

A photograph of a woman with brown hair, wearing a dark blue polka-dot cardigan over a striped shirt and dark blue pants, holding a baby. The baby is wearing a light-colored sweater with a blue dinosaur pattern and is laughing with its mouth open. The background shows a kitchen with white cabinets and a brick wall.

vinyl SUSTAINABILITY
COUNCIL

**OUR SUSTAINABILITY
JOURNEY | 2015–2019**

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Our Sustainability Journey

An executive summary of the Vinyl Sustainability Council's efforts in creating a sustainability framework for the entire U.S. vinyl value chain.

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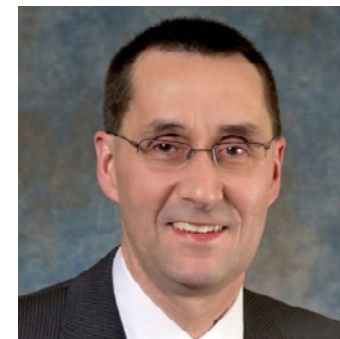
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A MESSAGE FROM INDUSTRY LEADERSHIP



DICK HEINLE



STAN GRAVELINE

Today's world population is 7.7 billion and is expected to reach 9.7 billion by 2050 and 11 billion by 2100.¹ At that rate, the United Nations reports, "Since global material resource use is likely to ... more than double by 2050 on current trends, the global economy must embrace resource efficiency to achieve the Sustainable Development Goals."²

Our current global resource consumption patterns must change to meet future needs. We must do more with less and understand that sustainability is critical to our health, our environment, our communities, and our companies.

The vinyl industry has embraced this imperative and is rising to the challenge. As a result, the Vinyl Institute (VI) established a robust and comprehensive sustainability approach four years ago building on existing sustainability efforts throughout the industry. VI members knew they could go further by collaborating across the industry, so we formed the Vinyl Sustainability Council—bringing together partners across the vinyl value chain to develop and implement the strategy and tactics to move the U.S. vinyl industry forward.

This report is an overview of our initial efforts to bring the industry together and gather data needed to set a baseline against which our ongoing efforts will be assessed in subsequent sustainability reports. And it is intended to encourage a collaborative dialogue with our internal and external stakeholders to constructively assess and refine our efforts to ensure alignment with the UN's Sustainable Development Goals.³

The three core elements of sustainability—environmental, social, and economic—provide a comprehensive, consistent approach for driving continuous improvement in all three areas. And we are not alone in our efforts. From the financial markets to the marketplace, consumers, retailers, and investors have made it clear: there is a need to do more with less—and rewards for companies and industries that walk the talk.

We invite you to join us on this journey.

Vinyl Institute Chairman,
Dick Heinle
Formosa Plastics Corp. U.S.A.

Vinyl Sustainability Council Chairman,
Stan Graveline
Sika Corporation - Roofing

¹ Source: United Nations Department of Economic and Social Affairs, Population Division, 2019 Version of World Population Prospects (referencing median projections)
² Source: United Nations Environment 2017 Assessing Global Resource Use
³ Source: Resolution adopted by the United Nations General Assembly (70/1), "Transforming our World: the 2030 Agenda for Sustainable Development," 25 September 2015 (United Nations 2030 Agenda for Sustainable Development 2015)



LANDSCAPE OF THE VINYL INDUSTRY

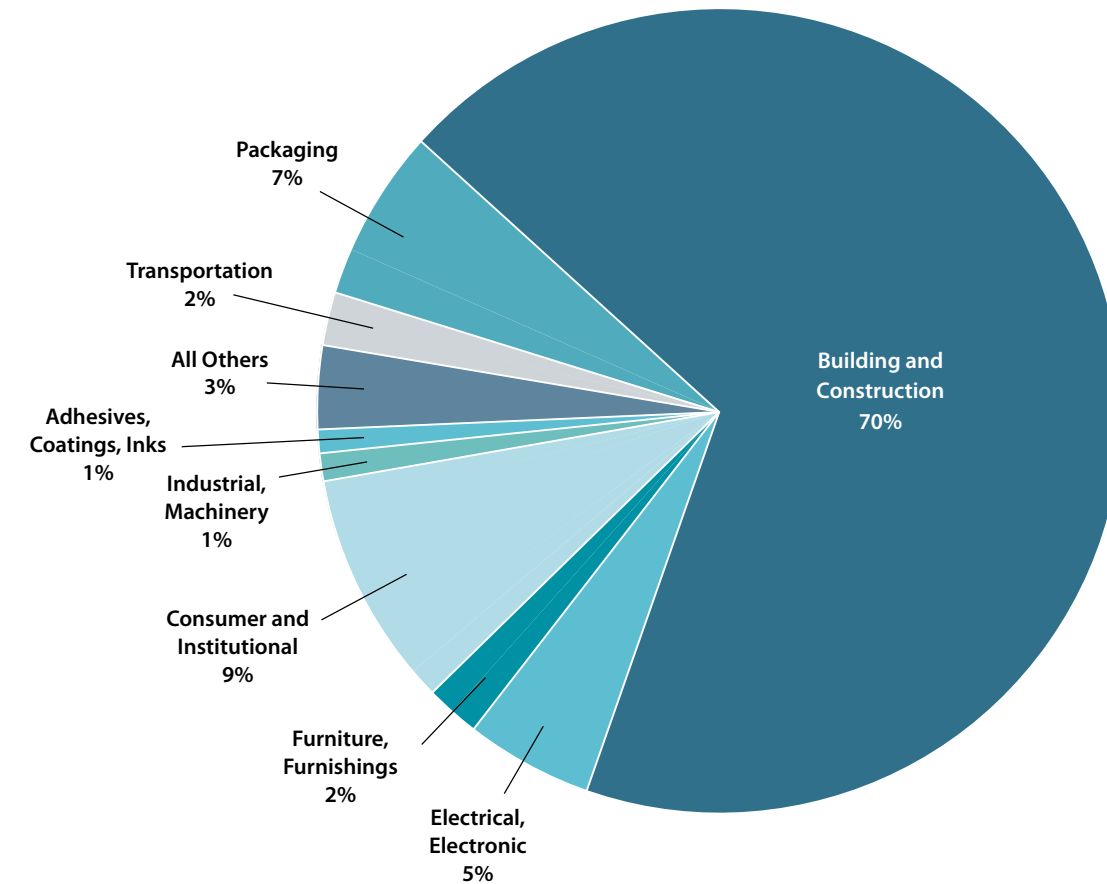
The U.S. vinyl industry encompasses nearly 3,000 vinyl manufacturing facilities, over 350,000 employees, and an overall economic value of \$54 billion.⁴ Our value chain includes chlorine and vinyl chloride monomer (VCM) producers; resin suppliers; raw material and additive suppliers; compounders; converter/formulators; end-product manufacturers; equipment manufacturers; recyclers; and distributor/transporters.

Vinyl is the third most-used plastic in the world, predominantly in durable goods that have long service life. Vinyl products are known for their durability and safety, and are found in key sectors throughout the U.S. economy. The majority of vinyl resin produced in the U.S. goes into the building and construction sector, including roofing, windows, railing, decking, siding, flooring, electrical wiring, wallcovering, and PVC pipes. It's in the IV bags that preserve blood and deliver needed hydration and medicine. And it's in use in transportation, packaging, and electrical sectors.

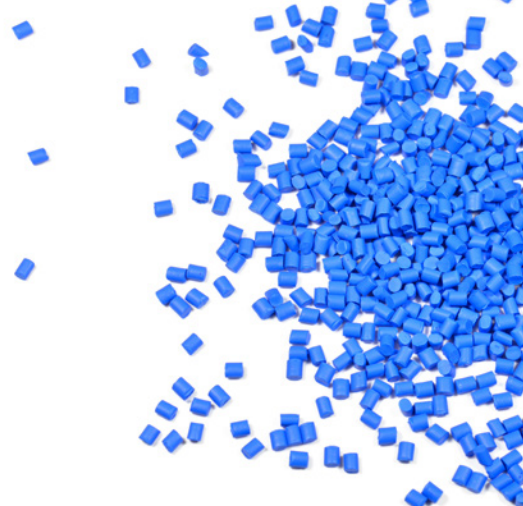


The proportional use of PVC in the U.S. by market segment.

