



GREEN SOLUTIONS
FOR A **BETTER** WORLD

WHO ARE WE ?

SCG Chemicals or SCGC is one of the leader in sustainable chemical innovations and manufacturing in Thailand and ASEAN that offers a full range of petrochemical products ranging from upstream production of olefins to downstream production of 3 main plastics resins: polyethylene, polypropylene, and polyvinyl chloride including finished products. SCGC is developing new technology and innovation to create high value added products (HVA) and holistic service solutions concerning growing area such as circular economy, medical & healthcare, and electric vehicle (EV) to better meet diverse places and emphasis demands sustainable environmental stewardship.

Chemicals Business for Sustainability

SCGC is determined to achieve leadership in integrated chemicals business for sustainability and committed to conducting business in line with Environmental, Social, and Governance (ESG) for achieving Sustainable Development Goals (SDGs) with SCGC sustainable development strategies.

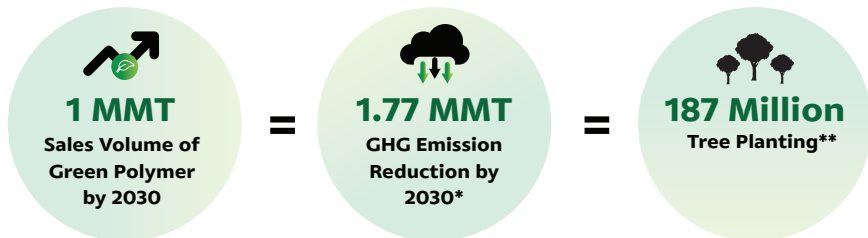


Our ESG Strategic Directions



“ With sustainability at the core of our business, SCGC is passionately committed to improving people’s lives and protecting the world for future generations ”

Our Goals



Remarks: *Green House Gas reduction calculation guideline by Thailand Green Gas Management Organization

**0.0095 MT CO₂ absorption/tree/year

Towards our vision for sustainable future, SCGC has integrated the concept of circular economy into our core strategies to provide green solutions in polymer business, resulting in **SCGC GREEN POLYMER™** with 4 major solutions: **Reduce, Recyclable, Recycle and Renewable.**

