



PETRONAS Chemicals Group Berhad
PCG Knowledge Sharing Series:

Specialty Chemicals Segment

3 September 2024
3.00pm – 4.30pm (MYT) | 9.00am – 10.30am (CET)

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Agenda

Introduction & Welcoming Remarks

PCG SC Business Overview

Resins & Coatings and Engineering Fluids Value Chains

Personal Care Value Chain

PCG SC Outlook FY2024

PCG SC Build For The Future

Q&A

Closing Remarks

Our Speakers



Dr. DEBBIE CHIU
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PCG



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General Manager
(Strategy & Business Development,
Specialty Chemicals)
PCG



Moderator:

ZAIDA ALIA SHAARI
General Manager
Investor Relations
PCG



GORM JENSEN
EVP
Commercial & Innovation
Perstorp

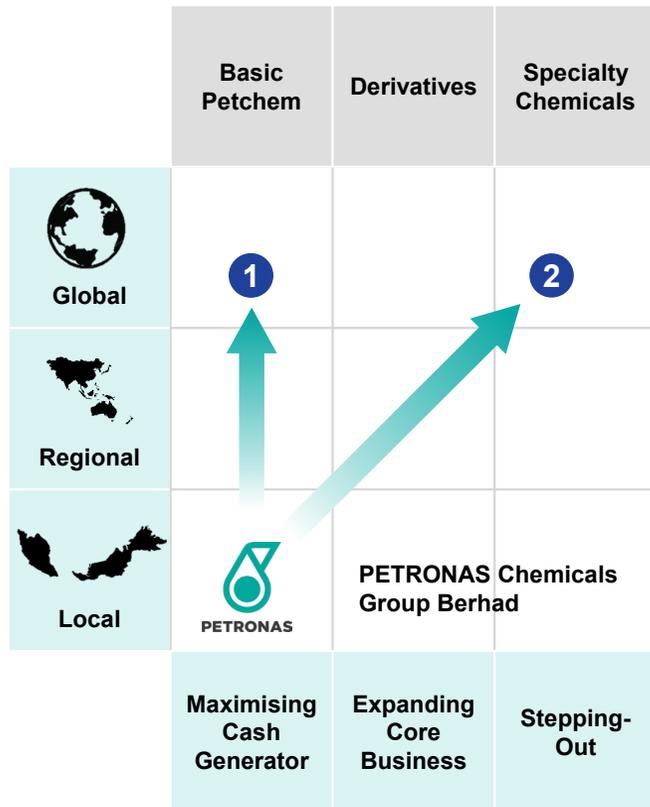


STAN VAN GEFFEN
Manager
Global Strategy and Planning
BRB

PCG Specialty Chemicals Business Overview

Specialty Chemicals is key to PCG's 2-pronged strategy

Two-pronged strategy



Diversify to future-proof the business

Expanding Core Business



Extend Value Chain (EVC)

via Downstream Investment

Stepping-Out



Build Specialty Platform

via Mergers & Acquisitions (M&A)



Create Optionality for Growth

via Technology Research and Corporate Venture Capital (CVC)



