

SHINING THROUGH THE NIGHT

In every downcycle, there is still some upturn for petrochemical industries.

The 14th PTT Group Petrochemical Outlook Forum

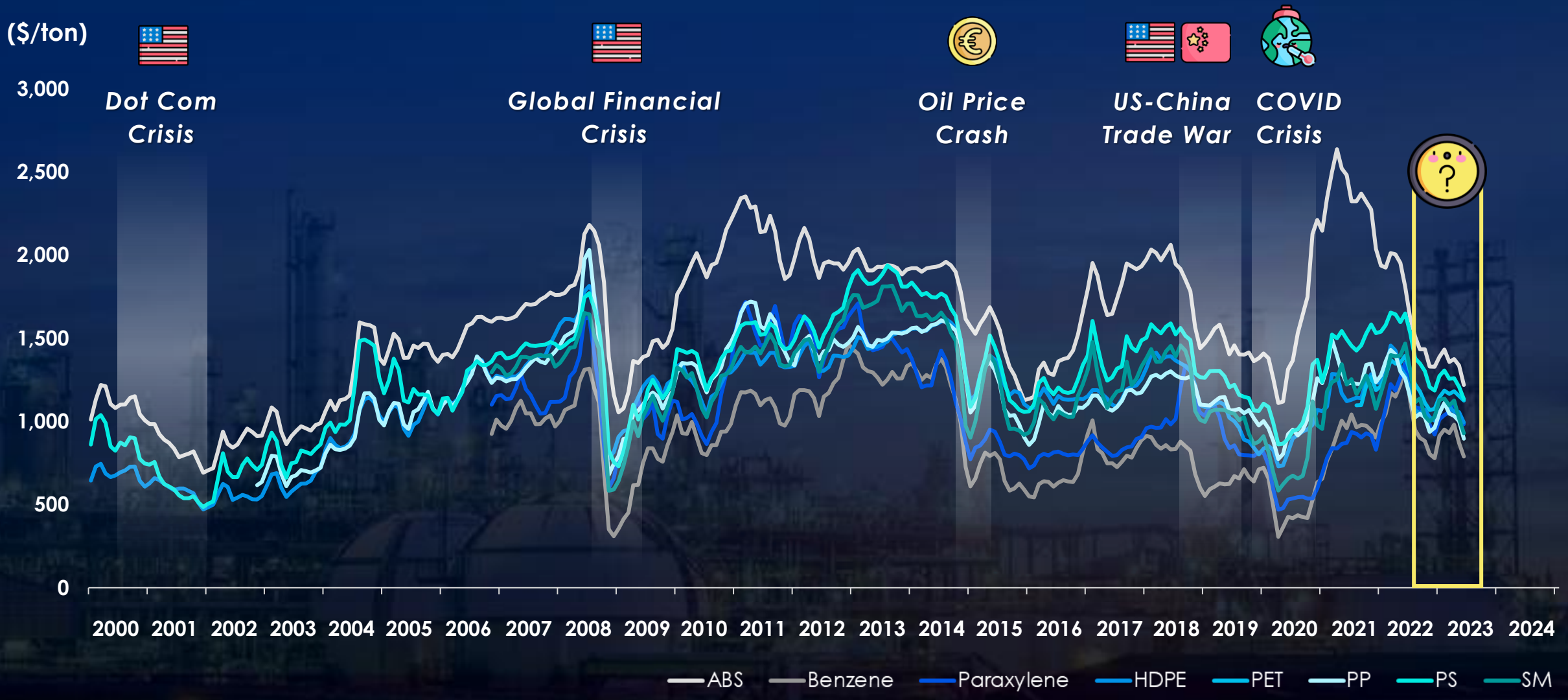
Wednesday, 12 July 2023



What Are We Facing?

Precipitous Petrochemical Downturn

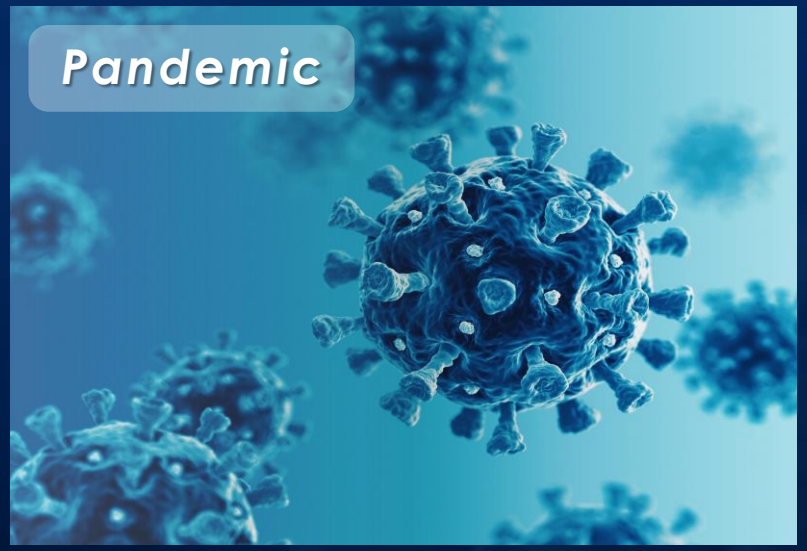
With Global Markets in Turmoil



Source: ICIS, Chemical Market Analytics by OPIS as of Spring 2023

External Factors

Downward Pressure on Petrochemical Industries













A Rocky Economic Recovery

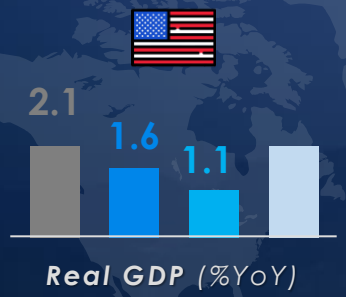
Uncertainty amid Financial Sector Turmoil & High Inflation