SCGC Green Solutions to Enable Circularity



Reduce

Enhancing Material for Eco-efficiency



Recyclable

Design for Recyclability



Recycle

Mechanical & Advanced Recycling



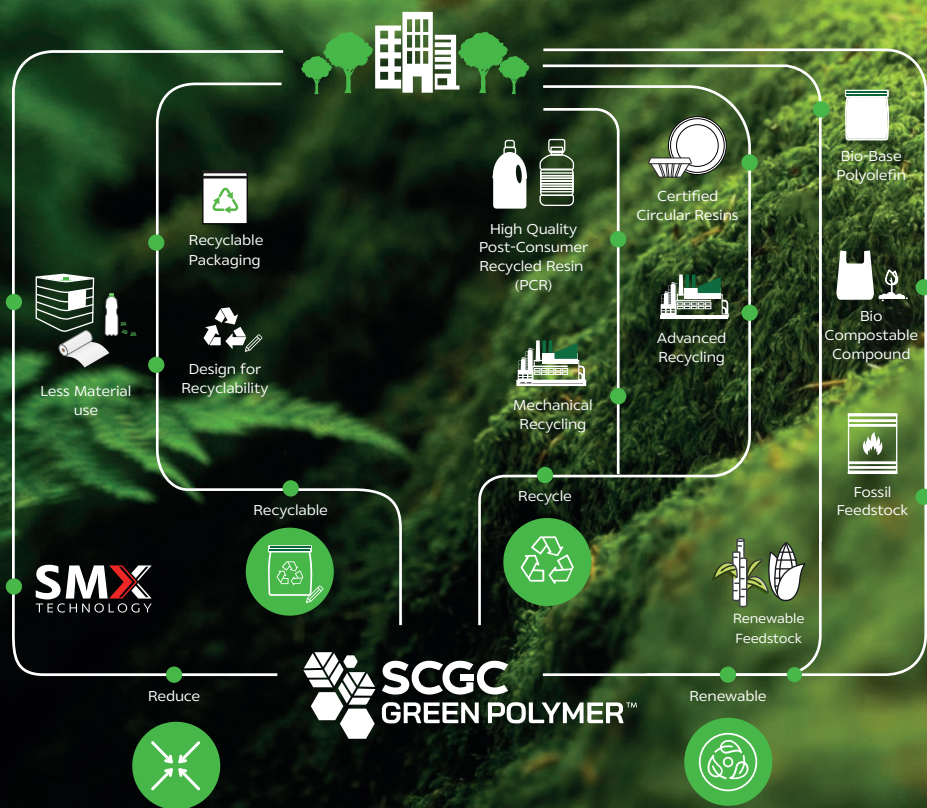
Renewable

Bioplastics



SCGC GREEN POLYMER™

Solution Landscape



REDUCE

Enhancing Material for Eco-efficiency



Growing awareness of sustainability, the most effective way to limit effect to mother Earth is to lessen resource consumption at the beginning. With massive amount of plastic consumption in current day, material reduction of only 5-10% can be first little drops of water to make a mighty ocean in sustainable world.

SCGC's breakthrough SMX™ Technology helps strengthen polyethylene resins and reduce the wall thickness in a product while retaining its functional properties. This does not only save raw material in manufacturing but also makes the product more lightweight, which translates to less energy required for transportation and less carbon dioxide emissions.

Benefits of SMX™ Technology

Low molecular weight

- ✓ Stiffness
- ✓ Process ability

High molecular weight

- ✓ Toughness

Very high molecular weight

- ✓ Mechanical properties
- ✓ Stress cracking resistance



High Performance HDPE Resin by **SMX** TECHNOLOGY

S111F

High Impact Film for Industrial Use



Up to **30%**
film thickness
reduction*



25% better
dart drop
impact*



25% better
puncture
resistance*



19% GHG
reduction**

Recommended Application

- ✓ Food contact e.g. chilled meat bag
- ✓ Industrial liner, box liner
- ✓ Premium shopping bag, trash bag

Product Characteristics

- High impact strength
- Good puncture resistance and seal ability
- Ability to blend with higher content of recycle plastic (PCR/PIR***) resin

SX002J/JA

Lightweight Carbonated Soft Drink and Sparkling Water Caps & Closures



Up to **20%**
less plastic
use*



Superior stress
cracking
resistance*



10% better
gas retention*



7% GHG
reduction**

Recommended Application

- ✓ Caps and closures for carbonated soft drink and sparkling water

Product Characteristics

- Material consumption reduction for lightweight closure designs
- Superior stress cracking resistance that ensures zero cracking rate
- Better carbonation preservation for carbonated beverage

SMX551BU

High Strength HDPE for Intermediate Bulk Container



Superior chemicals
resistance with
65% higher ESCR



6% weight
reduction*



12% GHG
reduction**



UN mark certification
for packaging of
dangerous goods

Recommended Application

- ✓ Bulk liquid container
- ✓ Hazardous chemicals container

Product Characteristics

- Excellent combination of stiffness and impact strength
- Excellent chemicals resistance
- Downgauging possibility up to 6%

S199F

HDPE Film for Consumer Use



20% better
dart drop
impact*



Up to **20%**
higher impact
strength*



>30% blended
with recycled
content



Excellent
processability

Recommended Application

- ✓ Shopping bag, roll bag, trash bag
- ✓ PE-gloves

Product Characteristics

- Excellent dart impact strength
- Good tensile strength and stiffness
- Able to be blended with > 30% recycled content while maintaining mechanical properties