2019



A Subsidiary of PETRONAS Chemicals Group



2022



A Subsidiary of PETRONAS Chemicals Group

PCG Specialty Chemicals (PCG SC) business at a glance

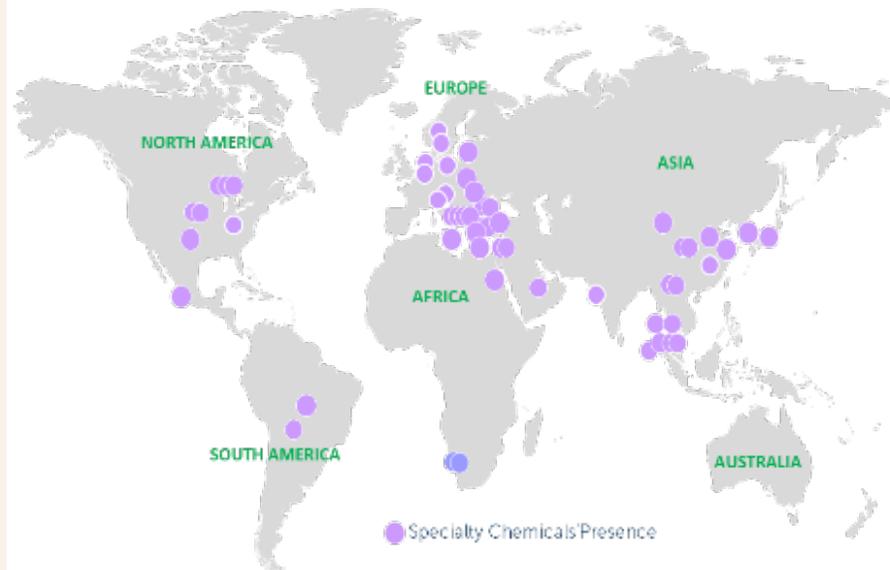
PCG SC 2024

~50%
of Sales from Leading
Market Positions

27+ countries
Global Presence

~2,000
Employees

PCG SC Worldwide



Specialty Chemicals portfolio boosts our market presence in Americas and EMEA, while strengthening our footprint in APAC

PCG SC Segments

1



Resin & Coatings

Range of building blocks and specialty products can be used and tailored to produce resins and coatings

2



Engineering Fluids

Provider of essential intermediates ester lubricant base stock and synthetic fluid solutions

3



Animal Nutrition

Specialist in organic acid-based solutions for the agricultural industry via feed additives and preservatives

4



Advanced Materials

Provider of focused and innovative chemistry for futureproof, safe, and sustainable materials

5



Silicones

Producer of specialty silicones and also supplier of broad range of core and specialty silicone intermediates

6



Lube Oil Additives & Chemicals

Formulator and manufacturer of additives that improve the performance of lubricants and fuels

To contribute towards 30% additional revenue from non-traditional business

PCG SC leverages on its global footprint to optimize supply, demand and pricing strategies



Success in Specialty Chemicals: Tailored approaches based on product functionality and customisation

CONTEXT

Key success factors

Commodity

- **Mastering scale:** combination of high volumes and continuous processes
- **Lowest cost per ton:** e.g., through low-cost feedstock
- Ability to adapt to **supply / demand cycles**

Specialty

- **Mastering complexity:** customisation, digitalisation
- **Innovation:** agile, customer-centric innovation centered on differentiation
- **Customer service and intimacy:** assess needs, and create solutions via technical expertise

Characteristics

Value proposition



Selling a molecule, ingredient or component



Selling a product functionality/ full solution to a problem

Customisation



Sold based on chemical specifications



Sold based on function and performance or highly customised

Applicative science



Limited knowledge



High laboratory application know-how

Pricing



Based on supply/demand balance often with indices



Based on usage value

Value chain

Large volume commodities

Intermediates

Niche intermediates

Specialty products

Specialty formulations

PCG Business

PCG OGD & PCG F&M

BRB & Perstorp

Deep-dive into the segments and their value chain

Resin & Coatings



Pentaerythritol (Penta)

