZEK Company

FULL-CIRCLE: AZEK Disrupts PVC Recycling by Revolutionizing Takeback

When your mission is to revolutionize outdoor living to create a more sustainable future, your goals must reflect that to show intent and ambition. So in 2021, The AZEK Company (AZEK) took the next big step in its sustainability journey: It pledged that it would recycle 1 billion pounds of materials annually by the end of 2026.

Collection Journey



Announced on the heels of launching its first state-of-the-art polyethylene recycling plant along with its acquisition of leading polyvinyl chloride (PVC) recycler, Return Polymers, CEO Jesse Singh believes the pledge—and the FULL-CIRCLE™ PVC Recycling program—is emblematic of how the company looks at sustainability, as a full circle. “Our financial and sustainability goals are inextricably linked: Our business drives our approach to sustainability and our sustainability initiatives drive our business,” he says.

AZEK began its recycling journey in 2018, with an initial development of recycled material formulations and investments to upgrade manufacturing lines. In order to be able to accelerate its use of recycled material, AZEK first had to figure out how to source and collect all that scrap. The challenge was not in using it, but in sourcing it. The company’s strategy that focuses on sourcing, collecting and recycling three primary

materials for recycling back into its manufacturing line: polyethylene, polyvinyl chloride (PVC) and wood flour. Sourcing recycled polyethylene and recycled wood flour had more established networks, while PVC proved to be modestly more challenging. One source for recycled PVC that AZEK was looking to explore was the scrap and waste generated from PVC-based building materials used in new construction and remodeling projects that would otherwise end up in landfills. With a diverse base of customers including distributors, dealers, contractors,

Source: <https://azeko-media.s3.amazonaws.com/wp-content/uploads/2021/02/11083235/AZEK-FULL-CIRCLE-Recycling-Overview-vF1.pdf>

and lumber yards across the United States, AZEK had multiple points of potential PVC collection but zero infrastructure at the state or municipality levels to tap into.

AZEK calls the strategy FULL-CIRCLE.

First, AZEK set up collection bins and established collection points along its value chain, including contractors, builders, dealers and distributors. Convenient, collapsible and storable 15-square-foot bins were delivered to AZEK's participating distributors strategically located in popular PVC markets throughout the U.S., who then provided them to their key lumber yard customers for scrap collection. Lumber yards can either house the bins at their yard for contractors to collectively recycle their PVC scrap material or the bins can be provided to a contractor to fill them up on their jobsite. Once full, the lumber yard partner will pick up the bin from the jobsite and bring it back to their yard for

pickup by the distributor. Once the distributor has aggregated enough bins for efficiency, AZEK will pick up and deliver the full bins to its PVC recycling facility in Ashland, OH.

In 2020, AZEK used approximately **400 million pounds of recycled product**, including primarily recycled polyethylene, recycled PVC and recycled wood flour. That was up from approximately **290 million pounds** in 2019.

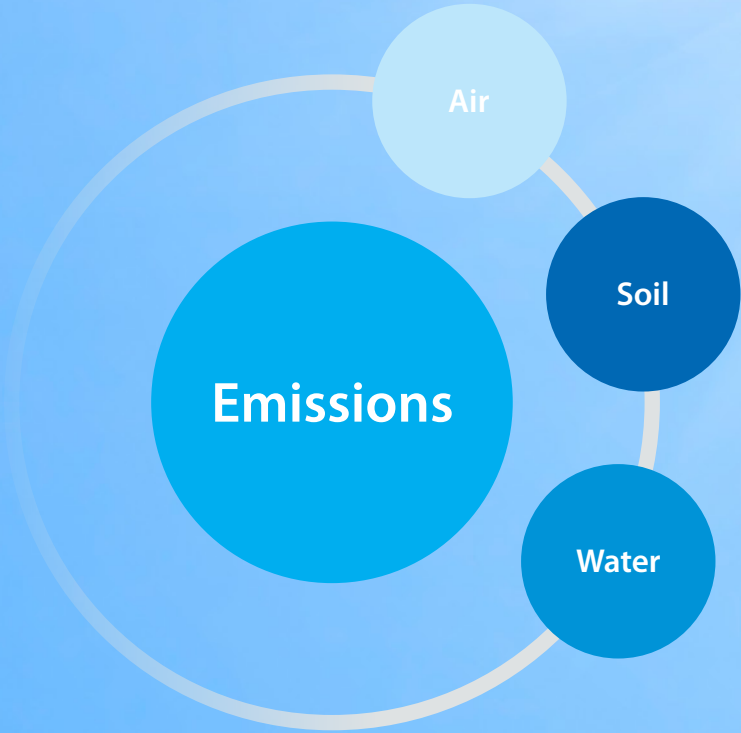
Ryan Manley, Business Development Manager, says the program is helping pave the way to a more efficient and sustainable future for their industry. "We're working with our entire value chain. Our program helps contractors cut disposal costs and keeps PVC out of landfill. It's a win-win," he says. His hope: that this entire value chain approach can disrupt the plastic waste paradigm meaningfully as AZEK continues to scale up collection and processing en route to 2026. [Read more about AZEK's efforts.](#)

