



# SUSTAINABLE GROWTH

How to grow your packaging production sustainably: The advantages for you and your customers

working for you.



# THE PATH TO SUSTAINABLE GROWTH

**COP26, NetZero, the UN SDGs – sustainability is one of the most critical issues of our time, and even in an era in which a global pandemic has dominated news headlines and legislative agendas, sustainability has remained near the very top of the agenda in business, politics, and the media. The challenges of managing finite resources, reducing waste and curbing greenhouse gas emissions have become a much higher priority in recent years and there is broad consensus that the pace of change needs to accelerate. Concerns about climate change and pollution – particularly ocean plastics – are driving a high degree of urgency about moving to a more sustainable way of living and making better choices in how we produce and consume.**

**Recent consumer surveys, such as a 2019 global survey of 6,000 participants by Accenture, show a heightened sense of awareness of environmental issues and – crucially – that this is playing an increasingly important role in informing buying decisions.**

## A 'MUST HAVE' – NOT A 'NICE TO HAVE'

For modern businesses – in whatever industry or sector – environmental sustainability goes hand-in-hand with business sustainability as more and more customers factor environmental considerations into their purchasing decisions, and rapidly changing legislation forces continuous adaptation. Taking an environmentally sustainable approach is no longer an optional or extra for the ethical business. It is an imperative to long-term business survival and success.

For packaging producers, the issue of environmental responsibility is particularly acute as packaging plays such a visible and fundamental role in all our lives. Because of its prominence, and due to its sheer volume, it has become a target for environmental campaigners, legislators, and consumers. Packaging companies, and the brands they serve, need to do everything they can to demonstrate tangible progress towards the development of products and processes which minimize environmental harm.

## A CIRCULAR ECONOMY IN PACKAGING

The Ellen MacArthur Foundation defines a circular economy as “a systems solution framework that tackles global challenges like climate change, biodiversity loss, waste, and pollution.” The end goal is an economy in which products at the end of their functional lives are fed back to replenish the system, rather than being discarded and replaced with new products created from limited primary resources.

Adopting the practices of the circular economy in your business – besides the obvious environmental benefits – can simultaneously boost business growth and enhance public perception.

Part of the strategy for arriving at this circular economy is the well-known mantra of the three Rs: Reduce, Reuse, Recycle, and while this is an excellent place to start, there are two more 'Rs' that are no less important: 'Renew' and 'Redesign'. Taken together, these 5 Rs provide an excellent framework for building a sustainability-focussed business that will create value in the eyes of its customers.

## WALKING THE TALK

Here, we aim to provide a practical guide for packaging producers looking to build their businesses in the most sustainable way possible. Meaningful environmental change can also bring significant business benefits and packaging businesses around the world are recognizing this opportunity.

As a global pigments, inks, coatings and adhesives supplier, Sun Chemical is supporting fundamental change in the industry by working with customers around the world to help improve environmental practices and move towards a circular economic model.

This guide considers each of the 5 Rs in turn, demonstrating that the path to a sustainable future lies in embracing enabling technology and through the power of innovation. Through the framework of the 5 Rs we'll outline practical steps businesses can take to become a meaningful part of this change – while at the same time future-proofing their businesses and, indeed, their reputation.



83%

of consumers believe that it is important for companies to design products that can be reused or recycled<sup>1</sup>



50%

of consumers would pay more for a product designed to be reused or recycled<sup>2</sup>



36%

of consumers would pay more for a product made from recycled materials<sup>3</sup>



# REDUCE

## YOUR PACKAGING CAN DO MORE, WITH LESS

The second R, “Reduce” is all about minimizing the amount of packaging, and eventually waste, created. Reducing packaging, in terms of structure, size, and weight – also known as ‘lightweighting’ – brings important environmental and business benefits. Not only does it save on materials, material costs, and the environmental impact of production and transportation processes, it can also make products easier to recycle. As a result, there is significant demand from converters to continue lightweighting their products through enabling technologies, in order to improve environmental credentials, extend shelf life and reduce waste.

Additionally, color management tools, such as ECG printing, reduce waste and press downtime, enabling full digital color management from design to press, enhancing productivity at each step of the workflow. Therefore, contributing to a reduction in packaging, by consciously choosing a supplier that contributes to waste reduction and landfill diversion, is essential for converters to remain ahead of the curve in meeting customer demands.

