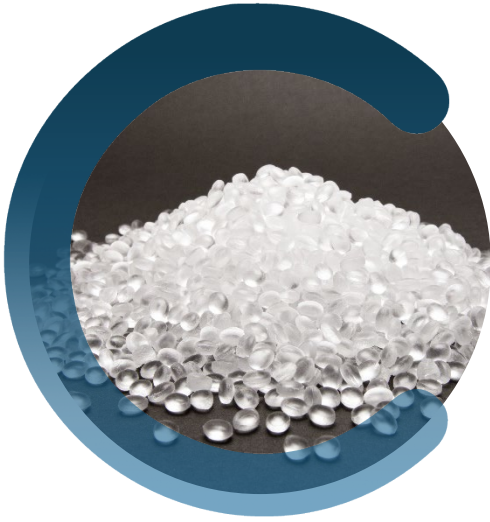


# **Taking Action to Shape a Better World: Solutions to advance the circular economy**



# THE FOUR C's – Our Sustainability Strategy



## Circular Economy

We are developing a portfolio of new and emerging products and technologies to recapture the value of plastic and create a world free of plastic pollution.



## Citizenship

We provide leadership and resources to end plastic waste in the environment, promote natural resource conservation, and protect ocean health.

We are a good neighbor that cares deeply for the communities where we live and work.



## Climate Care

We are committed to reducing our impact on our climate by managing our greenhouse gas (GHG) emissions in a responsible way.



## Care in Operations

We take care of the air, water, land, and biodiversity related to the operation of our facilities.

# Taking Action to Shape a Better World



## Citizenship

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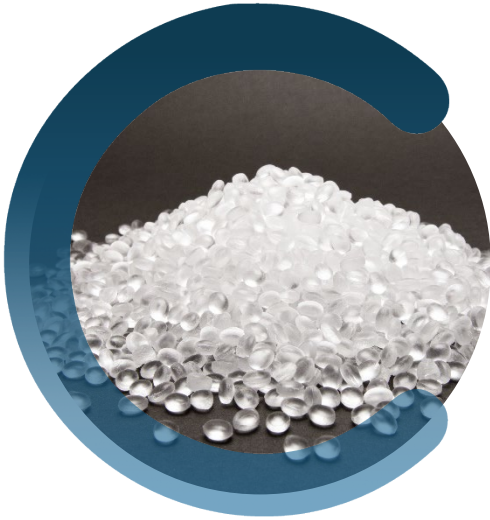
NOVA Chemicals is a founding member of the Alliance to End Plastic Waste



[WWW.STOPOCEANPLASTICS.COM](http://WWW.STOPOCEANPLASTICS.COM)

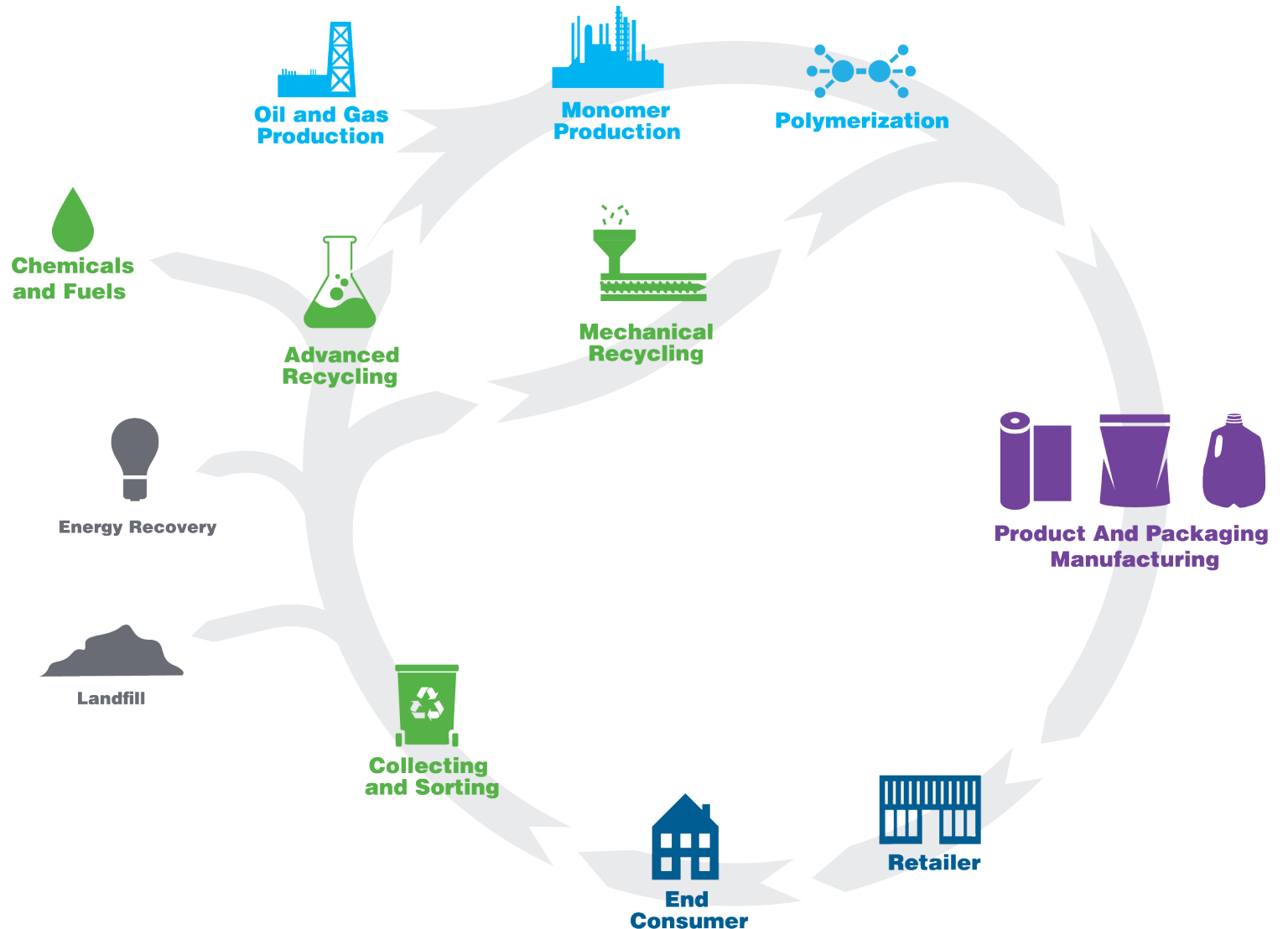
NOVA Chemicals is a strategic partner in Project STOP

