Sun Chemical Sustainability Report

Data to keep profitability flowing.

Issue Date: November 2021

working for you.

SunChemical®

a member of the DIC group

Color & Comfort

Message from Myron Petruch

We are pleased to present our twelfth and my third annual sustainability report. It is our mission at Sun Chemical to deliver products and services that help and enable our customers to meet their sustainability and business objectives. This might be through the transition we are making from fossil-sourced to responsibly biosourced raw materials, products designed to give improved performance during their useful lives or products that have enhanced performance and end-of-life in recycling streams. These innovations cannot be developed in isolation, and so Sun Chemical has joined many collaborative groups where material suppliers, brand-owners and recyclers work together to create change.

We're pleased with the progress we're making in the way we develop, manufacture and distribute our products and are excited to share some of that progress with you in this report.

Myron Petruch
President & Chief Executive Officer

Sun Chemical in Brief

Sun Chemical, a member of the DIC Group, is a leading producer of packaging and graphic solutions, color and display technologies, functional products, electronic materials and products for the automotive and healthcare industries.

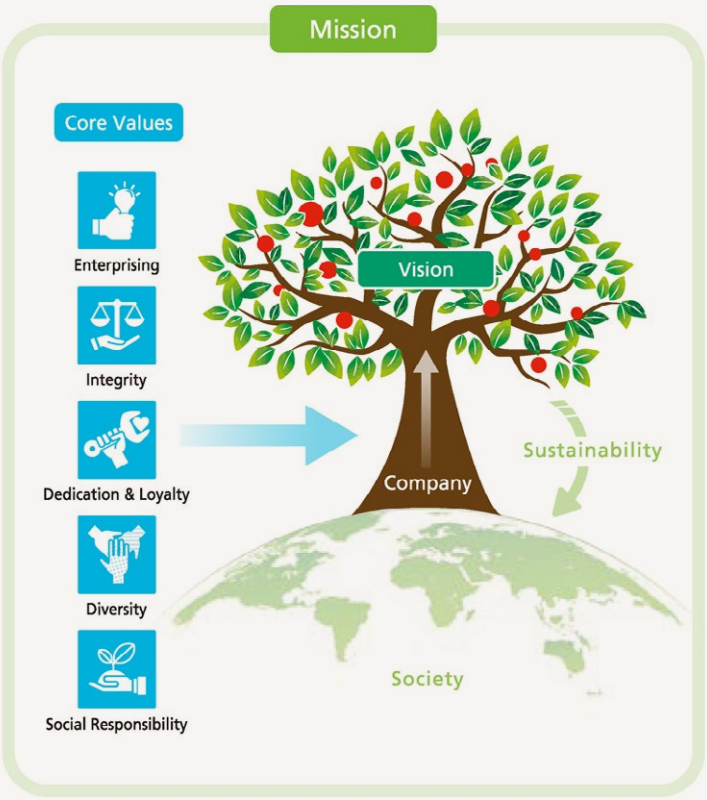
Together with DIC, Sun Chemical is continuously working to promote and develop sustainable solutions to exceed customer expectations and better the world around us. With combined annual sales of more than $8.5 billion and 22,000+ employees worldwide, the DIC Group companies support a diverse collection of global customers.

DIC and Sun Chemical have aligned their sustainability initiatives with the introduction of the "DIC Way." This approach provides guidelines to follow as we conduct our daily business and defines our fundamental management philosophy.

The mission of the DIC Way is to create enhanced value and utilize innovation to introduce socially responsible and sustainable products. The vision of DIC Way is to improve the human condition by safely bringing color and comfort into people's lives.

This is done through five core values:

- Enterprising
- Integrity
- Dedication and Loyalty
- Diversity
- Social Responsibility



A core value of the DIC Way is delivering sustainable product innovation through collaboration with industry leaders. DIC and Sun Chemical have aligned their global goals to define a shared sustainability strategy.


SUSTAINABILITY
STRATEGY

Sustainability Strategy

Working with industry leaders and in line with DIC Corporation's goal to achieve **carbon neutrality by 2050**, we are reducing global CO_2 emissions by increasing the use of biorenewable and recyclable materials, while promoting the value of these activities throughout the supply chain.

Our emphasis on sustainability continues to be fundamental to our innovation and product development, and our approach to sustainability will guide the way we develop, manufacture and distribute our products, as well as how we work with our customers and suppliers.

Sun Chemical's sustainability strategy is centered on how we innovate and how we optimize product development. Our commitment and focus are highlighted by our contribution to decarbonization and circularity. Understanding the impact of climate change, the reduction of waste and pollution, the preservation of resources and the social imperatives toward a sustainable society including food, safety and health matters are key in how we create a sustainable platform.

Our strategy includes key inputs to guide our decisions and our collaborations:

Alignment with the United Nation's Sustainability Development Goals
Focus on three pillars (Operations, Products and Services, Collaborations)
Create a cross-functional Sustainability Committee to implement and align key inputs
Build a sustainable framework focused on the "5Rs" (Reuse, Reduce, Renew, Recycle and Redesign)
Develop an umbrella branding called "SunEco" for products and services that communicate how product lines contribute to sustainability and circularity

Sustainability Strategy

Alignment with the United Nation's Sustainability Development Goals

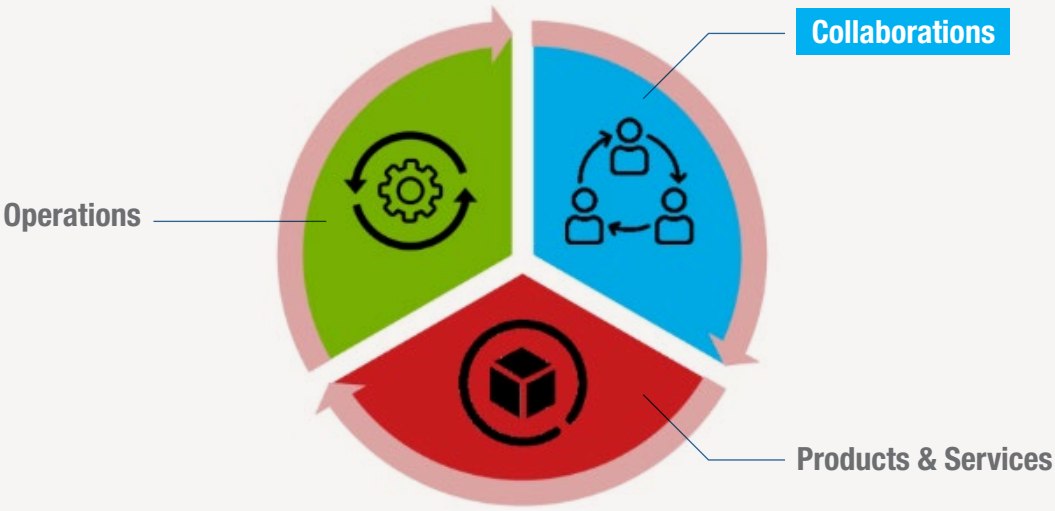
As part of the DIC Group, Sun Chemical has been a signatory to the United Nations Global Compact since 2010 and supports its Sustainable Development Goals (SDGs) and calls to action. The SDGs were set in 2015 by the United Nations General Assembly and are intended to be achieved by the year 2030. These 17 interconnected global goals are designed to be a "blueprint to achieve a better and more sustainable future for all." As a raw material supplier, Sun Chemical is most closely aligned with nine of the 17 SDGs—those impacting climate change and resource conservation; sustainable use of natural resources; and food, safety and health.

