


# Unlocking Resilient Future:

## The New Frontier of PE Sustainable Market Landscape

The 15<sup>th</sup> PTT Group Petrochemical Outlook Forum

Friday, 16 August 2024



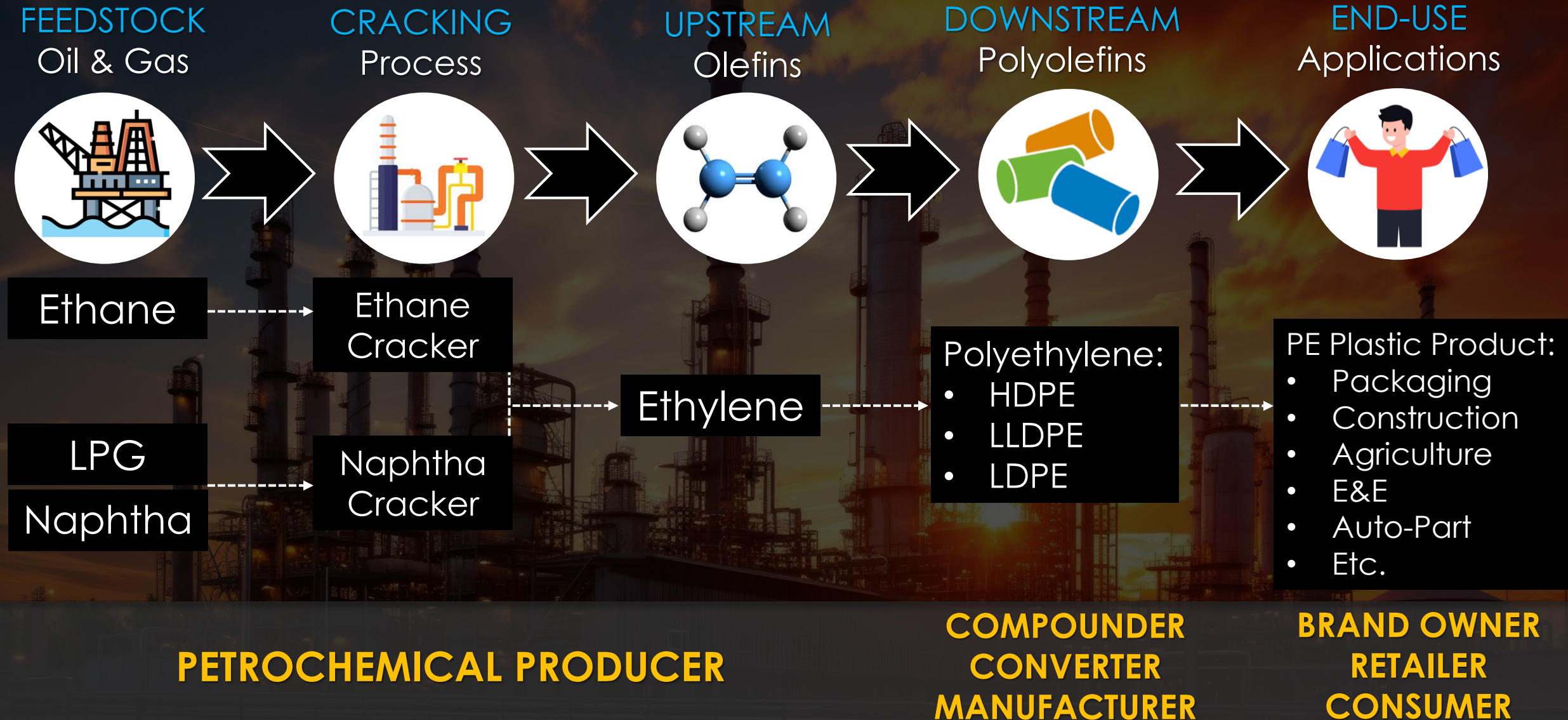
The background of the slide is a photograph of a city skyline at night. Several tall, modern skyscrapers with glass facades are illuminated from within, reflecting the city lights. The buildings are situated along a body of water, and their lights are clearly reflected on the calm surface. The sky is a deep blue with some light clouds. The overall scene conveys a sense of modern urban development and technology.

