



## **ESG Report**

Flexible Packaging and Sustainability

# Scholle IPN is Simply Flexible



## Diversified

We participate in markets around the globe in food, beverage, and non-food applications in multiple channels.

## Entrepreneurial

We are supported by a history of family ownership, invested in our long-term vision for success.

## Innovative

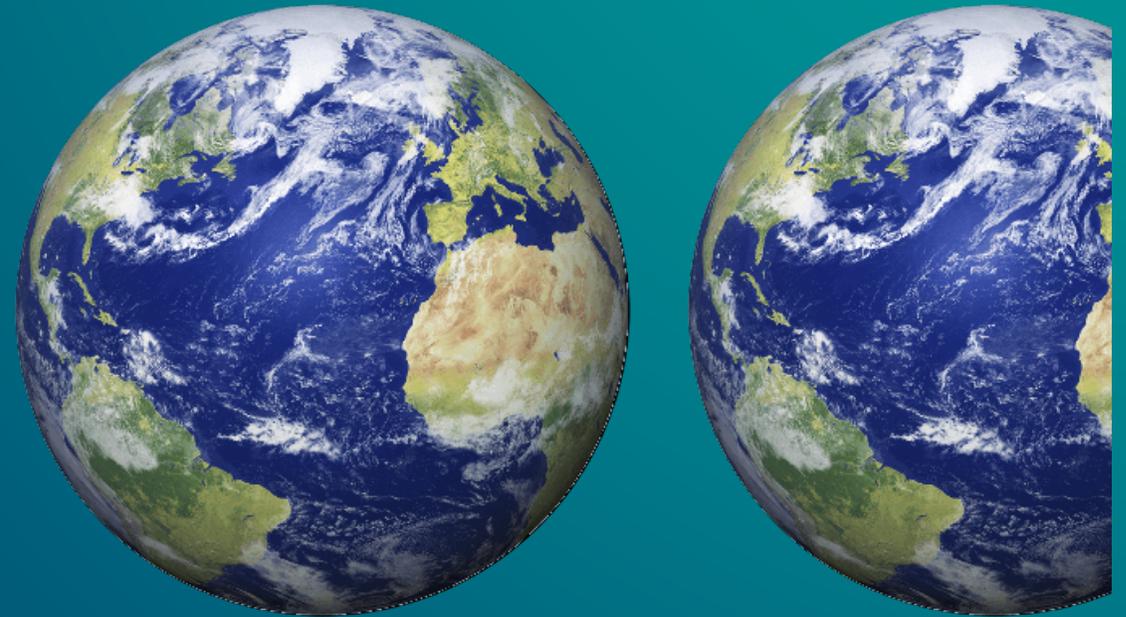
Our heritage is one of innovation. We invented bag-in-box packaging, as well as many of the connection systems that accompany it.

## Market Leader

We are driven to develop solutions that help our customers on their sustainability journey, while providing optimal total cost of ownership.

# 1.75 Earths

Required in order to meet all of  
humanity's raw material needs  
this year\*



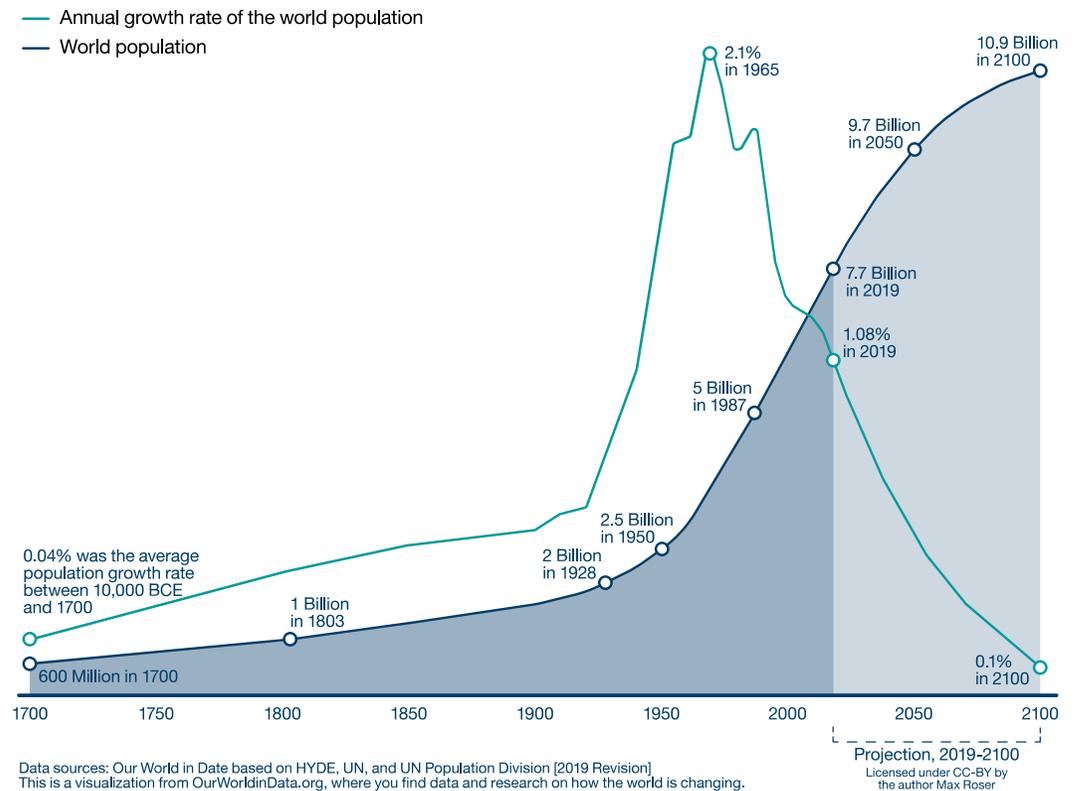
# Population Growth and Packaging

Sustaining MORE people with LESS packaging.