# Closing the Loop on End of Life Plastics



## Circular Economy

We are developing a portfolio of new and emerging products and technologies to recapture the value of plastic and create a world free of plastic pollution.



# **Helping Brand Owners Meet Their Sustainability Goals Through Polyethylene Innovation**

# Why Work with NOVA Chemicals

**NOVA Chemicals is leading innovation to advance the circular economy**

Industry  
Recognized  
Leaders

Polymer &  
Structure  
Expertise

Proprietary  
Technology

Innovation  
Facilities

Collaborative  
Approach

## **Our offerings and solutions:**

- ✓ Material replacement and reduction
- ✓ 100% recyclable cast and blown film packaging designs
- ✓ Oriented films resin technology
- ✓ Incorporation of recycled content (PCR)
- ✓ Investing in advanced recycling

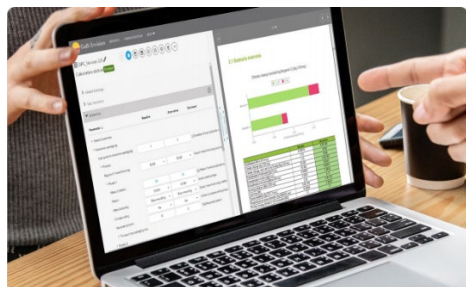
# Material Replacement & Reduction

Source reduction is the first goal of a circular economy. We have several tools, resins and film structure designs that help our customers create packaging that meets performance requirements with less material and less energy in the converting process:



Our proprietary [BONFIRE® Film Development Platform](#) is used to virtually evaluate multilayer film structures and speed time to market for new or improved packaging applications.

Customized [caps simulation software](#) allows for virtual exploration of the influence of resin parameters and process conditions on part performance and real world failure modes, reducing the number of physical trials and associated material usage.



The [GaBi Packaging Calculator](#) is lifecycle analysis software that allows us to comprehensively analyze the total environmental footprint and circularity of specific packaging options.



# Fully Recyclable Blown and Cast Film Packaging

NOVA Chemicals has developed a range of film structure designs with all the features you expect of high-performance flexible packaging – and the added benefit of recyclability.