# HOW will the Future of Polyethylene Change?



# POLYETHYLENE VALUE CHAIN OVERVIEW

**Holistic Prospect Fosters Sustainable Growth & Competitive Advantage for Stakeholders**





# POLYETHYLENE END-USE OVERVIEW

PE is Extensively Utilized in Everyday Applications owing to Its Beneficial Attributes

## PACKAGING



## CONSTRUCTION



## OTHERS



2024 Global  
Demand

~70%

~ 20%

~ 10%



# KEY FACTORS IMPACT PE MARKET

FEEDSTOCK  
COSTS

1

“Energy, Oil & Gas”

DEMAND/SUPPLY  
DYNAMICS

2

“Ethylene, Polyethylene,  
End-Use”

TRADE  
BARRIER

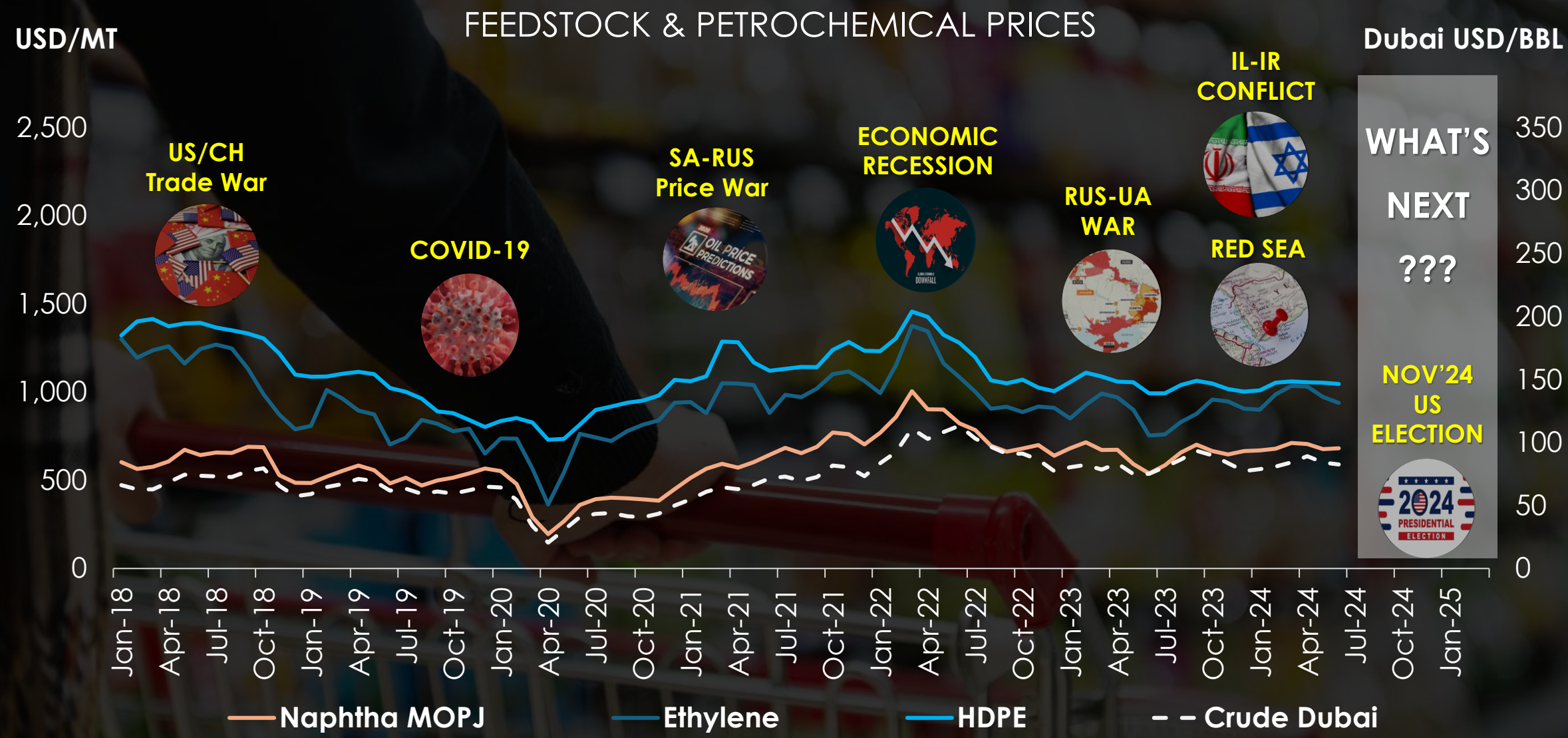
3

“Trade War,  
Sanctions,  
Geopolitics”