## Population Outpacing Supporting Resources

- Our next crises:
  - Access to (fresh) water
  - Access to food
  - Fossil fuel depletion
  - Rising temperatures
- Packaging can directly support the sustainable production, distribution, and protection of food.
  - Smart, **flexible packaging** can do this while reducing load in critical metrics:
    - Total Energy Used
    - Total Material Weight
    - Greenhouse Gas Emissions
    - Food wasted through protection and increased shelf life

## World Population Growth, 1700-2100



# Population Growth and Packaging

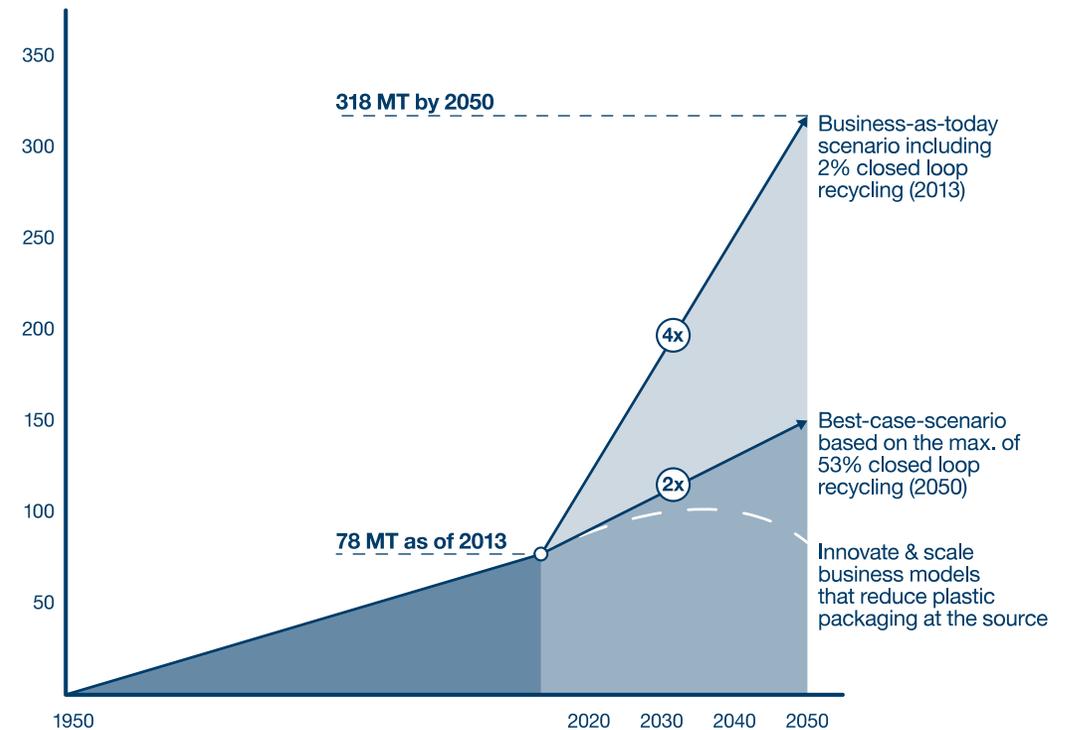
Sustaining MORE people with LESS packaging.

## The Inflection Point is Now

- Business-as-usual is not sustainable
- At the least we must begin wide-spread source reduction efforts in packaging:
  - Downgauge and lightweight where possible
  - Use mono-materials < 5% foreign bodies to allow recycling
  - Concentrate products to reduce packaging material
- Closed-loop, circular packaging streams must come online:
  - Improved, high-efficiency **mechanical recycling** systems installed at micro-regional sites
  - **Chemical recycling** systems to avoid dependence on fossil fuels
  - Retailers embrace re-fill style packaging and dispensing
  - Consumers gain access to **easy recycling** training
  - Regulations to allow recycled material to be used for food contact

## Global Plastic Packaging Production, 1950-2050

Current estimates predict plastic peak by 2100



© Zero Waste Living Lab

# Government Regulations for Plastic Packaging

EMEA is leading the way with packaging sustainability.



## Key Metrics

- All plastics packaging must be reusable or recyclable in a cost-effective manner by 2030
- Recycling of 55% of plastics waste generated in Europe by 2030
- Greater use of innovative materials and alternative (i.e. non-fossil fuel) feed-stocks for plastic production, where they are demonstrably more sustainable
- A ‘drastic’ decrease in the leakage of plastics into the environment
- The consumption of single-use plastics will be reduced, and the intentional use of micro-plastics will be restricted (Banning of some products already in place)
- Tax on plastics use
- Plastic packaging must be “single-piece” with no loose caps, fitments, etc.

[http://ec.europa.eu/environment/waste/plastic\\_waste.htm](http://ec.europa.eu/environment/waste/plastic_waste.htm)

Plastic (packaging) is facing a problem

**Threat or  
Opportunity?**

**Our Company Strategy and ability to improve sustainability scores is our differentiator.**



# A Total Flexible Packaging Solution Strategy

Our products, processes, and future are built upon responsible stewardship of the Earth's resources.

## Recyclability:

Simple, **mono-material** construction of components to aid recyclability of finished packaging.

## Equipment:

Engineer forming, filling, and sealing equipment with **high OEE expectations** that use the minimum amount of resources during use.