Focus	Climate Change/ Resource Conservation	Sustainable Use of Natural Resources	Food, Safety and Health
Social Issues			
Primary Value of Our Products	• Contain renewable raw materials • Energy saving and thermal insulation • Reduce weight • Cope with marine plastics	• Recyclable • Reduce waste • Long life • Reduce volume	• Health and comfort • Reduce food waste • Low VOCs and safety

VOC = volatile organic compounds

Sustainability Strategy

Focus on Three Pillars



Collaborations

By its very nature, the sustainability journey must be a collaborative one. No single entity can achieve success on its own; there has to be close cooperation among all stakeholders. Leveraging its position in the raw material supply part of the packaging value chain, Sun Chemical is active in cross-industry collaborative initiatives together with other sustainability leaders. We interact directly with our main customer base—the packaging converters—and their customers—the brands and retailers who sell to the consumer market, which ideally creates the inputs for the waste collection and recycling industry to create new raw materials.

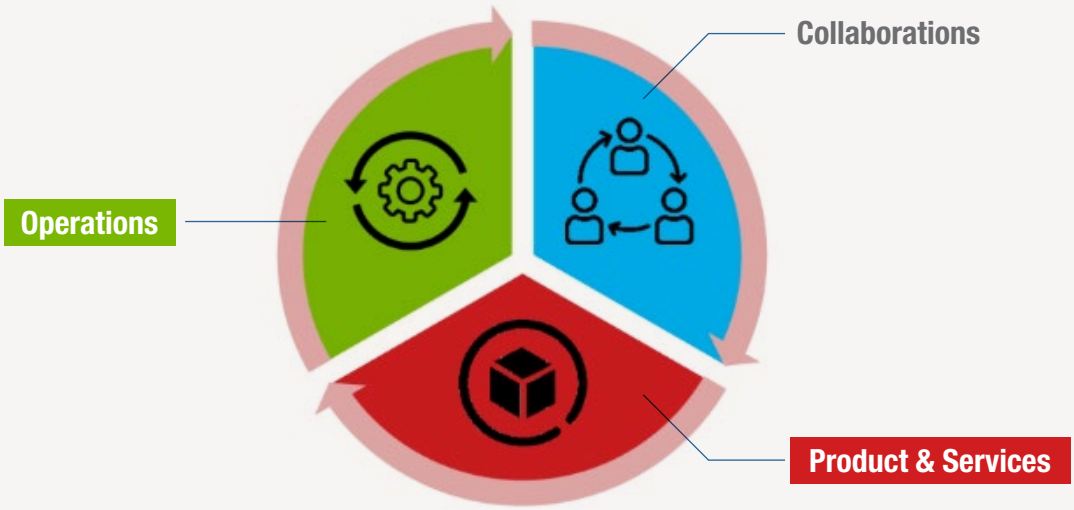
1. We are active with our suppliers in industry associations dedicated to corporate social responsibility and responsible material sourcing to ensure our suppliers are as committed to sustainability and corporate social responsibility overall as we are. We participate in various ink associations to ensure overall alignment of our part of the supply chain to the overall needs of the industry.

2. Through participation in respected packaging and recycling industry associations, we have contact with the full value chain. We gain visibility to requirements for today—whether from a brand owner or a recycler perspective, for example—as well as to new demands or technologies that are coming on the horizon.

Sustainability Strategy

Focus on Three Pillars

In addition to the wider industry connections, individual market collaborations toward more sustainable packaging formats are also part of the Sun Chemical strategy. While these initiatives are certainly good to reduce environmental impact, successful solutions are also market differentiators and bring opportunities for increased profitability. Some further examples of our collaboration efforts can be found in greater detail later in this report.



Operations and Products/Services

The ways in which we focus on operations and products and services will be outlined in greater detail in later sections of this report.

Sustainability Strategy

Create a Cross-Functional Sustainability Committee to Implement and Align Key Inputs

To formalize and further strengthen our commitment to sustainability, especially to address the specific needs in the packaging industry, Sun Chemical organized a Corporate Sustainability Committee in 2020. Comprised of a steering team of executive leaders, including CEO Myron Petruch, with a working team of responsible stakeholders from across all functions, divisions and regions, the Sustainability Committee is working to guarantee company-wide engagement in sustainability initiatives and will build and oversee the company's sustainability strategy, ensuring that resources are properly assigned for timely and effective implementation.

Driving many of the groups' activities are the sustainability goals of consumer packaged goods (CPG) companies. Increasingly, CPGs are setting ambitious sustainability targets for their organizations with goals of providing high levels of recyclable or renewable packaging as early as 2025, while reducing their use of plastics in packaging. These goals resonate with consumers and are driving many of Sun Chemical's product developments.

Sustainability Strategy

Build a Sustainable Framework Focused on the "5Rs"

The 5Rs framework is an organizing concept used to guide Sun Chemical's future roadmaps for existing and developing technology and product portfolios as well as our operational activities.

The 5Rs we reference are Reuse, Reduce, Renew, Recycle and Redesign, all of which support a circular economy and reductions in carbon footprint which can be applied from either an operational or product-oriented point of view.

When applying the 5Rs approach to operations:

- **Reuse** can entail recovering energy from waste streams, which also diverts those waste streams from less desirable disposal options like landfills.
- **Reduce** is about the various ways we minimize waste, energy use and emissions at our facilities.
- **Renew** can refer to accessing new renewable sources of electrical and fuel energy.
- **Recycle** can be about capture and recovery of solvents or other valuable raw material streams.
- **Redesign** reimagines alternate operational scenarios or technologies for conventional operations to improve efficiency and performance. Examples could include the use of automation or optimization of manufacturing campaigns to minimize unsustainable downtimes, equipment cleanups and startup waste.

Sustainability Strategy

Build a Sustainable Framework Focused on the "5Rs"

Similarly, applying the 5Rs framework to products, including pigments, inks, coatings and adhesives:

- **Reuse** is about designing products that contain post-consumer recycled materials or using protective coatings and resistant inks that can withstand multiple wash cycles to enable reusable articles or packaging.
- **Reduce** is about providing products that decrease overall packaging weight through protective and barrier coating or adhesive technologies as well as direct-food-contact inks. Sun Chemical products also help to reduce waste at converter facilities with multipurpose and extended-color-gamut inks.
- **Renew** can refer to Sun Chemical's product platform that delivers market-leading levels of biorenewable content, which immediately translates into CO_2 emissions reductions.
- **Recycle** denotes products we engineer that enhance recyclability, including repulpability and compostability of a range of packaging structures.
- **Redesign** of packaging and printing processes is enabled by our products. As the market considers transitions from plastic to paper or shifts from multimaterial to monomaterial structures or from laminations to monowebs, Sun Chemical has developed solutions that fundamentally redesign inks, which can lead to increased recyclability. Redesign is also about evaluating environmental footprints of different printing technologies, which Sun Chemical is supporting through implementation of life cycle assessment tools and capabilities.