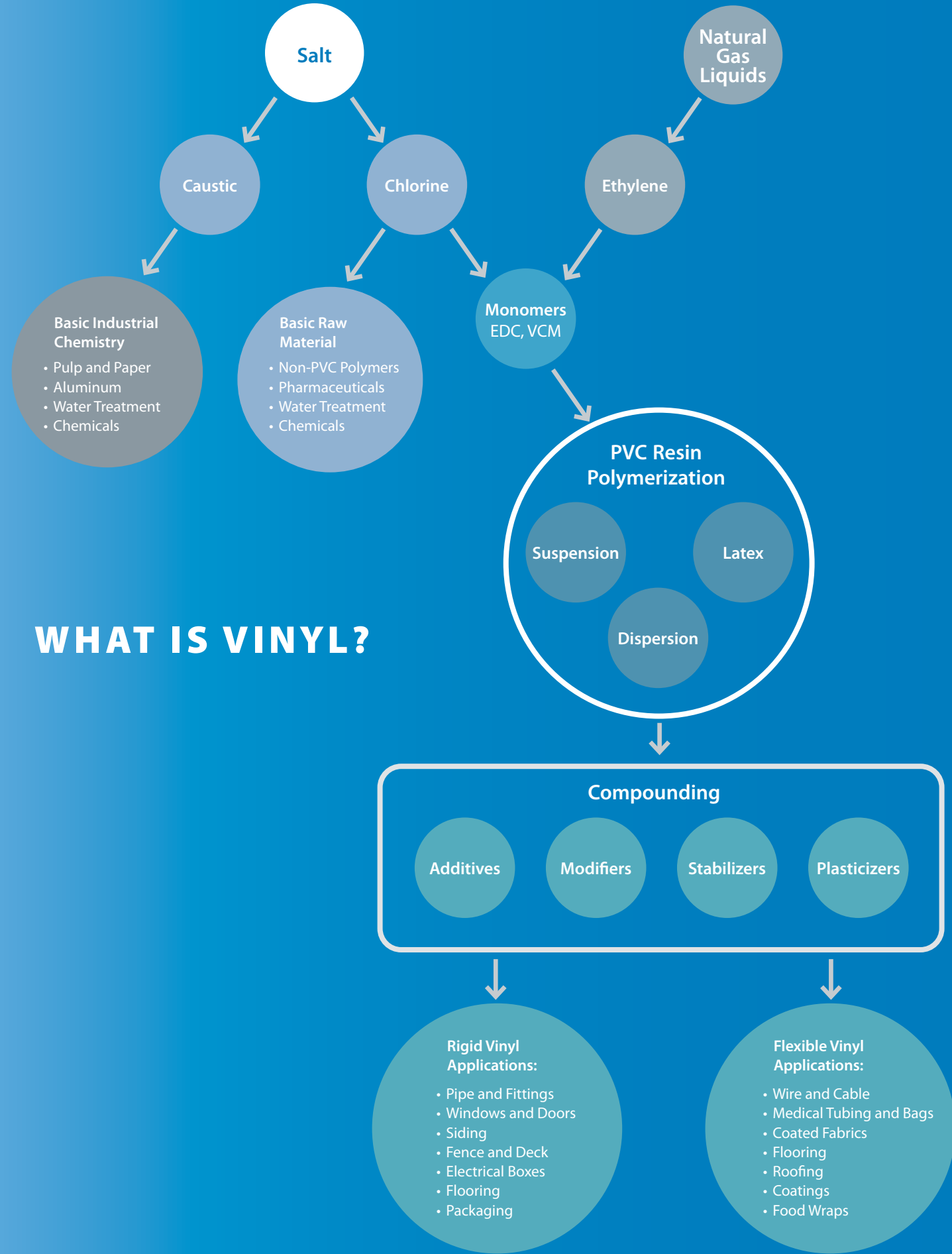
Source: American Chemistry Council Resin Report, 2019



⁴ Source: Tarnell Company 2014 Survey



WHAT IS VINYL?



So what is vinyl? It starts with two simple building blocks: chlorine (57%) derived from salt, and ethylene (43%) derived from natural gas. When combined, the resulting compound is ethylene dichloride, which is converted at very high temperatures to vinyl chloride monomer (VCM gas). Through the chemical reaction known as polymerization, VCM becomes a stable powder known as polyvinyl chloride resin (PVC or vinyl).

The largest domestic vinyl resin manufacturers are members of the Vinyl Institute (VI), which is a U.S. trade organization founded in 1982. In addition to representing the resin manufacturers, VI members include producers of VCM, vinyl additives, and modifiers — the raw material suppliers to the industry. The VI serves as the voice for the vinyl industry, engaging industry stakeholders in shaping the future of the vinyl industry.

More information about the U.S. vinyl industry efforts and innovation over the past 50 years can be found in Appendix 2.

VI Full Members



VI Supporting Members



MAPPING OUR JOURNEY

Population growth over the next 30 years will generate increased demands on finite natural resources. Vinyl products can help mitigate these pressures and resource needs.

For the vinyl industry, sustainability is about achieving more with less: better environmental and natural resources stewardship, with positive economic impact and social due diligence. Doing more with less is essential to the way we manufacture and market our products.

The vinyl industry's sustainability journey actually began more than 40 years ago with a focus on reducing emissions, eliminating certain heavy metal stabilizers, increasing recycling, and making other improvements to protect workers and the communities in which they live. That purpose-driven innovation continues to this day.

Our current initiative traces back to 2015, when the VI adopted a 4-year strategic plan that included developing a U.S. vinyl industry sustainability initiative. We did this recognizing that the resin and raw material suppliers, who are our members, could not do this work alone. Together, members of the vinyl value chain could develop an initiative that demonstrates true sustainability leadership.



The VI convened an industry-wide sustainability summit in 2016. At the end of the summit, participants agreed on a clear definition of sustainability (to meet the needs of the growing population we need to do more with less) and to work together to develop, nurture, and lead an industry-wide vinyl sustainability initiative facilitated by the VI.

Later in 2016, the VI launched the Vinyl Sustainability Council (VSC) to serve as the collaboration platform which provides all members of the vinyl value chain an opportunity to participate in advancing sustainability efforts across the industry. The VSC's next steps included embarking on a materiality assessment to determine the roadmap for our efforts over the next four to five years.

More information about the VSC and the industry's innovations can be found in Appendices 1 and 2 respectively.



WHAT IS A MATERIALITY ASSESSMENT?

Materiality assessment is a methodology used by sustainability experts to identify and prioritize stakeholder concerns and opportunities for improvement. The materiality methodology studies quantitative and qualitative data from published material, industry stakeholder surveys, and interviews with key industry partners.

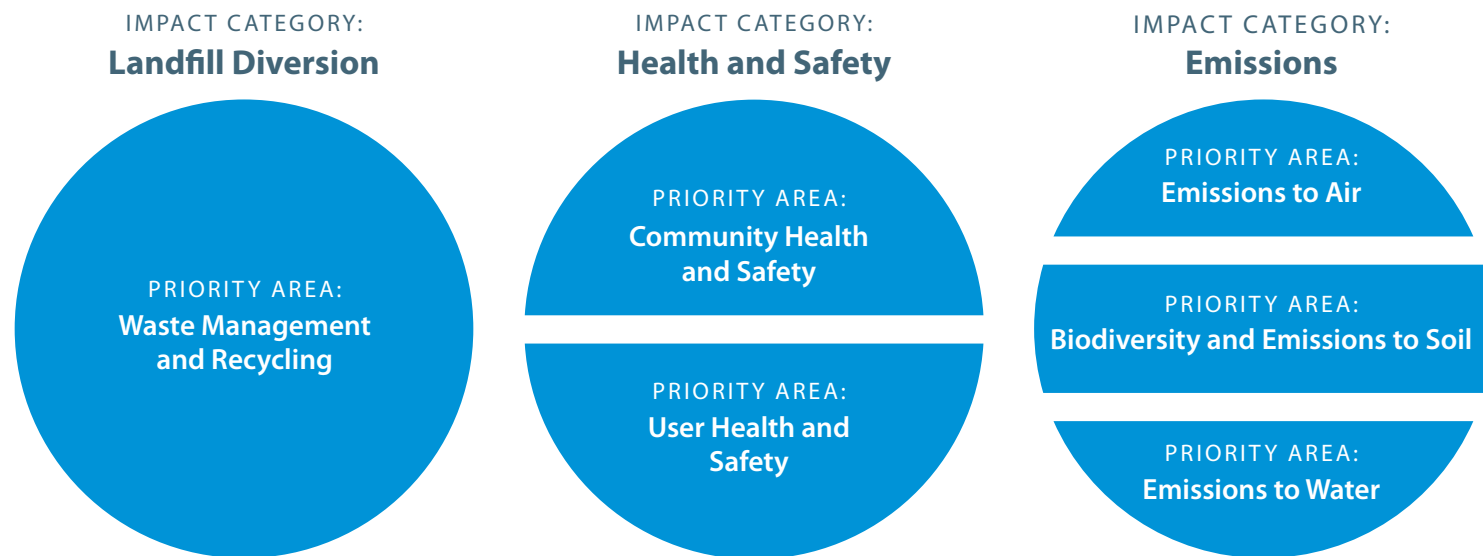
A materiality assessment distinguishes between what can be done and the aspirational goals embodied by the concept of sustainability. It maps out priority areas (areas of concern identified by stakeholders). These can be environmental, social, or economic in nature.

PLANNING OUR PATH FORWARD

In 2017 the VSC embarked on its first materiality assessment. The assessment was designed to gather input from a wide range of stakeholders regarding areas of concern, and where specifically those concerns are in relation to the vinyl supply chain.

Information was collected and analyzed by S & C North America Inc., an independent third-party firm. The materiality assessment was comprised of three parts: Part 1 was a detailed literature analysis of more than 350 publications, including government studies, academic research, and industry and NGO studies and reports. Part 2 was in-depth surveys and interviews with 60 critical U.S. vinyl industry partners. Part 3 was a survey of external stakeholders. Together, this information was synthesized to determine the prioritization and categorization of those priority areas the industry would address in the next four to five years.

The results of the materiality assessment identified six priority areas that fall into three impact categories:



Based on the materiality assessment, the VSC selected three impact categories (Landfill Diversion, Health and Safety, and Emissions), aligned with United Nations Sustainable Development Goals (UN SDGs),⁵ where the industry could make significant contributions through more than 50 separate goals from which companies could select.



While the vinyl industry can contribute to all the 17 UN SDGs to varying degrees, the three SDGs for which vinyl industry sustainability efforts contribute substantially are: 6-Clean Water and Sanitation, 9-Industry innovation and Infrastructure, and 12-Responsible Consumption and Production.

Developing our framework for action.

Guided by the materiality assessment and past sustainable development contributions, the VSC created a framework for moving forward. The framework includes a process for establishing industry sustainability goals and key performance indicators per impact category.