# 1. GLOBAL PE & FEEDSTOCK PRICES MOVEMENT

The Global VUCA Crisis Inevitably Affects the Fluctuation of Commodity Prices

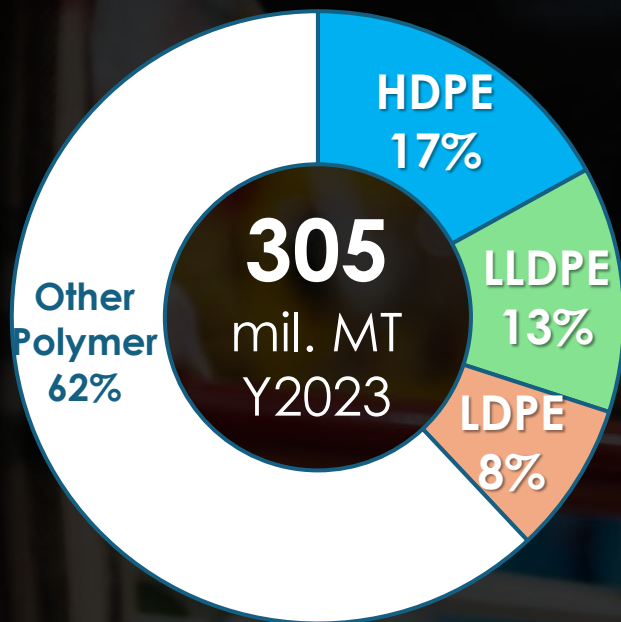


\*VUCA: Volatility, Uncertainty, Complexity, Ambiguity  
 Source: ICIS, PLATTS, CMA'24, GC Commercial Excellence Analysis 2024