Customer Testimonial: **"Cape Cod Lumber is a strong supporter of the AZEK recycling program for many reasons. Above all, it reduces the amount of waste that ends up in landfills. This has a positive impact on the planet, the environment and our local community. Our contractor customers love the recycling bins as well. When they have a job where they will be installing a large amount of AZEK trim, we drop off a recycling bin at the jobsite. All their cutoffs and scraps go into that bin, and this reduces the amount of material that gets thrown into a dumpster. The less material that goes into the dumpster, the less they pay in disposal fees. We even use these recycling bins in our own custom millwork shop."**

Emissions

The emissions impact category addresses the priority areas of emissions to air, water and soil, emphasizing climate and biodiversity. The Emissions Task Force is focused on collecting information from the supply chain to set realistic benchmarks. This requires specific data and a means to measure results on an ongoing basis. Thus, building on past successes in reducing vinyl resin manufacturer emissions, the VSC has an ongoing project to aggregate industry data across the supply chain for the purpose of establishing a baseline for further emission reductions. The infrastructure to accomplish this across the supply chain did not exist—and the VSC has spent the last two years successfully building it. Our goal is to complete this project in 2021 and to set emissions reduction targets in 2022.

The Emissions Task Force also provided educational workshops for members to advance their awareness and knowledge of emissions reduction technologies and programs.



Mapping Embodied Carbon

Embodied carbon is the carbon footprint of a material during its lifecycle. It encompasses the mining, harvesting, processing, manufacturing, transportation, and installation of the end-product. Disposal of the material at end of life is also often considered in embodied carbon analyses. Reducing embodied carbon is becoming a major opportunity for material suppliers and product manufacturers to have an impact on climate health.

Over the years, the vinyl industry has developed life cycle analyses (LCA) and environmental product declarations (EPDs). To make this information more accessible to the design community, the Emissions Task Force is working with Building Transparency, a nonprofit providing open-access data and tools to address carbon in the building industry, to develop product categories within the Embodied Carbon in Construction Calculator (EC3). This will help increase the transparency of the embodied carbon in vinyl materials.

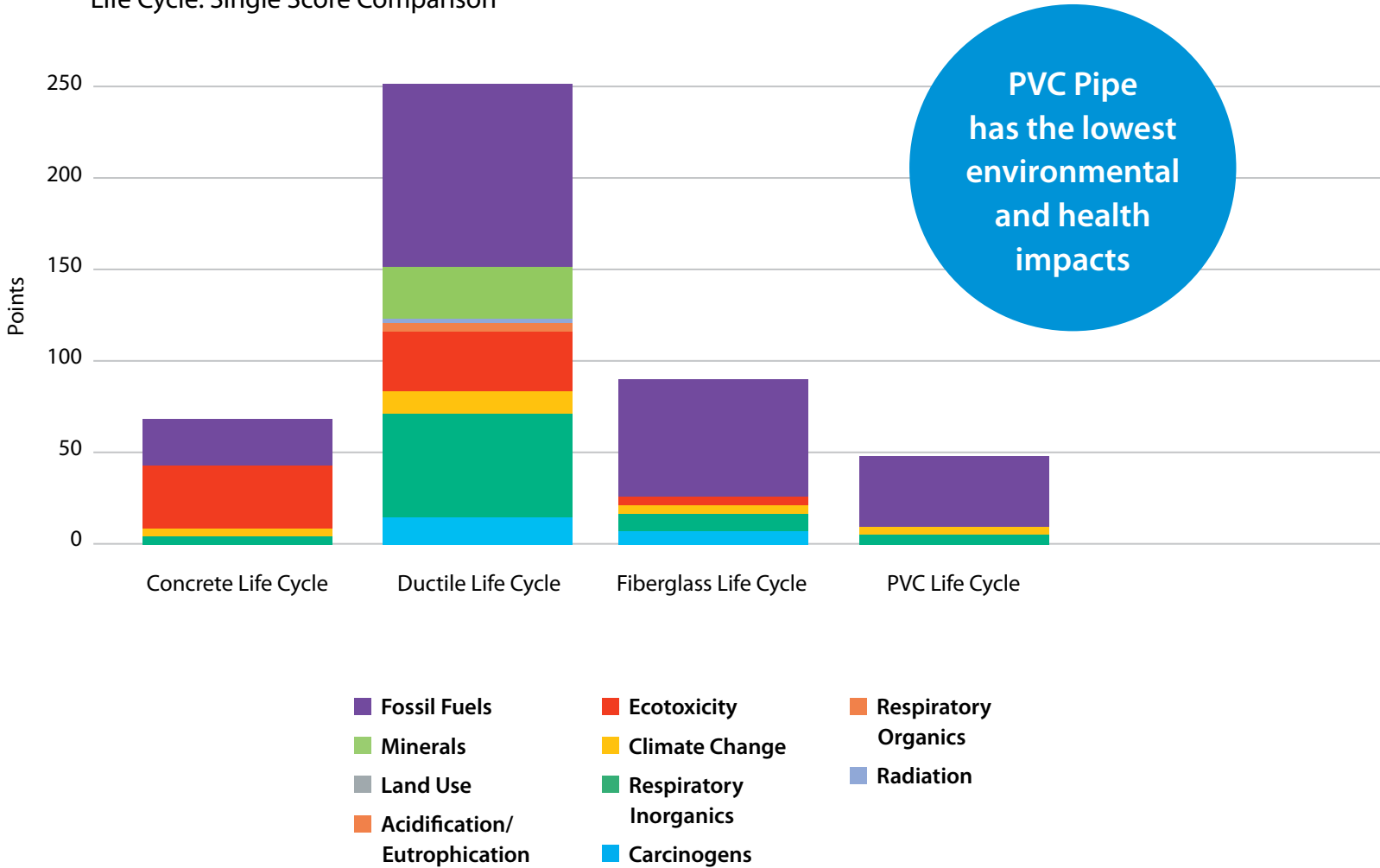
As a first step, the task force and Building Transparency are partnering with two vinyl product industry groups on this initiative: the Resilient Floor Covering Institute and the Vinyl Roofing Division of the Chemical Fabrics and Film Association. When this work is complete, specifiers will have data on the relative embodied carbon of materials in these two product categories. Beyond these two pilot categories, the task force continues to work with product trade associations on EPD and EC3 product category development.