# REUSE

## GET AHEAD OF THE CURVE: LEAD THE CHARGE TO REDUCE SINGLE USE PLASTIC

In recent years, we’ve seen a spotlight on the dangers of a ‘throw-away’ culture, and the use of materials such as single-use plastics, with a significant increase in research, documentaries, and media coverage highlighting the dangers. As disposable plastic generally doesn’t biodegrade, it ends up contaminating the environment, resulting in polluted oceans and overflowing landfills. With heightened awareness of the ongoing plastic crisis and regulations with regard to single-use plastics changing globally, brands are under increasing pressure to conform to sustainability demands. High-profile brands, particularly in the food and retail industry, have switched to reusable materials when it comes to cutlery, straws and plates for example, and have set a precedent for other brands to follow suit.

Conventional plastic’s lack of biodegradability is a well-known environmental challenge – but when it comes to the increasingly popular reusable, or multi-use packaging, this environmental weakness can become a strength. Packaging that can be washed and reused multiple times by the consumer, rather than being immediately disposed of, can provide significant environmental benefits over the long term. Its creation presents a very different set of inks and coatings challenges because printed articles need to be much more durable than traditional types of packaging.

With this being such a topical issue, the importance for brand owners to conform to the demands set out by consumers and the media are higher than ever. Converters must therefore ensure they have the materials and resources ready to cater to this demand – investing in inks and coatings solutions that are robust enough to survive multiple washes over longer periods of time.



# 95%

of consumers say that they would be willing to take back packaging or containers for refill<sup>4</sup>



# 43%

have participated in a product ‘take back’ program<sup>5</sup>

# RENEW

## SWITCH TO BIO-RENEWABLE INKS, COATINGS AND ADHESIVES THAT, INSTEAD OF BEING AT ODDS WITH THE NATURAL WORLD AROUND US, ARE INCREASINGLY IN HARMONY WITH IT

Beyond Reduce, Reuse and Recycle – think ‘Renew’ and consider the bio-renewable alternatives to fossil fuel-derived packaging products.

The appeal to consumers can be improved – as they become increasingly concerned by climate change and continue changing their habits to conserve the planet – by developing and promoting eco-friendly products that are made from renewable resources.

### START SLASHING CO2 EMISSIONS TODAY

Replacing fossil fuel-derived packaging with bio-renewable alternatives can translate into immediate CO2 emissions reductions for your business.

Increasing the use of bio-renewable resources in your business activities is also key to boosting sustainability and supporting circularity. Technology in this area has advanced considerably in recent years, with a rapidly growing range of options of responsibly sourced bio-renewable inks and coatings. These can allow substantial reductions in CO2 emissions by upwards of 1kg per for every kilogram of ink used, for example, or over 33% relative to conventional alternatives. And with ongoing developments, these figures are continuing to increase.



Global production of bioplastics is predicted to increase from around **2.42 million tonnes in 2021 to approximately 7.59 million tonnes in 2026<sup>6</sup>**. This will bring the overall share of bioplastics in global plastic production to more than two percent of total plastic

<sup>6</sup> <https://www.european-bioplastics.org/market>

<sup>4,5</sup> Accenture, 2019: <https://newsroom.accenture.com/news/more-than-half-of-consumers-would-pay-more-for-sustainable-products-designed-to-be-reused-or-recycled-accenture-survey-finds.htm>

# RECYCLE

## NO MORE CRADLE TO GRAVE. MAKE THE SWITCH TO CRADLE-TO-CRADLE ALTERNATIVES TO FEED THE CIRCULAR ECONOMY

Recycling is a key component of any conversation about sustainability in packaging. The use of more easily recyclable materials leads to lower levels of waste at the end of a product's life – making an important contribution to the circular economy. In response to pressure from brands and consumers – as well as legislation – the market will inevitably continue to move towards a more circular approach that allows valuable resources to be recycled and prevents packaging from ending up in landfill or, even worse, waterways and oceans.

The industry, under the guidance of organisations such as CEFLEX (Circular Economy for Flexible Packaging), APR (The Association of Plastic Recyclers), RecyClass and SPC (the Sustainable Packaging Coalition), is seeing a tremendous amount of work happening across the value chain to re-design packaging structures to make them recycle-ready. One of the most notable outcomes of these recyclability initiatives has been a drive towards mono-polyolefin structures and a reduction in the use of complex multi-material structures.

## IF THE INKS AREN'T DEINKABLE, THE PACKAGE CAN'T BE FULLY CIRCULAR

When it comes to the recyclability of both plastic and paper-based packaging, deinkability is crucial.

There are a range of inks and coatings available that wash off without creating color bleeding in standard mechanical recycling processes, allowing for higher quantity and quality recycling, without downcycling.