Sustainability Strategy

Develop an Umbrella Branding Called "SunEco" for Products and Services that Communicate How Product Lines Contribute to Sustainability and Circularity

SunEco

To further organize our portfolio of sustainable inks, coatings and adhesives, which are designed to enable sustainable packaging and to contribute to increasing social value, we have also created the SunEco branding platform.

The designation is aligned with and guided by our 5Rs framework and allows for easy identification of the sustainability products. The SunEco platform will also allow us to continuously monitor the evolution and performance of the sustainability portfolio going forward.

A list of many of our sustainable products that fall under the SunEco designation can be found in our Guide to Sustainable Packaging.

OPERATIONS

Operations

Sun Chemical's Goals to Reduce Energy Consumption

Sun Chemical is committed to managing and reducing its energy consumption. Sun Chemical along with its parent company, DIC Corporation, is committed to a long-term strategic target to reduce CO_2 equivalent produced from its manufacturing operations.

Previously Sun Chemical had set a goal of reducing these levels by at least 30% by 2030 (taking 2013 as baseline). The DIC / Sun Chemical Group has now set a much more ambitious goal for a 50% reduction in the CO_2 equivalent of its manufacturing operation by 2030 and to achieve net carbon neutrality by 2050. This level of reduction is in line with limiting the effects of climate change to a 1.5°C increase.

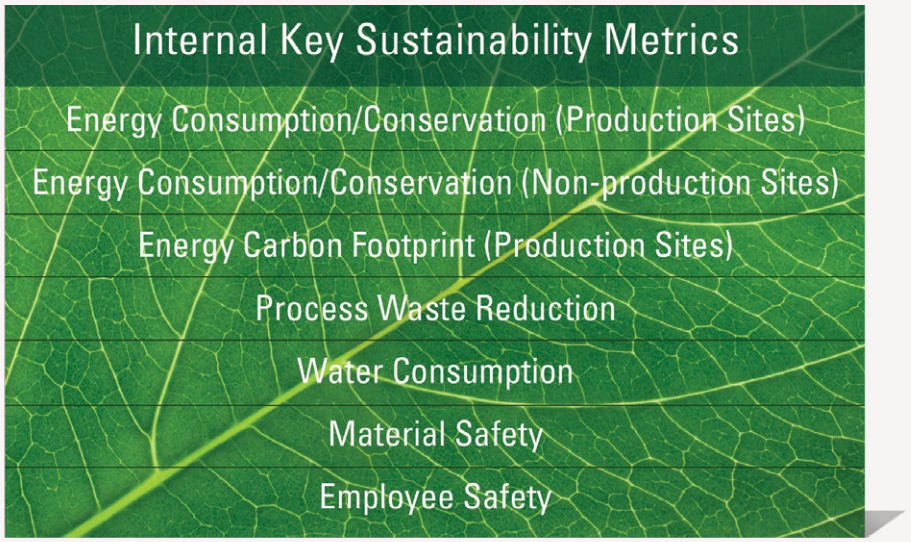
Solar power generating facilities at DIC Group sites in Japan (left: Tohoku, right: Nakatsu)

Sun Chemical has a strategic plan to achieve the CO_2 equivalent reduction target. This involves a combination of investing in green energy projects for Sun Chemical sites, investing in the energy efficiency of Sun Chemical buildings and manufacturing processes, and purchasing green energy as needed to ensure the targets are met.

Operations

Our Processes: Environmental Indicators

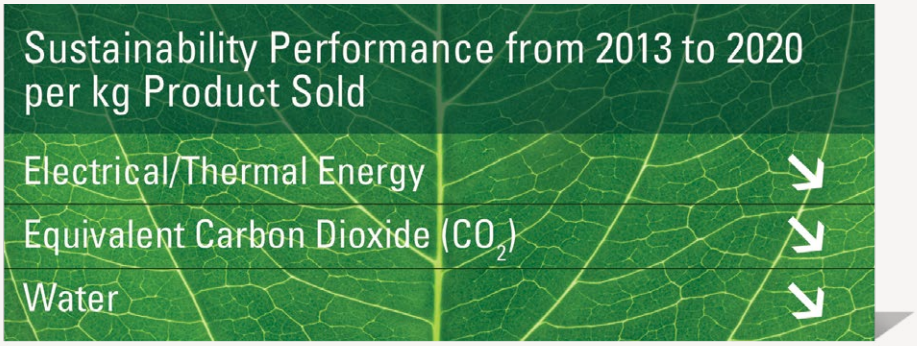
To achieve these ambitious goals, we are challenging ourselves to look for ways we can improve our processes at each individual site by monitoring key metrics to understand, manage and reduce our environmental impact. We regularly report on the following parameters:



Investments in Sun Chemical's Manufacturing Processes Reduce Energy Consumption

Sun Chemical continues to invest in projects that are designed to reduce energy usage and greenhouse gas emissions. Examples of the projects we have invested in that should result in the ongoing reduction of our global energy usage include:

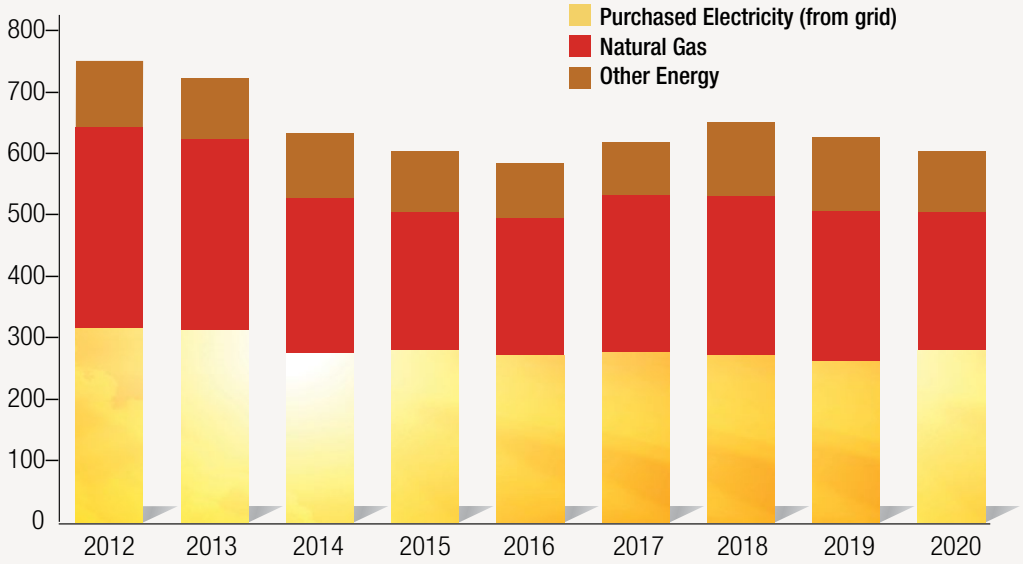
- the installation of solar panels
- a conversion to more energy-efficient motors on manufacturing equipment
- the installation of energy-saving lighting
- the improvement of compressed air systems' efficiency