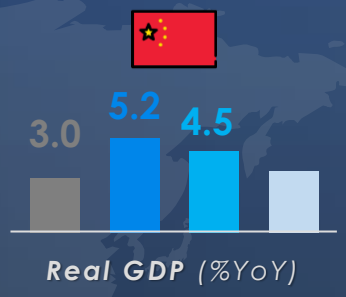
Source: : IMF – World Economic Outlook as of Apr'23, PTT's International Industry Research and Economics Department (IIRE)

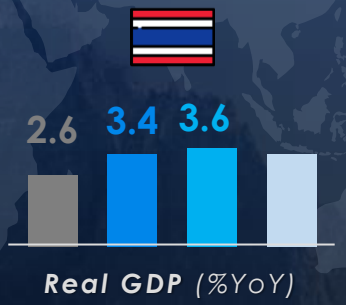
A Rocky Economic Recovery

Uncertainty amid Financial Sector Turmoil & High Inflation









Growth Projection by Region

2022 2023 2024 2028

Thailand Manufacturing PMI 58.2

Euro Area Service PMI 55.1

US Service PMI 54.9

China Caixin Manufacturing PMI 50.9

May'23 Jun'23

Purchasing Managers Index

The most reliable leading indicators for assessing economic activities

Source: : IMF – World Economic Outlook as of Apr'23, Markit Economics as of Jun'23, PTT's International Industry Research and Economics Department (IIRE)

Internal Factor

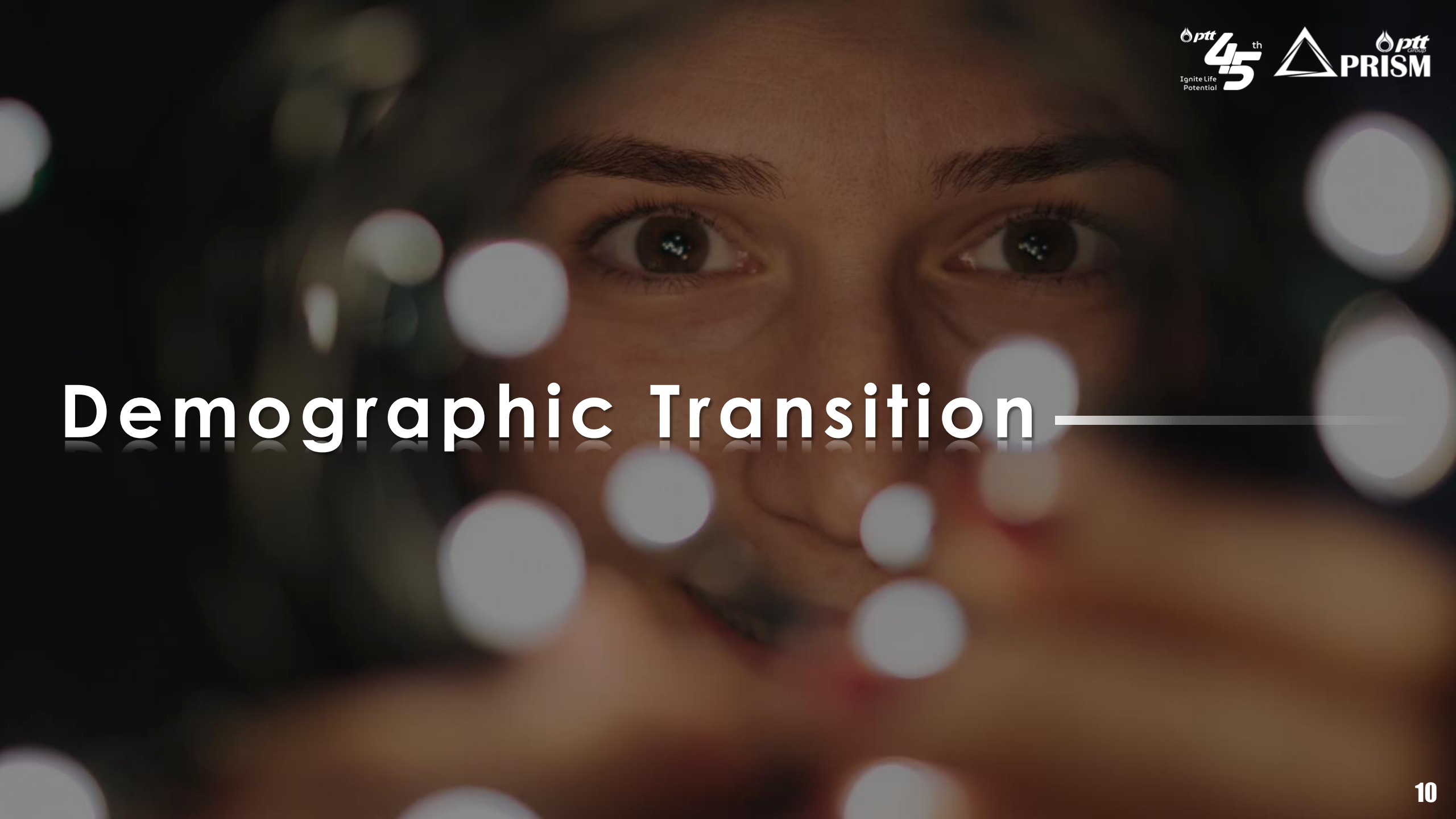
Downward Pressure on Petrochemical Industries




“No weather is bad weather,
If you are well-dressed accordingly”