Engineering Fluids



Synthetic Esters

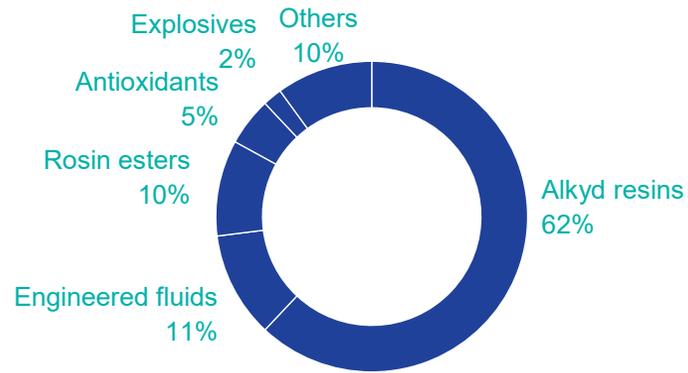
Silicones



Personal Care Formulations

PCG SC is the biggest producer of Penta with ~25% global market share

Breakdown of Penta Demand



End Market Application



Hot Melt Adhesives



Decorative Paints

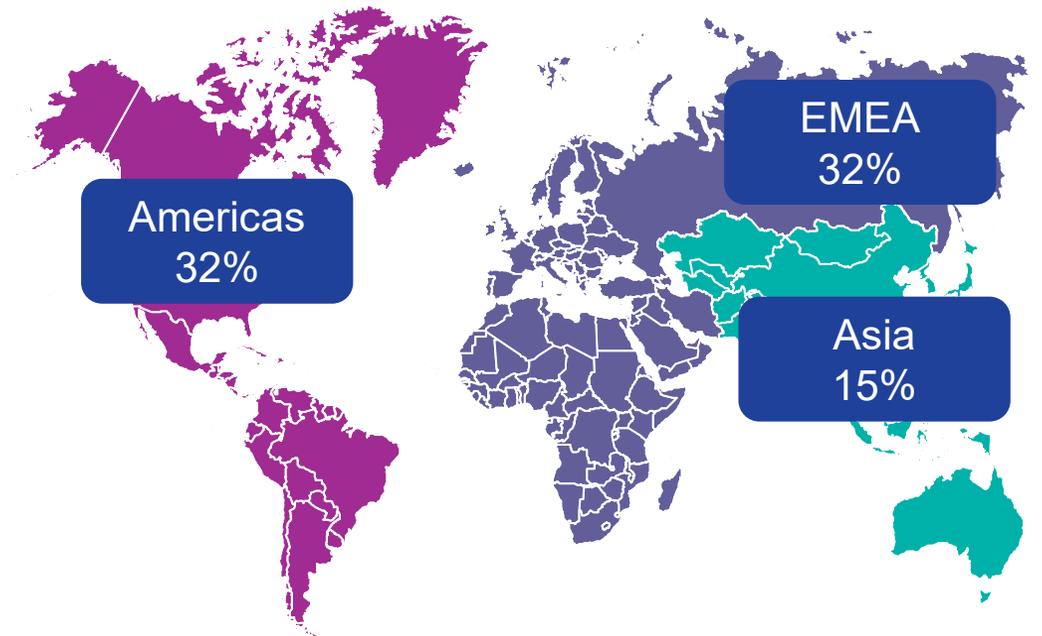


Industrial Coatings



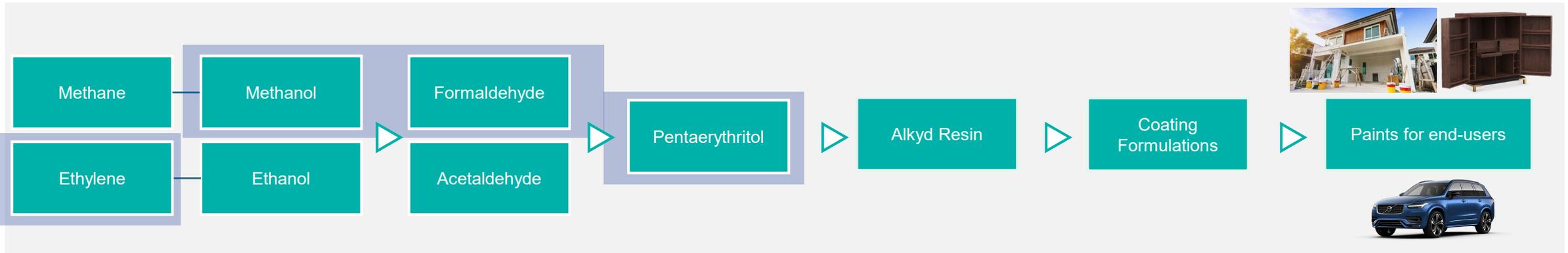
Refrigerant Fluids

*non-exhaustive



Legend: Market share

Value chain for Pentaerythritol (Penta) in Resins and Coatings



*Note: Penta is one of the many products in Resins & Coatings segment

Legend: PCG

Industry Players:

Basic Chemicals	Key Ingredients	Solutions	Coating Formulators	End Users
<ul style="list-style-type: none"> Methanex LyondellBasell Celanese Eastman Chemical 	<ul style="list-style-type: none"> Hubei Yihua Chemical Chifeng Ruiyang Chemical 	<ul style="list-style-type: none"> Arkema Evonik Industries Polynt Allnex 	<ul style="list-style-type: none"> PPG Jotun Sherwin-Williams 	<ul style="list-style-type: none"> Volvo Ruma Volkswagen IKEA

*Note: The companies listed above are examples that are non-exhaustive

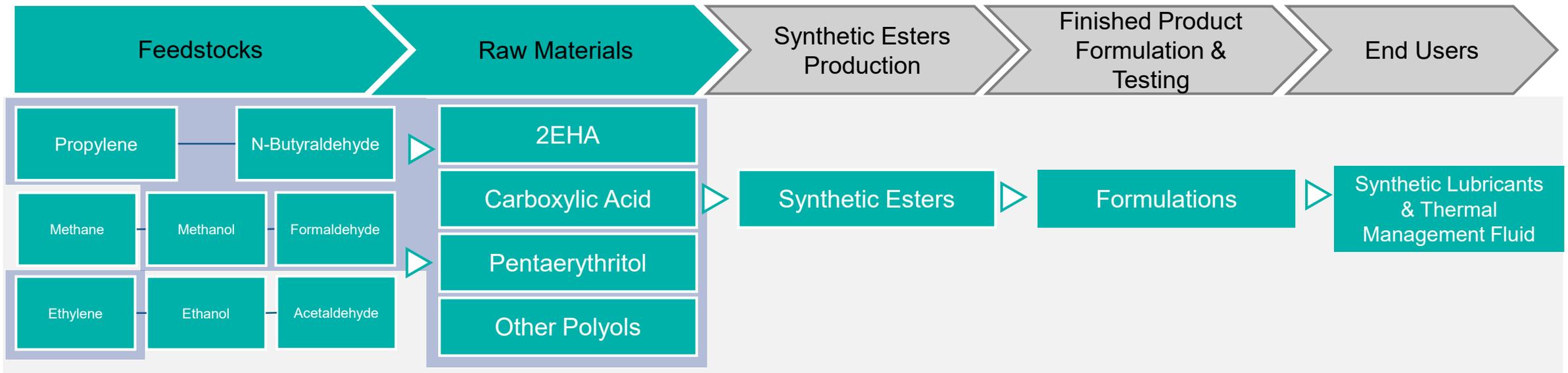


3,500 kg of Penta

Did you know about the Eiffel Tower?

- ➔ Repainted every 7th year
- ➔ Repainting takes 18 months for 25 painters
- ➔ 50,000 liters of paint
- ➔ 1,500 rollers and brushes
- ➔ One repainting consumes 3,500 kg of Penta