## Quality:

Quality and safety are always our first thought. Our products and processes **must perform 100%** of the time and cannot fail.

## Legislative Compliance:

R&D considers current and future-state regulatory concerns with **novel, timely solutions**.

## Lightweight:

Tenacious approach to **removing all waste** and unnecessary source material and still do the job right.

## Product Protection:

High-barrier film and closed-loop fitment systems that keep product **fresh and safe** from day one.

## Communicate and Inform:

Packaging that **provides simple, intuitive use** and disposal. Exciting brand and graphical opportunities.

## Manufacturing:

Our global footprint and focus on vertical integration ensures **we make the right product**, in the right place, at the right cost, with the right amount of resources.



# Why Flexible Packaging is Outperforming

Less is more.



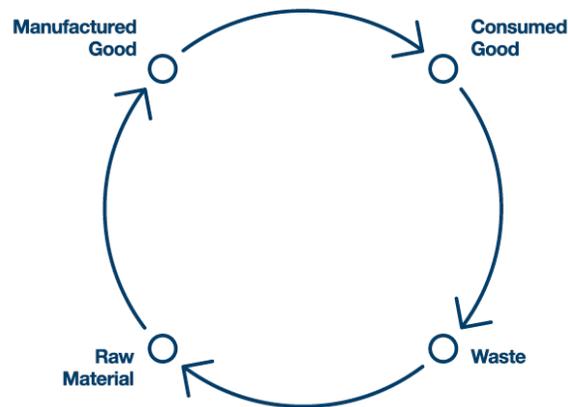
- Production of flexible packaging uses **fewer resources**.
- Food waste is minimized with flexible packaging because of its high barrier protection and high (up to **99.9%**) evacuation.
- Less packaging means less landfill waste or waste for the recycling stream to manage (up to **96% less** post-consumer solid waste).
- Lightweight and optimal storage ratio results in lower transportation emissions (finished bag-in-box has up to **99% cube efficiency** on pallets).
- Reduced raw material consumption:
  - Flexible packaging has up to **93% less** total material weight
  - Flexible packaging has up to **88% less** total energy used in production
- Using flexible packaging shall compensate for the increase in population growth and substantial reduction in fossil fuel resources.
- Using flexible packaging shall result in less post-consumer waste and lower recycling capacity needs.

# Circular Versus Linear

## The 'Linear' Economy



## The 'Circular' Economy



## Defining a New, Better Way

- Circular Economy promotes sustainable development by designing products, systems, and processes that focus on recycling and reuse, ultimately minimizing waste, conserving natural resources and providing efficiency gains.
- Statistics on Linear and Circular Economies:
  - Globally, we are currently only **9%** 'circular'
  - Extraction, processing, and manufacture of goods accounts for **62%** of total global greenhouse gas emissions.
  - **31%** of food produced is wasted.
  - **60%** of all materials are landfilled or incinerated.
  - Switching to a circular economy could unlock an additional **\$4,500,000,000,000** (USD) of global GDP by 2030.\*

\*HSBC – "Waste less, grow more," September, 2019

# Scholle IPN and the Circular Economy

How we provide value throughout the chain.

## Raw Material Selection:

Aim for circularity by specifying base materials which are **post-consumer recycled**.

## Product Development and Production:

Design for **light footprint**, recyclability, and circularity with maximum performance to minimize any waste.

## Recycling:

Mono-material components engineered for mechanical or chemical recycling that **create value** after their initial use.

## Consumer Use:

Extended shelf life of opened products, simple ergonomics for all ages and abilities, re-closeable fitments **reduce chance of food waste**.

## Product Waste:

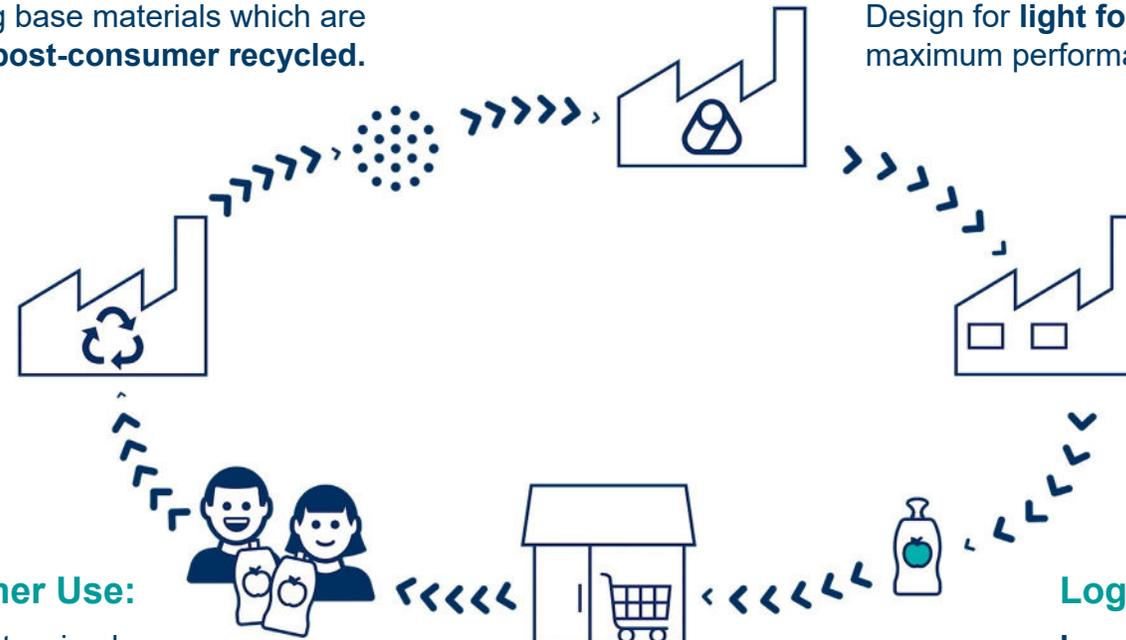
Extended shelf life with aseptic, **99.9% product evacuation**, closed-loop dispensing options.