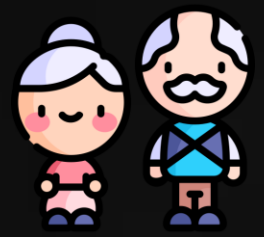
Global Megatrends



Demographic Transition

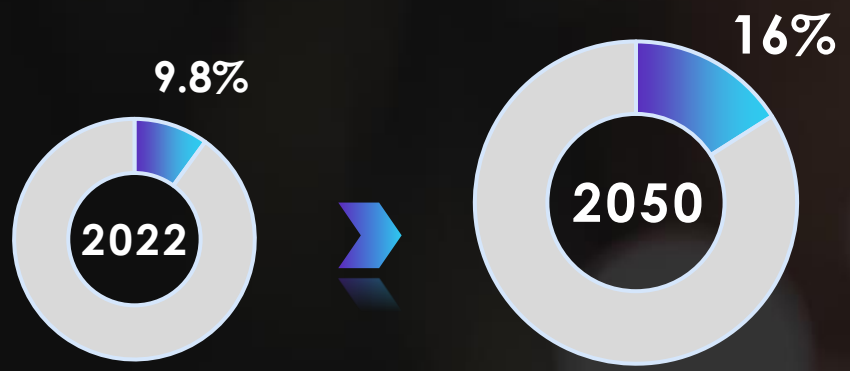
Demographic Transition

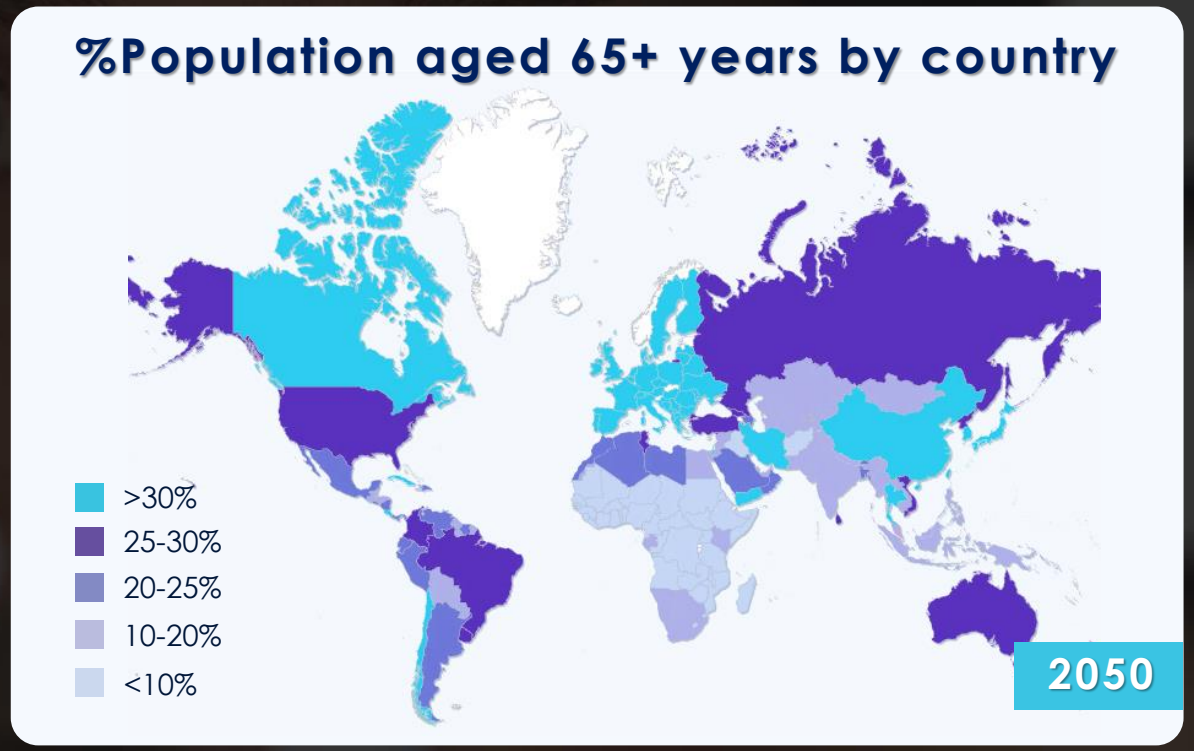
'Population Aging' is the Most Pervasive & Dominant Global Trend



771 Million people

Aged 65+ years globally





- Increasing need for healthcare, long-term care, and social services
- 90% of adults aged 65+ experience one or more chronic condition, and need specific medical care

Source: : World Health Organization, Thailand's Office of Industrial Economics

Demographic Transition

‘Population Aging’ is the Most Pervasive & Dominant Global Trend



Health & Wellness



Health & Wellness

Rising 'Medical Plastics' Demand from Health Awareness Expansion



6% *Revenue Growth (2020 - 2027)*

Medical plastics globally





Commodity Thermoplastics

PP, PE, PVC



Engineering Thermoplastics

PC, ABS, Polyamide, PMMA



Other Plastics

Silicone, TPE, Thermosets

7 Incredible Advantages:

Versatility, Easy Sterilization, Greater Safety, Improved Quality of Life, Cost-Effective, Environmentally Friendly, Potential of Future Innovations

Source: : Frost & Sullivan, ACS Publication

Health & Wellness

Rising 'Medical Plastics' Demand from Health Awareness Expansion















Source: Frost & Sullivan

Future of Mobility



Future of Mobility

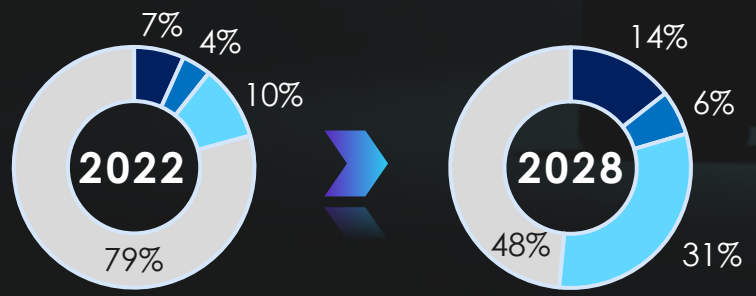
‘Electric Vehicles (EVs)’ is a New Age of Mobility with Technology Innovation



