The Atlas of Changes:

The Perfect Meltdown
Paving The Path to Global Realignment

The 16th PTT Group Petrochemical Outlook Forum
Friday, 1st August 2025

“Clouds over The Globe
The Atlas of Instability”

Source: GC Commercial Excellence Analysis 2025

“Volcanic Capacity”
When Expansion Turns Explosive

Source: GC Commercial Excellence Analysis 2025

THE FORCES BEHIND CAPACITY EXPANSION

China's Push for Self-Sufficiency

Governments to Promote Industrial Self-Reliance

High-Margin Leading Expansionary Phase

Waves of Overinvestment Following Periods of High Margin and Strong Demand

Rise of Alternative Production Routes

More Cost-Efficient Routes e.g., PDH and MTO

Surge in Low-Cost Feedstock Capacity

US and Middle East Low-Cost Gas Feedstock

Source: GC Commercial Excellence Analysis 2025

GLOBAL ETHYLENE & PE SUPPLY

Ethane Cracker → Ethylene → Polyethylene HDPE, LLDPE, LDPE
Naphtha Cracker → Ethylene

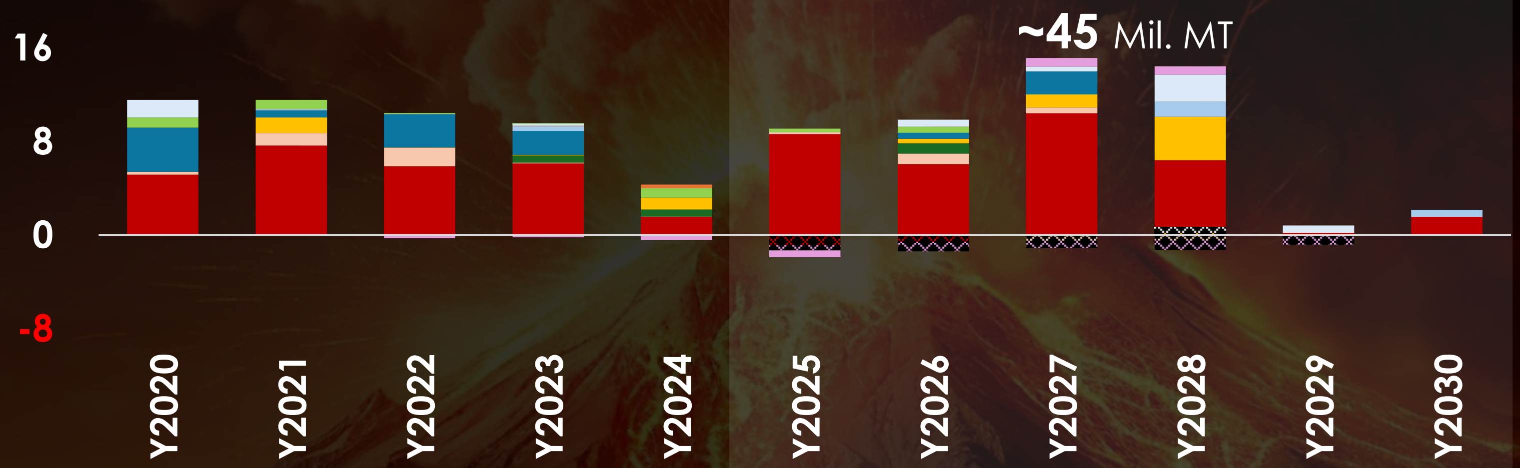
Over Half of Projected Capacity Additions from China, Followed by ME