## 2. GLOBAL PE DEMAND/SUPPLY LANDSCAPE

PE Still be the Major Polymer with Continuing Growth of Add. Demand & Capacity

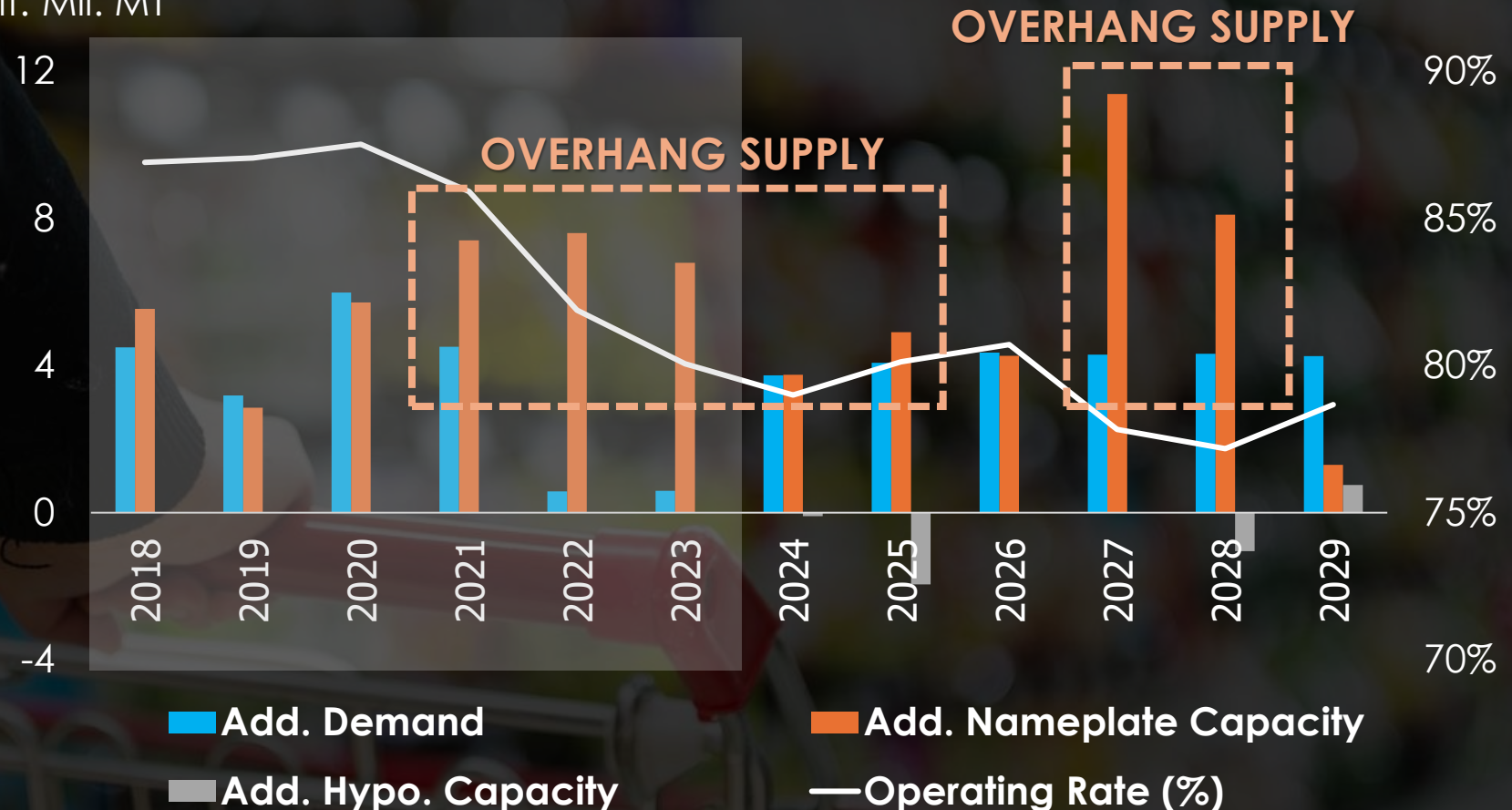
Global PE Accounts  
Almost **40%** Shares



Global PE Demand  
Est. **~3%** (CAGR 2018-2029)

### Global PE Additional Demand & Capacity

Unit: Mil. MT





# 2. GLOBAL PE TRADE LANDSCAPE & OUTLOOK

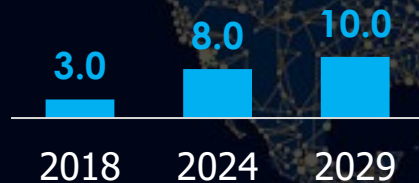
**Intense Competition - New N. American Supplies and Rising Chinese Self-Sufficiency**

Unit: USD/MT

Spread HDPE Film CFR SEA - Naphtha MOPJ



**America**



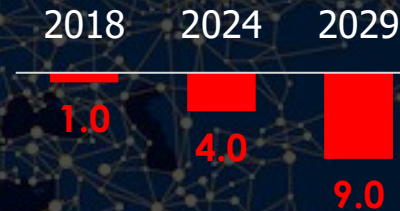
-Cost-Effective Shale Gas  
-Large-Scale Production Capabilities

**Europe**



-High Domestic Demand  
-Limited Feedstock Availability

**Indian Sub.**



-High Demand Growth  
-High Population Growth

**NE Asia**



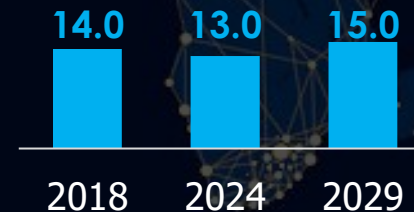
-World's Largest Consumer  
-Heavily Invested in Expanding Production Capacities

**SE Asia**



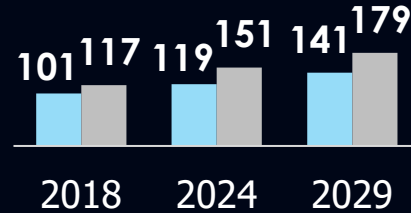
-Rising Demand from Rapid Economic Growth, Urbanization & Rising Middle-Class Population  
-Balancing Supply/Demand