Based on the framework, the VSC set about developing a branded performance program, called +Vantage Vinyl™ for companies throughout the vinyl value chain to track and third-party verify their efforts toward the goals and key performance indicators (KPIs). The VSC also established a trademark associated with +Vantage Vinyl to recognize companies participating in the program.

Details of the vinyl industry's priority areas and impact categories can be found in Appendix 3. More information about +Vantage Vinyl can be found in Appendix 4.

⁵ Source: United Nations 2030 Agenda for Sustainable Development 2015



INTRODUCING +VANTAGE VINYL

In 2018, at the VI's annual industry conference, the VSC rolled out +Vantage Vinyl, the U.S. vinyl industry's continuous improvement program.

+Vantage Vinyl is the mechanism vinyl value chain companies use to participate in the vinyl industry's sustainability initiative. The goal of +Vantage Vinyl is to generate performance improvements and report on our progress.

+Vantage Vinyl is a voluntary effort. Participation is open to any company in the vinyl value chain that operates in the United States and is a resin supplier, raw material/additive supplier, compounder, converter/formulator, end-product manufacturer, equipment manufacturer, recycler, or distributor/ transporter.

Participants must:

- Conduct business in the United States as part of the vinyl value chain
- Be a VSC Primary Stakeholder member
- Designate an employee with sustainability responsibilities as the primary +Vantage Vinyl contact
- Honor the initiative's aspirational Guiding Principles (Environmental Stewardship, Social Diligence, Economic Soundness, Collaboration, and Open Communication)
- Participate in task force activities focused on achieving industry goals
- Contribute to the industry's priority goals

How it works.

Participants must agree to engage in task force activities focused on achieving industry goals. These activities can include providing information or data for aggregation, financial support, and technical assistance.

+Vantage Vinyl's primary focus for 2019 was collecting and compiling baseline industry data and best practices while increasing member collaboration and support for VSC activities. This baseline data will be used to establish targets. Companies participating in +Vantage Vinyl are subject to an annual verification process provided by an independent third-party.

+ VANTAGE
vinyl FOR A
SUSTAINABLE
FUTURE™



Tracking our progress.

To measure our progress toward a more sustainable vinyl industry, we have committed to tracking our results and developing future targets and goals that are benchmarked for the industry based on selected metrics. An independent verification process is intended to provide assurance that our goals are being achieved.

The VSC currently uses GreenCircle Certified, LLC⁶ as our third-party verification service. GreenCircle's evaluation process provides independent verification that reporting of sustainable aspects of products and operations is valid.

Piloting the verification process.

We tested the +Vantage Vinyl program's design and processes during 2019. The pilot program tracked the verification process from application to goal documentation and verification by GreenCircle.

Once a company's application was submitted, GreenCircle held an initial call with the pilot participant to review the required information and corresponding verification schedule.

Participants provided feedback on the program's documentation and verification processes, generating clarifications and refinements. Documentation provided as part of the pilot process will be used to complete the final verification process, including final verification of each company's selected goals.

Eight VSC member companies participated in the +Vantage Vinyl pilot program: Formosa Plastics Corporation USA, Oxy Vinyls, Shintech, Westlake Chemical Company, Sika Corporation - Roofing, Geon Performance Solutions, Chemours, and Vestolit. More information about the impact categories and priority areas, and about +Vantage Vinyl can be found in Appendices 3 and 4 respectively.



Formosa Plastics®



⁶ Source: <http://www.greencirclecertified.com>



Lessons learned.

The pilot phase tested both the applicability of the +Vantage Vinyl program and the verification process established by GreenCircle. Participating companies were subject to multiple audits that reviewed required documentation, practices, and commitment according to the +Vantage Vinyl participation criteria. Participating companies also had the opportunity to provide input to GreenCircle on where +Vantage Vinyl or the verification scheme could improve. The feedback was collected and summarized by GreenCircle and will be used as direct input into the next version of +Vantage Vinyl in 2020.

More information about +Vantage Vinyl can be found in Appendix 4.

OUR PROGRESS IN 2019

Three separate task forces have been created to manage each of the impact categories and to bring the industry together to work on accomplishing our +Vantage Vinyl goals. Each task force is managed by an elected industry chair.

Landfill Diversion Task Force.

The United States and Canadian vinyl industry currently recycles more than 1.1 billion pounds of vinyl annually.⁷ While this is an impressive result, the Landfill Diversion Task Force is focused on further reducing the amount of vinyl reaching the landfill by increasing the percentage of post-consumer vinyl recycled. The task force is composed of VSC members, allied trade organizations, and recyclers. The task force's discussions are centered around the following:

- identifying success stories that can be replicated,
- working with recyclers to expand and create new recycled material applications,
- finding ways to effectively collect, transport, and recycle vinyl products at the end of their life cycle,
- partnering with private and public organizations that can help expand the recycling capabilities of the vinyl industry, and
- identifying meaningful numeric targets for recycling that the industry can strive for going forward.

The Health and Safety Task Force.

The Health and Safety Task Force is composed of VI and VSC members and allied trade associations. Task force members work together on:

- identifying and replicating best practices that involve community engagement,
- enhancing worker safety and adoption of volunteer government health and safety programs (such as OSHA's Voluntary Protection Program (VPP)), and
- continuing avoidance of cadmium and lead heavy metals as added ingredients.

The Emissions Task Force.

The Emissions Task Force is composed of VI and VSC members, and allied trade associations. This task force reviews information and data available for emissions to air, water, soil, and biodiversity throughout the vinyl value chain in order to establish tracking, improvement, and reporting goals for participating companies.

⁷ Source: Tarnell Company 2017 Vinyl Institute Survey, Sold Amounts

Preliminary benchmarking survey highlights.

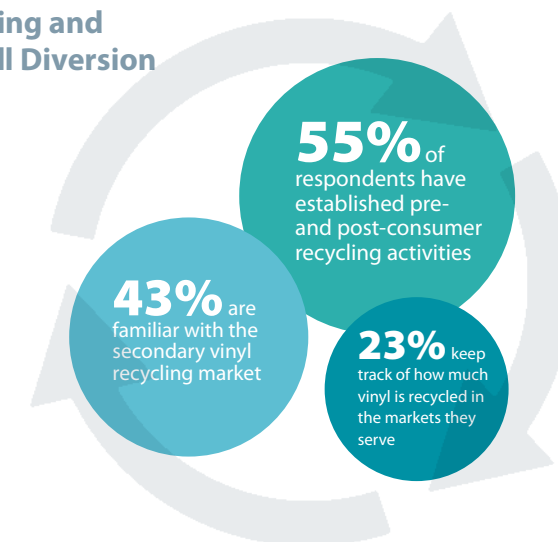
In 2019, the VSC hired the independent consultancy Sustainable Solutions Corporation (SSC) to conduct a benchmark survey throughout the vinyl industry on current sustainability practices and data.

A statistically-valid 12% of vinyl value chain companies participated in the survey, including product manufacturers, extruders, material/additive suppliers, compounders, recyclers, and distributors.

The SSC survey excluded vinyl resin producers who are in the process of an extensive benchmarking survey that takes place every four to five years. The combined results of the SSC survey and the vinyl resin producers survey are being used to refine the continuous improvement goals for 2020 and beyond.

Below are a few preliminary SSC benchmark survey results.⁸

Recycling and Landfill Diversion

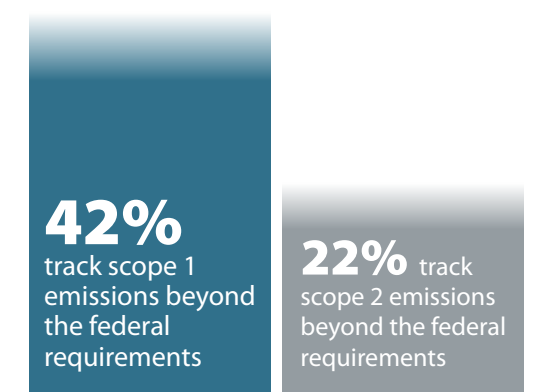


Health and Safety



0% of survey respondents use lead as an added ingredient

Emissions



¹ Scope 1 Emissions are direct emissions released from sources owned or controlled by the company or facility. Examples include on-site fuel combustion of boilers and equipment (forklifts, on-site vehicles). Reported emissions include GHG, NOx, and SOx. Scope 2 Emissions are indirect emissions from the generation of purchased electricity.

⁸ Source: Sustainable Solutions Corporation 2019 Vinyl Sustainability Council Industry-wide Benchmark Survey

Soliciting non-governmental organization stakeholder feedback.

Transparency and stewardship are two of the VSC’s core values. Constructive feedback from independent observers can support our efforts by helping us to refine our vision and focus on what matters most in our sustainability efforts. For this reason, the VSC formed an external advisory panel composed of sustainability experts from independent non-governmental organizations (NGOs) to provide critical feedback on our journey.

The Inaugural Stakeholder Advisory Panel members include Jay Thomas, Executive Board Member, Green Building Initiative; Susan Dorn, General Counsel, U.S. Green Building Council; and Carole Mars, Director Technical Development and Innovation, The Sustainability Consortium. Participation on the Stakeholder Advisory Panel is not an endorsement of +Vantage Vinyl by the panel members or their organizations.

An inaugural meeting of the Stakeholder Advisory Panel was held in September 2019. VSC leadership gave an overview of the industry, its past and present efforts, and its approach to developing its sustainability initiative.