VSC members are exploring and implementing technology to improve plant processes to drive lower energy usage and GHG emissions.



Single Score Graph for Life Cycle Comparison for all Piping Materials

Life Cycle: Single Score Comparison



Source: Sustainable Solutions Corporation 2017 Life Cycle Assessment of PVC Water and Sewer Pipe and Comparative Sustainability Analysis of Pipe Materials

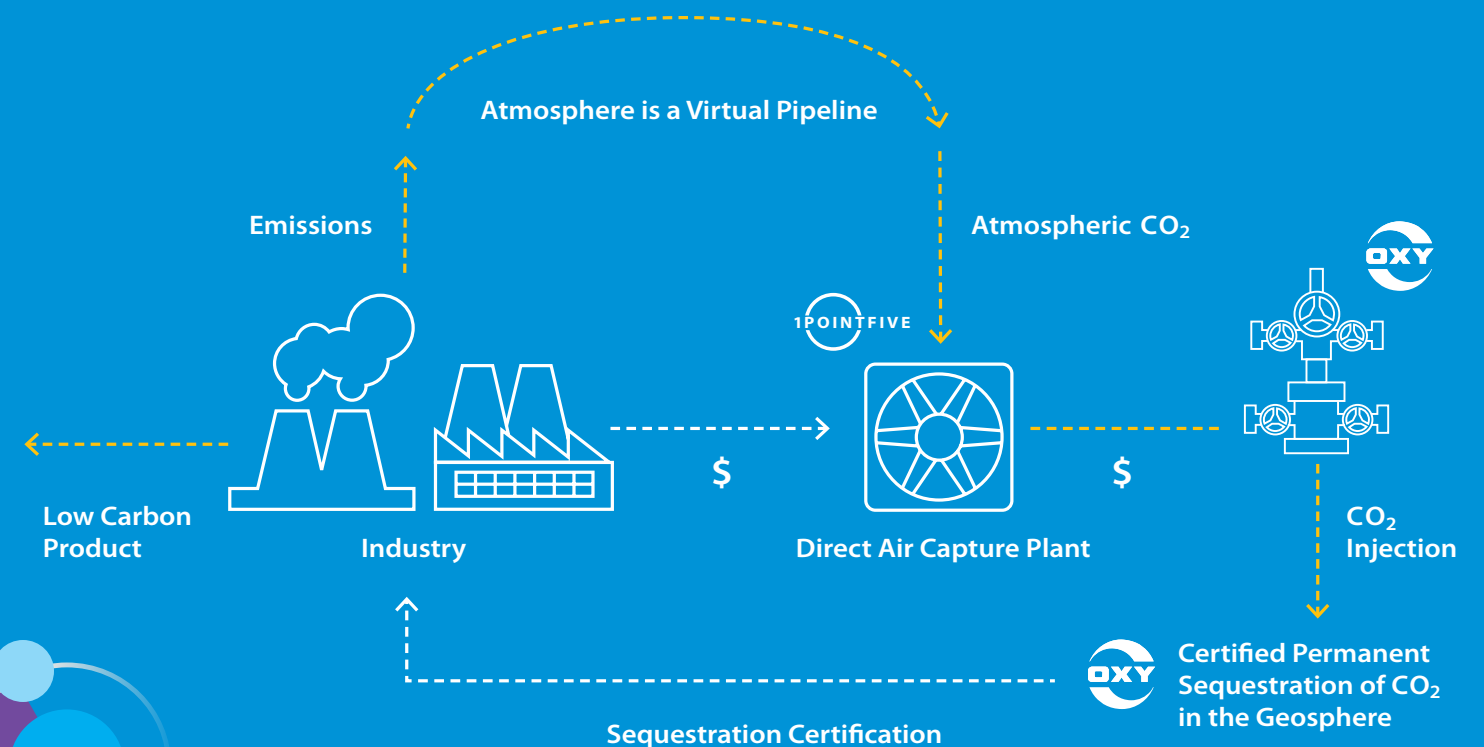
How Carbon Removal as a Service is Poised to Aid the Clean Energy Transition