Unit: Mil. MT

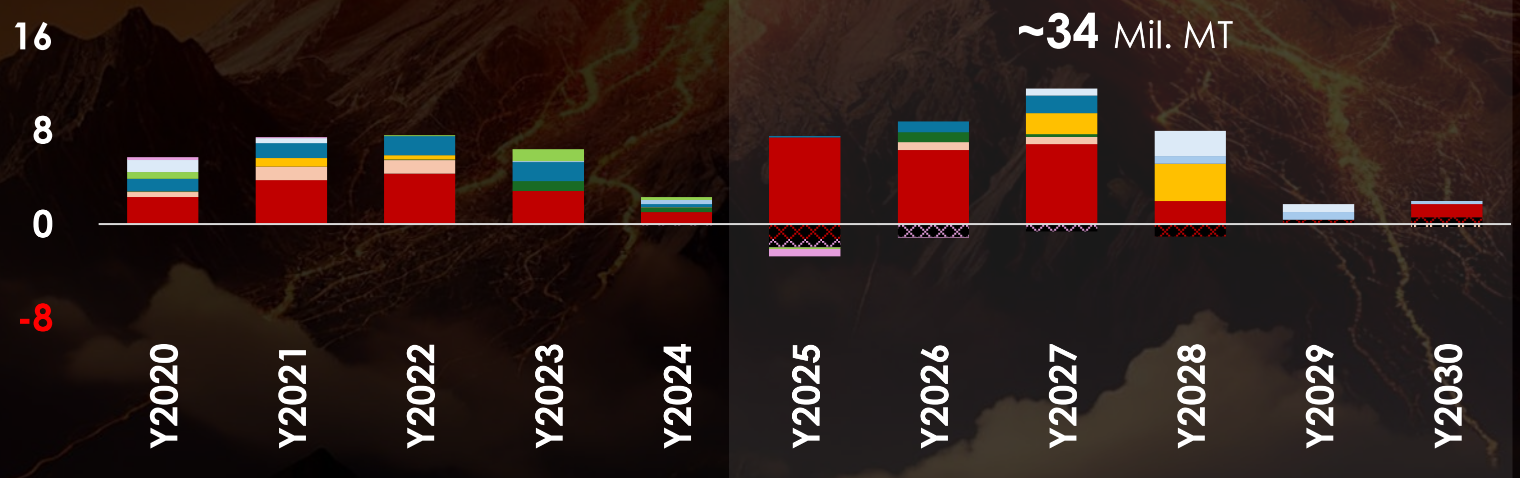
China | Indian Subc. | ME | US | S. America | Europe | Africa | Other NE Asia | SE Asia | Other N. America | CIS & Baltic States | Nameplate Capacity | Hypothetical Capacity