The feedback from the NGO’s focused on the following areas:

- Materiality analysis credibility and scope
- Impact categories and what to consider in setting goals and building value
- +Vantage Vinyl program goals and how to increase adoption
- Incorporation into green building standards
- Trademark considerations
- Comparable programs and examples to learn from
- Pace and timing issues and opportunities



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Going Beyond Award



Occidental Chemical Corporation



Shintech Incorporated



Westlake Chemical Company

Recycler of the Year Award



Return Polymers

Recognizing company efforts.

In 2019, the VSC introduced the Going Beyond Award, which recognizes companies that go beyond the requirements of +Vantage Vinyl participation and contributed to more than one goal per impact category. The 2019 Going Beyond Award recipients were Occidental Chemical Corporation, Shintech Louisiana, and Westlake Chemical Company.

The VSC also awarded its first-ever Recycler of the Year Award, which recognizes the efforts of recyclers and product manufacturers with operations in the U.S. that find new solutions and/or markets for post-consumer PVC materials, increase use of recycled vinyl content in their products, and/or engage in partnerships with companies in take-back programs.

The 2019 Recycler of the Year was Return Polymers. In a tight six-month timeframe, Return Polymers worked on their customer’s behalf to develop a 100 percent recycled vinyl compound capable of being extruded into complex refrigeration equipment profiles on either single or twin screw extruders, which also received a difficult-to-achieve V-0 flame-retardant rating at 1-millimeter thickness.

LOOKING AHEAD

As we continue to accelerate our work, we're setting goals for our sustainability journey. Here are the highlights for 2020 and beyond. We welcome your interest and participation in the VSC and the +Vantage Vinyl initiative. We look forward to working together to advance the industry's contribution to sustainable development.

Finally, we trust that collaboration in our approach and transparency in our activities and metrics is evidence of our commitment. We haven't been sitting still, and we're stepping up to do even more because we must. We know that sustainability is a journey, not a destination, and that sustainable development must be based on continuous improvement.

2020

Start Establishing Quantifiable Targets and Metrics

- Analyze existing practices, data availability, and maximum achievable targets completed, aided by an independent third-party organization
- Establish numeric goals and metrics when appropriate
- Identify third-party data collection organization. Data reporting for numeric goals initiated
- Goals and metrics (KPIs) adjusted to include numeric goals, where applicable



2021

Measure Progress Toward Industry-Wide Goals

- Aggregate +Vantage Vinyl data to assess industry progress
- Assess a possible product level sustainability initiative



2022

Refine Annual Reporting to Include Quantifiable Metrics and Progress

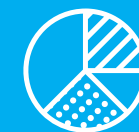
- Report annually about participation and progress toward numeric and non-numeric goals and KPIs



2023

Plan for Materiality Assessment Update

- Define scope and plan an updated materiality assessment



2024

Perform Second Materiality Assessment and Refine Goals

- Complete a second materiality assessment for the vinyl industry and confirm or revise focus areas
- Refine +Vantage Vinyl improvement categories, goals and KPIs, as needed





APPENDIX 1: ESTABLISHING THE VINYL SUSTAINABILITY COUNCIL

The Vinyl Sustainability Council (VSC) is a self-funded council of the Vinyl Institute (VI) that includes members from across the vinyl value chain. It was created in 2016 to further advance the efforts of the vinyl industry as we address sustainability and related communications and technical issues in North America.

Members of the VSC work together to develop and implement best practices and innovation leading to continuous improvement throughout the industry, and promote these achievements to key stakeholders.

Members of the VSC engage in the following activities:

- Collaborate with peers, suppliers and customers on sustainability-related issues affecting the industry.
- Create common sustainability strategies, action plans, communications, and educational materials.
- Identify opportunities for sustainability-driven product and process innovation.
- Create and periodically refine industry sustainability goals, key performance indicators (KPIs), and company engagement criteria.
- Participate in and forge the future of the +Vantage Vinyl™ industry sustainability initiative.
- Show leadership and drive continuous improvement in their companies and across the vinyl value chain.

VSC members.

Since its founding, the VSC's membership has grown to over 50 vinyl value chain participants representing resin and additive producers, recyclers, product manufacturers, compounders, trade associations, and retailers.

The VSC is managed by a leadership team comprised of up to eight members. The current VSC leadership team includes VSC Chairman Stan Graveline (Sika Corporation - Roofing); Past-Chairman Corey Carter (Metroflor/Halstead International); Landfill Diversion Task Force Chairman Dhruv Raina (Tarkett); Health and Safety Task Force Chairman David Adenuga (ExxonMobil); Emissions Task Force Chairman Matt Dobson (Vinyl Siding Institute); and Ned Monroe, President and CEO of the VI. The leadership team is chosen from the primary stakeholder member body, each of which is held by a representative from a different part of the value chain.

The VSC operates consistent with the bylaws of the VI and the related obligations of nonprofit, tax-exempt organizations.

Bringing together value chain stakeholders.

The VSC welcomes members from all facets of the vinyl industry, including resin producers, compounders, additives suppliers, distributors, recyclers, end-product and equipment manufacturers, and brand owners. Trade associations, retailers, resellers, end-users (building owners, architects, designers, etc.) and collaboration driven non-profit organizations are also invited to join.

2016 – 2019 Vinyl Sustainability Council Membership

PRIMARY STAKEHOLDERS	
ASSOCIATES	
V-CYCLE	
TRADE ASSOCIATIONS	

APPENDIX 2: BUILDING ON A HISTORY OF CONTINUOUS IMPROVEMENT

While the U.S. vinyl industry has created a formal, comprehensive industry-wide sustainability initiative for continuous improvement, members from across the vinyl value chain have focused on the environmental, economic, and social aspects of sustainability for almost 50 years. As a result, the industry has driven improvements achieved from the resin production sites to product manufacturers' facilities. Decades of innovation within each of the three impact categories (landfill diversion, health and safety, and emissions) reduced emissions, created best-in-class health and safety practices, and increased recycling of pre- and post-consumer vinyl products.

Here are some examples of our sustainability-driven innovation to date.

Innovating PVC resin manufacturing.

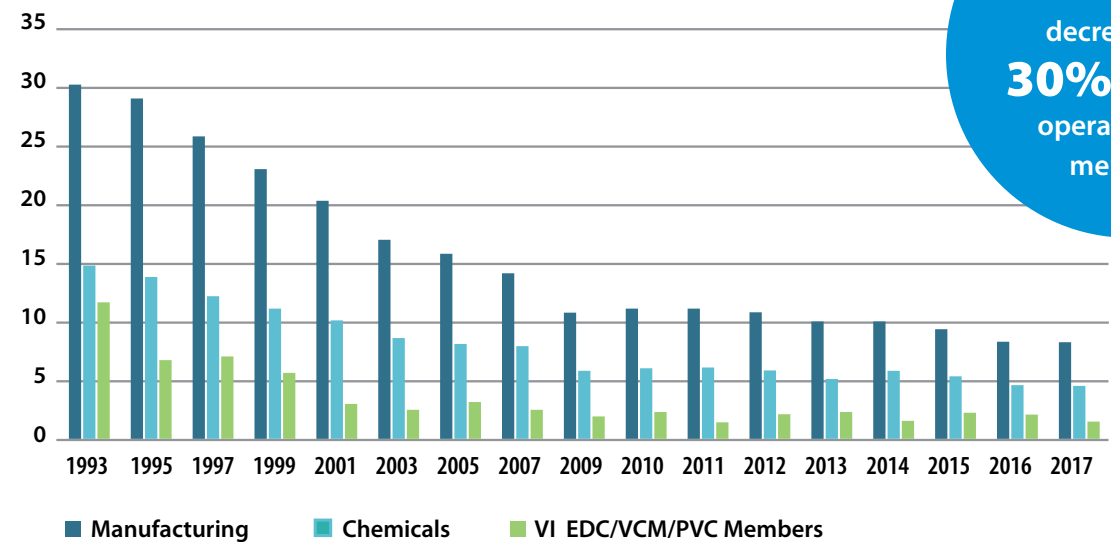
Voluntary capital investments in equipment have led to innovations in stripping vinyl chloride monomer from the resin. This significantly reduced exposure for workers at resin factories and workers downstream who use the resin to create products. Meanwhile, the vinyl chloride that is stripped out is recovered and reused in the resin manufacturing process, creating efficiencies and reducing waste.

We've also achieved innovations in chlorine production, which is one of the building blocks used to make PVC resin. U.S. resin manufacturers produce their own chlorine at or near their monomer plants, which is used to polymerize into PVC resin. This self-reliance for chlorine production minimizes the risks associated with chemical transportation and leaks from loading and unloading operations, reduces the industry's carbon footprint, and increases worker safety. The industry no longer relies on mercury-cell technology to produce the chlorine used in monomer to produce PVC resin.

Best-in-class worker safety practices.

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 record of OSHA recordable injuries is best in class compared to both overall U.S. manufacturing and chemicals production.

In 2017, 22 production facilities of VI member companies achieved zero OSHA recordable accidents. Three facilities reported zero OSHA recordable accidents for over 5 years in a row. Overall, the OSHA recordable injuries have decreased 30% in 2017 for the facilities operated by the members of the VI.¹



In 2017, OSHA recordable injuries decreased by **30%** in facilities operated by VI members

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

Vinyl Producer rate decreased 30% in 2017 and is 1/3 the rate for all chemicals [Work Related Incident Rate] Source: VI Surveys, US BLS Data

¹ Source: VI Surveys and U.S. Bureau of Labor Statistics Data

Elimination of certain heavy metal stabilizers.

The invention of alternative stabilization technology phased down the need for stabilizers that contain lead and cadmium. This technology was commercialized and has been used in the United States and Canada for the past three decades in rigid vinyl, and for the past 15 years in flexible vinyl. In addition, U.S. vinyl products manufacturers have led the way on this stewardship effort on a global basis.