15.5 Million EVs globally (2022)



59.2 Million ICE globally (2022)

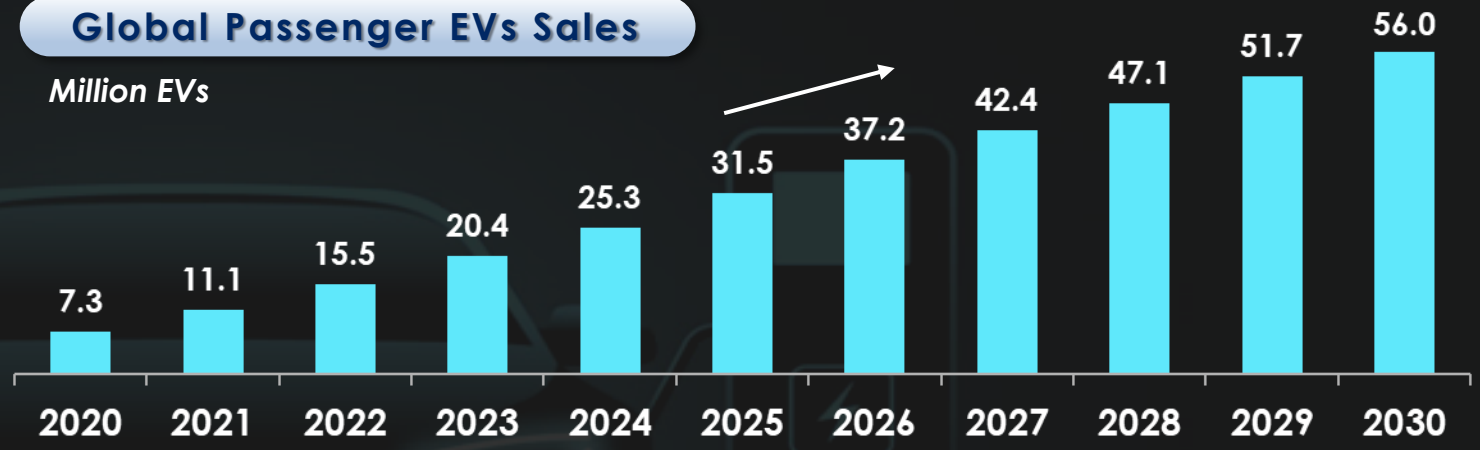


%Share in passenger vehicles

HEV PHEV BEV ICE

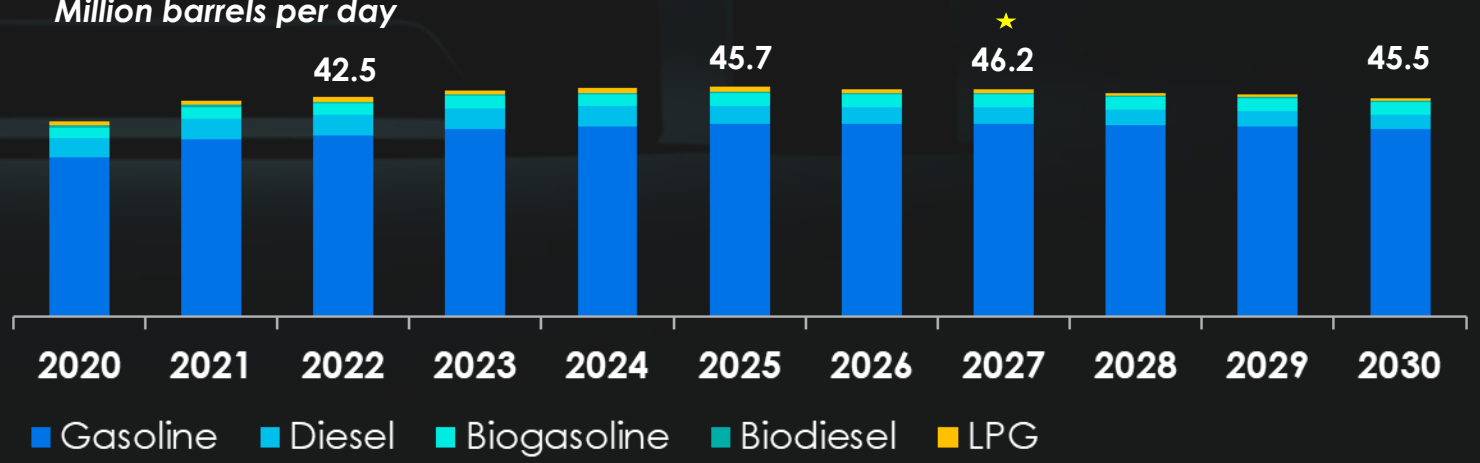
Global Passenger EVs Sales

Million EVs



Global Fuel Consumption for Road Transportation

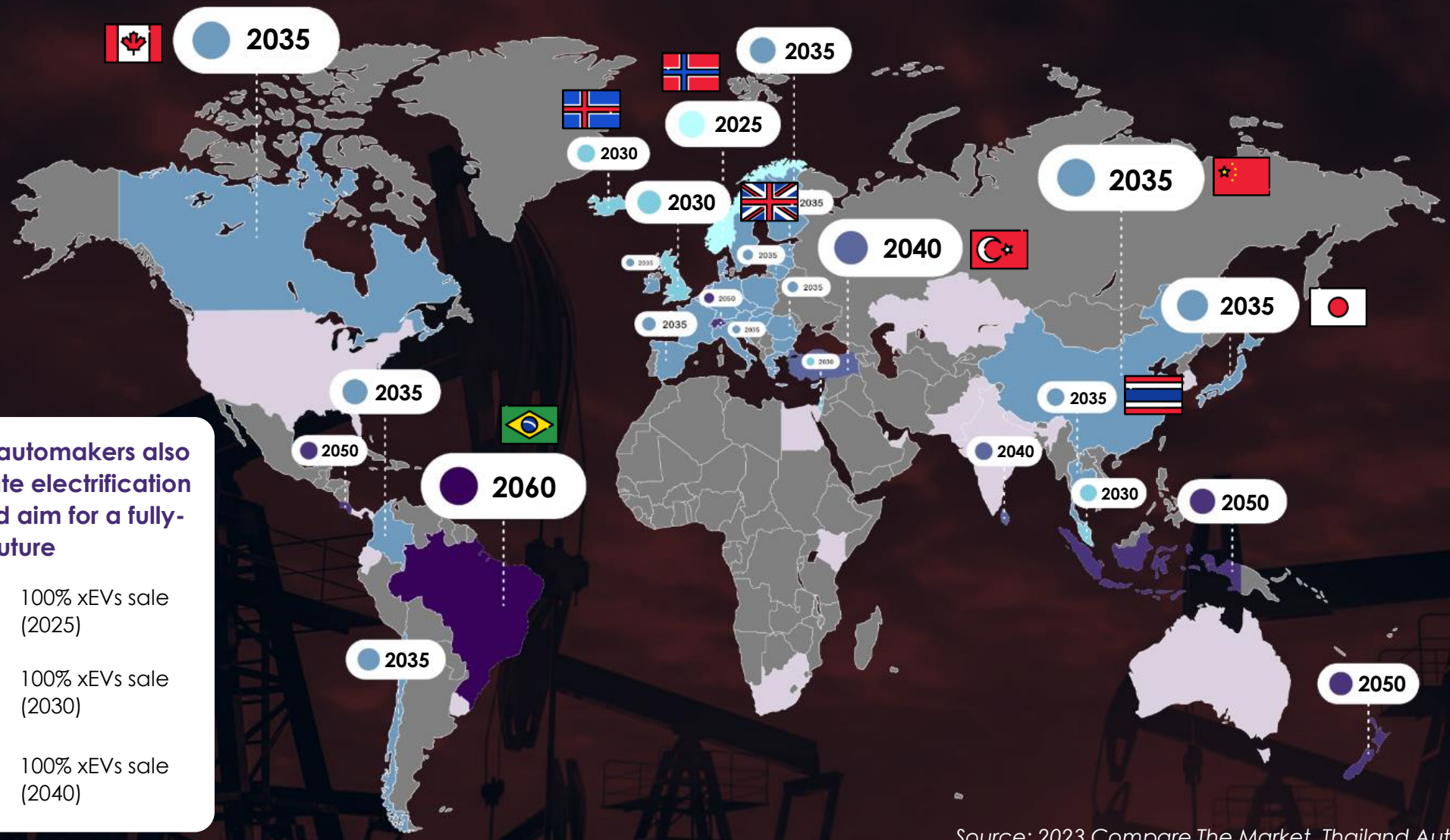