Global Capacity Change

Ethylene



Poly-ethylene



Top Capacity Growth

2020-2024	2025-2030
~56%	~65%

of Global Additional Capacity

2020-2024	2025-2030
~48%	~60%

of Global Additional Capacity

Source: GC Commercial Excellence Analysis 2025

GLOBAL PROPYLENE & PP SUPPLY

Refinery
PDH
Naphtha Cracker
→ Propylene → Polypropylene

Over Half of Projected Capacity Additions from China

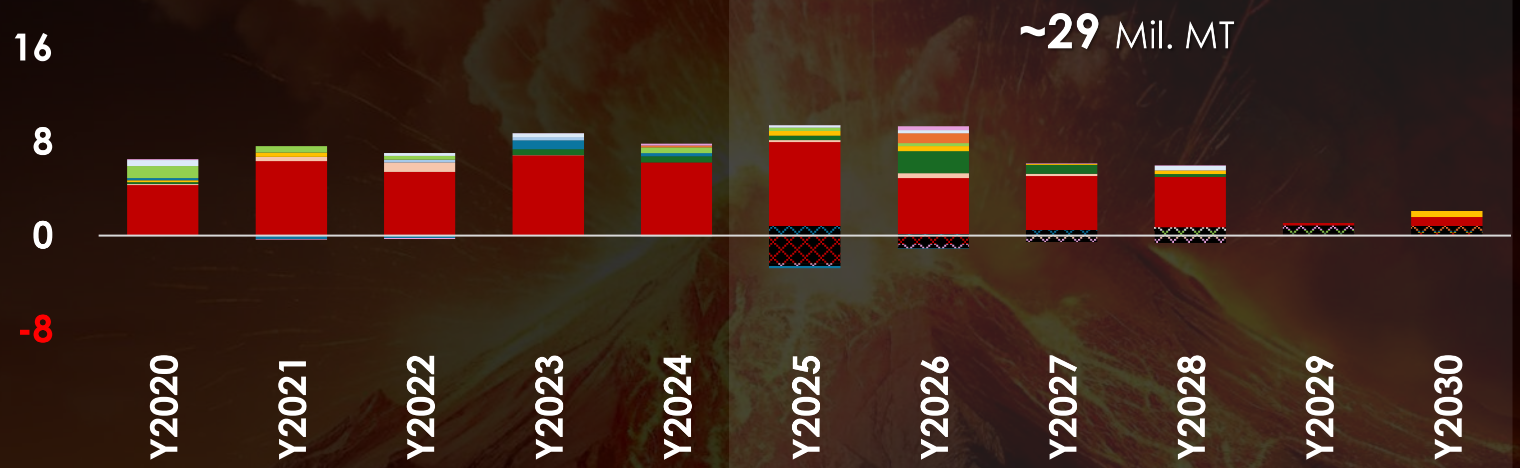
Unit: Mil. MT

China | Indian Subc. | ME | US | S. America | Europe | Africa | Other NE Asia | SE Asia | Other N. America | CIS & Baltic States

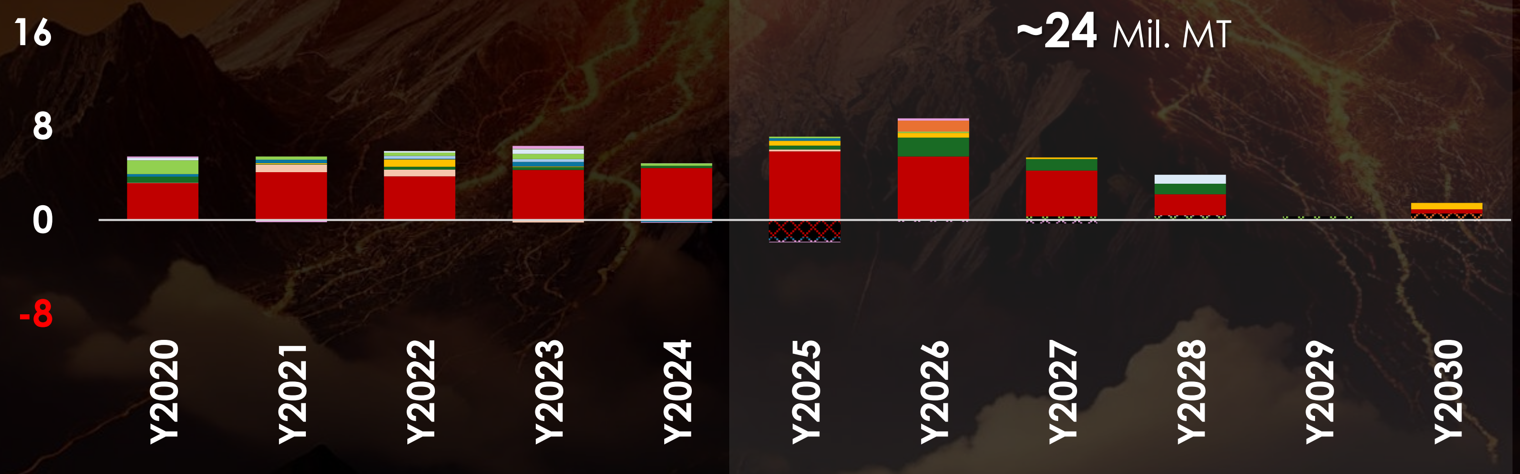
Nameplate Capacity
Hypothetical Capacity

Global Capacity Change

Propylene



Poly-propylene



Top Capacity Growth

Propylene

2020-2024	2025-2030
~77%	~64%

of Global Additional Capacity

Polypropylene

2020-2024	2025-2030
~71%	~64%

of Global Additional Capacity

Source: GC Commercial Excellence Analysis 2025

“From Fire to Frost”
The Cold Storm of Cooling Demand

Source: GC Commercial Excellence Analysis 2025

REFLECTING ON PAST CHALLENGES

Pandemic-Driven Market Shake-Up

Initial Surge in Food and Delivery Packaging, and Pandemic-Related Medical Demand, yet Followed by Supply Chain Disruption and Overbuying