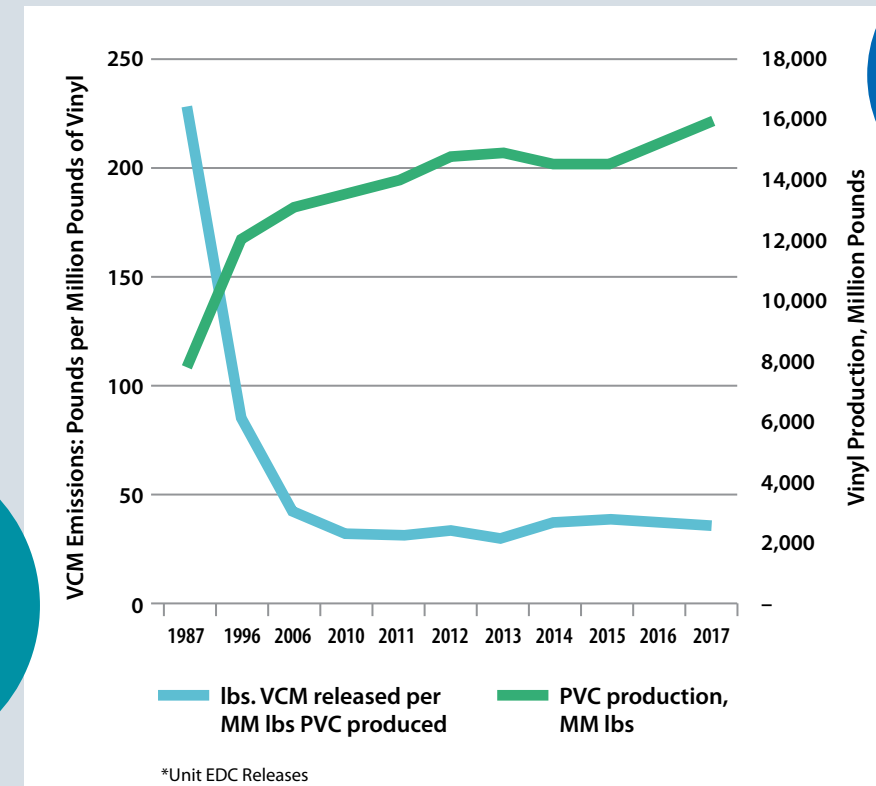
Reducing emissions.

The U.S. vinyl industry is among the most regulated. The industry must comply with an array of strict U.S. Environmental Protection Agency (EPA) regulations.

Beyond that, environmental stewardship is at the core of how we do business throughout the vinyl value chain. For example, the U.S. vinyl industry's vinyl chloride monomer (VCM) ambient air emissions per pound of product produced has decreased 84% since 1987, while overall production of resin has increased by 99% over the same period.²

Unit VCM Emissions have declined **84%** since 1987

Emissions to Water have declined from **0.2%** in 1987 to **0.01%** in 2017



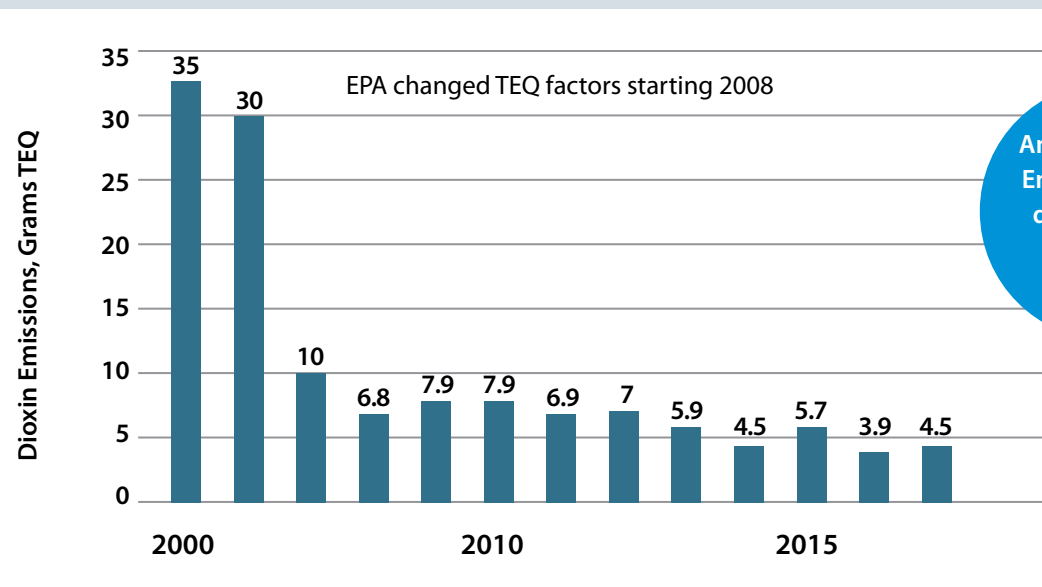
Vinyl Resin Production has increased by **99%** since 1987

VCM Emissions

Source: U.S. EPA Tri Data, Air and Water Data

² Source: U.S. Environmental Protection Agency TRI Data, Air and Water (2017)

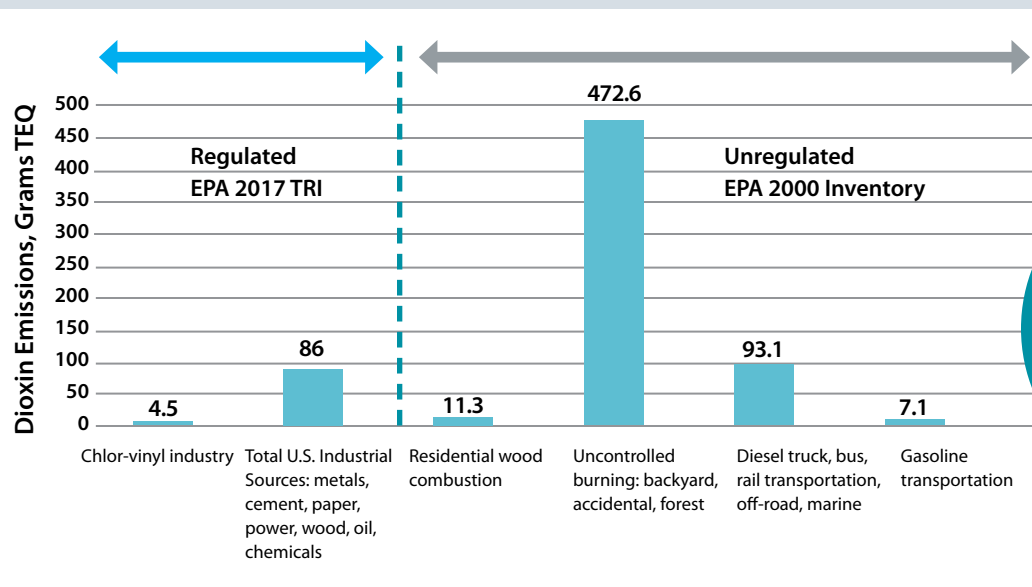
In addition, U.S. chlor-vinyl manufacturing air- and water-related ambient dioxin emissions have decreased 43% since 2009.³



Ambient Dioxin Emissions have decreased by **43%** since 2009

Dioxin Emissions *Ambient emissions exclude secure land disposal
Source: EPA Tri Air and Water Data

According to EPA's Toxic Release Inventory (TRI) as well as unregulated emissions data, the chlor-vinyl air- and water-related dioxin emissions are significantly lower than competing industries, materials, and sources.⁴



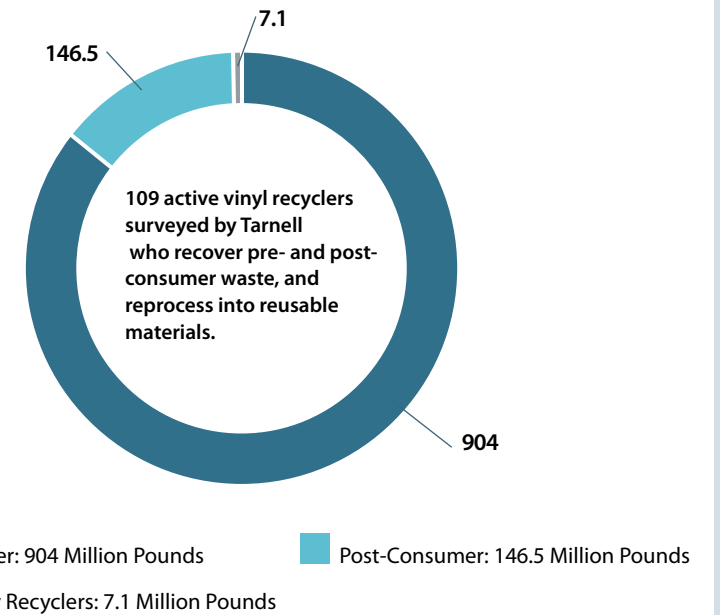
Dioxin emissions are **significantly** lower than competing industries, materials, and sources

Dioxin Releases to Air and Water / Regulated and Unregulated
Source: U.S. EPA Data

³ Source: U.S. Environmental Protection Agency TRI Data, Air and Water (2017)
⁴ Source: U.S. Environmental Protection Agency TRI Data, Air and Water (2017)

More than **1 billion** pounds of vinyl materials recycled annually

Post-Consumer Recycled Vinyl up **40%** since 2014



Recycled Vinyl Materials – U.S. and Canada, 1,050 Million Pounds
Source: Tarnell Company 2017 Survey, Sold Amounts

Recycling vinyl.

