ASEAN-CHINA BIOECONOMY

Circular Economy Actions: Collaboration for Sustainability

THE SHANGRI-LA HOTEL

19 November2020 (11.40-11.55)

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GLOBAL BIOECONOMY SUMMIT 2020

NSTDA

nxpo

Office of National Higher Education Science Research and Innovation Policy Council

SCG Overview

One of Thailand's largest conglomerates with over 100 years of experience.

- Siam Cement Public Co., Ltd. (SCC) founded in 1913 and listed in 1975 on the SET
- $15 Billion in market capitalization (Top 5 in Thailand's stock market)
- 3 Business Groups: Historic roots in **Cement and Building Materials** with diversification into **Packaging**, and **Chemicals**

SCG BUSINESS GROUPS

Chemicals Business

Cement-Building Materials Business

Packaging Business

KEY FIGURES (FY2019)

Sales Revenue	**14**	billion USD
Net Profit	**1**	billion USD
Company	**311**	companies
Employee	**54,224**	staffs

Market Coverage & Overseas Office

120
Countries

340
Destinations

4,800
Customers

SCG Innovative & Extensive Product Range

Innovative Products

To provide greater opportunities and enhance value for customers,
Chemicals Business, SCG offers a broad spectrum of innovative products that serves customers' needs in various industries

General Plastic:
Agriculture,
General Packaging,
Personal Care Products,
Household Products,
Storage & Container

Building & Infrastructure:
Pipe System,
Wire & Cable,
Building Accessories,
Underground Applications

Food & Beverage Packaging:
Cap & Closure,
Flexible Packaging,
Rigid Packaging

Automotive:
Automotive Parts,
Battery

Home Appliance:
Parts of Washing Machine,
Refrigerator, Vacuum Cleaner
and Air Conditioner

Circular Economy
Mono-Material
Mechanical Recycling
Chemical Recycling

Application Development Center (ADC) in Thailand & Europe

Provide differentiating competitive advantages to our customers with Advance Development Center for New Applications and New Product Developments, with fully-equipped machines and facilities

ADC @ Norway

- Research & Development Center
- Plastic processing
  - Blow molding
  - Injection molding
  - Thermoforming
- Application trials in state-of-the art pilots
- Recycling pilots

ADC @ Thailand

- Fully-Equipped Plastic Processing & Application Development Facility
- 10 commercial-sized plastics processing machines & facility such as
  - Blow molding
  - Blown film & injection molding
  - High speed extrusion coating
  - Thermoforming and injection machine
  - SMART Rotomolding machine

Recognitions received:

QUALITY MANAGEMENT AWARDS

- **Deming Application Prize;** by JUSE)
- **The TPM Advanced Special** Award from Japan Institute of Plant Maintenance (JIPM)
- **ASEAN Best Practices** Energy Management of large factories - Award 2015

INNOVATION AND DESIGN AWARDS

- **Supreme:** ASEAN Plastic Design Awards from ASEAN Federation of Plastic Industries
- **Excellence :** ITEX 2016 from Russian House for Int'l Scientific and Technological Cooperation

SUSTAINABLE DEVELOPMENT AWARDS

- **Leader:** 5th consecutive year ;Dow Jones Sustainability Indexes (DJSI)
- **Gold Class** ((Construction Materials; RobecoSAM/DJSI)
- **Eco Factory** The 1st Certificate from the Federation of Thai Industries

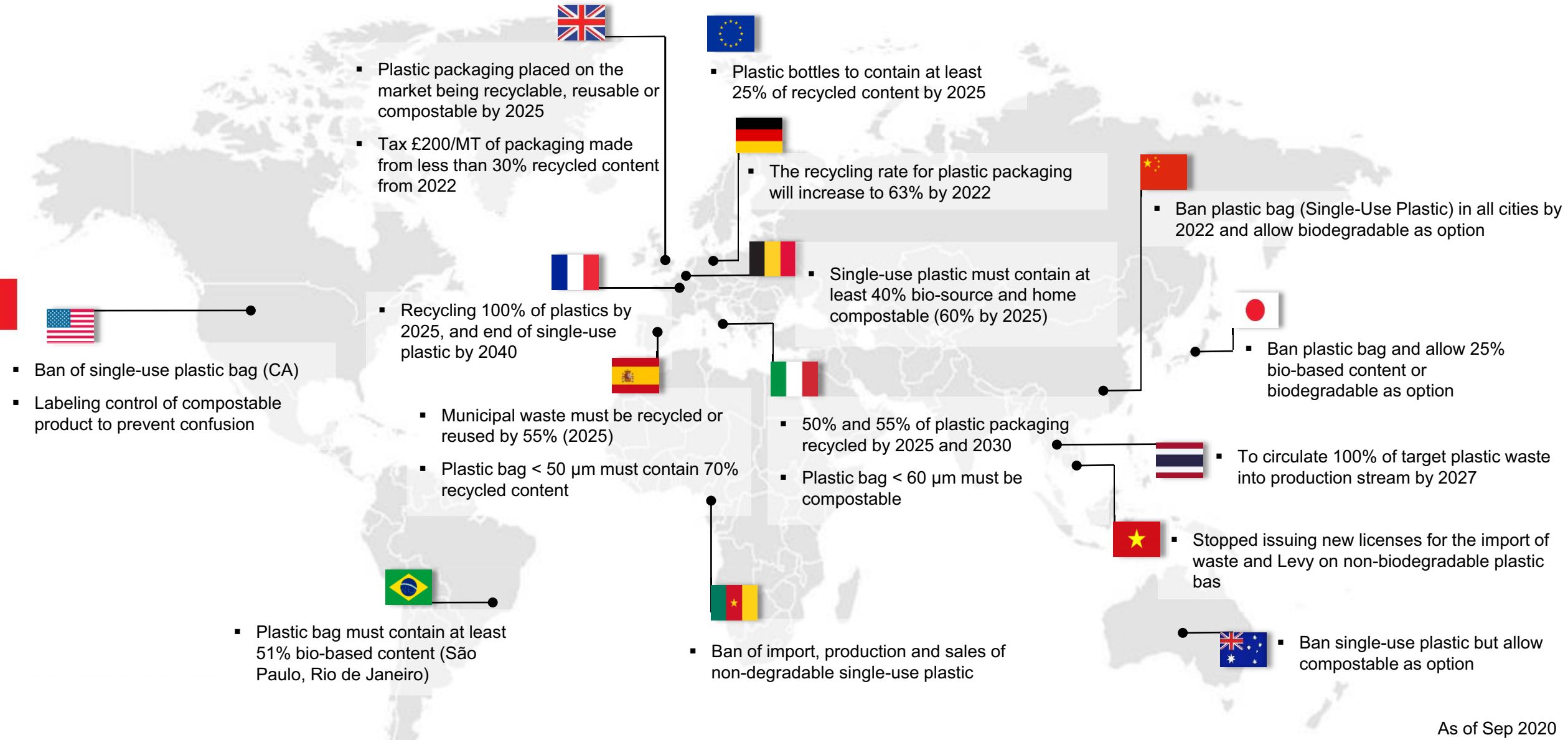
ROBECOSAM
We are Sustainability Investing.