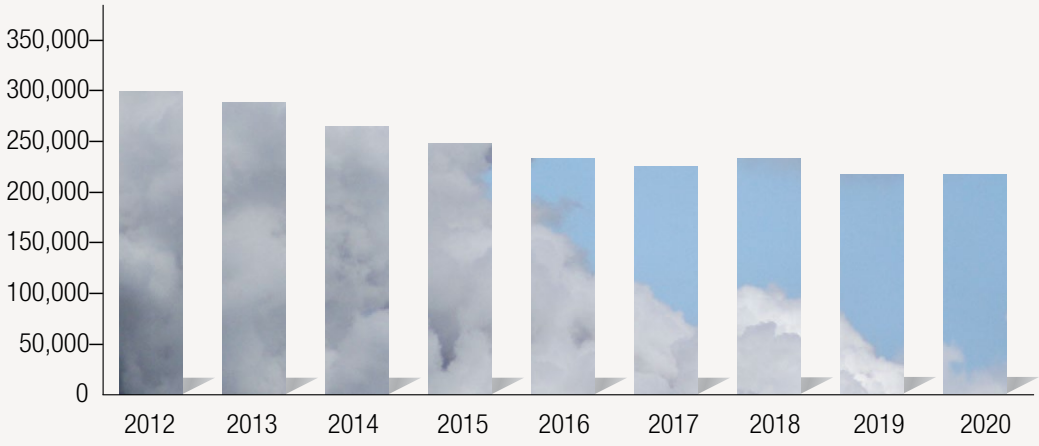
Operations

Energy Usage

Global Energy Usage [in GWh/yr]



CO_2 Equivalent of Global Energy Consumption [in tCO_2 e/yr]



In 2020 Sun Chemical reduced the CO_2 equivalent of its energy usage by 0.54% compared to 2019, with 2019 being 3.7% less than 2018.

The 2020 Sun Chemical CO_2 equivalent of energy use is now 20.8% less than it was in 2013.

The CO_2 equivalent reduction in 2020 as compared to the 2013 baseline is equivalent to:

Greenhouse Gas Emissions from:

13,261

Passenger vehicles driven for one year

or

153,239,727

Miles driven by an average passenger vehicle

Carbon Sequestered by:

1,008,218

Tree seedlings grown for 10 years

or

74,704

Acres of U. S. forests in one year

or

417

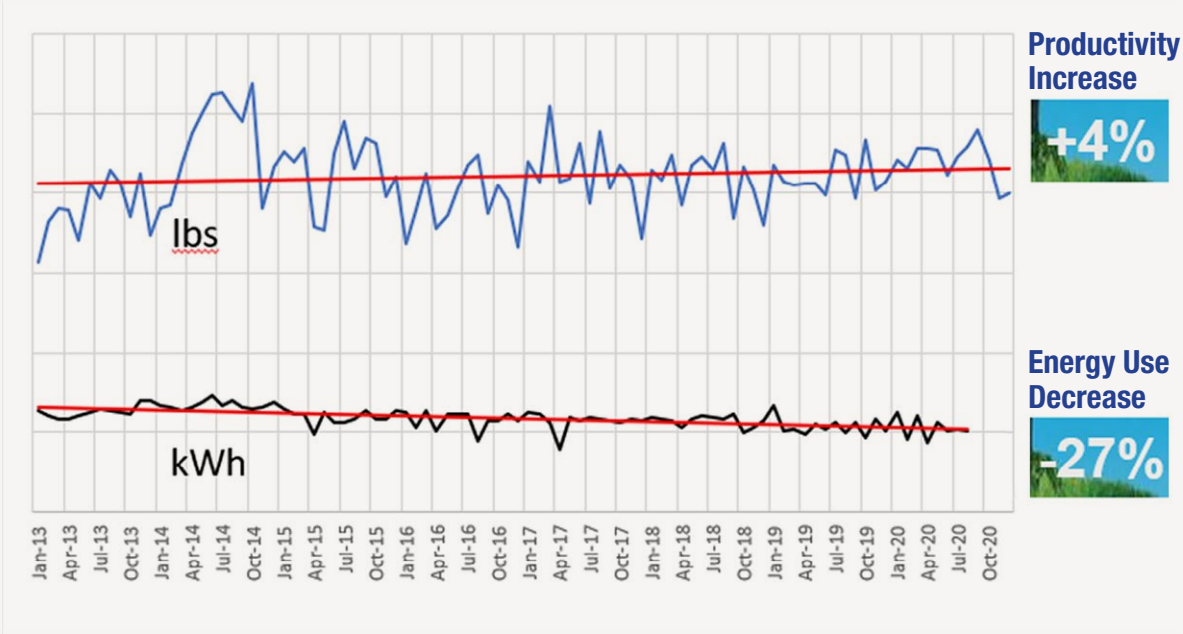
Acres of U. S. forests preserved from conversion to cropland in one year

Operations

CASE STUDY: Milling Optimization Program Increases Productivity and Reduces Energy Usage

Sun Chemical's milling optimization program was developed to maximize pigment color strength development in inks while minimizing dispersion time. This led to scheduling optimization to minimize the number of transitions needed and reduced the need for cleanups. It also allowed for improved equipment monitoring and the ability to measure the overall equipment effectiveness, ensuring the equipment is maintained within its OEM specifications.

The result has been both an increase in productivity and decrease in energy use.



Bead mill where productivity has been increased at the same time energy use has decreased.

Operations

CASE STUDY: Tub Washer Investment Significantly Reduces Electricity Usage Per Day

The investment in a tub washer at a United States manufacturing plant has reduced energy usage by 130 kW per day, the equivalent of 232 miles driven by an average passenger vehicle. The tub washer also uses 5.5% less detergent.