Vinyl is recyclable. The vinyl industry has a great track record of both post-consumer and pre-consumer recycling. With the help of product manufacturers and over 100 recycling facilities, the vinyl industry recycles over 1 billion pounds of vinyl materials annually in the U.S. and Canada. Post-consumer recycling contributes roughly 15%, and this number has grown 40% since 2014.⁵

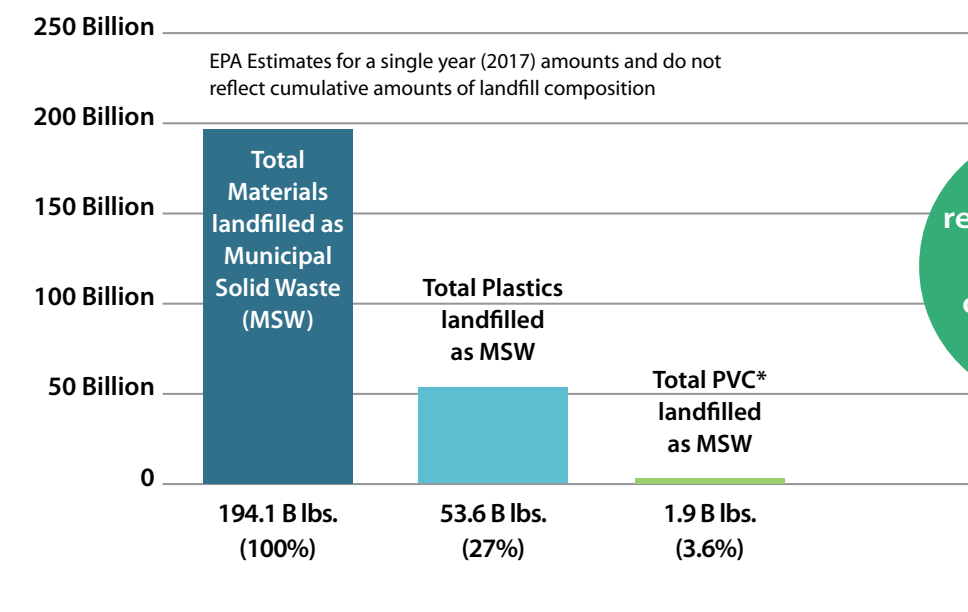
The vinyl recycling industry is robust and post-consumer recycling is growing. Recycling vinyl reduces the carbon footprint of finished products and enhances their sustainability.

According to 2017 U.S. EPA estimates, there were approximately 1.9 billion pounds of vinyl landfilled in the United States, and this represents 3.6 percent of all plastics sent to landfill.⁶ But we're not satisfied with our progress to date. The vinyl industry is increasing its efforts to divert landfilled material for repurpose, recycled feedstock, and reuse.

Implementing take-back programs.

Product manufacturers, including Interface, Tarkett, and Sika Corporation – Roofing, have implemented post-consumer take-back programs to reduce waste and improve recycling rates.

⁵ Source: Tarnell Company 2017 Recycling Survey, Sold Amounts
⁶ Source: U.S. Environmental Protection Agency Advancing Sustainable Materials Management 2016 and 2017 Tables and Figures pg. 15



PVC represents only 3.6% of all plastics landfilled

Landfill PVC in Perspective

Source: U.S. EPA Municipal Solid Waste Report for 2017

Interface's Flooring -ReEntry® program began in 1995 for post-consumer flooring. The company pre-screens commercial carpet tile and resilient flooring for plasticizers and certain heavy metals which have not been used in vinyl products for more than 20 years. The reclaimed vinyl materials are repelletized and used for content backing. On average, Interface recovers 10 MM pounds of vinyl material per year.

Tarkett's Flooring-Recovery program for post-consumer commercial flooring began in 1998. The company also pre-screens commercial carpet tile for plasticizers and certain heavy metals. The recovered carpet tiles are shredded and used for backing on new carpet tiles. Tarkett has recovered nearly 300 MM pounds total and 20 MM pounds in the last three years.

Sika Corporation – Roofing began its pre-consumer recycling efforts in 2000, and added its post-consumer effort in 2005. The recycling program allows building owners to recycle vinyl roofs at the end of their useful life. To date, the company has recycled 68 MM pounds.

Innovating with reclaimed vinyl materials.

Return Polymers, a company that develops recycled PVC compound solutions, has focused on diverting PVC from the landfill for more than 25 years. In a recent customer project, the company developed a 100% recycled vinyl compound capable of being extruded into complex refrigeration equipment profiles that was certified by the global safety certification company, Underwriters Laboratories (UL). The compound received the difficult-to-achieve V-0 flame retardant rating. Over the past 18 months, the company has diverted nearly 500,000 pounds of reclaimed vinyl materials from the landfill into this application.

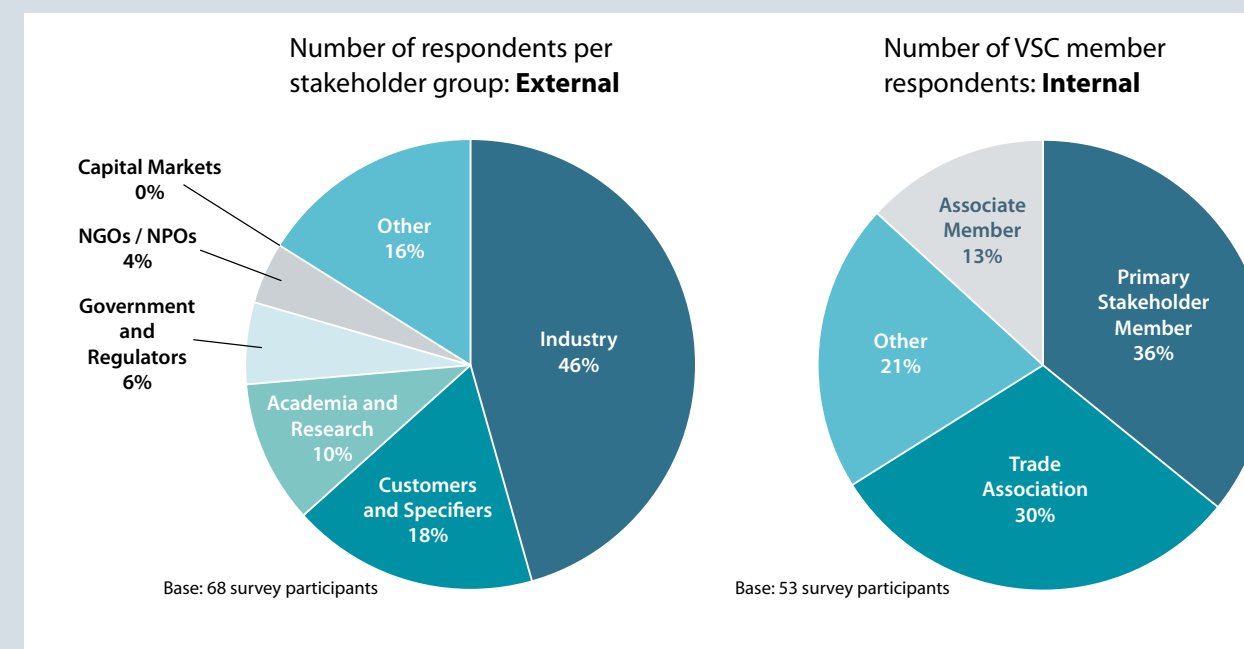
APPENDIX 3: LISTENING TO OUR STAKEHOLDERS

The Vinyl Sustainability Council (VSC) in 2016 hired an independent consulting firm to conduct a materiality assessment to identify opportunities for the vinyl industry to become more sustainable.

An inclusive approach.

The assessment included three components: a literature analysis, which consisted of analyzing more than 340 documents from academia, government, industry, and non-governmental organizations (NGOs); more than 60 surveys and in-depth phone interviews with critical external stakeholders; and an online survey of approximately 50 internal stakeholders (VSC members).