Dow Jones Sustainability Indexes

WEIS ECO Factory

SCG

Regulations push toward single-use plastic ban, % recycle contents in packaging and CO2 emission reduction target



- Plastic packaging placed on the market being recyclable, reusable or compostable by 2025
- Tax £200/MT of packaging made from less than 30% recycled content from 2022

- Plastic bottles to contain at least 25% of recycled content by 2025

- The recycling rate for plastic packaging will increase to 63% by 2022

- Ban plastic bag (Single-Use Plastic) in all cities by 2022 and allow biodegradable as option

- Single-use plastic must contain at least 40% bio-source and home compostable (60% by 2025)

- Ban plastic bag and allow 25% bio-based content or biodegradable as option

- Ban of single-use plastic bag (CA)
- Labeling control of compostable product to prevent confusion

- Recycling 100% of plastics by 2025, and end of single-use plastic by 2040

- Municipal waste must be recycled or reused by 55% (2025)
- Plastic bag < 50 μm must contain 70% recycled content

- 50% and 55% of plastic packaging recycled by 2025 and 2030
- Plastic bag < 60 μm must be compostable

- To circulate 100% of target plastic waste into production stream by 2027

- Stopped issuing new licenses for the import of waste and Levy on non-biodegradable plastic bas

- Plastic bag must contain at least 51% bio-based content (São Paulo, Rio de Janeiro)

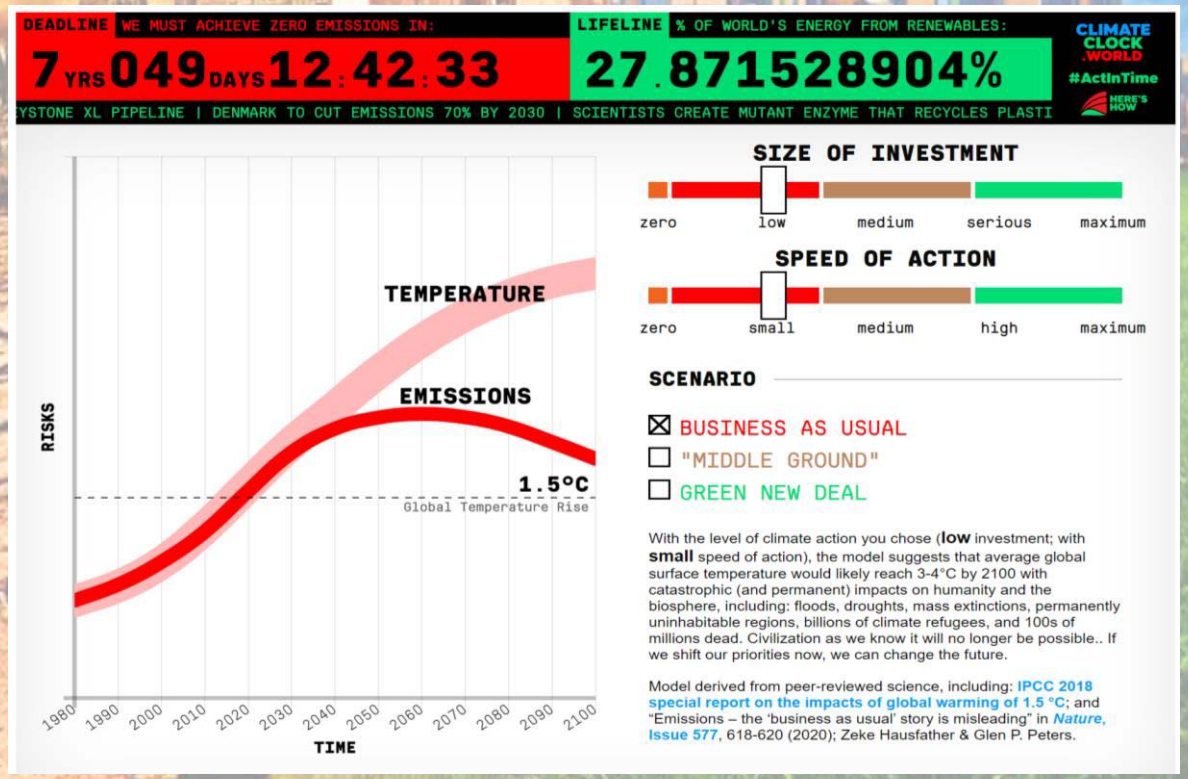
- Ban of import, production and sales of non-degradable single-use plastic