Value chain for Synthetic Esters in Engineering Fluid



*Note: Synthetic Esters is one of the many products in Engineering Fluid segment

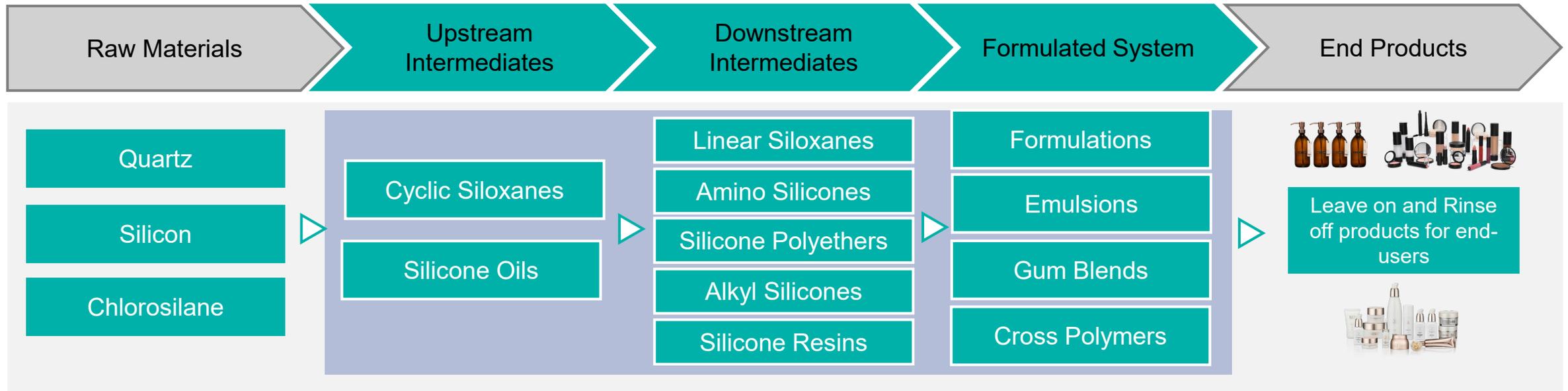
Legend: PCG

Industry Players:

Basic Chemicals	Basic Ingredients	Formulators		End Users
<ul style="list-style-type: none"> LyondellBasell Eastman Chemical 	<ul style="list-style-type: none"> BASF Oleon Croda Afton Chemical 	<ul style="list-style-type: none"> Chevron ExxonMobil Lubrizol LANXESS 	<ul style="list-style-type: none"> Infineum Afton Chemical 	<ul style="list-style-type: none"> PETRONAS ENEOS Chevron Lubricants Intel

*Note: The companies listed above are examples that are non-exhaustive

Value chain for Silicones in Personal Care



*Note: One of the many value chains for silicone formulations

Industry Players:

Legend: PCG

Basic Chemicals	Basic Ingredients	Functionalised Ingredients	Personal Care Formulators	End Users
<ul style="list-style-type: none"> • Dow • Wynca • Shin-Etsu Chemical • Wacker • Elkem 	<ul style="list-style-type: none"> • Dow • Wynca • Shin-Etsu Chemical • Wacker • Elkem 	<ul style="list-style-type: none"> • Dow • Wynca • Shin-Etsu Chemical • Wacker • Elkem 	<ul style="list-style-type: none"> • Milliken & Company • Innospec • Evonik Industries • Avantor 	<ul style="list-style-type: none"> • Procter & Gamble • Unilever • L'Oreal • Dabur • Amway

*Note: The companies listed above are examples that are non-exhaustive

Personal Care – The Power of Smart Ingredients

Color Cosmetics

Soft & silky feel, enhance spreading, emollience, long lasting and transfer resistant.



Hair Care

Soft & silky feel, shine, enhanced combing, color & heat protection and frizz control



Skin Care

Smooth & silky feel, moisturising, long lasting, enhanced spreading and water resistant



Volatile Fluids

Dimethicones

Crosspolymers

Phenyl Modified Fluids

Silicone Emulsions

Polymer Fluid Blends

Silicone Resins

Dimethicone Copolyols

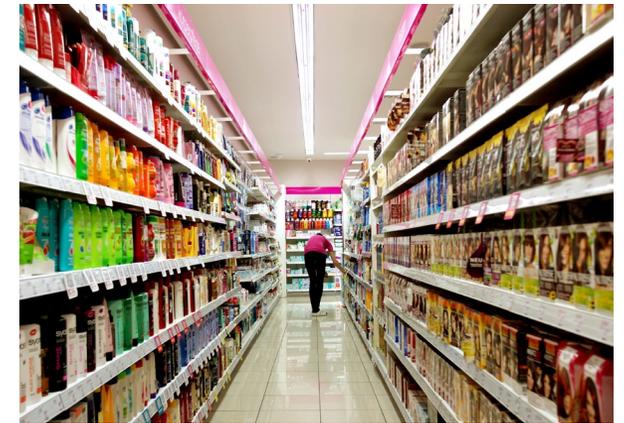
Silicone

EMFINITY

“**Em**powering beauty through **em**pathic consumer engagement, fueled by an **infinite** array of cosmetic ingredients solutions”

PCG SC Outlook FY2024

Market outlook of the segments are influenced by the end markets that the specialty products serve



KEY MARKET OUTLOOK

Construction Industry

- Soft global residential and commercial demand.
- Elevated interest rates remains a headwind. Recovery estimated to be a 2025+ scenario.
- Meanwhile, non-residential & infrastructure demand is expected to remain healthy for 2H 2024.