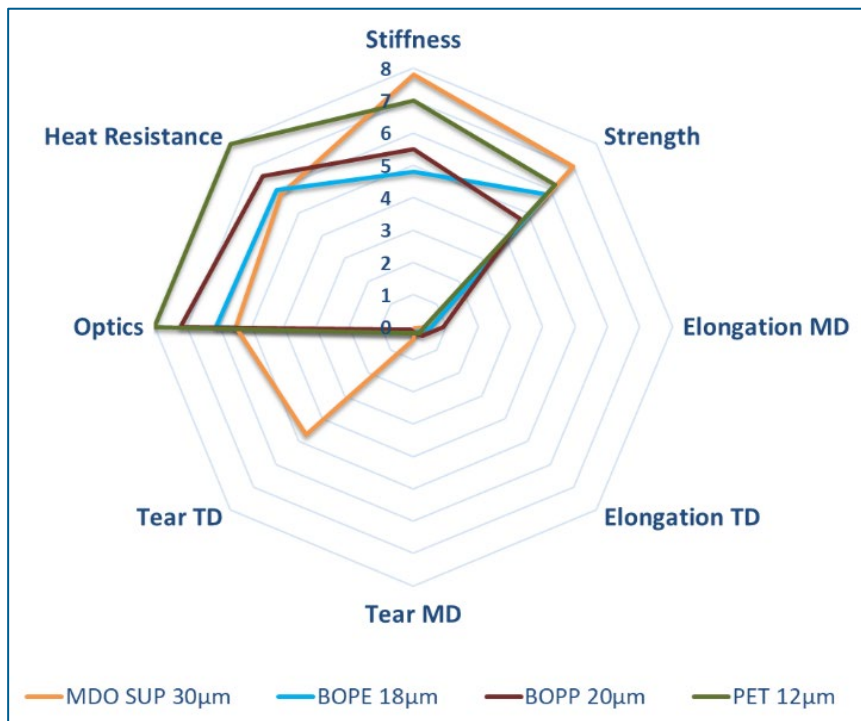
- H2R compliant recipes
- Industry leading barrier performance
- Zipper and fitment compatibility
- Suitable for use in a wide range of packaging formats and food applications



*Our customer Emmerson Packaging worked with Anita's Organic Mill to redesign all of their product packaging for recyclability. Now, Anita's 70+ grains and flours are sold in all-PE, fully-recyclable, box bottom pouches made with NOVA Chemicals' PE resins.*



# Fully Recyclable Oriented PE Film Structures



*MDO and BOPE have comparable physical properties to BOPP and BOPET*

## Machine Direction Orientation (MDO)

– Well developed, commercially available; ability for higher level of customization

**High-Density Biaxially Oriented Polyethylene (HD-BOPE)** – Emerging, game-changing technology where NOVA Chemicals is leading the industry

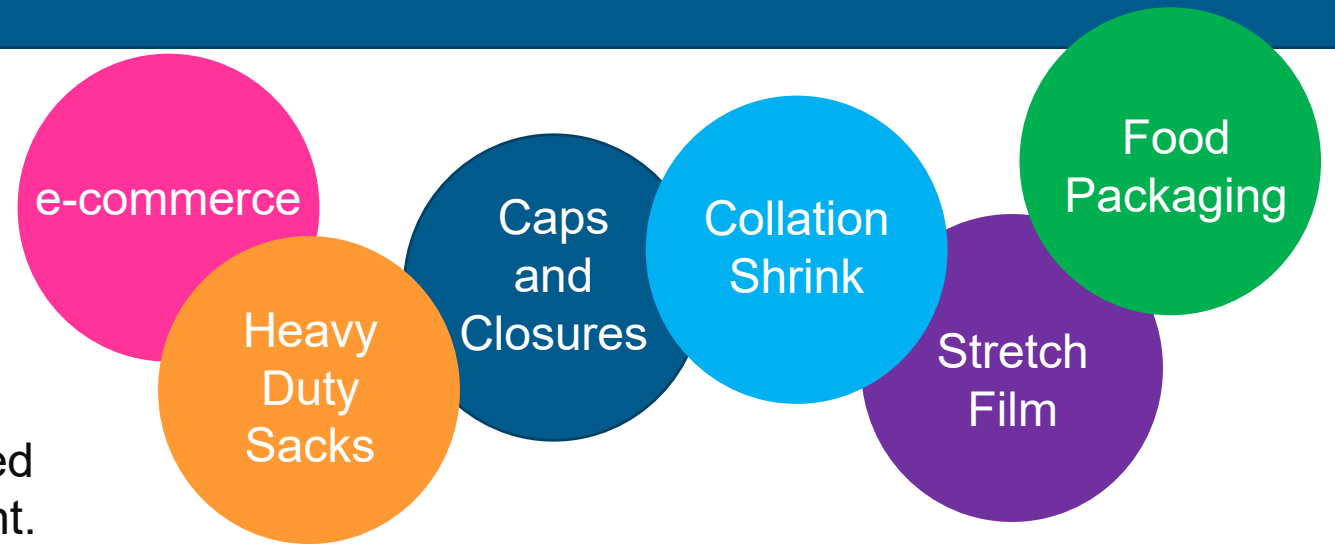


*This prototype was made with an HD-BOPE print web laminated to an LLDPE blown film sealant web.*

# PCR Incorporation

We're collaborating throughout the value chain to develop new recipes for film structures and rigid products that incorporate recycle, and have comparable performance to 100% virgin resin.