- Ban single-use plastic but allow compostable as option

As of Sep 2020

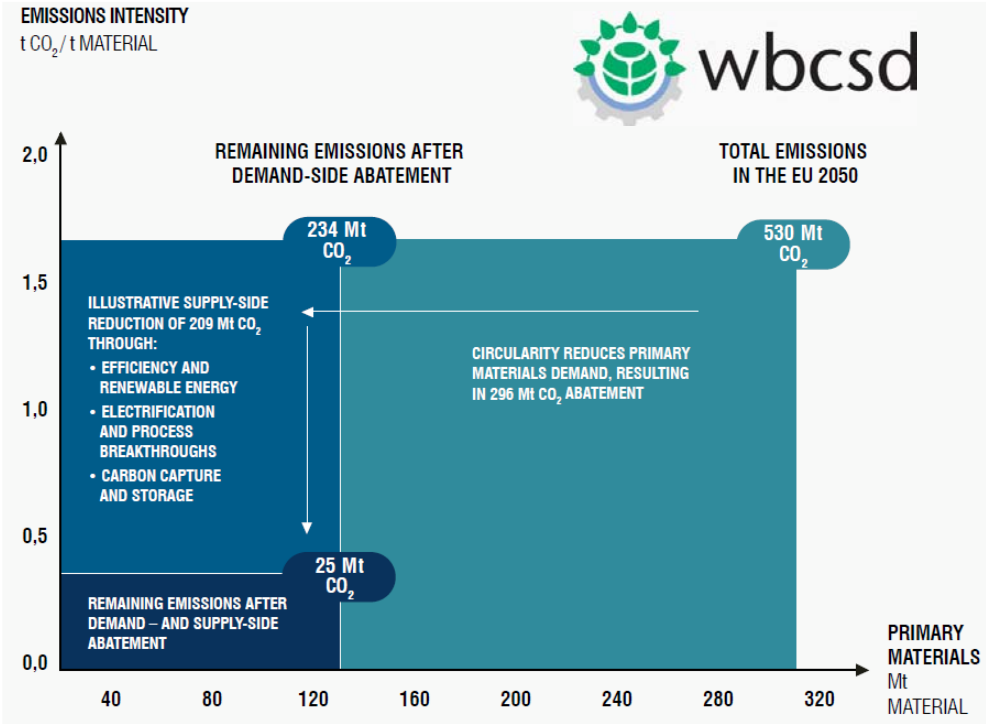
Not on track to meet Carbon target of 2°C scenario:

- Energy Efficiency & Zero carbon Energy: Necessary but not enough
- Both supply-side & demand measures are compulsory



Achieve zero emission in 7 years needed

Circular Economy is essential for Climate Change



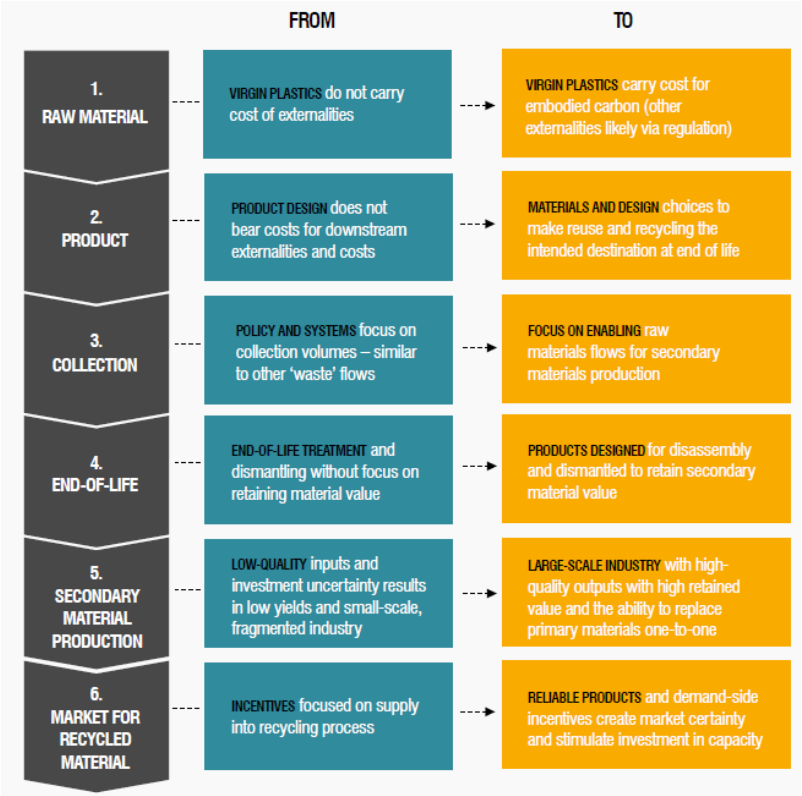
- **Supply-side (Energy) & Demand-side (CE): To be measured for decarbonization**
- **Recycled materials: Far lower emissions than primary materials**
- **More circular economy:** EU-emissions cut by 56% by 2050 (296Mton), and 3.6 Bton per year globally up to 333 Gt by 2100
- **To do more of shared economy to increase overall efficiency**