Imagine a world where all the carbon dioxide (CO₂) that is emitted through activities such as manufacturing, air travel and hydrocarbon production could be captured with the carbon put right back underground where it came from.

Carbon Removal as a Service

A New Option—Allowing Industry to Focus on What They do Best

one for one
emissions
reductions



Source: Oxy Low Carbon Ventures

“We need the most practical, economic solutions to meet our net-zero goals. Some facilities will implement point-source capture, some will change technologies, some will use emission reduction credits, such as from reforestation, to get to net-zero. Direct Air Capture provides a technology solution that can work in tandem with other efforts to enable even greater emissions reduction quickly, to achieve our net-zero goals.”

—**Dr. Robert Zeller**, Vice President for Technology.

This is the future that energy company Occidental and its subsidiary Oxy Low Carbon Ventures (OLCV) are demonstrating is feasible. Occidental is on a path to achieve net-zero emissions in its own operations and those associated with their products before 2050. And they are helping others reduce theirs too. Launched in 2018 to support Occidental's carbon management efforts, OLCV has rapidly grown from investing in low-carbon technologies to working towards deploying several at commercial scale.

One of the company's solutions is Direct Air Capture (DAC), a technology that captures CO₂ directly from the atmosphere to be permanently sequestered deep underground. In 2020, Occidental formed 1PointFive, focused on large-scale commercial development of Carbon Engineering's DAC technology.

Here's how DAC works: the technology captures and concentrates the CO₂ in the atmosphere from 0.04% to over 95%. It uses a potassium hydroxide solution to capture the CO₂, converting the potassium carbonate to calcium carbonate, and then decomposing the calcium carbonate to CO₂. Once concentrated, the CO₂ is compressed and liquified, and Occidental has the ability to securely inject it deep underground into suitable and certified geologic formations, where it becomes trapped and eventually turns into rock.

Measuring the opportunity

The opportunity of DAC to address rising greenhouse gas (GHG) emissions is vast. The United Nation's *Intergovernmental Panel on Climate Change* (IPCC) and most recently the International Energy Agency (IEA) have reinforced the importance of carbon capture utilization and storage (CCUS) and DAC solutions in the global 'race to zero'. These technologies will be critical, both in terms of decarbonization efforts and in removing billions of tons of CO₂ per year that climate science requires to be slashed in just a few decades to keep global warming within 1.5°C.

In their quest to commercialize carbon capture technology and utilize the captured CO₂, OLCV is actively engaged in many different types of projects in the CCUS space. A recent example: In April, OLCV announced that it had teamed with bioengineering startup Cemvita Factory to construct and operate a one metric ton per month bio-ethylene pilot plant using a jointly developed technology that uses human-made carbon dioxide (CO₂) instead of hydrocarbon-sourced feedstocks. [Read more about Occidental's efforts.](#)

SPOTLIGHT Occidental



Reducing SO₂ Emissions with Innovative Cost Savings

Vestolit, which belongs to the Polymer Solutions Group, one of the five distinct Business Groups within Orbia (formerly Mexichem), drives its sustainability initiatives in close collaboration with the corporate sustainability team. At Orbia, sustainability is an integral part of a broader commitment to advance life around the world.





“We know together, we can push the boundaries for a better tomorrow. Our commitment to SO₂ emissions reductions and overall becoming more future-fit in our work is a key part of how we are driving Vestolit—and Orbia—forward.”—**Jim Gray**, General Manager, Henry, IL plant

One of Orbia's sustainability goals is to reduce its Sulphur Oxide (SO_x) emissions by 60% by 2025. Right alongside corporate efforts, various plants and facilities have also been working to better understand emissions reduction opportunities and potential cost savings. For example, the second year into its commitments, the Orbia facilities team at its Henry, IL, resin manufacturing facility identified an opportunity to significantly reduce and ultimately eliminate a source of SO₂ emissions related to its boiler operations. By modifying plant operations, the team was able to reduce annual SO₂ emissions by 30% and in turn reduce Orbia's overall emissions by 5%. They also expect the benefit to continue year over year.