*Compared to conventional grade

**Green House Gas reduction calculation guideline by Thailand Green House Gas Management Organization

*** PCR = Post Consumer Recycle
PIR = Post Industrial Recycle

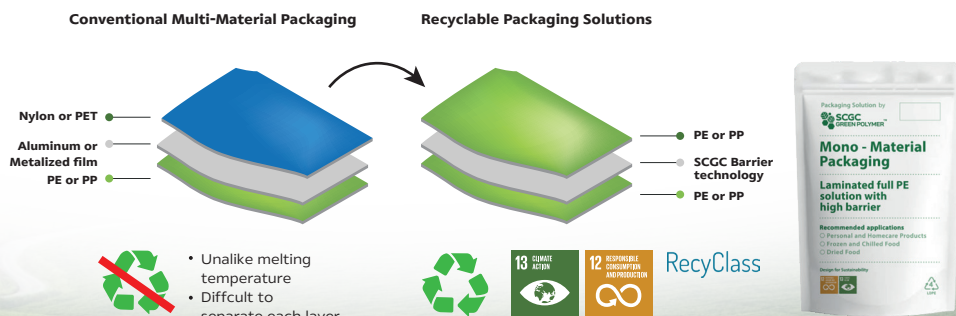
RECYCLABLE

Design for Recyclability



The packaging industry is the largest consumer of plastic, and Flexible Packaging is a major type of plastic packaging that takes 70% of the market. Normally, flexible packaging consists of inextricable layers of different materials with different properties and melting points, thus is not easy to get to recycling process.

SCGC's new innovations can reinforce **"Recyclable Packaging Solutions"** that maintain the functional properties of the packaging while using solely PE, PP or PO as materials, thus lends itself to recycling in the post-consumer stage



Recyclable Packaging Solutions

X34H009F

HDPE Resin from SMX™ Technology for Biaxial Oriented Polyethylene Film via a Tenter Frame Technology



Good alignment in CMYK
registration at higher line speed
for printing process



High clarity with
haze $\leq 9\%$

Recommended Applications

- ✓ Printing layer for recyclable film structure
- ✓ BOPET, BOPA, and BOPP replacement
- ✓ Moisture barrier application

Key Benefits to Customers

- Wider operation window for bag making and packing line
- Better pouch appearance
- Ability to use form-fill-seal machine

P408F

PP Resin for High Heat Resistant Biaxial Oriented Polypropylene Film



4-10% faster
packing speed



Better seal
appearance



High clarity with
haze $\leq 1.4\%$

Recommended Applications

- ✓ Printing layer for recyclable film structure
- ✓ High-line speed packing machine

Key Benefits to Customer

- Higher speed for vertical form-fill-seal

BWO1501G

Water-Based Barrier Coating Agent for Flexible Packaging



Prevent
oxygen
permeation



Certified by
RecyClass



Meet standard Food
Safety Packaging



Water-based
with 15%
solid content

Recommended Applications

- ✓ Coating agent on film substrates
- ✓ Widely used in food and non-food industrial packaging (not suitable for boiling and retort application)

Key Benefits to Customers

- Tailor-made oxygen barrier level (achievable OTR less than 1 cc/day/m^2)
- Ready-to-use one component

AM25

Medium Barrier Coated MDOPE Film for Flexible Packaging



Oxygen barrier
 $< 30 \text{ (cc/day/m}^2\text{)}$



Water-vapor barrier
 $< 10 \text{ (g/day/m}^2\text{)}$



Good as a
printing layer



No primer
coat needed

Recommended Applications

- ✓ Printing layer for recyclable film structure
- ✓ BOPA and BOPET replacement
- ✓ Widely used in food and non-food industrial packaging (not suitable for boiling and retort application)

Key Benefits to Customers

- Prolonged product shelf-life
- Ability to be recycled in the current PE recycling stream

Remarks: All benefits of X34H009F are based on blending 20-40% LLDPE and compared to LL-BOPE
All benefits of P408F are compared to Gen-BOPP

RECYCLE

Mechanical & Advanced Recycling



The global waste crisis has had far-reaching effects on the environment and all living creatures, including humans. Consequently, the concept of the circular economy has become ever-more important. SCGC has set out two major “Recycle” solutions to regenerate the environment: **High Quality Post-Consumer Recycled Resin (PCR)** from **Mechanical Recycling** and **Certified Circular Resin** from **Advanced Recycling** to tackle plastic waste problem.