Plastics

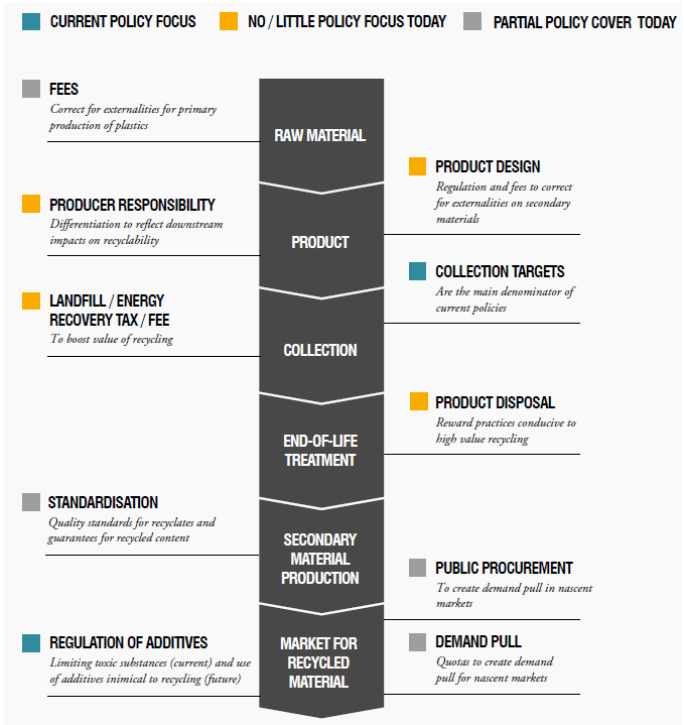
Highlights

- Most plastics are recyclable, and recycling saves 90% of the CO_2 emissions arising from new production
- A combination of re-use and recycling could provide 60% of plastics demand by 2050, cutting CO_2 emissions by half.
- This requires systems that enable high quality recycling and preserve the value of plastics.

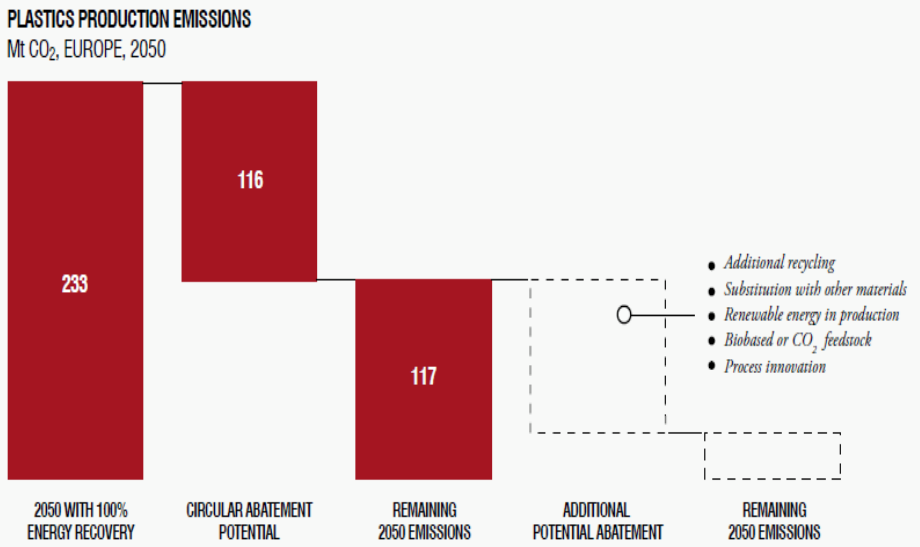
IMPROVING PLASTICS RECYCLING WILL REQUIRE TRANSFORMATION ACROSS THE ENTIRE VALUE CHAIN



CURRENT POLICIES COVER ONLY PARTS OF THE RANGE OF BARRIERS TO HIGH-VALUE PLASTICS RECYCLING



IMPLEMENTING A CIRCULAR PLASTICS SCENARIO CAN REDUCE 2050 EMISSIONS BY 50%



Source: *The Circular Economy – A Powerful Force for Climate*

Brand owners have set their strategic goals

To promote recyclability & increase recycled content in their packaging

	GHG Reduction	Design for Recyclability
Nestlé	• Zero net GHG emissions by 2050	• 100% of Packaging Recyclable or Reusable by 2025
P&G	• 50% GHG reduction by 2030	• 100% Recyclable or Reusable packaging by 2030
Unilever	• Zero net GHG emissions by 2039 100% renewable and recycled carbon in Home Care formulations by 2030	• 100% of Plastic packaging to be Reusable, Recyclable, or Compostable by 2025
IKEA	• Climate positive by 2030	• Renewable and Recycled materials by 2030