**Middle East**



-Abundant/Low-Cost Feedstock  
-Strategic Geographic Location

**PE WORLD**



CAGR Growth 3%

Unit: Mil. MT

■ Demand ■ Production ■ Net Export ■ Net Import



# 3. GLOBAL MARKET TRADE-THAI FTA PROGRESSION

FTAs Shaping Competitive Market Dynamics, Supporting Sustained Growth & Investment on a Global Scale

2024 DTN Plan for Free Trade Agreements



-  Completed
-  On-Progress
-  Plan to Negotiate
-  ASEAN Agreement



- 15 Agreements were Activated
- 6 Agreements are Negotiating
- 5 Agreements Need to be Upgraded
- 10 Agreement on Plan to Negotiate



# 3. TRADE BARRIER ESG SUSTAINABILITY-EU CBAM

## CBAM Compels Petrochemical Producers to Change for Sustainable Markets

**EU CBAM : Initiatives to Cope with Global Climate Change which will be Fully Enforced in 2026 with Charging of Greenhouse Gas Tax Fee**

### IMPACT TO PRODUCERS :

#### THREATS



Production Cost



Trade Competitiveness



Reporting Challenge

#### OPPORTUNITIES



Tech Improvement



Access Premium



Brand Recognition



CO2 FREE



2023

CEMENT

ELECTRICITY

IRON/STEEL

FERTILIZER

ALUMINUM



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2026

CEMENT

ELECTRICITY

OIL REFINING

IRON/STEEL

FERTILIZER

POLYMERS

ALUMINUM

HYDROGEN

ETC.

CO2 FREE

2030

ALL PRODUCTS



**FAQ: 2025** - Carbon Tax Implementation, Aiming for Net Zero Emissions.



The background of the slide is a photograph of an industrial facility, likely a refinery or chemical plant, at sunset. The sky is a mix of orange, yellow, and blue, with wispy clouds. A tall, dark smokestack is prominent in the upper center. The foreground and middle ground are filled with complex industrial structures, including distillation columns, storage tanks, and piping, all illuminated by the warm light of the setting sun.