Global Economic Headwinds

High Inflation, Interest Rate Hikes, Recession, and Monetary Tightening

China’s Weak Post-COVID Recovery

China's Post-Pandemic Recovery Underperformed, with Ongoing Issues in Real Estate Sector

ESG Toward More Sustainable Choices

Restrictions on Single-use Plastics Weaken Virgin Resin Demand Growth

Source: GC Commercial Excellence Analysis 2025

DECLINING GLOBAL PLASTIC DEMAND

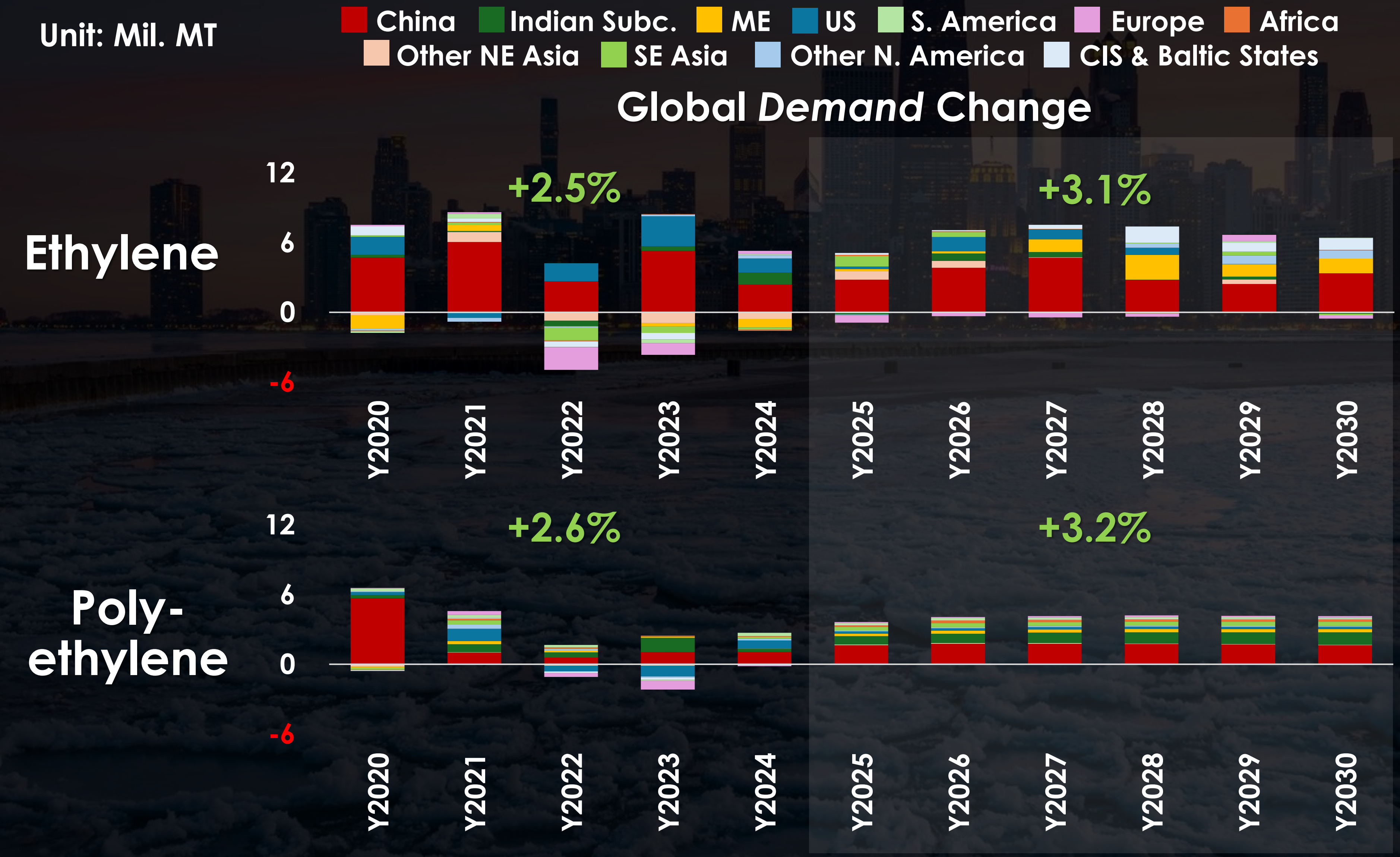
Source: GC Commercial Excellence Analysis 2025