232

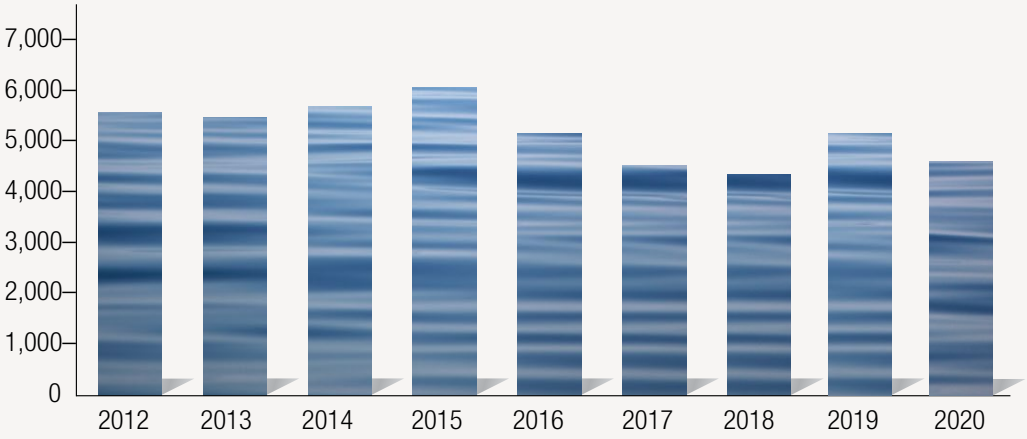
Miles driven by an average passenger vehicle

Operations

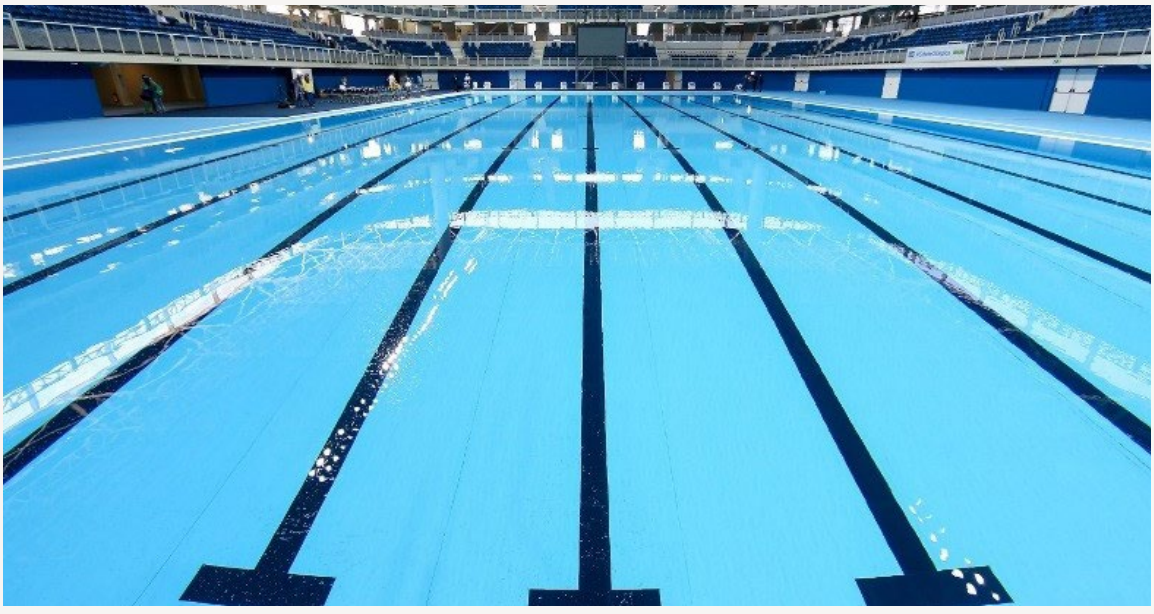
Water Consumption

Pigment manufacturing consumes the most water at Sun Chemical, but the company has implemented many projects to reduce it. In 2016 Sun Chemical targeted to not increase water consumption over the next two years. We are still achieving this goal.

Global Water Consumption [in thousands of cubic meters]



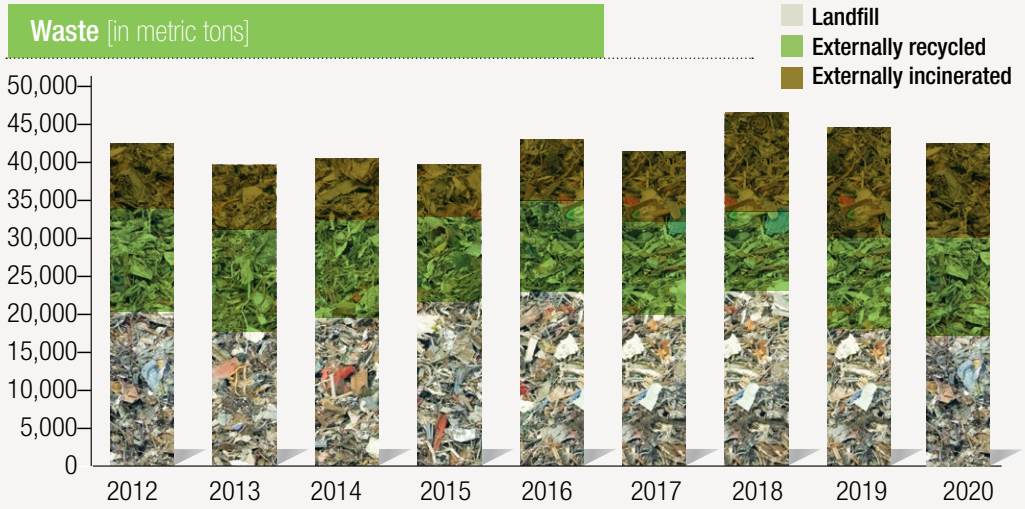
Water used in 2020 decreased by 6% compared to 2019. This water saving represents the water used to fill 120 Olympic-size swimming pools.



Operations

Waste Reduction

Sun Chemical's waste reduction programs are focused on improving the utilization of incoming materials, promoting recycling and optimizing the end of life of a product or material.



Sun Chemical's use of landfill is almost zero in Europe, while landfill is still an accepted and cost-efficient method for waste disposal in the Americas. Overall, use of landfill for waste disposal has declined over recent years, with recycling and energy-recovering incineration becoming more prominent.

In 2020 Sun Chemical sent 6.5% less waste to landfills compared to 2019, with 2019 being 19% less than 2018. Sun Chemical recycled 3.9% more waste than in 2019, and the overall waste produced was down 5% compared to 2019.

Initiatives such as using recycling bins throughout most of our Sun Chemical sites have enabled this trend.

Operations

CASE STUDY: Distillation Technology Investment Leads to the Recycling of Cleaning Solvents

One example of waste reduction at Sun Chemical is the use of modern distillation technology to recycle cleaning solvent. Units can be scaled according to need, from five gallons to 1,000+ gallons. The systems offer up-time, yield, quality and safety-management tools with a myriad of benefits, including:

- Every gallon of solvent recycled saves up to 10 kg of CO_2 emissions
- Minimal waste and disposal impact and costs
- Minimized virgin solvent use and costs
- Minimal associated transport impacts and costs

The installation of solvent recycling equipment has played an important role in reducing waste at Sun Chemical.

Operations

CASE STUDY: Investment in New Gas Scrubber Improves Emissions

The investment in a gas scrubber at Sun Chemical Poland is allowing the manufacturing plant to treat more than 7,000 cubic meters of air per hour, leading to improvements in emission air quality while at the same time increasing production capacity to meet local demands.

A gas scrubber investment at Sun Chemical Poland improved air quality and production capacity.