Circular Economy Solution Platform

1 DESIGN FOR RECYCLABILITY

2 MECHANICAL RECYCLING

3 CHEMICAL RECYCLING

4 BIOPLASTICS

Digital Solution in Circular Economy

Circular Economy Collaboration & Partnership

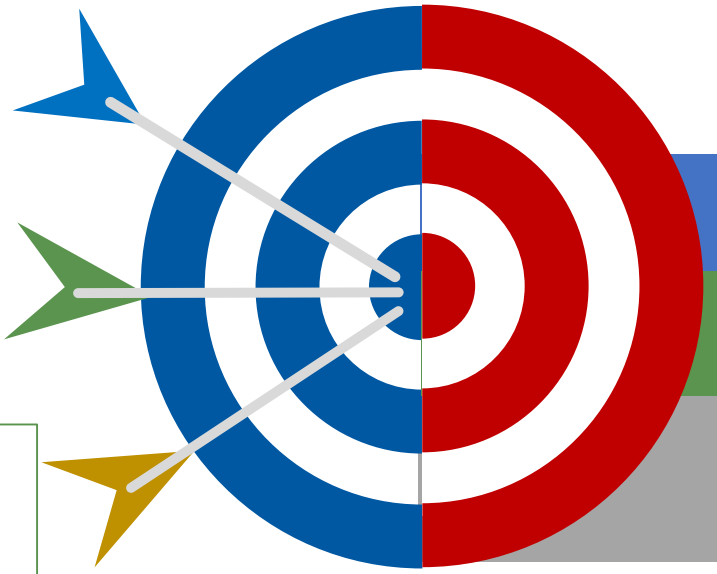
together we will achieve….

Commitment to achieve by 2030

"Becoming Climate Positive"

"Designing all products with new circular principles, with the goal to only use renewable and recycled materials in our products"

"Improve collect back/ Circular infrastructure, Upgrade informal sectors and integrate digital technology as enabler"



SCG Circular Economy Solutions

✓ **Bioplastics**
- Drop-In Renewable Polyolefin
- Own Formulated Biodegradable

✓ **High Quality PCR** (Post-consumer Recycled)
- PCR LL/LDPE for flexible packaging

✓ **High Quality PCR** (Post-consumer Recycled)
- PCR HDPE for personal and homecare packaging

✓ **Co-Collection Campaigns (CCC)**

Circular Economy Solution Platform

1

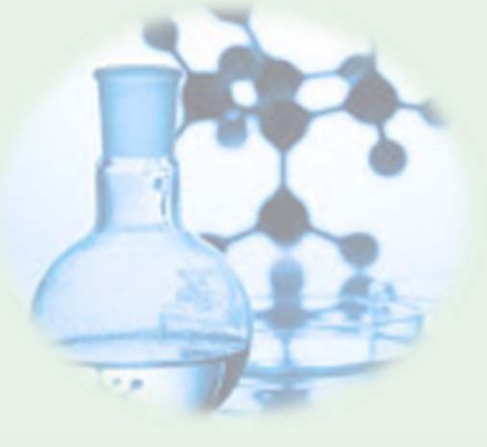
DESIGN FOR RECYCLABILITY

2

MECHANICAL RECYCLING

3

CHEMICAL RECYCLING

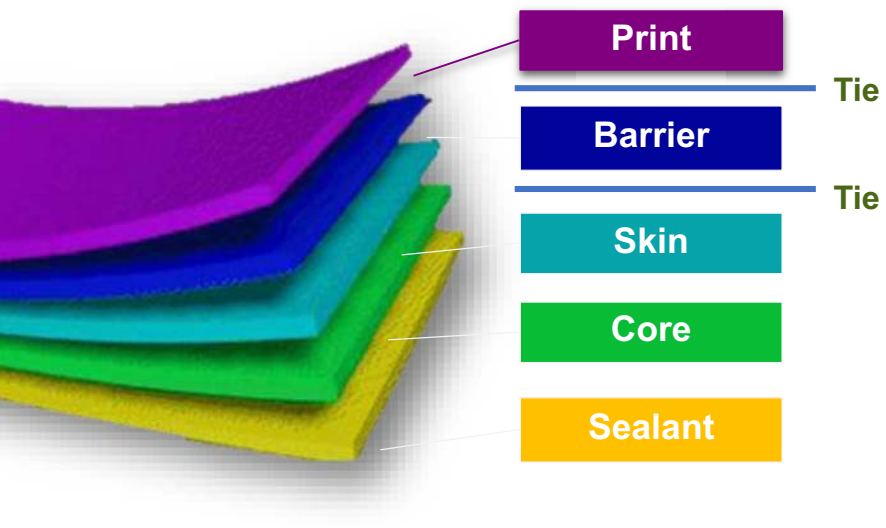


4

BIOPLASTICS

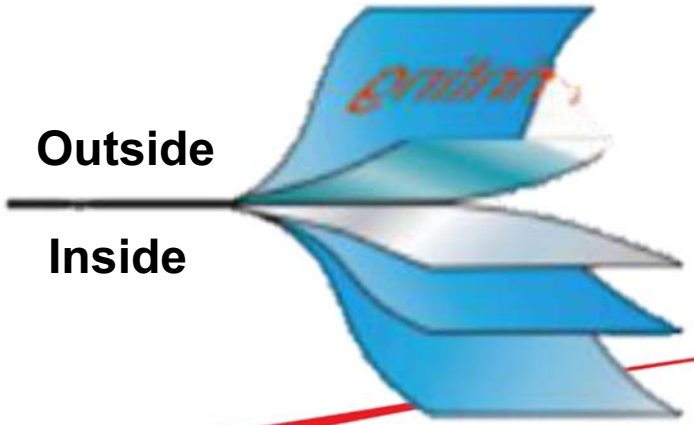
Digital Solution in Circular Economy

Existing flexible film structures are Multilayer with Multi-material



Layer	Characteristic	Material
Printing	**Good appearance** and **excellent printing**	PET, Nylon, BOPP, CPP
Barrier	Protect oxygen and water vapor from outside and **increase product shelf-life**	Aluminum, Metalized film, Nylon, PET,BOPP
Sealant	Excellent **seal strength** at low SIT and **increase packing speed**	LLDPE, LDPE,HDPE, hPP, PP Terpo, Plastomer