**CHANGE IS AN ESSENCE.**





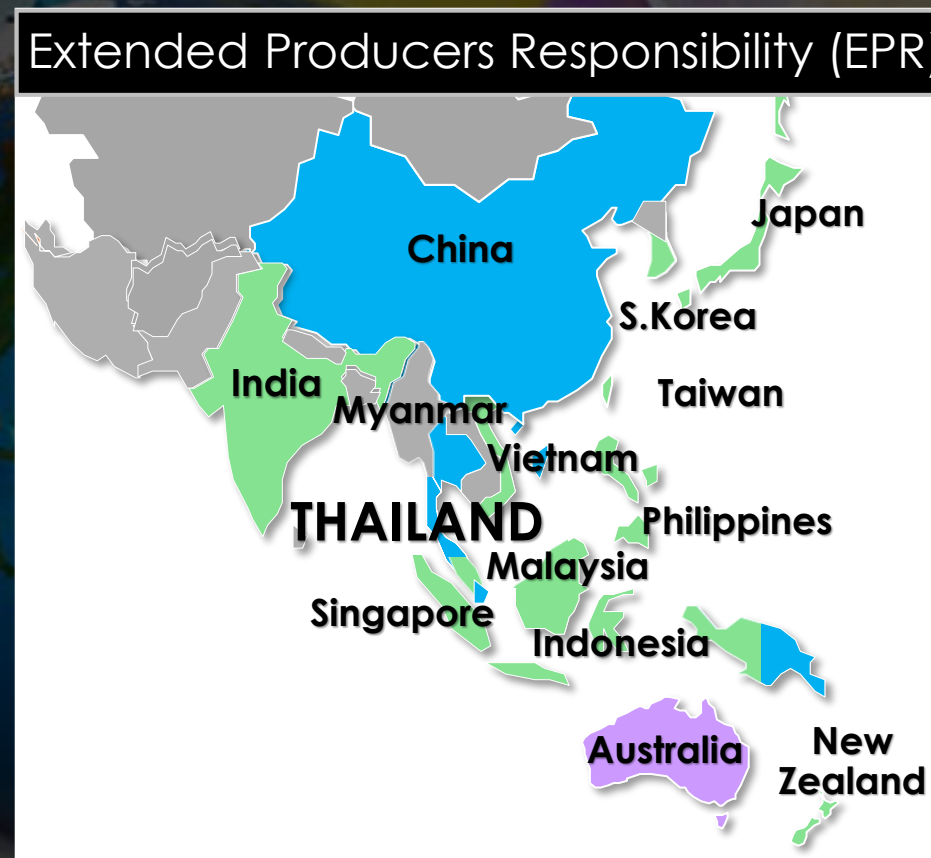
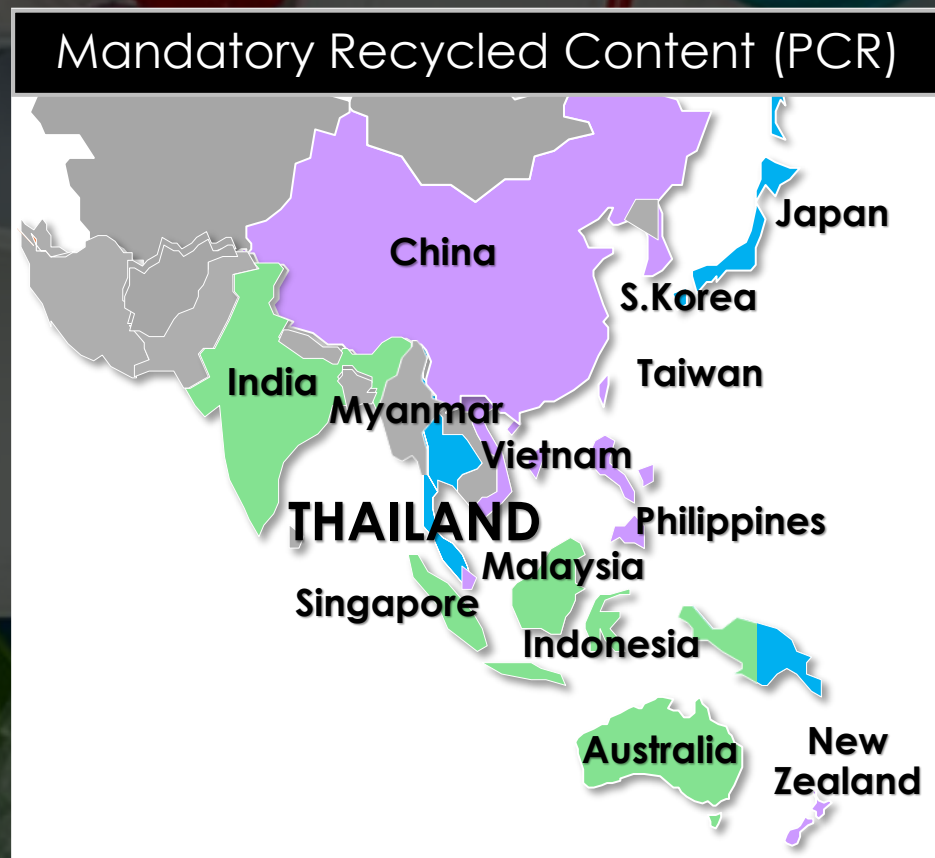
**SUSTAINABLE  
+  
INNOVATION  
= NEW FRONTIER**

**CHANGE PERSPECTIVES**



# CIRCULARITY APAC-Regulatory Landscape

## The Policy Fragmentation & Progress Towards Plastic Circularity



- Established
- Draft Registrations/In Progress
- Does Not Exist

**In Fact, Many Countries have Established Policies and are Actively Working on Implementing Measures to Promote Plastic Circularity.**