Our solutions

Mechanical Recycling

- ✓ High quality PCR with Global Standard Compliance



- ✓ Partnership with regional to global recyclers



- ✓ Full range of products; Material type, Color, Special feature



Advanced Recycling

- ✓ Virgin-like resin and suitable for food and hygiene plastic packaging



- ✓ The first demonstration plant in Thailand with end-to-end product, process, and technology



- ✓ ISCC PLUS Certification throughout whole supply chain



RECYCLE | Mechanical Recycling

SCGC GREEN POLYMER™ - **Post-Consumer Recycled Resin (PCR)** is one of product in our “Recycle” solution. With SCGC’s exclusive formulations and wide-ranging network of household waste collection, we can turn waste into high-quality PCR by **Mechanical Recycling**.



Traceability Standard

- ✓ Comply with Global Recycle Standard (GRS)
- ✓ 100% sourced from local post-consumer waste in Thailand



Global Compliance Standard

- ✓ International certifications



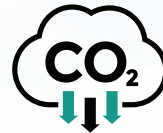
Quality Management

- ✓ Excellent mechanical recycling processing equipment
- ✓ Systematic quality control and assurance method



Superlор Quality and Appearance

- ✓ Good color and sharp cosmetic appearance
- ✓ Packaging functions meet customer requirement



70% Green House Gas Reduction*



Processing-Friendly

- ✓ Ease of use as single pellet drop-in solution



Remarks: *Green House Gas reduction calculation guideline by Thailand Green House Gas Management Organization

High Quality Post-Consumer Recycled Resin (PCR) for Rigid Packaging Application




Regular PCR Product

Product Name	Color	Product Grade
PCR HDPE - Natural Color		PCRHO1BN
PCR HDPE - White Color		PCRHO2BW
PCR HDPE - Black Color		PCRHO3BB
PCR PP - Natural Color		PCRP01JN



Recommended Applications

-  Personal & home care packaging
-  Industrial small blow packaging

Odorless PCR Product

Product Name	Color	Product Grade
PCR Odorless HDPE - Natural Color		PCDH01BN
PCR Odorless HDPE - White Color		PCDH02BW
PCR Odorless PP - Natural Color		PCDP01JN

Recommended Applications

-  Personal & home care packaging
-  Baby & cosmetic packaging



HDPE Virgin Booster for Post-Consumer Recycled (PCR) for Household Chemical Bottle Application

It is quite difficult to get the same ESCR level when incorporating highly content of PCR HDPE comparing with virgin HDPE.

Our Solutions



SCGC™ Product Offering

BTE01BN, HDPE virgin booster to improve **ESCR** property for bottle that made from Post-Consumer Recycled (PCR) HDPE.



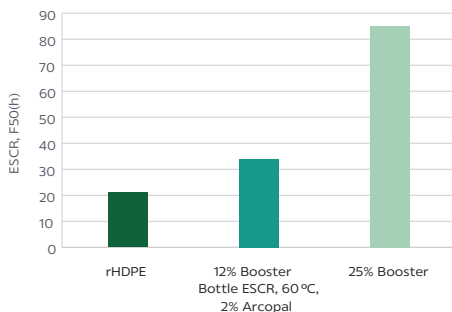
SCGC™ Booster Solution

Adding only **10-20%** of Booster into PCR HDPE to get ESCR performance at same level as virgin HDPE without scarifying of both mechanical properties and processability.