For example, recycle-friendly washable ink technology can be removed without staining the flake or wash water from post-consumer printed PET packaging during the hot caustic wash step of the recycling process. Designed specifically for printing on crystallisable PET shrink sleeves, these inks allow for the increased recovery of high-quality, clean, recycled PET resin flakes.

Another common customer demand is systems for caustic-resistant ink – for retention on BOPP labels and sleeves meant for PET bottles, for example. Caustic-resistant primers, coatings and inks can be used for this purpose. They can offer high resistance properties for mono-web labels, as well as improving recycling performance. UV curing primers

## BARRIERS AND PACKAGING MATERIALS MUST ALSO BE CONSIDERED

Sometimes packaging materials superficially appear to be recyclable, but due to the presence of hidden layers, one example being film barrier layers in paper or board structures, they are in fact, not, and are ultimately sent to landfill. Functional barrier coatings are therefore also very important for recycling.

## REAL ALTERNATIVES. REAL SOLUTIONS

The right barrier coatings, inks and adhesives, can together enable a mono-material package with oxygen barrier properties matching those of a multi-material structure, while preserving all other application properties.

Ultimately, with recycling being such a hot topic, it is crucial for converters to understand the processes and what is required from a packaging point of view. By working with suppliers that offer enabling technology to minimize non-recyclable packaging and waste, brands can meet customer demands for more sustainable solutions, and enhance their overall perception in the market.

# REDESIGN

## THINK CREATIVELY, THINK DIFFERENTLY TO GET YOUR PACKAGING WORKING MORE SUSTAINABLY

To make packaging more reusable; to reduce packaging waste and weight; and to make it more renewable and recyclable, often requires a fundamental rethink of packaging design.

### REDESIGN TO MAKE PACKAGING MORE REUSABLE

As the linear economy declines, packaging redesign is critical, with an emphasis on packaging lifecycles that do not end up in landfill or incineration, but instead re-enter the circular economy.

Choosing a packaging design that predominantly or entirely includes conventional non-biodegradable plastic, enables consumers to wash and use it multiple times in the future. Ultimately, this benefits the environment more than if they had used single-use packaging that is set for the landfill after the first and only use.

### REDESIGN PACKAGING TO REDUCE WASTE AND WEIGHT

Protective barriers can ensure better quality and shelf life of products, thereby helping to reduce waste.

Barrier selection in packaging redesign is a crucially important aspect of reducing packaging weight to help it contribute to carbon reduction – also known as lightweighting.

Water-based coatings that can be applied by flexo or gravure applications can create a barrier against moisture, oxygen, CO<sub>2</sub>, UV light, odor and migration, keeping products protected and simplifying structures without adding extra weight through traditional plastic films.

Additionally, solvent-based lamination adhesives can deliver oxygen barrier properties to high-performance structures such as retort and sterilization, reducing the volume and cost of the film used, enabling the production of thinner and lighter laminated packaging films, as well as preventing food deterioration. In addition to using fewer raw materials, these innovative packaging solutions are also potentially easier and less energy-intensive to recycle.

The need for barrier technology will only increase going forward, as the market attempts to develop mono-material structures. Protective coatings that reduce the need for laminates and extruded plastic films and which therefore allow for the downgauging and simplification of label structures, among other solutions, will be necessary.

### REDESIGN PACKAGING TO USE MORE RENEWABLE MATERIAL

The exploration of alternative technologies is another key area of redesign. Across all inks and coating types – whether water-based, solvent or energy curable – there are more and more options for making each of them more sustainable.

Instead of using full petrochemical-based inks, packaging companies are using more renewable inks, based on bio-renewable raw materials.

Using water-based inks with more biorenewable content, setting up solvent capture systems for solvent inks, or using low energy curing UV ink alternatives, are all ways that your business could lower its carbon footprint for its printing processes and packaging applications.

### REDESIGN PACKAGING TO MAKE IT MORE RECYCLABLE

Switching from plastic packaging to paper-based alternatives is a growing trend in the market – yet this requires different ink, coating and adhesive selections in order to achieve good performance, so this must be considered.

A particular aspect to keep in mind is that in the switch from plastic to paper, moisture, grease and oxygen barrier properties must be maintained.

Polyolefin structures, which can be recycled, generally have lower barrier properties compared to the current PET structures, so will need enhancing going forward.

Barrier coating and adhesive products can be key enablers, and Direct Food Contact (DFC) barrier varnishes can act as plastic replacements in redesigned plastic packaging using paper-based alternatives.