To further reduce this footprint, the team is now exploring investment options. Its objective: to completely eliminate all SO₂ emissions associated with the Henry facility by 2025. Orbia's recently launched inaugural sustainability-linked bonds in the international capital markets will help by funding additional investments in emissions reductions. To demonstrate accountability, Orbia also adopted and published its sustainability-linked bond framework alongside the bonds issuance, validated by ESG rating agency ISS. [Read more about Vestolit's efforts.](#)



SPOTLIGHT

ExxonMobil
Intermediates Global Business Unit – Oxo



Minimizing Plastic Pellet Loss from Operations

ExxonMobil is taking action to help address plastic waste in the environment by increasing plastic recyclability and supporting improvements in plastic waste recovery, for example, through its founding membership in the Alliance to End Plastic Waste. ExxonMobil is also working on advanced recycling solutions that create and capture value from plastic waste with opportunities for lower overall greenhouse gas emissions (GHG) over the full life cycle of the plastic. In addition, minimizing pellet loss from its operations is integral to its commitment to responsible operations.



Pellets are typically loaded into a bag, truck or railcar via a mechanical process. Plant personnel monitor facilities via routine daily rounds, and if a loss of containment is discovered, loose pellets are promptly recovered. Pellet recovery equipment, such as skimmers and sieves, is also in place to recover pellets captured in water drainage systems.

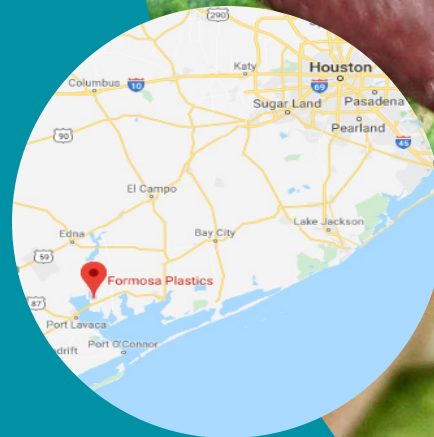
ExxonMobil actively participates in industry initiatives related to pellet loss. Since 2008, ExxonMobil has been a member of Operation Clean Sweep, a voluntary international industry program for plastic manufacturing facilities that encourages the use of best practices for pellet management and containment to reduce pellet loss. It has incorporated Operation Clean Sweep principles into its global Operations Integrity Management System, which is applied at its plastics production and handling facilities around the world

and requires a regular assessment of procedures to ensure they are effective, and improvement measures are implemented if needed. ExxonMobil has also incorporated Operation Clean Sweep principles into its Supplier Relationship Management process to inform third-party logistics suppliers about the company's commitment and we encourage participation in similar programs or activities to prevent pellet loss.

In 2019, ExxonMobil joined Operation Clean Sweep-Blue, which is a voluntary extension of Operation Clean Sweep in the United States that includes enhanced commitments for the awareness, prevention, management and reporting of plastic pellet releases to help further reduce plastic pellet loss at industry facilities. [Read more about ExxonMobil's efforts.](#)

How Has Formosa Plastics Established Wetland Habitat and Conducted Research and Development to Rejuvenate Biodiversity in Texas?

At Formosa Plastics Corporation USA, environmental responsibility is a core Guiding Principle. As a vertically-integrated supplier of plastic resins and petrochemicals, the company owns and manages extensive land holdings near the Formosa Plastics Corp. Texas plant site in Point Comfort, Texas. Among these holdings are the Formosa Agricultural and Environmental Research Center (AERC) and the 200-acre Formosa-Tejano Wetlands (The Wetlands), both of which were established in the 1990s.





Switching Gears: Monarch and Milkweed

The AERC was the vision of Formosa Founder Y.C. Wang and tasked with conducting research to explore strategies for environmentally friendly agriculture. Over the last six years, that focus has evolved in response to changes in the environment and Formosa Plastics' growing involvement in sustainable land use.

"It started in 2015 when the AERC entered into a partnership with the U.S. Fish and Wildlife Service (USFWS) to grow milkweed plants that could attract monarch butterflies and help restore the species' declining numbers," said Curtis Short, lead scientist at the AERC. "Milkweed is the only plant monarch

butterflies consume and our initial goal was to produce enough plants to provide food plots on Formosa properties as well as providing plants to the USFWS for distribution to other organizations. This original project became the catalyst for a completely different operational strategy at the AERC. We quickly moved from basic soil science research and into applied land resource management.