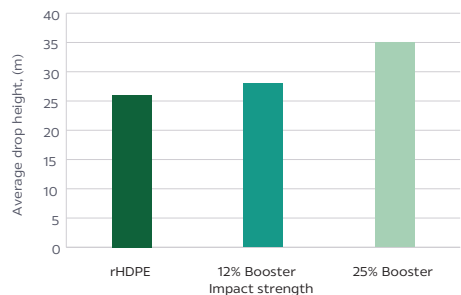
The Right Choice for Sustainable Goal

SCGC™ BTE01BN booster helps increase the PCR HDPE content up to **75-80%** while maintain other significant properties of bottle.



325%

**higher ESCR
of finished product (bottle)**



35%

**higher bottle impact strength
of finished product (bottle)**

RECYCLE | Advanced Recycling

This technology will convert post-consumer plastics, that have not been properly sorted, into recycled feedstock, which will then be reproduced into recycled plastic resins of equivalent quality to virgin plastic resins. Moreover, Advanced Recycling technology will encourage the circular economy's effective use of resources and eliminate waste to landfills, leading to reduction of greenhouse gas emissions from waste burning.

SCGC is the first company in Thailand certified with the International Sustainability and Carbon Certification "**ISCC PLUS**" throughout whole supply chain, accelerating advancement of high-quality post-consumer recycled resins to meet ESG commitment.

Jan 2021

SCGC Launched First Advanced Recycling Demonstration in ASEAN



Sep 2021

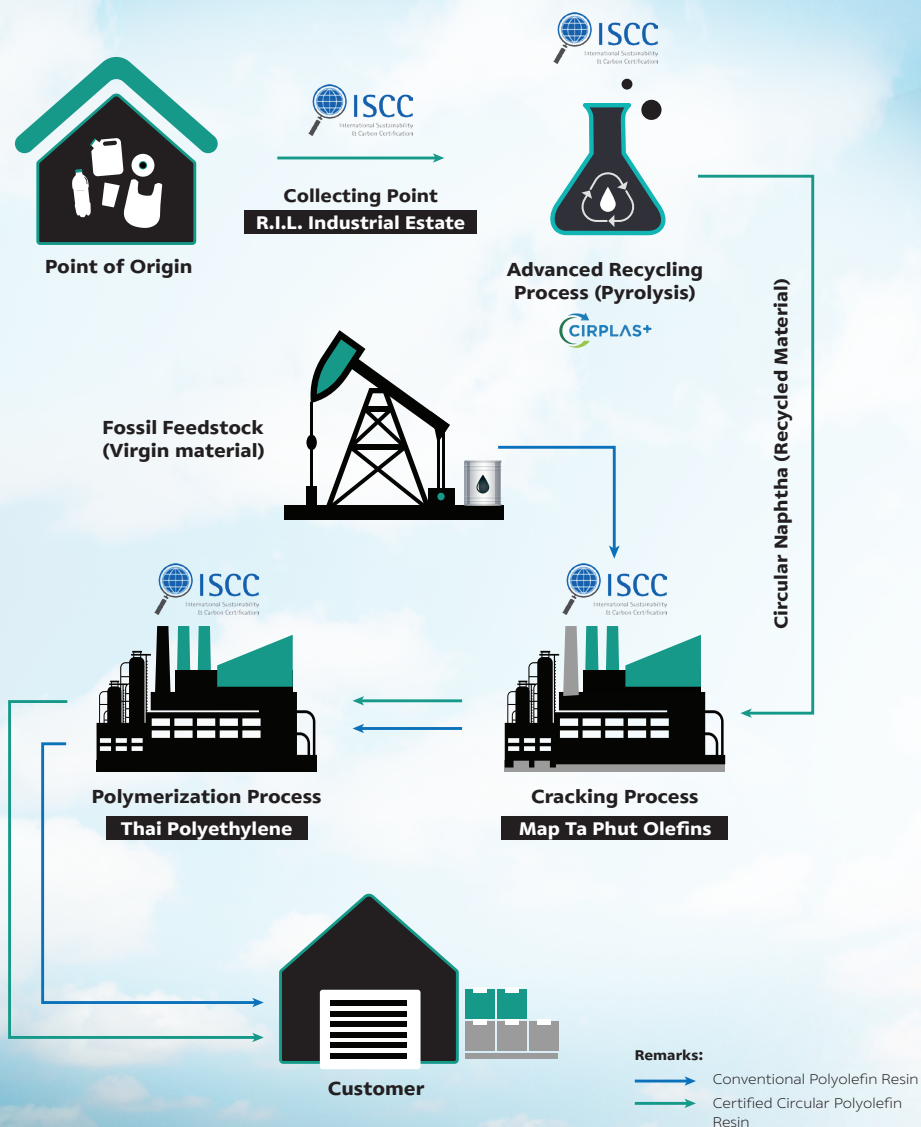
Thailand's first Chemical Recycling demonstration plant with ISCC PLUS certification of whole supply chain