## Equipment OEE:

High-speed, efficient filling and sealing equipment **runs on minimal inputs** (labor, electric, air, footprint).

## Logistics:

**Less weight, more product** per pallet and truck, aseptic enables an ambient supply chain.





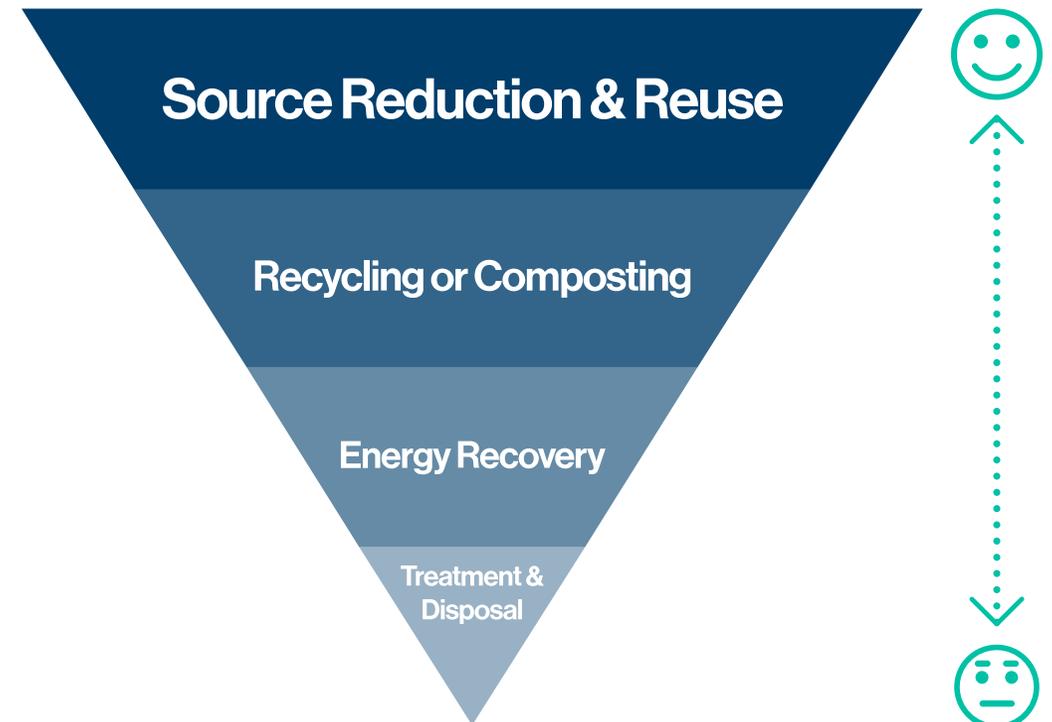
Our innovation and technical capabilities enable the realization of a **significant reduction** in the use of fossil materials for plastic packaging and related CO<sub>2</sub> footprint.

# Sustainability and Flexible Packaging

Using less to start should be the goal.

## Plastic is good. Waste isn't.

- REDUCE
  - Improved yields and shelf-life lead to less food and product waste.
  - Significant source reduction compared to rigid containers; including lightweight fitments and downgauged films.
  - Less in-process waste and greenhouse gas emissions, and less energy and fuels needed for transportation.
- REUSE
  - Bulk-size packaging eliminates need for single-use containers, diverting landfill waste.
  - The prospects for chemical recycling offer more efficient and profitable recycling for single-use plastics.\*
- RECYCLE
  - Barrier film solutions feature mono-material technologies that simplify recycling processes.
  - Globally, only 9% of the plastic that has been produced has been recycled.\*



US EPA Sustainable Materials Management:  
Non-Hazardous Materials and Waste Management Hierarchy

\*Mintel, 2020

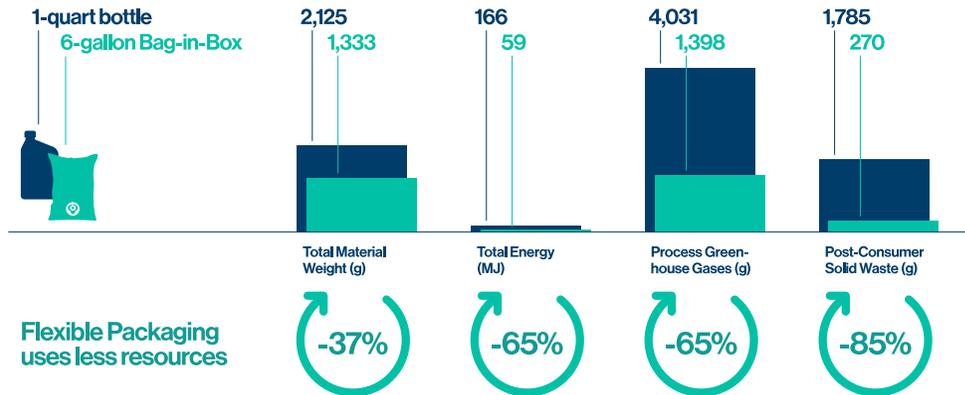
# The Environmental Impacts of Flexible Packaging

Packaging comparisons for the automotive oil market.