Segments affected:



Resin & Coatings Engineering Fluids Advanced Materials Silicones

Transportation & Automotive Industry

- Global automotive production growth rates estimated to slow down for the remainder of the year.
- By 2H 2024, China expected to drive most growth compared to Europe and North America.

Segments affected:



Resin & Coatings Engineering Fluids Silicones Lube Oil Additives & Chemicals

Consumer Goods Industry

- In China, consumer sentiment remains conservative throughout 2024.
- US and European consumers remain hopeful of potential interest rate reduction in 2H 2024.

Segments affected:



Resin & Coatings Advanced Materials Silicones Lube Oil Additives & Chemicals

Build For The Future

Our strategy is guided by future applications of products and solutions derived from megatrends



Urbanisation



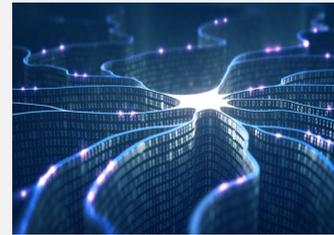
Electrification & Mobility



Health & Wellbeing



Clean Production & Energy



Artificial Intelligence & Data



Sustainability

Solution clusters/themes

- Smart cities
- E-mobility
- Digitalisation
- Packaging

“PCG SC aims to provide solutions addressing these clusters via our product offerings across different segments.”

PCG SC will look to provide range of solutions to address the most pressing needs of the future & key megatrends

KEY OPPORTUNITIES TO BE ADDRESSED BY PCG SC

- Safe environment in houses
- Durable & lightweight material
- Energy saving & thermal management
- Carbon neutral buildings
- Renewable electricity production
- Digitalisation & A.I

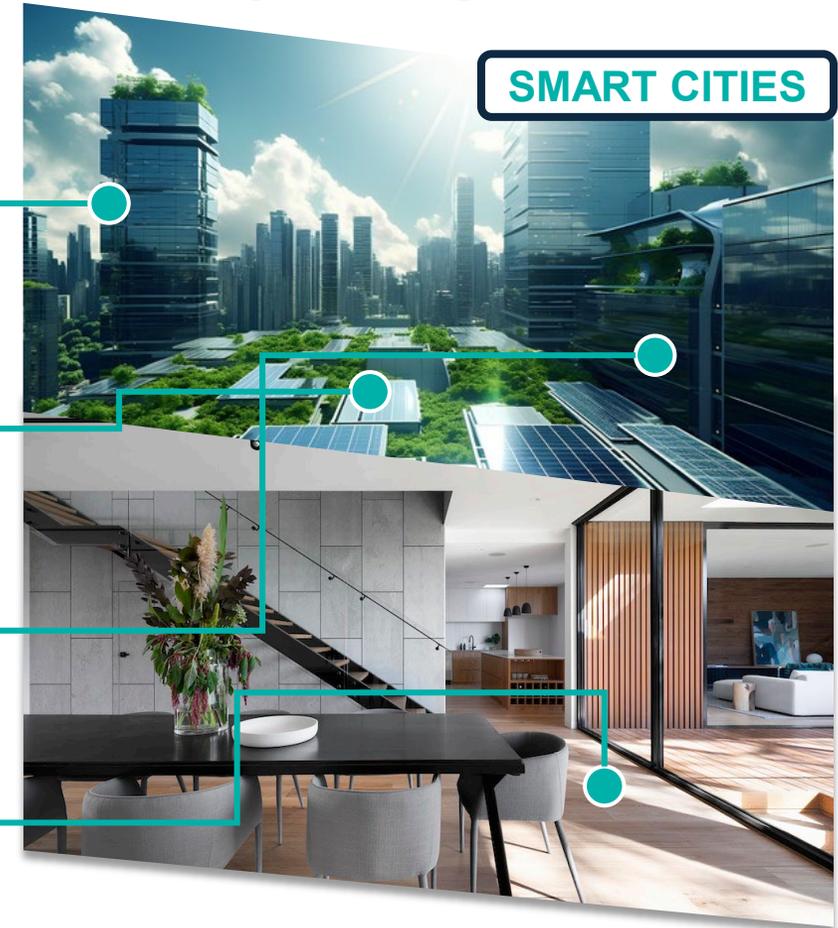
PCG SC PORTFOLIO ADDRESSING SMART CITIES