Feb 2022

Introduced "Circular PP", made with Advanced Recycling Technology for food packaging





The Scope of ISCC Plus Certification for Advanced Recycling

RENEWABLE

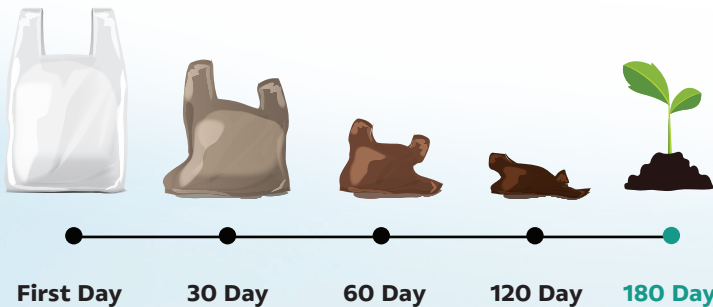
Bioplastics



The global climate change and waste crises have had a tremendous impact on the environment and living creatures, including humans. To alleviate these crises, SCGC has adopted the concept of circular economy into its business practices. In this process of make-use-return, we have made the important step in becoming more sustainable. However, such initiatives can only transform into concrete actions with the support of different parties in the plastic industry.

SCGC GREEN POLYMER™ - Bio Compostable Compound offers “Renewable” solution. Consist of **renewable resources**, this compound help to reduce greenhouse gas emissions along the production chain. The resin is ready to use as a **drop-in compound** and processing friendly. There are a number of recognized certifiers in Europe, **DIN CERTCO** and **Biodegradable Products Institute (BPI)** in USA.

As the product can be completely composted, there will be no threat to environment along the sustainable chain.



Bio-Compostable Compound Resin for Consumer and Industrial Film Application

BIOC01FN, bio-compostable compound under the brand “**SCGC GREEN POLYMER™**” is produced with a unique formulation with particular film-forming properties for the production of compostable bag for household and industrial sectors.

This bio-compostable compound has been certified by the world's leading institution, **DIN CERTCO**, from in Germany, for being industrial compostable at 60 degrees Celsius, converting to carbon dioxide, water, and biomass in 180 days without leaving residues in the environment. Furthermore, this innovation has the ability to contribute to a full and environmentally-friendly recirculating process.



ISO 9001
ISO 14001

Global Compostable Certification

- DIN CERTCO
- SEEDLING by Australasian Bioplastics Association (ABA)



Drop-in Compound with Easy Processing

- Ready-to-use drop-in compound
- High processability

Global Compliance Standard

- International certifications



Non-Eco Toxicity

- Ability to contribute to a full and environmentally-friendly recirculating process

An aerial photograph showing a vast, dense tropical forest with a variety of green trees. The forest meets a narrow, light-colored sandy beach, which then borders a clear, turquoise ocean. A small wooden pier or dock extends from the beach into the water. The text "THE SOLUTIONS" is overlaid in white, bold, sans-serif capital letters in the center of the image.

THE SOLUTIONS



FOR A BETTER WORLD





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