## Quart Bottles vs Bag-in-Box

### Plastic Bottle vs. Bag-in-Box

Estimated Impacts Basis: 1,000 Fluid Ounces of Packaged Product

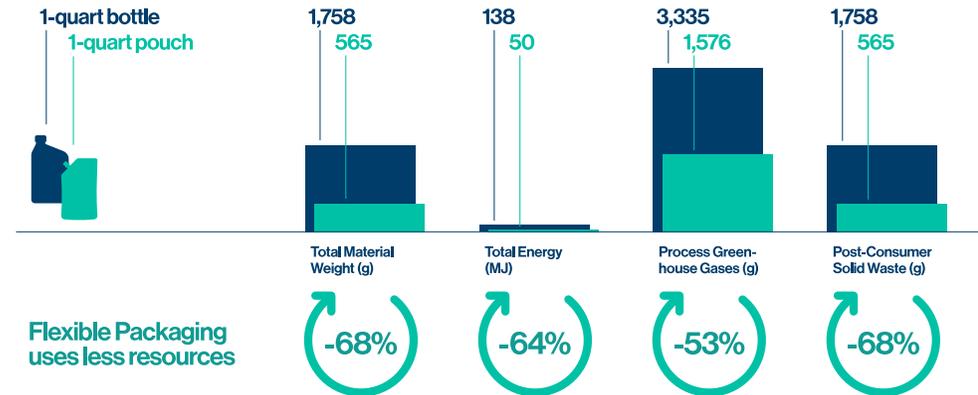


Scholle IPN

## Quart Bottle vs Quart Pouch

### Plastic Bottle vs. Spouted Pouch

Estimated Impacts Basis: 1,000 Fluid Ounces of Packaged Product



Scholle IPN

Data from Dow and Allied Development's Simplified Environmental Impacts Calculator

# Aseptic Solutions Can Help Our Food Waste Epidemic

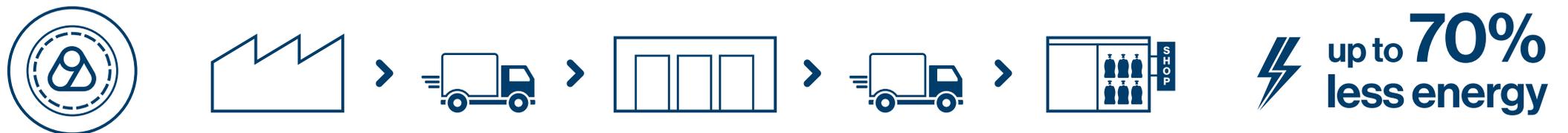
Extending the shelf life of fresh products without our any refrigeration requirement.

- Product does not require cold chain logistics – saving up to 70% energy.
- Aseptic products can stay fresh, unopened, for up to 12 months.
- With an ambient distribution network, companies can expand their distribution reach.