GLOBAL ETHYLENE & PE DEMAND

Cooling Demand Post-COVID, but Gradual Recovery on The Horizon

Unit: Mil. MT

Global *Demand* Change



% AAGR Demand Growth

Top Demand Growth 2025-30

CIS & Baltics
+11.3%

China
+5.9%

India
+8.2%

Africa
+4.1%

Source: GC Commercial Excellence Analysis 2025

GLOBAL PROPYLENE & PP DEMAND

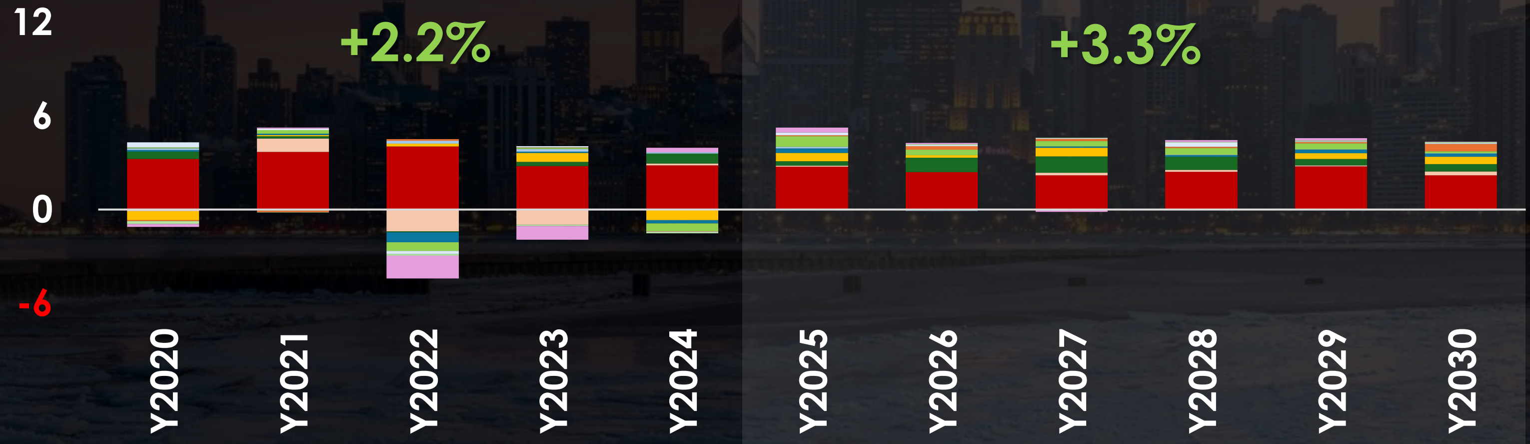
Cooling Demand Post-COVID, but Gradual Recovery on The Horizon

Unit: Mil. MT

China | Indian Subc. | ME | US | S. America | Europe | Africa | Other NE Asia | SE Asia | Other N. America | CIS & Baltic States

Global *Demand* Change

Propylene



Poly-propylene

% AAGR Demand Growth

Top Demand Growth 2026-30

Africa
+11.0%

India
+8.1%

India
+8.5%

Africa
+4.4%

Source: GC Commercial Excellence Analysis 2025

The Trigger of A Global “Perfect Storm”