Million barrels per day



Source: BloombergNEF as of Jun’23

Policy to Accelerate EVs Penetration

Norway just a few years away from deadline to prohibit new ICE sales



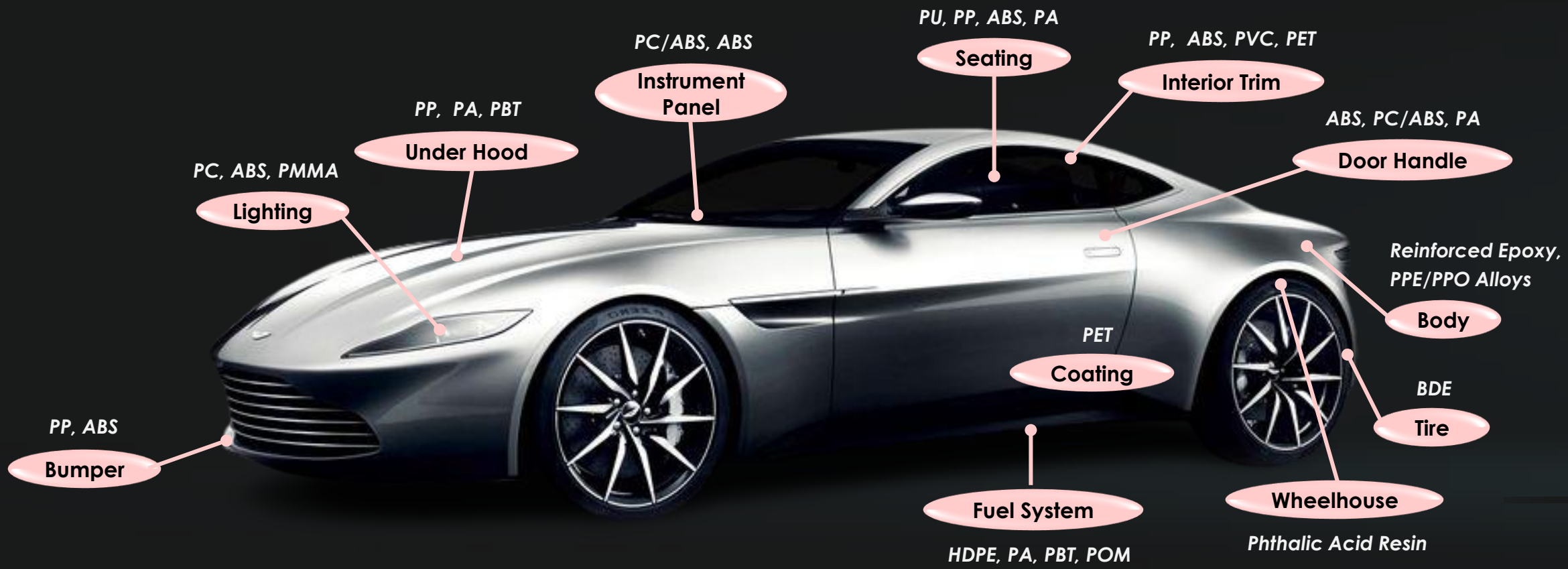
Major automakers also accelerate electrification plans and aim for a fully-electric future