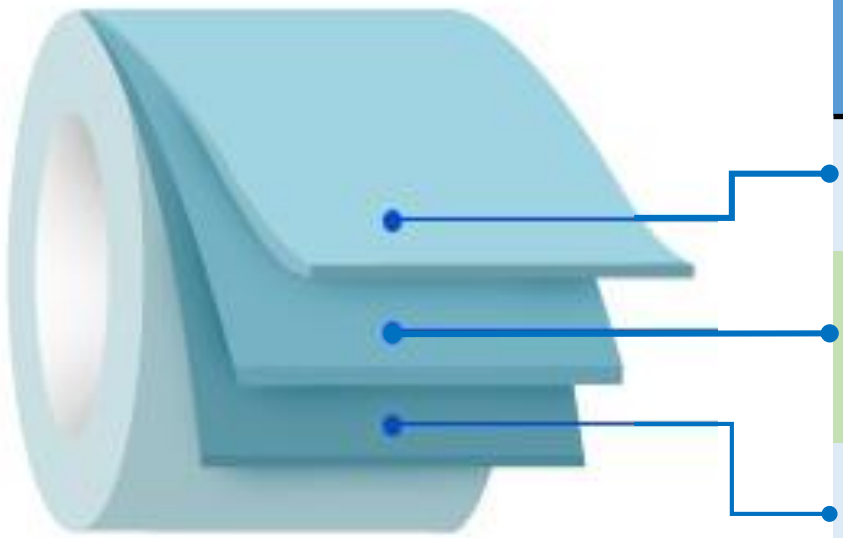
**** Structure film in same application may be different depend on requirement***



PET
INK
ADH
MPET
ADH
LLDPE

SCG Design for Recyclability

Under developing mono-materials both PE & PP structure to serve recyclable pkg.



Layer	Target Replacement	MonoMat PE Based	MonoMat PP Based
Printing	Nylon, PET	**BOPE**	**BOPP high heat resistant**
Barrier	Nylon, PET Metalized film Aluminum	**Medium** **High – Very high** **Ultra High**	
Sealant		PE (existing grade)	**CPP** **Low temp seal**

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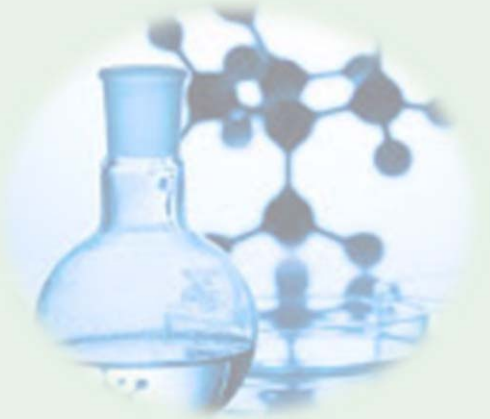

4 BIOPLASTICS

Digital Solution in Circular Economy

SCG PCR HDPE

"The solution delivers global standard of PCR quality. This can achieve the Personal & Homecare packaging new boundaries by giving a sustainable product consistency while enabling customer to commence a Circular Economy model and accomplish recycled content commitment"

✔ ***Global Compliance Standard***

ISO14001 REACH RoHS COMPLIANT ISO 9001 EuCertPlast

✔ ***Processing Friendly***

✔ ***Product Quality & Appearance***

✔ ***Traceability Guarantee***

✔ ***Sustainable Product Availability***

PCR LD/LLDPE

SCG suez

SUEZ Circular Polymer:

- *30,000 T/year is the final recycling capacity of the plant, will be of recycled materials in 2023*
- *OUR DNA: Compliance and High Quality Products"*

Production and Quality (as a producer)	SUEZ CIRCULAR POLYMER (THAILAND) CO., LTD.
Sales and Marketing (as a sold broker)	SCG PLASTICS CO., LTD.
Product	HIGH QUALITY PCR RESIN (PCR LLDPE Resin and PCR LDPE Resin)
Market	ASEAN
Plant Location	Bangkok Free Trade Zone, Bangplee, Samutprakarn
Availability	Commercial product will be available from Q4/2020

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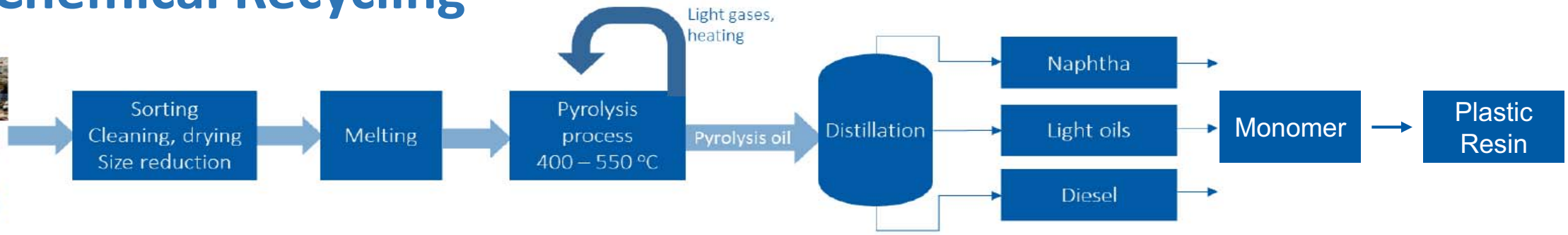
Digital Solution in Circular Economy