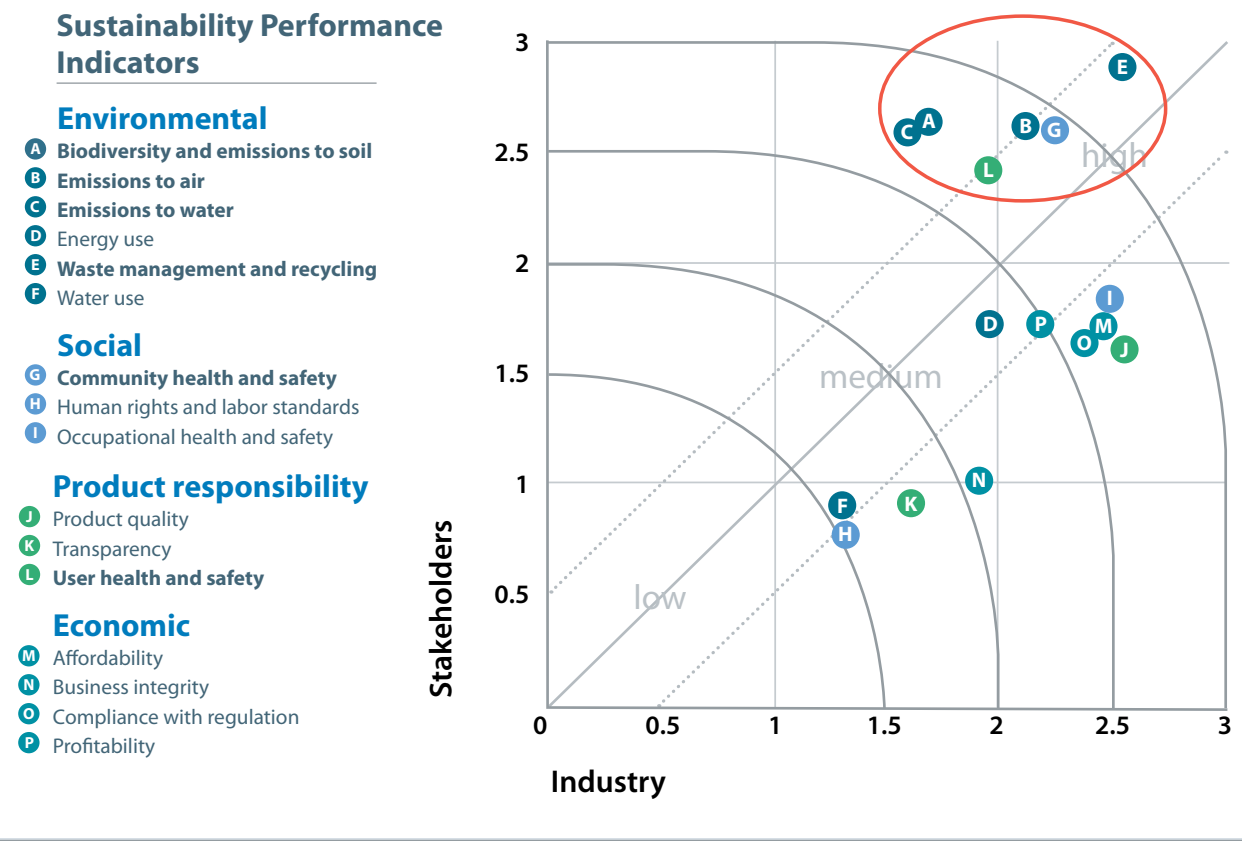
Internal and external stakeholders were asked to identify priority areas that are the most meaningful for the industry to act upon today. They also were asked to identify where within the value chain they perceived the biggest opportunities for improvement. This was an important component of the analysis because it helped the VSC identify where in the value chain an issue needs to be addressed.



Make-up of Internal and External Stakeholders Who Participated in the Materiality Assessment

The results of this research were synthesized and systematically assigned to sustainability performance indicators (SPIs),¹ which are used to measure a company's performance and to monitor and report on future progress. The assigned SPIs are grouped into three areas covering economic, environmental, and social aspects of sustainability.

Once assigned, the SPIs were ranked into high-, medium-, and low-priority areas and mapped onto a materiality matrix. The six SPIs located in the high upper right relevance quadrant are the priority areas the U.S. vinyl industry is focused on for the next four to five years.



Materiality Assessment Matrix

The literature analysis and the external stakeholder survey data were combined and given equal weight. The rankings were placed on the Y-axis. The internal stakeholder rankings were placed on the X-axis. External relevance is based on stakeholder survey (50%) and literature analysis results (50%). Source: S&C North America Inc

Our priority areas and impact categories.

The VSC's six priority areas ranked as high on the materiality matrix are waste management and recycling, biodiversity and emissions to soil, emissions to air, emissions to water, community health and safety, and user health and safety. The six priority areas were grouped into three overall impact categories: landfill diversion, health and safety, and emissions.



Mapping to UN SDGs.

The VSC's next step was to align our efforts with the United Nations Sustainable Development Goals (UN SDGs).² The VSC members determined that the sustainable benefits of vinyl products could tie back to almost all 17 goals. We decided to focus our efforts, however, on the three UN SDGs where the U.S. vinyl industry can make the most substantial contributions.



¹ Source: <https://www.pre-sustainability.com/sustainability-consulting/sustainable-practices/sustainability-strategy/sustainability-performance-indicators>

² Source: United Nations 2030 Agenda for Sustainable Development 2015

The VSC used the results of the materiality assessment to create a purpose-driven continuous improvement roadmap. We also used the results to mark our progress to date, establish a baseline, and benchmark our results moving forward.

At the 2017 Vinyl360 annual conference, the VSC led an industry discussion about impact categories and priority areas. During our discussion it was clear the VSC had gaps in information.

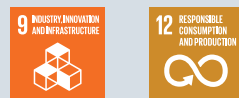
In response and as a next step, the VSC formed an industry task force in January 2018 that included representatives from the entire value chain. The task force reviewed feedback collected at Vinyl360 and began to develop industry goals and key performance indicators (KPIs) to address the information gaps as a starting point for 2019. The task force agreed that identifying best practices and calculating baselines needed to be the focus in the first period before setting numeric metrics. This resulted in the following goals and KPIs per impact category and the associated UN SDGs where the industry is and can continue to make significant contributions.

Impact Category 1 — Landfill Diversion

Priority Area: Waste Management and Recycling

Definition: Any impacts relating to the end of life of vinyl products as well as impacts stemming from the disposal of intermediary and byproducts during the production process.

Contributions to UN SDGs:



Location in the value chain where the opportunity exists based on the materiality assessment:

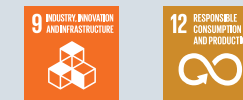


Impact Category 2 — Health and Safety

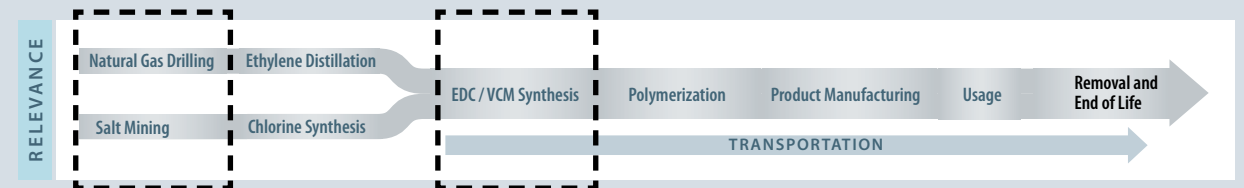
Priority Area: Community Health and Safety

Definition: Impact on the health and safety of communities immediately surrounding sites where raw materials are sourced for manufacturing facilities, and the location at which the product is used or disposed of.

Contributions to UN SDGs:



Location in the value chain where the opportunity exists based on the materiality assessment:



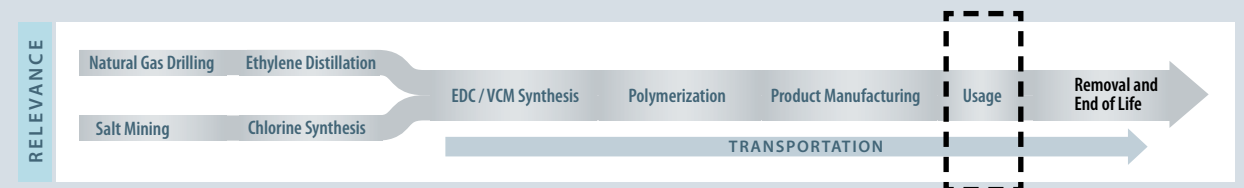
Priority Area: User Health and Safety

Definition: Product safety; minimizing health and safety issues such as hazardous emissions and contaminants, which can adversely affect human health and safety in the use phase of the product.

Contributions to UN SDGs:



Location in the value chain where the opportunity exists based on the materiality assessment:



Impact Category 3 — Emissions

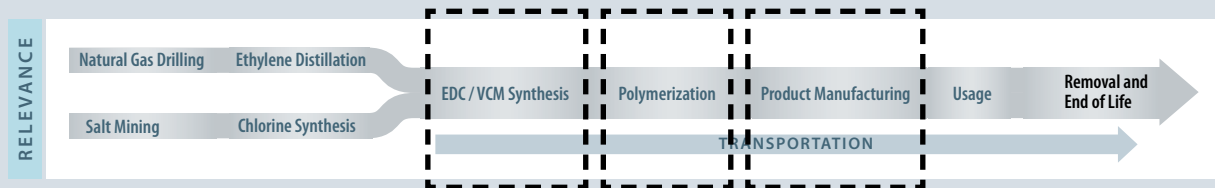
Priority Area: Emission to Air

Definition: Air pollutants as listed on the EPA's list of hazardous air pollutants, greenhouse gases (CO₂, CH₄, N₂O, HFCs, PFCs, SF₆), and also other air emissions considered "harmful" by stakeholders.

Contributions to UN SDGs:



Location in the value chain where the opportunity exists based on the materiality assessment:



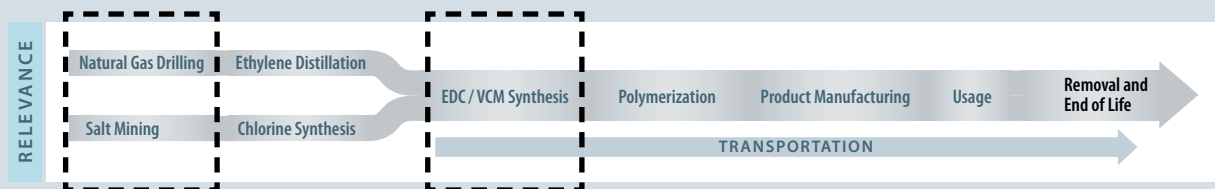
Priority Area: Emission to Water

Definition: Emissions stemming from point or diffuse sources that could affect the quality of surface water or groundwater it is emitted to.