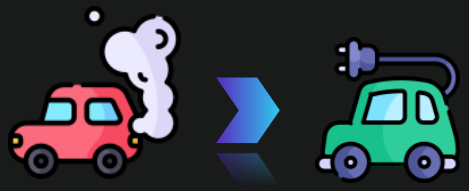
- PSA GROUPE: 100% xEVs sale (2025)
- mazda: 100% xEVs sale (2030)
- HONDA: 100% xEVs sale (2040)

Source: 2023 Compare The Market, Thailand Automotive Institute

Future of Mobility

Plastic Consumption from Internal Combustion Engine (ICE) to EVs



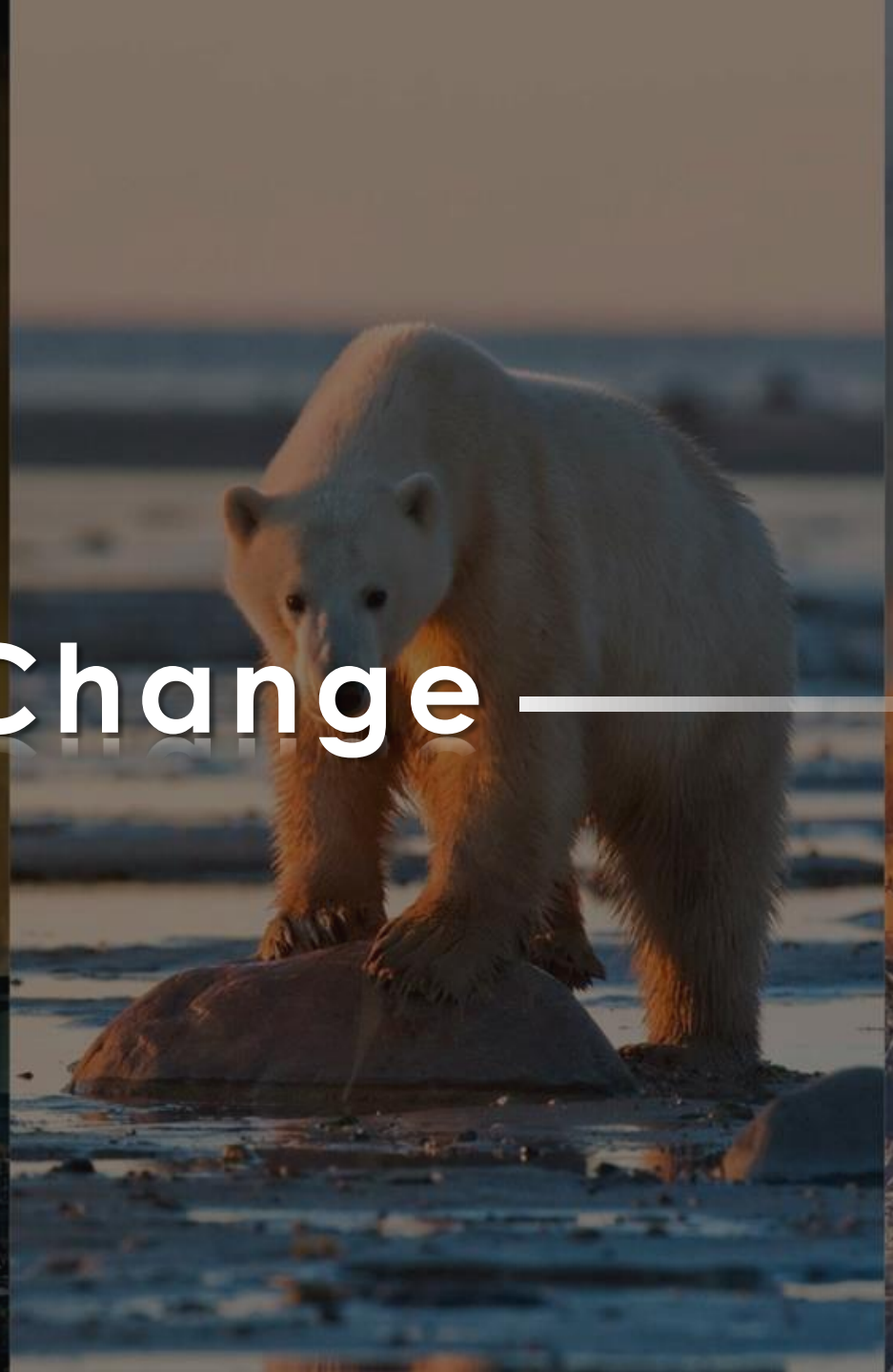


From ICE to EVs

- Battery brackets & housing (PP-based)
- Battery separator (PE, PP-based)
- Rising lightweight plastics/composites
- Lower steel component

Climate Change







Climate Change

Initiatives to Tackle Climate Challenges – Europe as a Forefront

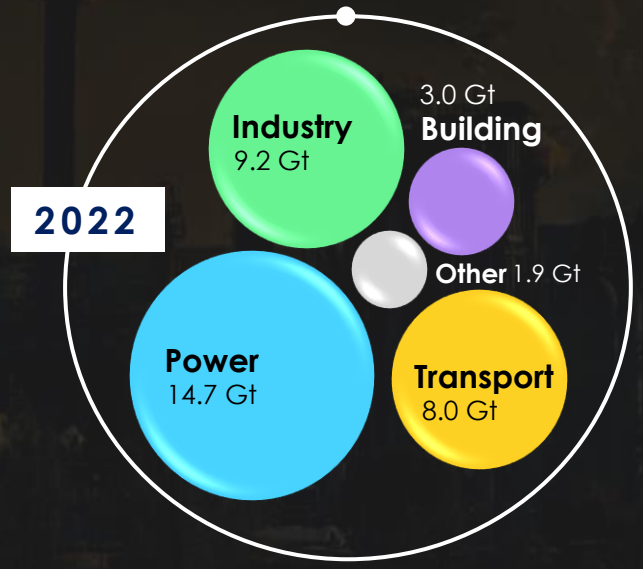
36.8 Gt CO_2

Emissions globally in 2022

(+0.9% from 2021)