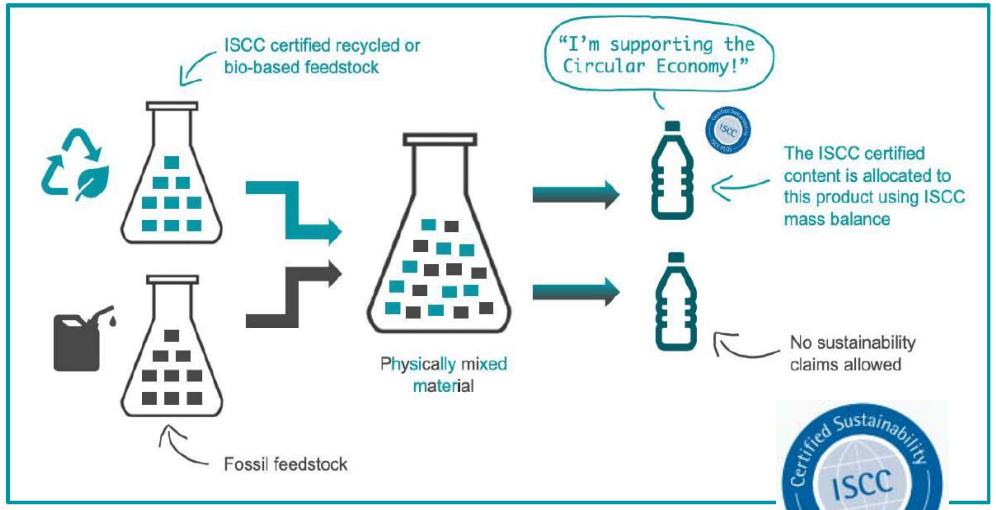
Chemical Recycling



- Polymer breakdown & Reproduce monomer building blocks
- Solutions for Mixed-plastic waste
- End-of-life extension

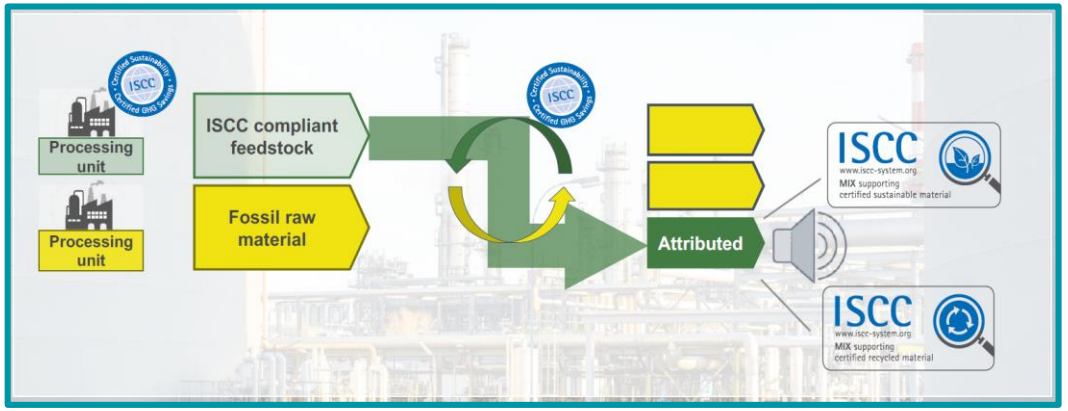
ISCC Certified based on Mass Balance Concept

ISCC International Sustainability & Carbon Certification



Mass balancing is a method to document and track recycled/bio-based content through complex manufacturing systems.

By using mass balance, companies can track how much recycled/bio-based material has been used in their manufacturing systems and balance it out exactly with the certified content in the end products.