To date, the AERC has produced upwards of 3,200 plants, many of which have been donated to other environmental organizations in south Texas. [Read more about Formosa's efforts.](#)



"We are proud of the work we do at the Wetlands in maintaining a haven for migratory species and in providing wetlands habitats tailored to the biological needs of local species of birds, mammals and reptiles. In addition, very few public-school children in Texas will experience the hands-on environmental education that is provided at the Wetlands. Maintaining earth's biodiversity will require a lot of work but we welcome the challenge."—**Bill Harvey, Wetland Manager/Consultant**

Photo credits: The Monarch Butterflies picture and the Monarch Caterpillar picture were taken by Curtis Short of Formosa. The attached photo of Curtis Short planting trees was taken by Steve Marwitz of Formosa. Photos of the wetlands are taken by Steve Marwitz.

Celebrating Continuous Improvement

The PVC manufacturer’s trade association, Vinyl Institute (VI), proudly recognizes member facilities in the PVC, EDC/VCM, plasticizer production, additive production, and PVC and chlorinated PVC compounding categories that have achieved outstanding performance in Environmental Excellence and Environmental Honor.

The performance criteria for these awards are based on the U.S. Environmental Protection Agency’s (EPA) National Emissions Standards for Hazardous Air Pollutants (NESHAP), other regulatory permit performance, and the EPA’s Toxic Release Inventory (TRI) data for air and water during the previous calendar year.

VI recognized 10 member facilities in 2020 that had outstanding environmental performance for five or more consecutive years.



Formosa Plastics Corporation,
EDC-only plant, Point Comfort, TX
8 consecutive years of performance

Formosa Plastics Corporation,
PVC Compounding plant, Point Comfort, TX
9 consecutive years of performance



Occidental Chemical Corporation,
EDC-only plant, Convent, LA
8 consecutive years of performance



Westlake Chemical Corporation,
Plasticizer/Additive Manufacturing plant,
Aberdeen, MS
7 consecutive years of performance

Westlake Chemical Corporation,
PVC/CPVC Compounding plant,
Aberdeen, MS
7 consecutive years of performance



GEON Performance Solutions,
PVC Compounding plant, Avon Lake, OH
6 consecutive years of performance

GEON Performance Solutions,
PVC Compounding plant, Long Beach, CA
6 consecutive years of performance

GEON Performance Solutions,
PVC Compounding plant, Pasadena, TX
6 consecutive years of performance

GEON Performance Solutions,
PVC Compounding plant, Terre Haute, IN
6 consecutive years of performance



Lubrizol Advanced Materials Inc.,
CPVC Compounding plant, Louisville, KY
5 consecutive years of performance



Health and Safety

As part of our health and safety focus, the VSC is identifying areas for continuous improvement in community health and safety efforts. As an industry, we are also encouraging the use of environmental management systems and ensuring the continued safe use of ingredients in our manufacturing processes and products. In addition, the pandemic demonstrated how vinyl value chain members can assist their communities in times of need. Many donated supplies, money, and time to those hit hardest by COVID.

The Health and Safety Task Force is addressing community health and safety and end-user health and safety. The task force in 2020 developed the VSC's Product Safety Principles to document evidence of implementation of best manufacturing practices.