INFRASTRUCTURE AND BUILDINGS
sustainable coating ensuring durable solutions

ELECTRICAL INFRASTRUCTURES & TRANSPORTATION
efficient & safe electricity distribution and durable materials

DATA CENTRES & ELECTRONIC DEVICES
efficient & safe emerging cooling granting aggressive growth of data centers

HOUSING & PACKAGING
renewable and durable material minimising use of plastic maximising recyclability



Safe and Sustainable UV-Curing

Resins & Coatings – Pure performance. Pure Advantage

Current product

PCG SC's leading products & technologies



- Penta / Voxtar™ - Alkyd Paints
- Bis-MPA™ - PU Dispersions
- Curalite™ - UV Cured Resins
- Charmor™ - Intumescent Coatings

Regulatory changes and challenges for TMPTA.

International Agency for Research on Cancer (IARC) & California Prop 65 classified TMPTA as carcinogenic.

Problem Statement

Replacing TMPTA: The new standard in UV-curing



To address the regulatory changes PCG SC have developed polyol building blocks that enables continued development of safe, sustainable and high performing inks and coatings.

Pipeline Project

Safe and Sustainable UV-Curing: navigating high-performance TMPTA alternatives



- Acrylates based on alkoxyates provide a safer option for UV-curing processes as they do not have any carcinogen classification.
- Offer properties similar to TMPTA when looking at diluting effects, reactivity and crosslinking.

This shift towards safer materials aligns with the evolving regulatory landscape and emphasises the industry's commitment to worker and end-user health.

Engineering Fluids – functional fluids for thermal management

Current product

Essential intermediates ester lubricant base stock



PCG SC's leading products & technologies serving:

- Hydraulic Fluids
- Refrigeration lubricants
- Di-electric Fluids
- Refrigeration lubricants
- Aviation Turbine Oils
- Metalworking Fluids

Problem Statement

A future-proof solution to the challenges posed by digitalisation, electrification, new mobility and sustainability