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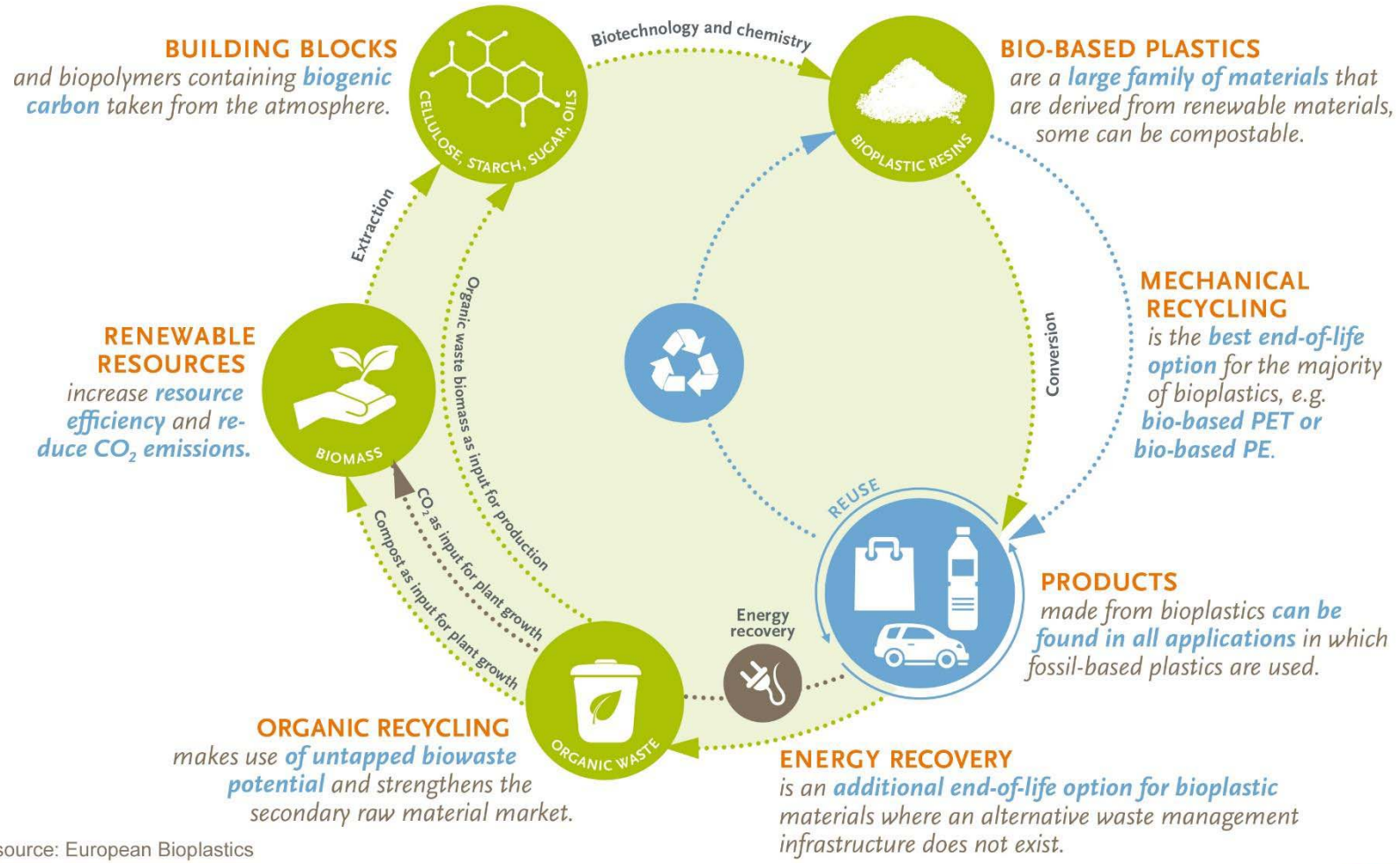
Digital Solution in Circular Economy

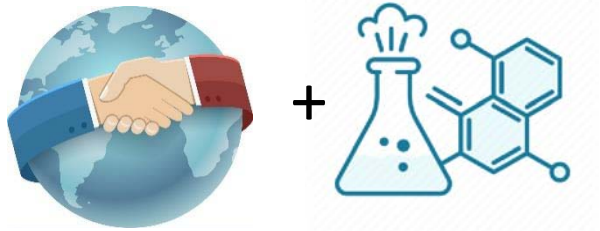
Bioplastic & Bioeconomy ----→ BCG Model(s) THAILAND

Bioplastics – closing the loop



source: European Bioplastics

Bio-Plastic



Five key barriers prioritized based on survey results & interviews

wbcsd

Policy support

Current policies often support fossil-fuel materials through e.g. subsidies

Investment & operational costs

Investment costs restrictive due to required research & development

Input materials with higher general costs

Technology not offering low cost opportunities yet

Technological developments

Technologies for production of some bio-based products already exist, but innovations in many areas required

Scaling-up or scaling-down of many technologies currently not possible

Scaling-up of production

Material availability, technologies and experience compared to existing alternatives hindering scaling-up of concept

Public perception of concept

Land-use challenge, perception of Genetically Modified Organisms (GMO) and consideration of trade-offs for biomass use impede full embracement of concept

Missing sense of urgency to change current practices and unawareness about link to climate agenda

SCG

DIGITAL PLATFORM FOR CIRCULAR ECONOMY

Waste Bank Collaborations

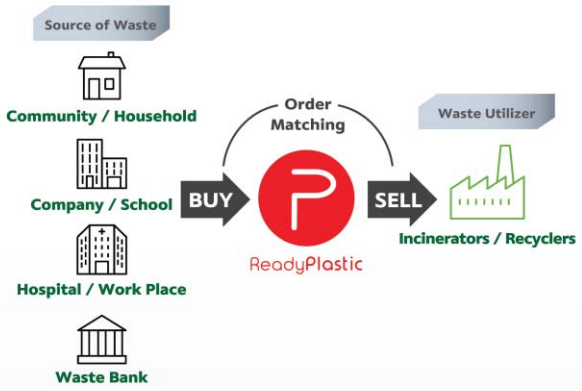
KoomKah

DIGITAL PLATFORM FOR SUSTAINABLE WASTE MANAGEMENT

KoomKah is a digital platform developed to promote correct waste sorting in order to improve recycling efficiency right from the beginning. The platform offers waste collectors and waste banks more convenience, as waste types, amounts, and prices can be easily recorded and organized via KoomKah mobile application.

KoomKah also serves as an additional digital channel where users can directly sell each type of waste to specific recyclers and incinerators.

KoomKah is not only allows sorted waste to be sold at good prices but also delivers quality waste to recyclers and enables waste banks to manage and plan waste purchase and logistics more efficiently.



SCG

SCG : Summary

- Dedicated to follow world trend on climate change and SDGs.
- Open up for collaborations to drive on circular economy
- Together with collaboration we shall make this possible

SCG

PASSION FOR BETTER