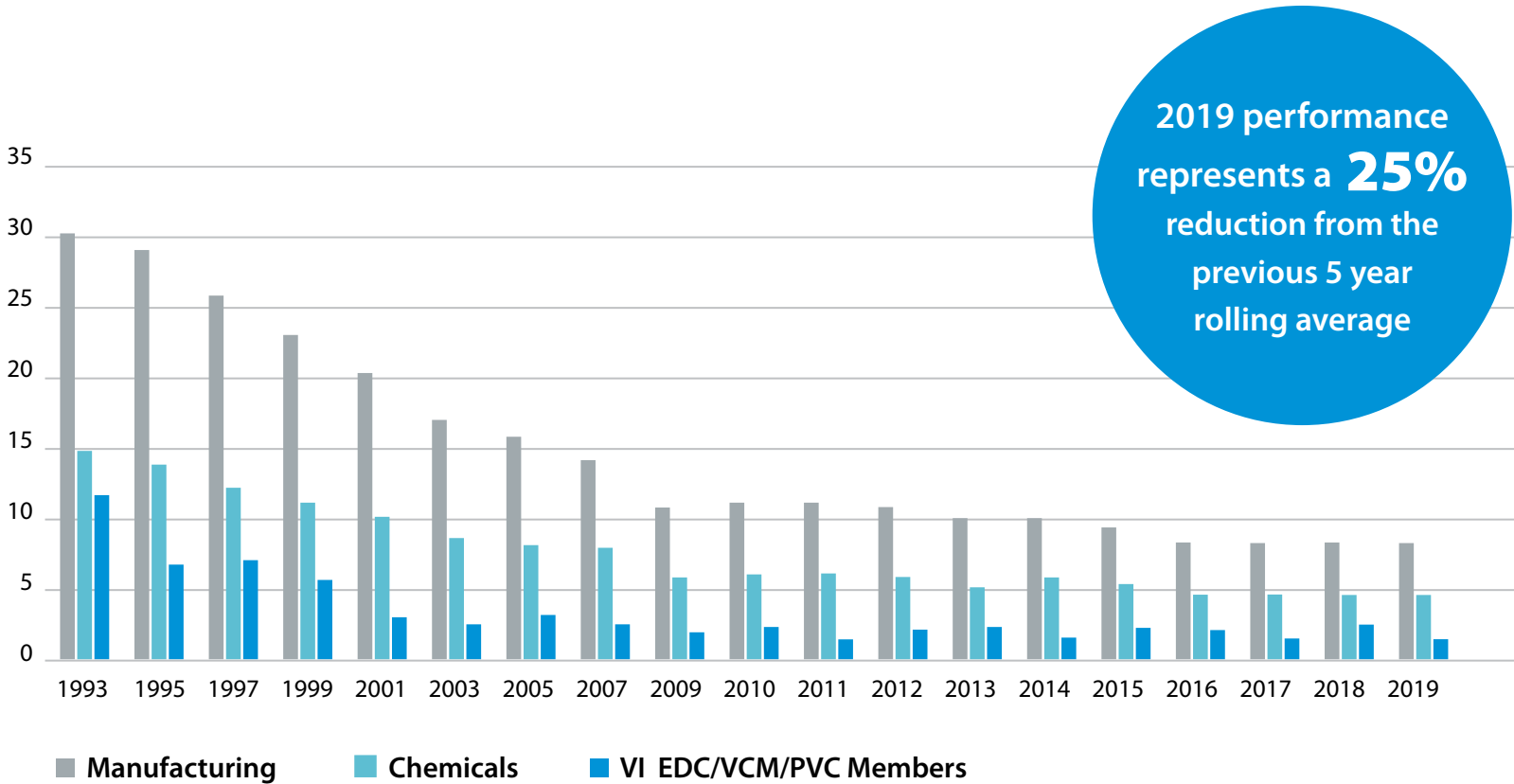
The +Vantage Vinyl verified companies that manufacture, consume, or handle products produced with vinyl materials strive to demonstrate excellence and continuous improvement in five categories: safety culture, product safety competency, stakeholder considerations, workforce involvement, and verification and continuous improvement. Collectively, these categories support each company's sustainability efforts and ability to learn and improve over time.

Recognizing Worker Safety

The Occupational Safety and Health Administration (OSHA) regulates workplace safety in the United States. Production facilities are mandated to report any recordable work-related accidents to OSHA on a regular basis. The vinyl industry resin and monomer producers’ record on OSHA recordable injuries is best in class compared to both overall U.S. manufacturing and chemicals production.

In 2020, the Vinyl Institute recognized 33 production facilities for members that achieved zero OSHA recordable accidents. Seven facilities reported zero OSHA recordable accidents for over 5 years in a row. Overall, U.S. vinyl producer OSHA recordable rates (per 200,000 employee hours) is one-third the rate for all chemicals, and one-sixth the rate for all manufacturing¹.

1. Source: 2020 VI Surveys, U.S. Bureau of Labor Statistics data



OSHA Recordable Rates: Reportable Injuries per 200,000 Employee Hours

Source: VI Surveys, US BLS Data

At Shintech, Local Communities Enable Success

Spread over 7,000 acres in the heartland of Louisiana and Texas, Shintech is the world's largest manufacturer of PVC. Yet, it lives by a much simpler mission: to Live Local, Hire Local and Buy Local.

In fact, one of the major factors behind the company's success has been its loyal and tenured workforce and support from its close-knit communities. And their data speaks to it as well, as the workforce across its three plants grew from 241 in the year 2000 to 741 at the end of 2020.

One of the key drivers of this work has been the company's participation in local Community Advisory Panels (CAP) both in Freeport, Texas, Plaquemine and Addis, Louisiana, soon after the plants were started in the mid 70s and 2000 respectively. The CAPs were initially set up to maintain continuous dialogue between the company and the community on local development issues.





For Shintech, these CAPs are a vital connection to the local communities. “They are our eyes and ears; they challenge us, they support us, and they keep us accountable,” says Richard Mason, Advisor to the President of Shintech. A 30+ year Shintech veteran, Mason has seen firsthand how the Louisiana CAP, for instance, has evolved over the last two decades into a meaningful partner in community development and local hiring.

One of the partnerships that came out of this engagement is a training program hosted by Shintech to promote local hiring through upskilling. The training program is a win-win for all. It gives Shintech the advantage of being able to observe potential talent as well as train those who do want to work for Shintech directly on their proprietary processes. For the participants, the

program provides them valuable skills and a clear career path that they can use to find or change jobs, get promoted or consider whole new careers.