1.2 Gt CO_2

from petrochemical



Carbon Border Adjustment Mechanism (CBAM)



- *Transitional phase:* ***Oct 2023*** *(Reporting)*
- *Full Operation:* ***Jan 2026*** *(Reporting & Payment)*

Plastic Recycling

Total Global Demand of Recycled Plastics

Global	PP	ABS	PS	HDPE	PET
2020 %Recycle	6%	1%	2%	9%	6.5%
2040 %Recycle	16%	3%	6%	22%	17%
%CAGR	8.9%	10.2%	7.0%	8.5%	7.7%

Growth Drivers

- Growing consciousness on energy savings
- Government policies & initiatives to increase adoption

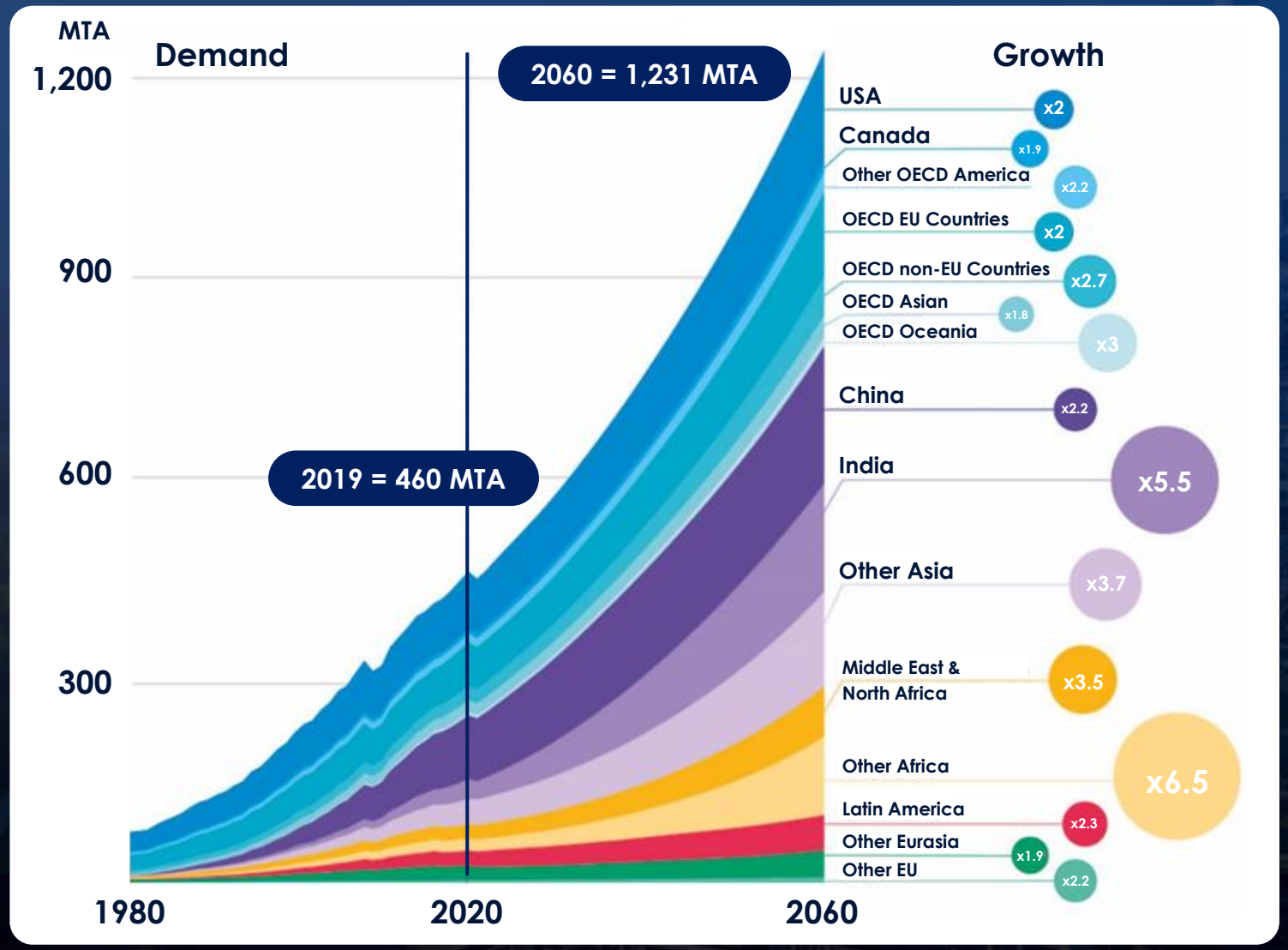
Source: IEA, IHS Markit Thailand



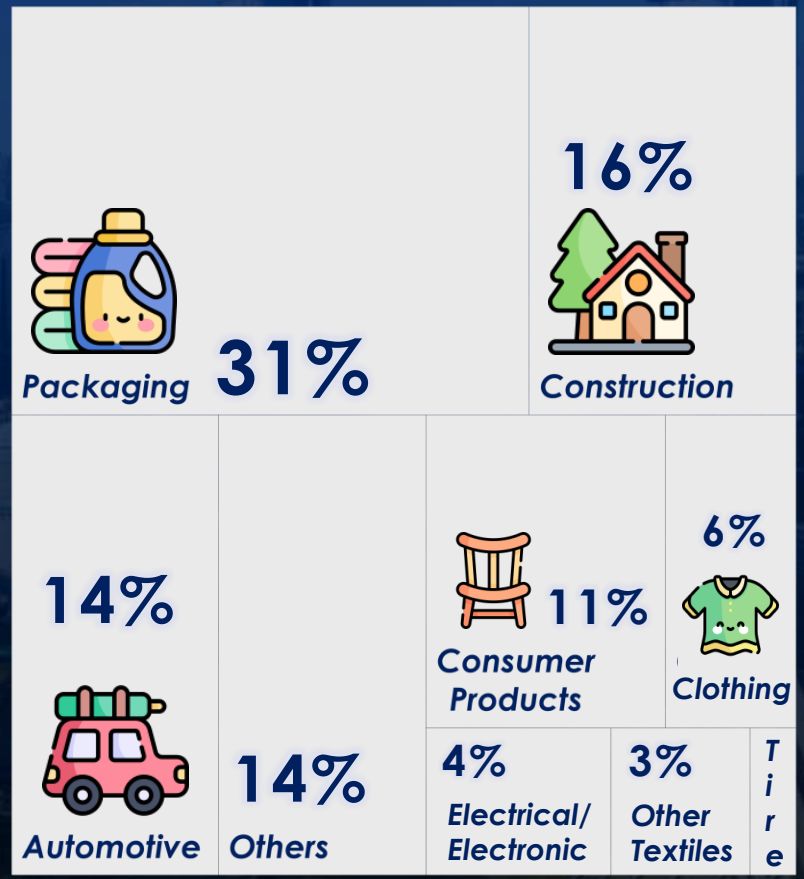
When Are We Shining Once Again?

Future Growth of Petrochemical Looks Brilliant

Fastest Growing of Plastics Use in Developing and Emerging Economies

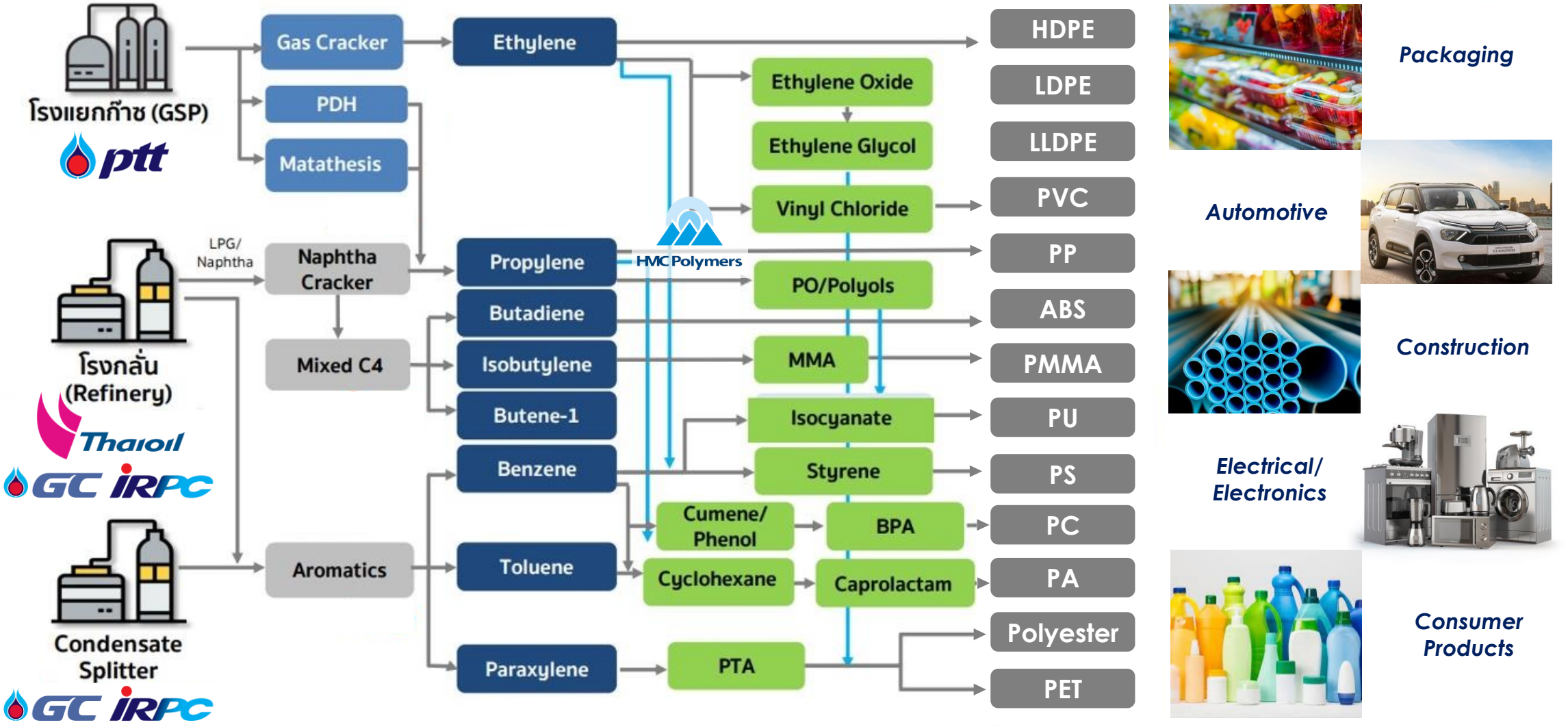


Consumption by Application



Source: OECD as of Jun'23

Petrochemical Value Chain




"Every challenge, every adversity contains within it the seed of opportunity & growth"
- Roy Bennett -