# EPR GC-Integrated All 3 ESG Principles

## Extended Producer Responsibility is NOW A MUST

### Efficiency-driven

**Asset Decarbonization**  
~194 GHG Reduction Projects.

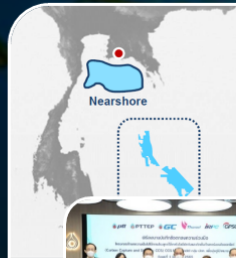


Biogas /H2

### Compensation-driven

**Carbon Management**  
~27 kt CO2/y Carbon Credit Inventory

CCS Hub Study



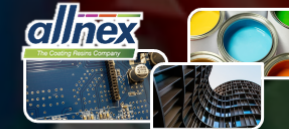
Forestation  
o Mangrove  
o Terrestrial



### Portfolio-driven

**Low Carbon Growth**  
~22,000 mt Plastic Waste Mgmt.

Specialty & Perf. Chem



Circularity Products



Bio-based Products

PLA, PBS, Oleochemicals, Bio-fuels



PTT Global Chemical Public Company Limited  
Chemical Industry

**Top 1%**

S&P Global Corporate Sustainability Assessment (CSA) Score 2023

S&P Global CSA Score 2023: 80/100  
Score date: February 1, 2024  
The S&P Global Corporate Sustainability Assessment (CSA) Score is the S&P Global ESG Score without the inclusion of any resulting adjustments.  
Detailed and complete ESG ratings, details, and related information are available at <https://www.spglobal.com/esg/ratings>

S&P Global Sustainable 1

Member of  
**Dow Jones Sustainability Indices**

Powered by the S&P Global CSA

## Commitment to NET ZERO by 2050 with Rebalancing Sustainability Actions

(2023) GC is Ranked No. 1 for 5 Consecutive Yrs in the Chemicals Business Group by the DJSI.



# MOVING TOWARDS SUSTAINABLE INNOVATION



# GC SUSTAINABLE PRODUCTS

## GC Chemistry for Better Living

### INNOVATION (4S)

CHEMISTRY FOR BETTER LIVING : MEGATREND



#### SUPERIOR

Processability,  
Loss Reduction



#### STRONG

Durable,  
Longer Shelf Life



#### SLIM

Lightweight,  
Easy to Use



#### SAVING

Energy Saving,  
Cost Saving



LINE OFFICIAL : @PMSOLUTION

### SUSTAINABILITY (4R)

NET ZERO : CARBON FOOTPRINT REDUCTION



#### REDUCE (DOWNGAUGING)



#### RECYCLABLE (MONO MATERIAL)



#### RECYCLED (POST-CONSUMER RECYCLE : PCR)



#### RENEWABLE (BIOPLASTIC)



LINE OFFICIAL : @PMSOLUTION



# TRANSITION OF RECYCLED (PCR)

Post Consumer Recycled Driven by Consumers Shifting Towards Environmentally Friendly Practices, together with Gov. Regulations & Policies