In fact, it's because of this commitment to nurture local talent and build expertise continually, that the company was able to navigate both the 2008 financial crisis as well as the more recent COVID-19 pandemic without a single layoff and maintain its record of never having a layoff. By growing their local talent, Shintech is filling a critical need among these communities. And with the right training and support, they have provided hundreds of people with the opportunity to live locally, improve their skills and continue professional success. [Read more about Shintech's efforts.](#)

“Hiring locally is important for us because we are a part of our communities’ bedrock. We live here, we work here. And our communities don't want to see their children leave town, so we’re all invested in each other’s success.
—**Danny Cedotal**, Vice President of Manufacturing

Celebrating Industry Leaders

One pillar of the triple bottom line sustainability model includes social impact – and, in 2020, the VSC created the Social Impact Award. Two companies received recognition.

HMTX Industries

HMTX Industries founded the Halstead/Metroflor Addiction Crisis (HMAC) in 2019, a nonprofit providing rehabilitation scholarships and support to families who otherwise would not be financially able to help their loved ones suffering from substance addiction disorders. By the end of 2020, HMAC had raised a quarter of a million dollars to fund more than 25 rehabilitation scholarships. They intend to raise \$500,000 by the end of 2021, which will be matched by HMTX’s founders, the Stone Family, for a total of \$1 million.

GEON Performance Solutions

As the COVID-19 pandemic swept the nation, GEON Performance Solutions found an opportunity to help vinyl supply chain members bring essential products to market. GEON worked through Project Collaboration to provide free support to small- and medium-sized companies that were struggling with challenges related to logistics, supply, sourcing, and manufacturing of COVID-19 relief products.



SPOTLIGHT

GEON Performance Solutions

At GEON, Making an Impact is a Rallying Cry

At GEON Performance Solutions, CEO Tracy Garrison likes to say, “Make an Impact.” It’s his way of galvanizing the team to always keep their focus on trust and transparency. In 2019 when the company was spun out of PolyOne Corporation (now Avient) and sold to private equity firm SK Capital Partners, he asked his team to trust each other and keep the focus. “There’s 70 years of legacy here, we will build a great company,” he told them.

With the COVID-19 pandemic putting a pause on most plans, the team quickly pivoted its focus to its employees and communities. With one of GEON's Sustainability Strategy Pillars "Shape Thriving Communities," the team reached out to its employees for ideas. Within a few days, one employee suggested "Project Collaboration." The project would leverage GEON's resources to help small and mid-size companies that needed solutions to COVID-19 manufacturing issues. Over the next few months, GEON team members got to work offering logistics assistance, manufacturing support, and connections across the country to help support the business community.

Dozens of companies contacted GEON. Many needed personal protective equipment while hospitals were looking for protective gowns. Manufacturers were looking for finished goods like coated fabrics or gloves. Inventors were looking for viable channels to market. On all fronts, the GEON team stepped up and helped in any way they could. One of the biggest highlights for the team: connecting a mask manufacturer with a clear sheet supplier and enabling the manufacturing of hundreds of thousands of masks as a result. GEON also bought and distributed over 60,000 of these masks to local authorities, for nursing homes, hospitals and first responders.

Looking back, Project Collaboration is a perfect example of the way business, industry and community can come together to solve critical challenges. In the end, the GEON team did exactly what they were asked to do: "Make an Impact." [Read more about GEON's efforts.](#)



Collaborating Globally

Exploring Reciprocity with the Vinyl Council of Australia's PVC Stewardship Program

Collaboration is critical to the VSC's progress. In January 2021, the VSC signed a memorandum of understanding with the Vinyl Council of Australia (VCA) to explore a pathway to reciprocity between VCA's PVC Stewardship Program and +Vantage Vinyl. By working together, the two programs aim to facilitate further supply chain involvement in industry sustainability programs and to accelerate improvements in sustainability. The VI is also a member of the Global Vinyl Council working together across the globe to advance sustainability in the industry.

Launching Industry-led Recycling Pilot Programs

The VSC is working through the V-Cycle Task Force in collaboration with two vinyl product industry associations – the Vinyl Roofing Division of the Chemical Fabrics & Film Association and the Vinyl Siding Institute – on pilot projects to demonstrate the feasibility of industry-led post-consumer vinyl recycling programs. We're collaborating to produce a roadmap for developing the logistics, transportation infrastructure, and recycling capacity to expand recycling in vinyl roofing and vinyl siding.

Engaging with Researchers and Circularity Experts

In 2020, VI became a trade association member of the REMADE Institute, which is a consortium of academic researchers, national labs, and industry with the mission to enhance the nation's industrial competitiveness and lead the transition to the circular economy. Membership gives the VI and the VSC access to a network of experts to compliment and extend the research of the vinyl industry.

Supporting Government-led Recycling Initiatives

Each year, the U.S. Environmental Protection Agency (EPA) hosts America Recycles Day, recognizing the importance and impact recycling has on our environment. The VI signed the America Recycles pledge in 2019 as another way to further show the industry's commitment to build on the existing efforts to address the challenges facing our nation's recycling system and to identify solutions that create a more resilient materials economy and protect the environment. VI participated in the 2020 America Recycles Day event with a virtual exhibit.



PVC STEWARDSHIP


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