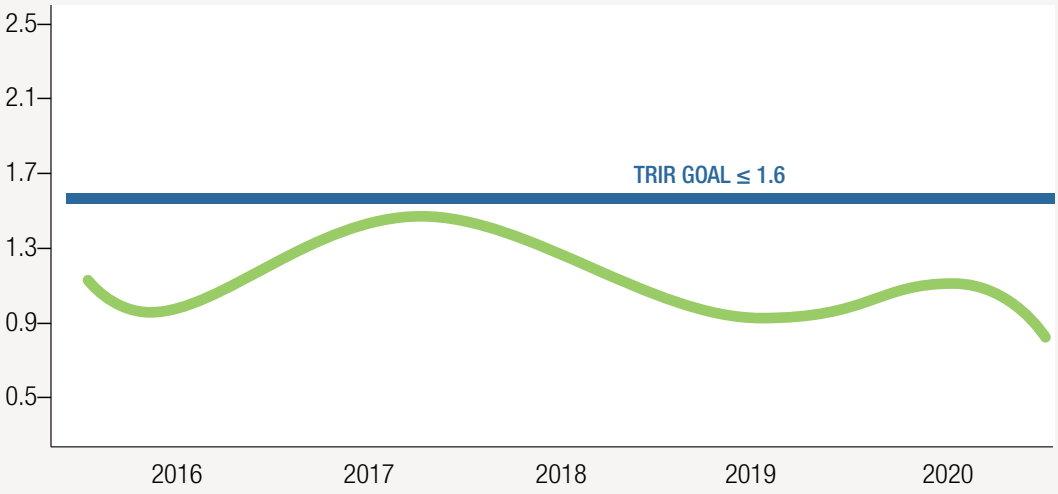
Operations

Safety Indicators

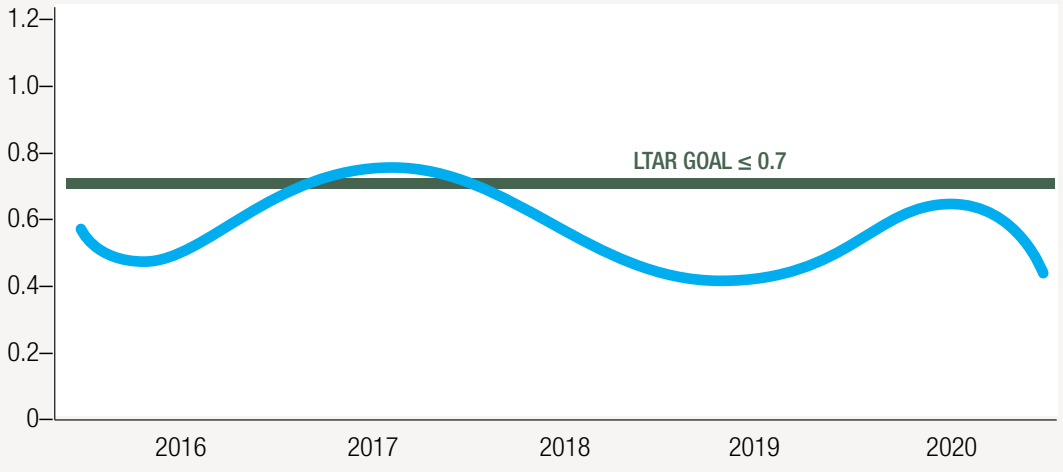
Like many other companies, Sun Chemical experienced incredible challenges in the response to the pandemic. Sun Chemical's strong safety culture and leadership enabled swift implementation of controls and practices to protect our workforce and business. In 2020, we saw an adjustment and then steady decline of workplace injuries from the start of the year, with an overall five-year favorable trend. Through dedication and teamwork, our remarkable employees continue to demonstrate resolve as we navigate the peak pandemic hotspots in the world.

Five-Year Incident Rate Performance (12-month rolling)

Total Recordable Incident Rate



Lost Time Accident Rate



PRODUCTS AND SERVICES

Products and Services

Reuse

Sun Chemical strives to design products that contain post-consumer recycled materials or with protective coatings and resistant inks that can withstand multiple wash cycles to enable reusable articles or packaging. Here are some ways Sun Chemical is enabling reuse:

- Sun Chemical has launched new **SunCure®** coatings made with high levels of biorenewable carbon-containing raw materials that can be incorporated into post-consumer recycled materials. The coatings have received excellent feedback following commercial trials. The launch marks a breakthrough for Sun Chemical's energy-curing line, as it is the first of many such products to be rolled out featuring significant levels of biosourced and recycled material.
- Waste material from spirulina algae production at Earthrise Nutritionals, DIC / Sun Chemical's food supplements business, is being purchased, processed and reused to develop new natural colorants for fully renewable ink formulations.
- The technical development of high-resistance inks and coatings continues toward products that can withstand multiple wash cycles to enable reusable printed containers and packaging.

Spirulina algae is sustainably cultivated and manufactured by DIC / Sun Chemical at Earthrise farm in California, U.S.A. Waste material from the algae is being reused to develop new natural colorants for inks.

Products and Services

Reduce

Sun Chemical works to develop products that decrease overall packaging weight or waste. Here are some ways Sun Chemical is using its products to reduce:

- Full-color-gamut ranges of direct-food-contact inks have been developed and approved for commercial applications in Europe, with expansion to additional global regions under review. Chemically formulated based on proprietary pigment selection, these water-based (**SunVisto® AquaSafe**), solvent-based (product not yet commercialized) and sheetfed (**SunPak® DirectFood Plus**) direct-food-contact inks enable packaging lightweighting by allowing for removal of protective film layers.
- Digital printing by its nature can deliver sustainability benefits through reduced ink waste and print inventory for applications in packaging, labels and textile printing. Two technologies developed to support this are pigment and direct-sublimation inks, now available through Sun Chemical's integration of the Sensient Imaging Technologies business.

  Pigmented inks (**Xennia™ Pearl, Xennia™ Emerald**) designed for printing natural fibers, polyester and cotton-polyester blends enable a dry process with no need for the steam fixation and post-wash processes required by other dye-based technologies. Direct-sublimation inks (**ElvaJet® Coral**) for polyester printing remove the need for a paper transfer step, eliminating a production process and the waste of paper and residual ink that are often discarded after application to the fabric. It is critical that the ink is designed for direct printing using appropriate chemistry that will not require a washing step to remove undesirable chemicals.
- A full range of UV-LED curing inks are available in the **SunWave™** offset and **SolarWave™** flexographic product lines. These inks enable a number of efficiencies and improvements on press, including the elimination of hazardous mercury and ozone, and reductions in energy use relative to traditional mercury UV lamps.
- Extended-color-gamut (ECG) and four-color process printing, supported through the **SunColorBox** color management digital platform, are being adopted by increasing numbers of customers globally. The technology enables reductions in ink inventory, press wash-ups and associated downtimes for increased efficiency and lower cost to print.
- **Benda-Lutz®** metallic powders and pastes provide industry-leading solutions for the autoclaved aerated concrete (AAC) market. AAC blocks are a thermally insulating, lightweight, precast building material. Using our premium products, AAC manufacturers can reduce the consumption of aluminum by up to 10% compared to alternative products.