## Cold Chain



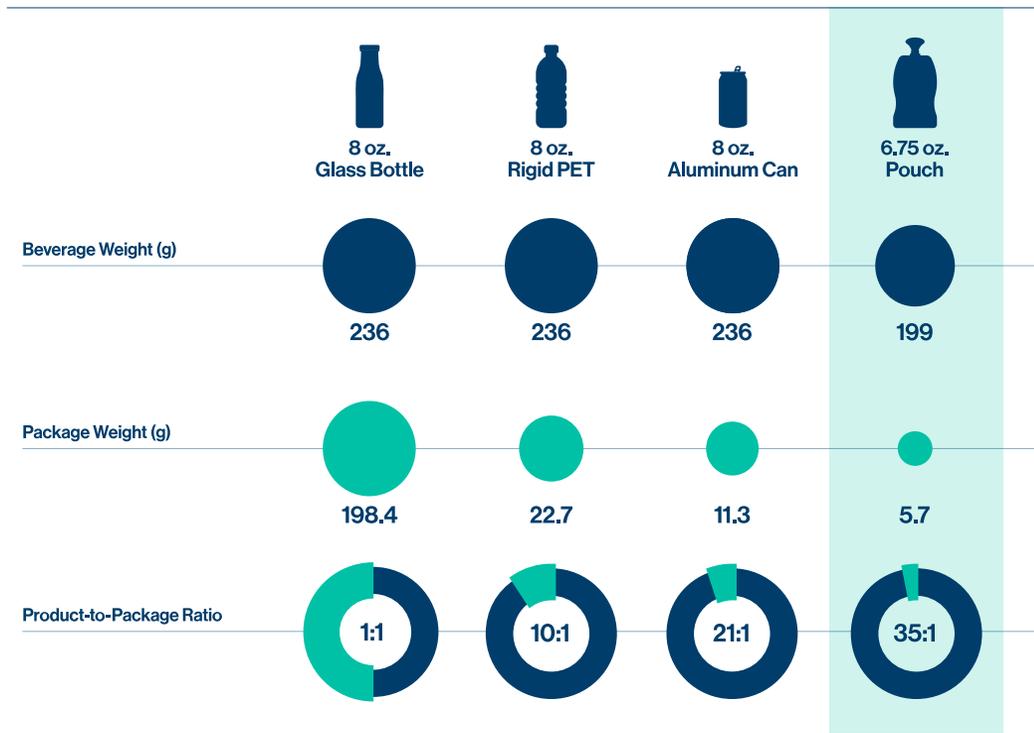
## Aseptic



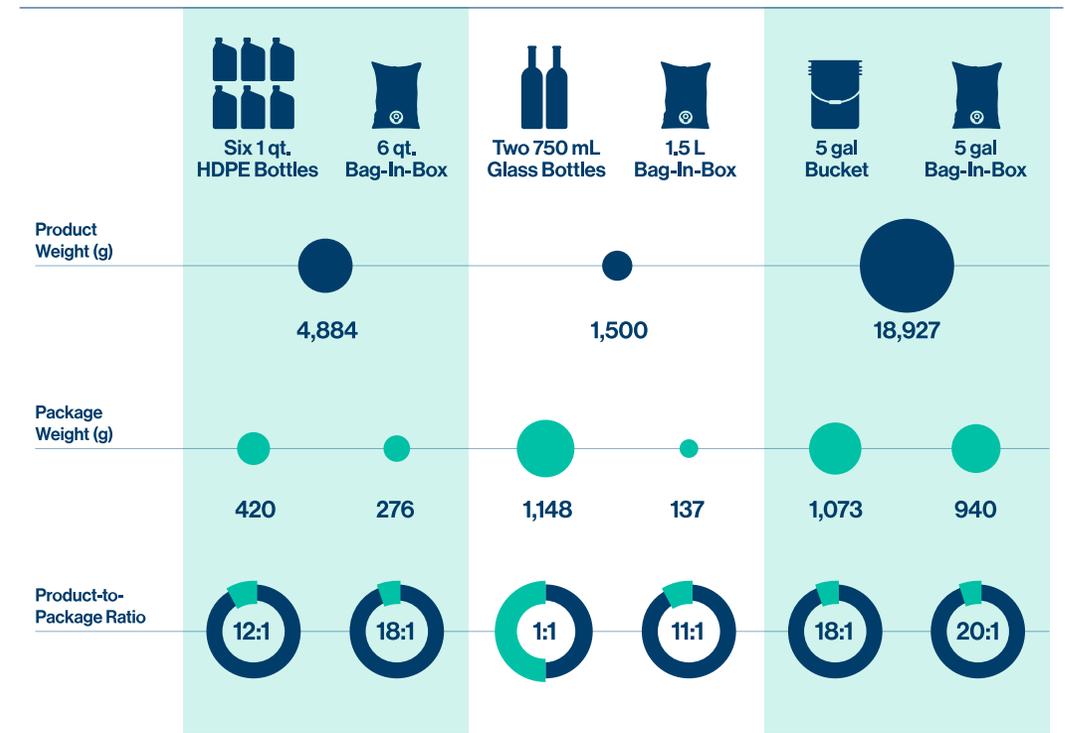
# Product-to-Package Ratios

Flexible packaging is a better fit for liquid products.

## Pouch vs Rigid Packaging



## Bag-in-Box vs Rigid Packaging



# Recyclable Film Technology

Provide a wide range of environmental benefits beyond recyclability.

## Surface Printing:

- Using solvent-free printing ink.



## Eliminate Aluminum:

- Barrier technology in plastics has progressed to a point where we **no longer need** to incorporate environmentally-costly metals.

## Solventless:

- Eliminating solvents from the lamination process **eliminates emissions.**

## Lightweight Structures:

- By using fewer base materials, we can **save raw materials** throughout the supply chain.

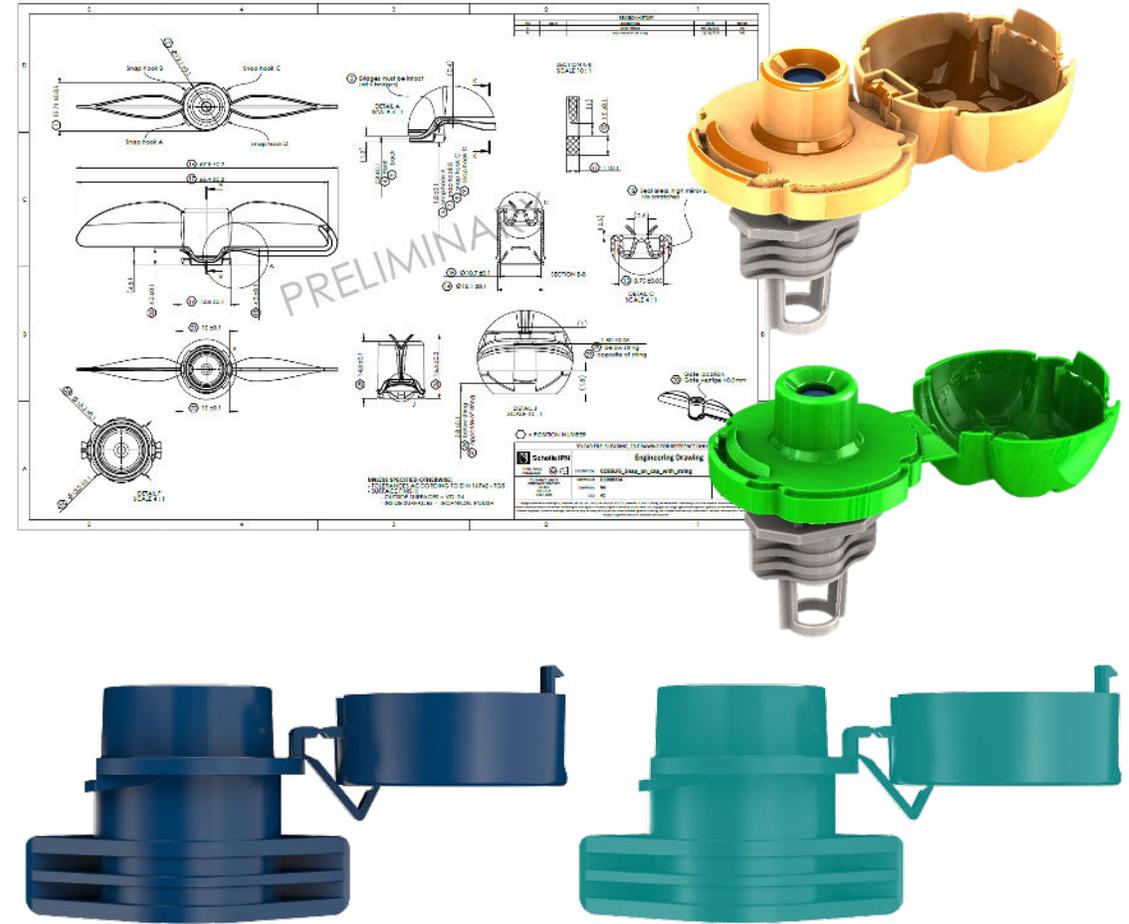
## Eliminate Lamination:

- Films requiring no lamination **use less energy** and chemicals during production. The structures are also simpler, which aid in recyclability.

# Fitment Innovation

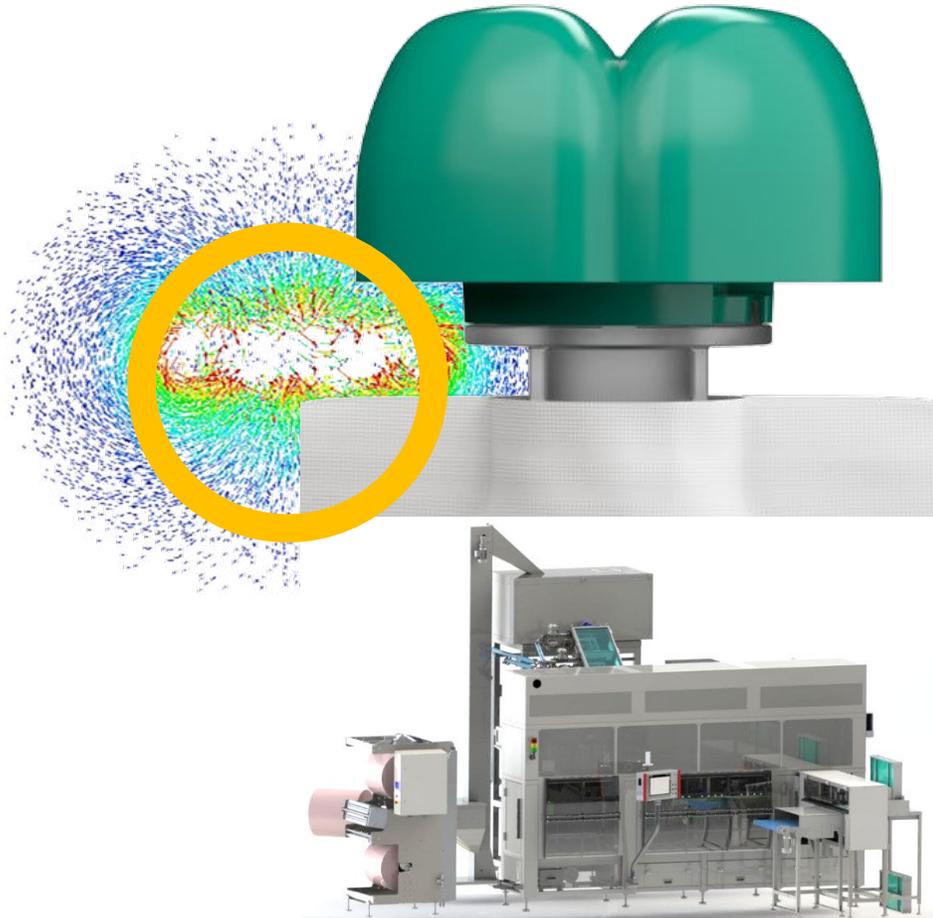
Making sure closure components are disposable and recycled.

- European regulations pushing toward single-piece fitment designs.
- Eliminates loose components that might not be placed into the recycling stream.
- Child-safe designs to prevent choking.
- Improved ergonomics with “flip-open” mechanics.
- Easy to re-seal, making spills and other opportunities to waste products less likely.



# Equipment Made For Recyclable Materials

How CleanSeal™ makes using recycling film structures possible.



## Next-Generation Induction Sealing Technology

- Suitable for low modulus / heat-sensitive, recyclable structures like polyolefin-based films.
- Works with recyclable PP and PE laminated structures.
- Overall, uses less energy during production.
- Sealing cycle times are faster than traditional heat-seal method – improved output.
- Small equipment footprint means logistics and labor efficiencies.

# Packaging Equipment Systems

The keystone to quality flexible packaging.