# SUN CHEMICAL SOLUTIONS

## ENSURE A SUSTAINABLE FUTURE FOR YOUR BUSINESS

Over the decades, Sun Chemical has invested in its R&D to improve the efficiency and sustainability of its inks, coatings and adhesives. With the expertise that we've developed through that process, we offer not just a range of highly efficient products to help your business to improve its environmental credentials – but through our 5 Rs approach, we also offer expert advice and consultation to ensure you derive full benefit from our solutions and get the best possible results.

Whatever your business's specific environmental challenges, Sun Chemical has the product range and the expertise to help you to meet those challenges head on and to take advantage of the business growth opportunities this sustainable approach provides.

## RENEW

Sun Chemical is actively developing its solutions to include higher bio renewable content, including more sustainable solvent-based solutions. In 2002, Sun Chemical made a decision to reformulate its sheetfed offset inks to use renewable raw materials to the highest possible proportion.

Sun Chemical's SunVisto™ AquaGreen offers an effective solution as a water-based range of renewable inks. The range is uniquely formulated with significantly higher levels of bio-renewable resin content (65%), compared with previous market offerings, while still exhibiting equal or superior print performance. The formulations meet the current technical and cost criteria of acrylic based inks, while the overall bio-renewable content of the inks is approximately 55-60%. This unique technology enables the inks, which are widely used for food packaging, to meet demand from customers and brand owners for more sustainable products. If this technology were globally adopted by all brands, carbon dioxide emissions would be reduced by an estimated 700,000 tons.

Sun Chemical's flagship low migration food packaging offset ink set, SunPak FSP, is based on renewable biobased materials and has achieved a new standard in eco-friendliness through a combination of compliance and sustainability. Not only is the ink set compliant with all existing food packaging legislation worldwide, but it has also been independently tested by Beta Analytic, the world leader in carbon-14 measurements, to prove the high level of environmental sustainability.

## REDUCE

Sun Chemical has two breakthrough oxygen barrier technologies which aid lightweighting while ensuring high standards of food preservation and extended shelf life.

**SunBar** is a water-based coating that can be applied by flexo or gravure applications that delivers oxygen barrier properties of less than 1 cc/m<sup>2</sup>/24 hours from a 0.3µ thick coating. Creating barriers against moisture, oxygen, CO<sub>2</sub>, UV light, odor and migration, SunBar coatings provide cost-effective, durable and compostable films by creating a pinhole-free, and flexible gas barrier layer that can be easily overprinted with our compostable inks and laminated to a variety of secondary films.

**Paslim** is a solvent-based lamination adhesive suitable for high performance structures such as retort and sterilization, which also delivers oxygen barrier properties that potentially allow three ply structures to be down gauged to two ply structures delivering both cost and environmental benefits. Enabling the production of dramatically thinner and lighter laminated packaging films, as well as preventing food deterioration, Paslim reduces the volume and the cost of film

## REUSE

Sun Chemical's SunCure® coatings are 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.

Additionally, waste material from spirulina algae production at Earthrise Nutritionals, DIC / Sun Chemical's food supplements business, is being processed and reused to develop new natural colorants for fully renewable ink formulations and our technical development of high-resistance inks and coatings continues toward products that can withstand multiple wash cycles to enable reusable printed containers and packaging.

## RECYCLE

Sun Chemical is actively exploring a range of solutions to enhance recyclability, including repulpability and compostability of a range of packaging structures.

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.

**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. They are highly cost competitive with polyethylene-containing structures and processes.

## 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, leading to increased recyclability.

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**) – both also mentioned above in 'Reduce'.

Additionally, in line with the trend to replace plastic with fibre-based alternatives, Sun Chemical has developed DFC inks for use with its compostable DFC barrier varnishes. These DFC inks – Sun Chemical's water-based **SunVisto™ AquaSafe** inks, which have been successfully used on paper drinking straws – can be printed flexo on paper or corrugated board. Significantly, the combination of DFC and compostable inks and barrier coatings means that you can safely print on the inside of food packaging without the need for a plastic film to protect the food.

## 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:

**Global Marketing and Environmental Health & Safety**  
Sun Chemical | 135 West Lake Street, Northlake, IL 60164

[globalmarketing@sunchemical.com](mailto:globalmarketing@sunchemical.com)  
[www.sunchemical.com](http://www.sunchemical.com)  
[www.sunchemical.com/sustainability](http://www.sunchemical.com/sustainability)  
<https://www.sunchemical.com/sustainability-resources/>



**SunChemical**<sup>®</sup>

a member of the DIC group