A portfolio of ready-to-recycle resins are formulated to compensate for any degradation in PCR content.

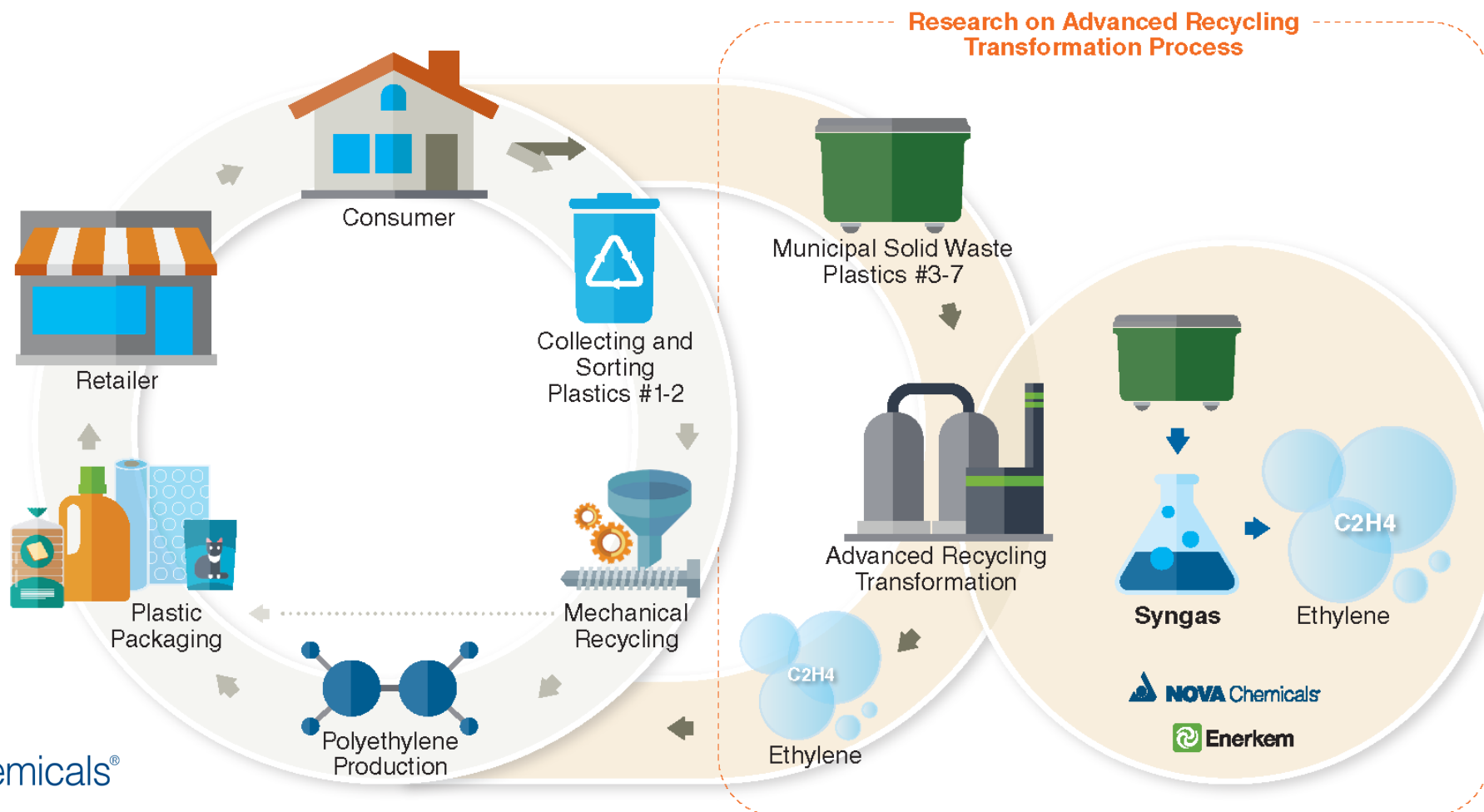


We are pursuing agreements with a number of North American recyclers to be able to offer a portfolio of rHDPE and r(L)LDPE resins.

Our first agreement, with Canada's largest plastics recycler Merlin Plastics, will turn high-density polyethylene (HDPE) recycle into resin for use in everyday products and packaging including food applications.

# Advanced Recycling

In May 2020, NOVA Chemicals entered into a joint development agreement with Enerkem, a leading producer of advanced biofuels and renewable chemicals, to research new advanced recycling catalyst technology.







[novachemicals.com](https://novachemicals.com)



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