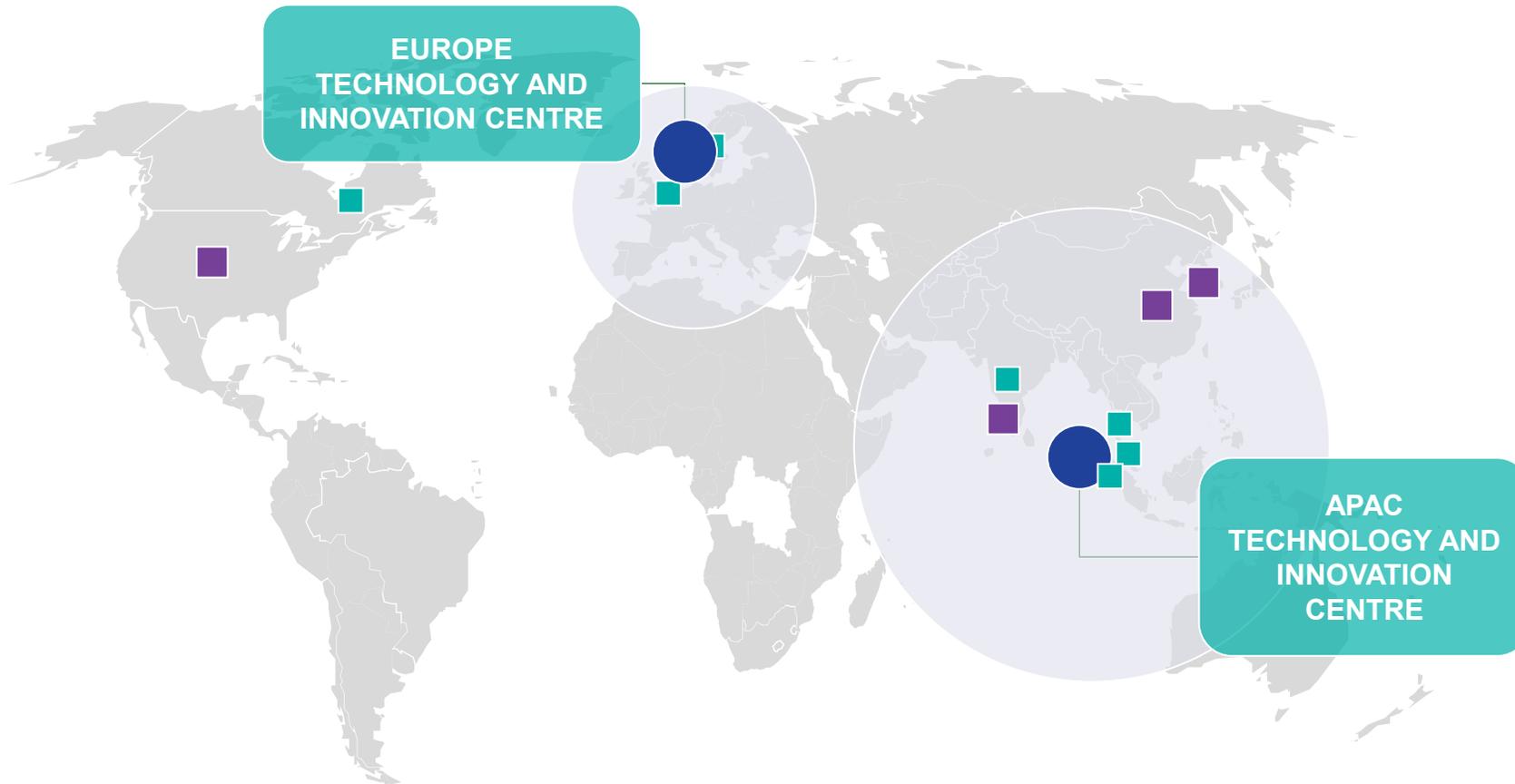


Pipeline Project

High-performance synthetic thermal management fluid specifically designed for immersion cooling in data centers



Building a global network of Technology & Innovation hubs



■ 7 current R&D laboratories

● New Tech & Innovation Centre

■ New Application Lab

Tech & Innovation Centres

New Tech & Innovation hubs will complement the growing base of industrial assets, bringing innovative product and process development together.

Labs will be strategically located near key industrial hubs in APAC and Europe to facilitate close cooperation.

Application Lab

A distributed system of application labs will enable closer and more collaborative relationships with customers.

Labs will be strategically located in key priority geographies and critical innovation hubs (e.g. Korea, China, Taiwan)

..with the ambition to build a best-in-class eco-system for leading end-to-end innovation capabilities

THE FOCUS

Synthesis Lab

*New chemistry & processes
(Reactor, Purification, Extraction)*



Analytical Lab

*Physical, Chemical,
Instrumental tests*



Pilot Plant Farm

*Process scale up
& sampling*



Applicative Science Lab

Functional & Performance tests for new product development based on customer's needs



Starting from a journey to optimise the value of our molecules, we will continue to push forward and deliver our transformative growth for specialty chemicals business



Bringing 190+ years of experience

PETRONAS
foundation
50 years ago

PETRONAS
Chemicals Group
launch >30 years ago

PCG first steps
towards specialties
2019-2022

PCG Specialty
Chemicals:
Now & beyond

PCG established to **move into**
oil and gas derivatives

Acquisitions of Perstorp and
BRB as **first steps**

Building a world leading
specialty chemicals company



 **Perstorp** Foundation
140+ years ago

 **BRB** Foundation
40+ years ago



PETRONAS



50
YEARS