Products and Services

Renew

Sun Chemical manufactures products that deliver market-leading levels of biorenewable content, which immediately translates into CO_2 emissions reductions. Here are some ways Sun Chemical is developing products that renew:

- The **SunVisto® AquaGreen™** platform of high-biorenewable-content water-based inks and coatings continues to expand and advance with fully natural ink prototypes now available. These are enabled by proprietary in-house resin developments that allow 100% biorenewable carbon content and styrene-free formulations. New SunVisto AquaGreen products have been launched for corrugated and liquid packaging applications, to supplement the foodservice product line.
- The solvent-based product lines are also developing toward high biorenewable content, with replacement of conventional raw materials by natural and/or renewable alternatives, including with fully or partially biobased resins, additives and solvents.
- New natural and renewable colorant and dispersion technologies are being developed for packaging and cosmetics applications. As an example, **LINABLUE®** spirulina extract is a unique natural blue food colorant and the only one approved for use in North America, EMEA (Europe, Middle East and Africa) and Asian-Pacific regions.
- Sun Chemical has launched new biorenewable cold-seal-release lacquer products, which are used in combination with cold-seal adhesives to seal heat-sensitive food packaging such as chocolates, candy or cereal bars. These new products contain more than 94% dry biorenewable content. Formal compostability certification is in progress, with promising results from preliminary field testing.

DIC plant-derived LINABLUE® is a vibrant blue food colorant that is extracted with water from spirulina algae.

- **SunPak® DirectFood Plus** sheetfed inks with market-leading pigmented direct-food-contact biorenewable content to 88% have been introduced to the market. These inks are suitable for direct food contact and represent a further advancement of Sun Chemical's SunPak® product offering of plant-based sheetfed inks. **SunLit®** commercial sheetfed inks have also been developed to provide the highest BRC content—up to 80% and more. These products are based on organic pigments and provide ISO 2846-1 conformity. Corresponding mineral oil-free, plant-based technology is also being developed in the commercial coldset product lines.
- Designed for the luxury packaging market, **SunCure® Agricure** (available in Europe only) has been launched as a new UV-curable ink technology based on high levels of biobased raw materials.

In all cases, responsible sourcing of raw materials is a key priority, which is supported through increasing involvement of Sun Chemical's supply chain in corporate social responsibility compliance and reporting managed through the EcoVadis platform. Sun Chemical is working with suppliers to ensure responsible sourcing for biobased raw material purchases.

Products and Services

Recycle

Sun Chemical actively explores ways to formulate solutions that enhance recyclability, including repulpability and compostability of a range of packaging structures. Here are some ways Sun Chemical is using products to improve recycling:

- Sun Chemical's **SunSpectro® SolvaWash GR and FL** washable/deinkable gravure and flexo-printable solvent-based inks have been designed initially for reverse printing of crystallizable PET shrink sleeves to allow higher quality and yield of recycled PET from bottle recycling streams. Additional product technologies, including UV-flexo and water-based inks, are in press trial and applications testing stages for PET shrink sleeves.
- The wash-off/deinking technology is simultaneously being extended to other film packaging formats, such as monomaterial polyolefin structures, with promising results against industry-standard recycling test protocols, including the enablement of greater recyclability of flexible film packaging by allowing the removal of color and other printing ink components during mechanical recycling. Additionally, for certain applications, recyclability entails design of retentive inks that stay with the printed substrates through specific recycling steps. For floatable film labels for PET bottles, for example, which are separated by floatation, the inks are required to stay on the labels. In both cases, either for deinkable or retentive systems, Sun Chemical offers technologies that enable recyclability of the printed packaging.
- Sun Chemical is also focused on recyclability of paper-based products and has developed internal or outside collaborative capabilities to study paper deinking, recycling and repulpability, including ways to minimize the formation of specks and stickies that can contaminate the recycled paper. **SunSpec™ SunStar** PE extrusion replacement coatings for paperboard in hot and cold cup applications impart repulpability and compostability to paper cups and straws, offer excellent liquid barrier and heat-seal properties, and are cost competitive with current polyethylene-containing structures and processes.

Sun Chemical has developed extrusion replacement coatings for paperboard in hot and cold cup applications that impart repulpability and compostability.

- To meet growing demand for compostable flexible packaging structures, a DIN CERTCO–certified industrially compostable solvent-free adhesive **(SFC100-HAC306)** developed by Sun Chemical can be used in combination with compostable films such as PLA, cellophane or BioPBS™, to name a few. The adhesive, which contains 74% biorenewable content (per ASTM D6866-18), helps create strong lamination bonds and can be used at required application weights without affecting biodegradability or disintegration of packaging structures. Both traditional and digital printing converters are developing compostable structures based on the SFC100-HAC306 enabling technology.
- Sun Chemical continues to expand its portfolio of OK Compost–certified inks, offering the market a full range of product technology for a comprehensive range of compostable packaging applications.

Products and Services

Redesign

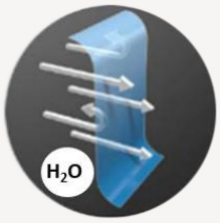
As the market considers transitions from plastic to paper or shifts from multimaterial to monomaterial structures and from laminations to monowebs, Sun Chemical has developed solutions that fundamentally redesign inks that can lead to increased recyclability. Here are some examples:

Conversion from Laminated Structures to Polyolefin Monomaterials

Traditional flexible packaging laminate structures employ multiple materials that are selected for their specific properties, such as printability, clarity, dimensional stability, heat resistance and barrier to gases and moisture. However, those mixed-material structures are not considered acceptable for the existing mechanical recycling infrastructure. Those packages are being redesigned to polyolefin (PE or PP) monomaterials.

Sun Chemical's barrier coatings for polyolefin films allow for recycling.

In order to provide such structures with suitable barrier properties for a wide range of applications and to enable the transition to those monomaterial designs, Sun Chemical has launched a flexo/gravure printable barrier coating (**SunBar™ Aerobloc**) for polyolefin films and a solvent-free adhesive with intrinsic barrier properties (**SunBar® Paslim SF**). The materials can be used independently and in combination to achieve an excellent oxygen barrier with high lamination bond strengths to enable the next generation of recycle-friendly flexible packaging.



Aqueous direct-food-contact varnish/ adhesive technology allows for the recyclability of paper substrates.

Conversion from Plastic to Paper

Most current flexible paper and rigid board food packaging still requires use of a plastic layer (mainly polyethylene) to protect the base substrate or the packed goods and to impart sealability. While this current solution, obtained either by lamination or extrusion processes, provides the desired functionality to the final package, it has limited recyclability in the paper-pulp stream and is ultimately unsustainable.

To improve the end-of-life attributes for such packaging, Sun Chemical launched new aqueous direct-food-contact varnish/adhesive families—**SunSpec™ SunStar** and **SunBar® Vaporbloc.** Both product lines provide heat sealability in replacement of polyethylene and can be used alone or as overprint varnishes on top of Sun Chemical inks. Both can be printed onto paper or natural fiber substrates in traditional paper mill and/or converter printing processes (e.g., flexography, rotogravure).