## Energy Consumption:

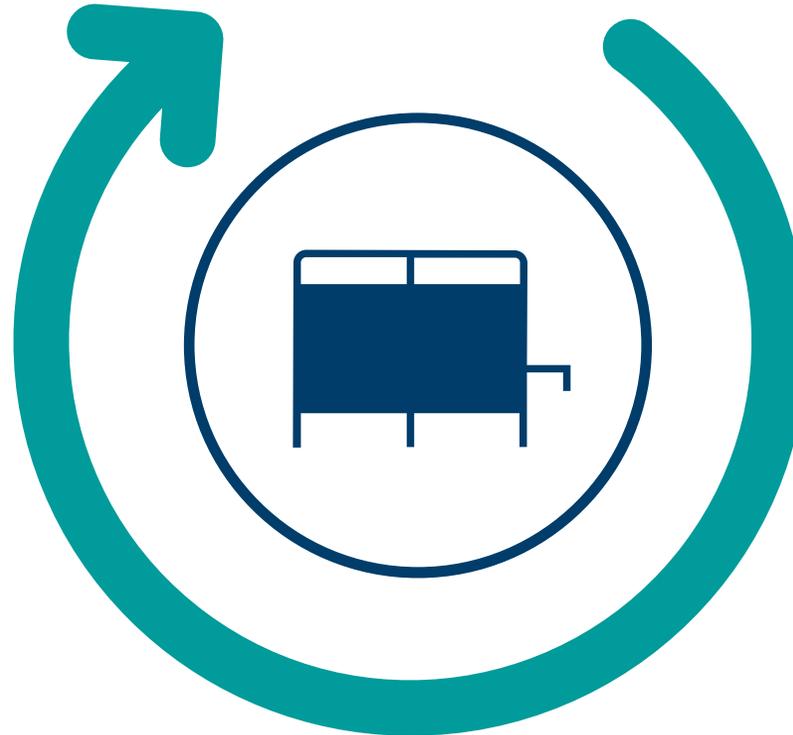
Designed to **pull as little** electricity, air, and water as possible during production runs.

## Product Flexibility:

A single machine design could create **several size and shape** packages.

## Lifespan:

Engineered with sturdy materials that **last for years** when well-maintained.



## OEE:

Engineered for maximum “up-time” to **reduce time and materials wasted** to troubleshoot production issues.

## Quick Changeover:

Less waste in material, product, and labor with **simple, fast** changeover.

## Low Maintenance Requirements:

Simple maintenance regimens and **easy-to-replace modules** reduce downtime and travel required to service equipment in the field.

Highlights

# **Flexible Packaging Sustainability in Practice**

# Reducing Our Reliance on (Fuel) Resources

In the last 20 years, Scholle IPN has produced +60MM bag-in-box packages for drinking water.



## Plastics Saved:

Saves 86% plastics use compared to bottles

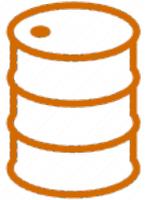


## Total Weight Saved:

Saved 2,404,040 kg (5,300,000 lbs).  
= 44 rail cars

## Total Energy Saved:

Saved 1,200,000,000 MJ  
= Energy equivalency of 204,725 barrels of oil



## Total Greenhouse Gas:

22,300,000 kg (24,582 US tons)  
= 4,900 cars driven for one year



 **60 million Bag-in-Box**

are equal to

 **1.3 billion Plastic Bottles**



## Total Post-Consumer Solid Waste:

Saved 509,958 m<sup>3</sup> (667,000 yd<sup>3</sup>)  
= 6 Royal Albert Halls

Almost 1.5MM products in single-use plastic bottles are bought *every minute*

# Flexible Packaging = Flexible Solutions

Materne GoGo SqueeZ: lightweight and recyclable



## RecShield™ Recyclable Film

- Our recycle-ready, high-barrier family of films for flexible packaging.
  - Available in both PE and PP structures
  - Provides recyclability for the environment with barrier protection for products and consumers

## Lightweight Cap

- Transition to the lightweight Amerigo cap has significant savings in material weight:
  - 1.3 g (0.05 oz) per cap.
- Significant plastics savings:
  - **Each cap uses 43% less plastic.**
  - **2,267,962 kg (5,000,000 lbs of plastics eliminated in 2020.**

# Flexible Packaging = Flexible Solutions

Automotive Lubricants Industry: eliminating waste and inefficiency



## Institutional Systems

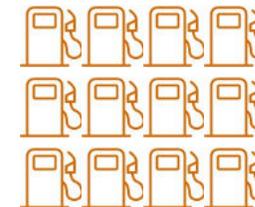
- Since 2012, Scholle IPN has produced over 60MM bag-in-box packages for automotive oil.
- Helped Shell Oil convert all North American Walmart lube locations from 1-liter (1-quart) bottles to dispensed bag-in-box system.

## Retail Bag-in-Box

- Oil producers are now moving to retail-friendly sizes of their institutional packs.
- Bag-in-box can easily be re-sized to fit a wide range of applications and sales channel requirements.

## Reducing Waste

- Bag-in-box shows a **65% reduction** in greenhouse gas emissions versus incumbent bottles.
- 99.9% product evacuation.
- Diverted production and landfill waste of **+1,000,000,000** 1-liter (1-quart) bottles.



65% savings in GHG across 1Bn bottles is equal to the CO<sub>2</sub> emissions from 35,888,789 liters (9,480,815 gallons) of gas consumed.

# Flexible Packaging for Concentrated Products

Coca-Cola Freestyle: a concentrated, precision beverage system



## Equipment Overview

- Introduced in 2009.
- Touchscreen-operated system will 100+ drink flavor combinations.
- Scholle IPN provides 100% of the packaging for the liquid ingredients for this innovation.

## Bag-in-Box

- Syrup is delivered to the post-mix dispenser head with a screw-on bag-in-box connector.
- Water, the heaviest ingredient of a sparkling beverage is supplied on-site, reducing the overall resource drain for this system.

## Pouch

- Highly-concentrated flavoring pouches deliver the 120+ drink combinations to consumers.
- For simplicity, the dispenser requires plug-in functionality using the Clean-Clic® fitment system.
- Significant plastics savings:
  - Each pouch uses 85% less plastic than a BIB.
  - Saved 9525440 kilograms (21,000,000 pounds) of plastic since 2017!

Our Vision

# Simply Flexible



# Thank you!