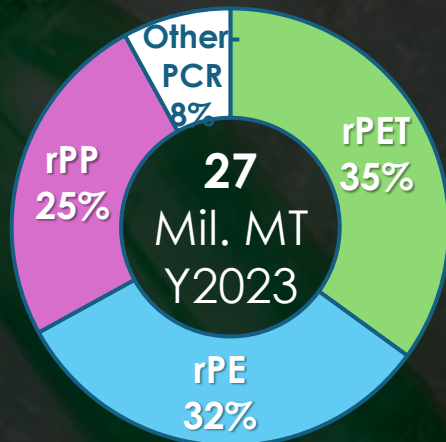
## Global Demand of VIRGIN/PCR

Unit: Mil. MT

VIRGIN ~3% CAGR

PCR ~10% CAGR

2022 2023 2024 2025 2026 2027 2028



100% TH Post Consumer Waste



ENVICCO

InnoEco by GC

rPET



Packaging Food & Beverage

CAPACITY 30 KTA

rHDPE /rLDPE



Packaging Homecare & Personal Care

CAPACITY 15 KTA

Technology: European Standard

PCR PP – Experimental Grade

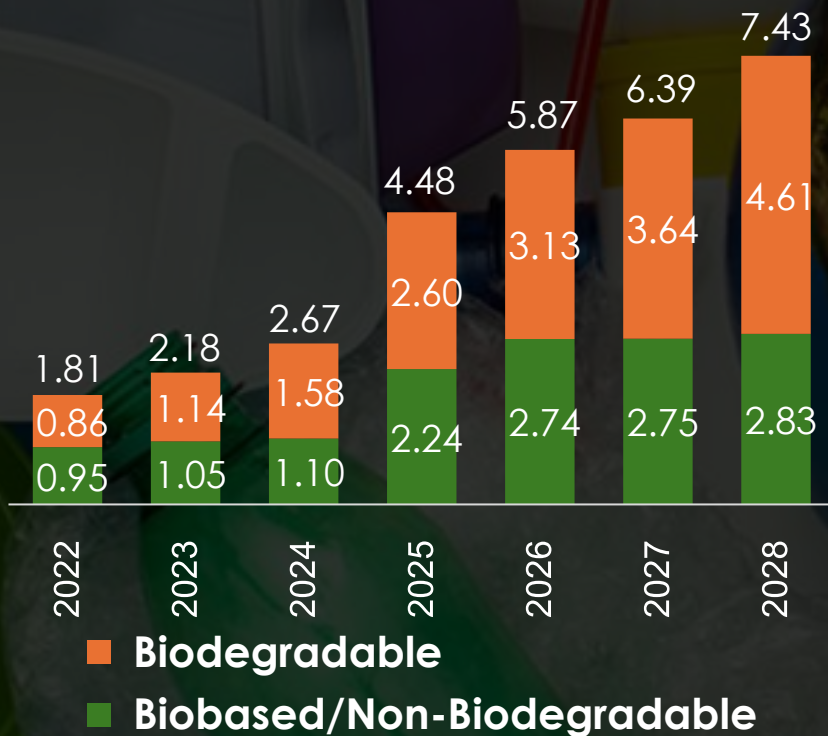


# TRANSITION OF RENEWABLE (BIOPLASTIC)

## Bioplastics Derived from Agricultural Raw Materials (Biobased Compostable Plastic)

Unit: Mil. MT

### Global Capacities of Bioplastics



Global Production Bioplastics  
Est. ~27% CAGR

ingeo™

NatureWorks

Polylactic  
Acid (PLA)

PlastMate

Bioplastic  
Compound

BiOPDS™

ptt  
MCC  
Biochem

Polybutylene  
Succinate  
(PBS)



**BIOBASED PE – 2025 NEW LAUNCHING**

\*Compostable Plastic = Compostable Under Appropriate Conditions  
e.g., Temperature, Moisture, etc.



# SUSTAINABLE PACKAGING-DESIGN & INNOVATION

**GC Applies 4S/4R as a Key to Sustainable Innovation in Plastic Packaging by Helping Customers to Solve Packaging Challenges**



**TETHERED CAP  
(HDPE)**



**SPOUT CAP  
(HDPE)**



**FILM PACKAGING  
(C6-mLLDPE)**



**PACKAGING  
(PE) Take-Away Bag**



- ✓ Easy to Open Design & Processing
- ✓ Lightweight, Strong, Superior, Down-Gauging
- ✓ Easy to Recycle, Reduce Plastic Use & GHGs
- ✓ Mono Material (PE Take-Away Bag)



# KEY TAKEAWAYS

- Uncertainty in feedstock, energy, and geopolitical factors will impact PE prices, necessitating ongoing monitoring and rapid adaptation.
- The PE market will see gradual demand growth, though faces challenges from potential overbuilt capacity in the future.
- Shifting to high-value, sustainable products that align with global trends, is a key strategy to meet consumer demands and tackle trade barriers and industry challenges.



**SUSTAINABILITY**

**ECONOMIC  
CHALLENGE**

**SOCIAL  
RESPONSIBILITY**

# **“SUSTAINABLE INNOVATION” THE KEY TO UNLOCK RESILIENT FUTURE**

**TECHNOLOGICAL  
ADVANCEMENT**

**LAW & REGULATION  
COMPLIANCE**

**CUSTOMER CENTRIC**



**SUSTAINABILITY IS NO LONGER  
A CHOICE, BUT A SURVIVAL  
AGENDA TO ENSURE  
THE LONGEVITY & PROFITABILITY  
OF THE BUSINESS.**