Contributions to UN SDGs:



Location in the value chain where the opportunity exists based on the materiality assessment:



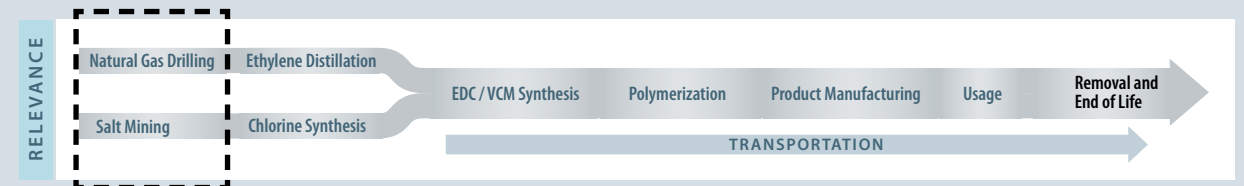
Priority Area: Biodiversity and Emissions to Soil

Definition: The degree to which life forms within an individual species, as well as across species in an ecosystem, are affected during sourcing of raw materials for production, use, and disposal of vinyl.

Contributions to UN SDGs:



Location in the value chain where the opportunity exists based on the materiality assessment:



APPENDIX 4: FORGING A PATH FORWARD

Guiding Principles.

+Vantage Vinyl™ is a value-driven management system focused on people and resources. It reflects our commitment to the prudent use of economic and natural resources to promote the long-term wellbeing of our society and environment.

Participants in +Vantage Vinyl seek to improve in three interrelated areas to benefit society and our global resources: environmental, social, and economic.

Commonly called “continuous improvement,” +Vantage Vinyl recognizes that opportunities for improvement may not occur in every aspect of every operation at any given time. Improvements will occur periodically in different areas and to different degrees by participating companies. The key is to ensure that continuous improvement permeates our thinking and allows us to seize the available opportunities, and never assume that today’s performance is the best achievable.

+Vantage Vinyl aims to drive continuous improvement across all three sectors of sustainability – environmental, social, and economic performance. This will be supported by collaboration and open communications through the Vinyl Sustainability Council, maximizing its contribution to the triple bottom line.



+ VANTAGE VINYL GUIDING PRINCIPLES

Our Guiding Principles set the direction and parameters of +Vantage Vinyl as aspirational pillars to be achieved over time within the scope of this initiative.

ENVIRONMENTAL STEWARDSHIP

- Reduce releases to the environment.
- Use land and other natural resources prudently to protect biodiversity and ecosystems.
- Implement water conservation practices to reduce the depletion of water resources and, thereby, support the availability of clean water.
- Minimize waste.
- Promote reuse, recycling, and recovery in accordance with sustainable materials management principles throughout the vinyl value chain.
- Employ responsible sourcing practices that encourage supplier reductions in environmental impacts and minimal use of natural resources with positive life-cycle implications.

ECONOMIC SOUNDNESS

- Treat suppliers, customers, and business partners fairly and ethically through honest and mutually beneficial dealings.
- Promote open and fair competition throughout the industry and in dealing with other business entities, regulators, and government officials. This includes compliance with competition and antitrust laws.
- Establish sustainability as a criterion in identifying research and development and innovation projects.
- Support long term planning through resource conservation and material efficiency when setting business strategy objectives and goals.
- Encourage educational programs or research related to sustainability and innovation.

COLLABORATION

- Work collaboratively to find solutions, create pilot programs, identify opportunities, and implement them for sustainability-driven advances and innovation.

SOCIAL DILIGENCE

- Manufacture safe and user-friendly products and consider potential effects throughout the product life cycle.
- Use environmental and safety management systems and operational best practices that minimize risk to employees, customers, and consumers.
- Avoid the use of lead, hexavalent chromium, and cadmium as added ingredients in vinyl components, and avoid the use of VCM that relies on mercury as a catalyst or reactant in any part of the process.
- Safely employ additives based on current data and scientific assessment methodologies.
- Continue to advance safe manufacturing practices that protect employees and the environment.
- Train employees on health and safety programs to minimize worker injury and illness.
- Provide ready and easy-to-understand access to relevant information about the company’s compensation, benefits, recognition and incentive opportunities that meet the changing needs of employees.
- Contribute to charitable outreach in the communities in which we operate.
- Subscribe to corporate governance policies that are opposed to child labor, bribery and corruption, human trafficking, and forced labor.

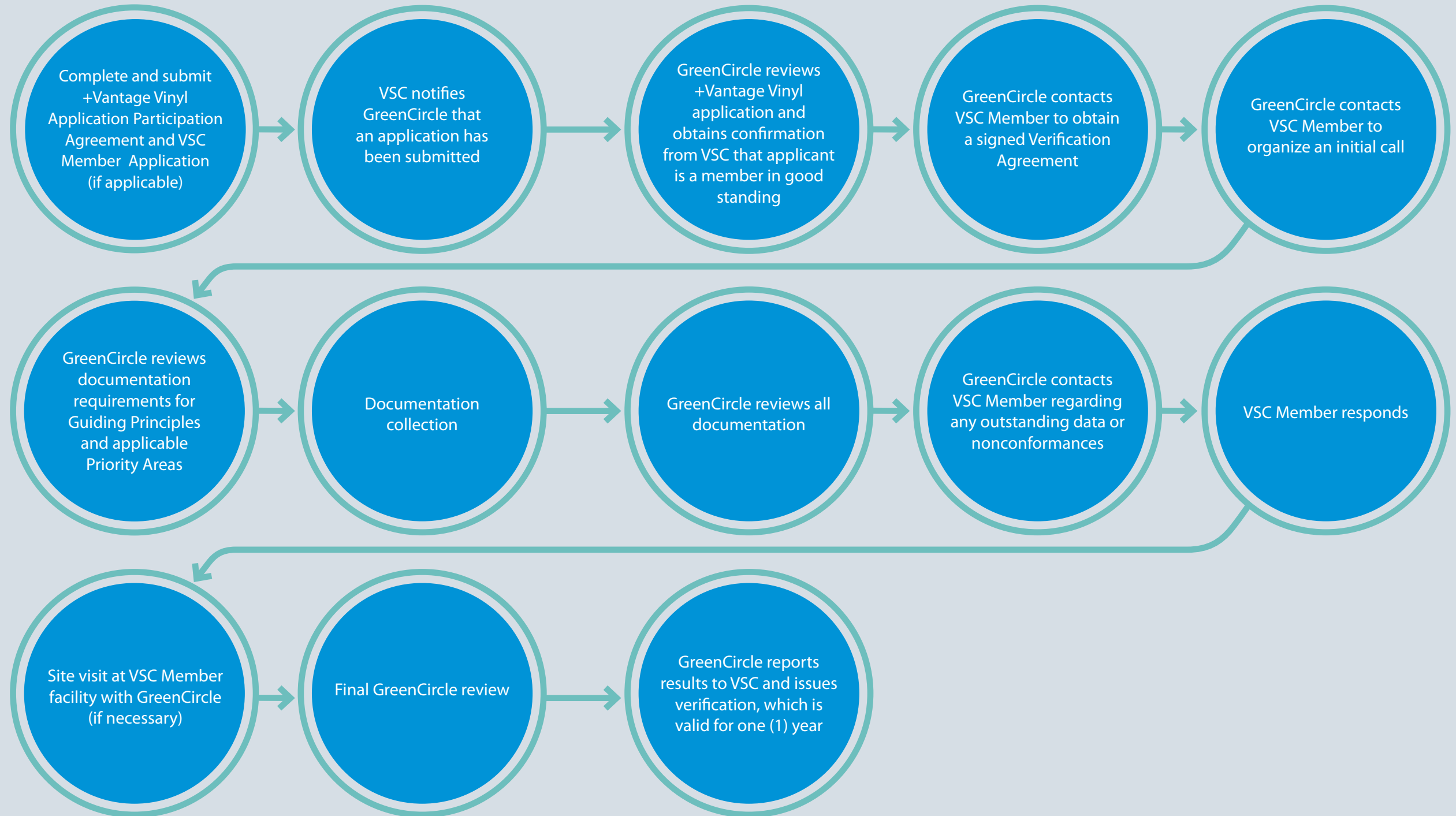
OPEN COMMUNICATIONS

- Recognize the principles of transparency and open communication.
- Support or contribute with relevant information to the VSC sustainability reports to highlight the initiative’s developments, accomplishments, and progress toward the goals and targets established through the initiative.
Note: VSC respects confidential business information (CBI), and participants are not expected to disclose CBI. In addition, the antitrust laws prohibit information exchanges that could serve as a facilitating mechanism for anticompetitive conduct. To avoid antitrust problems, competitively sensitive data will be aggregated and disclosed only when the identification of individual company information is protected and other antitrust criteria for sharing information are satisfied.
- Provide support to VSC to periodically inform stakeholders, consumers, and the public about opportunities, plans, and accomplishments related to the industry’s sustainability efforts.
Note: To promote awareness of sustainability, VSC and participating companies may hold community or stakeholder meetings to highlight the sustainable development efforts and engage participants in an open dialogue.
- Seek an open and collaborative dialogue with balanced social, environmental, and consumer non-profit organizations to constructively assess and refine +Vantage Vinyl to ensure alignment with sustainable development goals.

Monitoring and accountability.

Companies that participate in +Vantage Vinyl are subject to an annual verification process provided by GreenCircle Certified. This process verifies compliance with +Vantage Vinyl criteria.

Verification Process



Differentiating with the +Vantage Vinyl trademark.

Companies that successfully complete the verification process are awarded the right to use the +Vantage Vinyl royalty-free trademark and receive a verification certificate from GreenCircle. The trademark is used solely to indicate participation in the +Vantage Vinyl program and fulfillment of the company's commitments.

+ VANTAGE
vinyl FOR A
SUSTAINABLE
FUTURE™



vinyl SUSTAINABILITY COUNCIL

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