SunSpec™ SunStar additionally features grease and water resistance for transient to medium-term shelf-life packaging protection. SunBar® Vaporbloc also offers a moisture barrier, even in tropical conditions, for long-term packed goods protection. These materials can be used independently and in combination and can be further integrated with other oxygen- and mineral oil–barrier varnishes based on the target performance required by the specific plastic-to-paper package redesign process and on the type of food to be packaged. **SunScreen™** is a technology for accurately metering the applied coating weight of a transparent barrier varnish to optimize cost and efficacy.

COLLABORATIONS/SOCIAL RESPONSIBILITY

Collaborations / Social Responsibility

Working with Trade Associations

Participation with other sustainability stakeholders in cross-value chain associations is a foundational element in Sun Chemical's sustainability strategy. We are actively engaged in defining packaging design guidelines for recyclability, especially with respect to printing inks, coatings and adhesives, through leadership roles in CEFLEX, RecyClass and the Association of Plastic Recyclers (APR). We are also working toward the next generation of packaging waste sortation processes via the Holy Grail 2.0 project.

Collaborative Projects Lead to Proof-of-Concepts

Sun Chemical develops state-of-the-art proof-of-concepts for many collaborative industry projects that are designed to contribute to the enhancement of packaging sustainability and recycling. Here are some examples:

Collaborative project between Bobst, Plastchim-T, Ticinoplast and Sun Chemical led to this monomaterial BOPE barrier flexible packaging proof-of-concept.

Collaborative project between Elif and Sun Chemical led to a monomaterial MDO-PE barrier flexible packaging proof-of-concept.

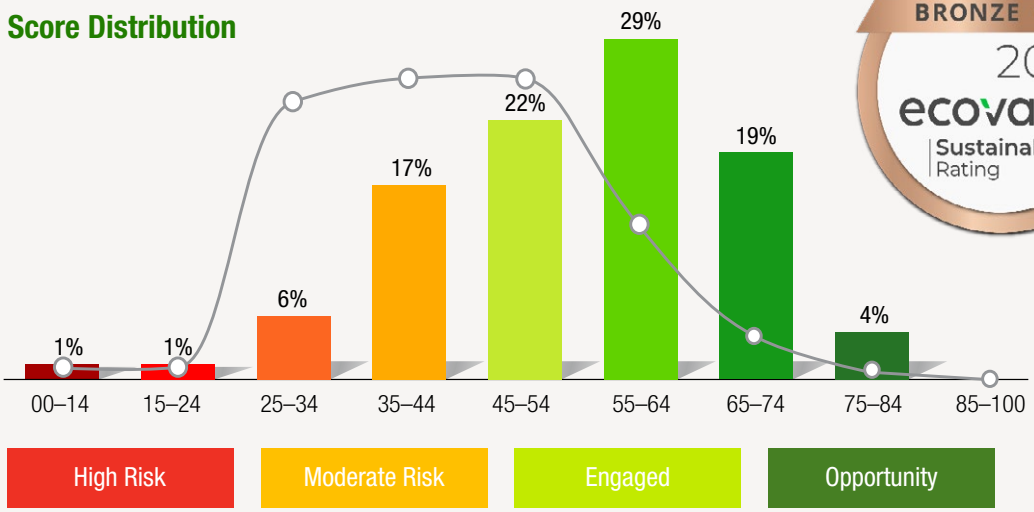
Collaborative project between Uteco, Novamont, Ticinoplast and Sun Chemical led to a compostable barrier flexible packaging proof-of-concept.

Collaborations / Social Responsibility

EcoVadis Sustainability Ratings

Sun Chemical continues to use EcoVadis to rank its corporate social responsibility (CSR). Over time, Sun Chemical's rating has improved. Sun Chemical currently scores 53/100, giving it a bronze EcoVadis rating and putting Sun Chemical in the 69th percentile as compared to similar businesses.

Sun Chemical has started an initiative for rating its supply chain using EcoVadis. Sun Chemical now has data from 78% of suppliers, with pending responses likely to increase this number to close to 90%. Sun Chemical suppliers have an average EcoVadis score of 54.1/100, significantly better than the EcoVadis database average of 43.1/100.



EcoVadis sustainability ratings evaluate strengths and weaknesses in corporate sustainability practices by providing benchmarking data that compares performance and offers customized recommendations specific to Sun Chemical.

ecovadis

Average score on EcoVadis database
43.1/100

SunChemical
a member of the DIC group
Color & Comfort

Program average
54.1/100

Collaborations / Social Responsibility

Corporate Social Responsibility (CSR)

Sun Chemical is working with its customers and the Carbon Disclosure Project (CDP) to provide data related to the environmental impact contribution for Sun Chemical products. This creates transparency in the value chain to allow meaningful sustainability strategies to be implemented.

In addition, Sun Chemical has been active in supporting other industry-recognized and/or recognized sustainability, circular economy and corporate social responsibility assessments.

SunLit® Diamond sheetfed offset process printing inks for paper and board application, as well as the **SunFashion™ BE Heatset Series** mineral oil, varnish and flush-based process ink series for heatset/offset printing for paper substrates, have been awarded bronze-level material health ratings by the Cradle to Cradle Products Innovation Institute.

As a group, DIC / Sun Chemical earned a B score in Enablers toward circularity in the Ellen MacArthur Foundation's Circulytics® assessment methodology, outscoring upstream chemical industry benchmarks across all categories, including strategy and planning, innovation, people and skills, operations and external engagement. The DIC / Sun Chemical Group is continuing to build on this strong foundation going forward.

SUSTAINABILITY LEADERSHIP

Sustainability is nothing new at Sun Chemical. For over a decade, Sun Chemical has shown its commitment and market leadership. With a newly launched cross-functional sustainability committee; a cohesive strategy focused on operations, products and services, and collaborations; and a guiding framework positioned around the 5Rs approach—**Reuse, Reduce, Renew, Recycle** and **Redesign**—Sun Chemical has continued to strengthen its message and advance its portfolio of enabling solutions in the marketplace to be the clear sustainability partner of choice.

Additional resources and information are available at **www.sunchemical.com/sustainability**, and at **#SunSustainability** on **LinkedIn** and **Twitter**.

A partner who transforms with you.

Today's environment requires more than change. It demands transformation—and a partner who's willing to transform with you. Sun Chemical, a member of the DIC Group, is a leading producer of packaging and graphic solutions, color and display technologies, functional products, electronic materials, and products for the automotive and healthcare industries. Together with DIC, Sun Chemical is continuously working to promote and develop sustainable solutions to exceed customer expectations and better the world around us. With combined annual sales of more than $8.5 billion and 22,000+ employees worldwide, the DIC Group companies support a diverse collection of global customers. Sun Chemical tailors solutions to unique customer needs and brings new ideas and the latest technology to market. As you move forward into a world of stiffer competition, faster turnarounds, more complex demands and sustainable products, count on Sun Chemical to be your partner.

working for you.

Contacts and Other Information

For more information regarding Sun Chemical's sustainability policy and effort, please contact:

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