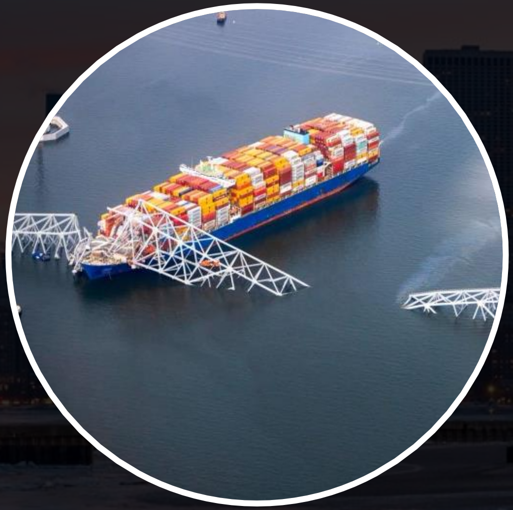
Tariff Storm

Source: GC Commercial Excellence Analysis 2025

DEMAND SUFFERS IN THE EYE OF THE TARIFF STORM

Unpredictable Tariff Regimes

The Root Cause of 2025 Global Turmoil



Supply Chain Fragility

Logistical Bottlenecks Leading to Delays, Increased Costs, Halted Production

Demand & Economic Slowdown

Impact on Export-Oriented Economies due to Limited Demand

Geopolitical Fragmentation

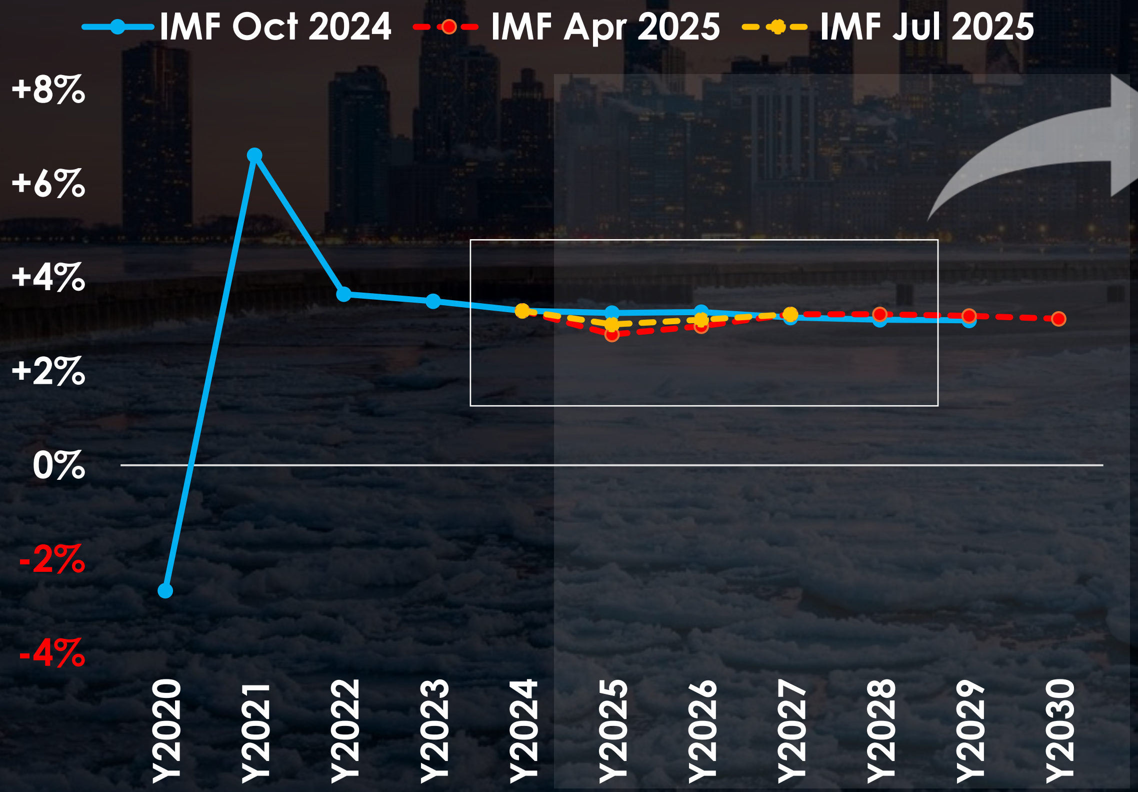
Accumulating Shocks such as Russia-Ukraine Conflict and Israel-Iran-US War

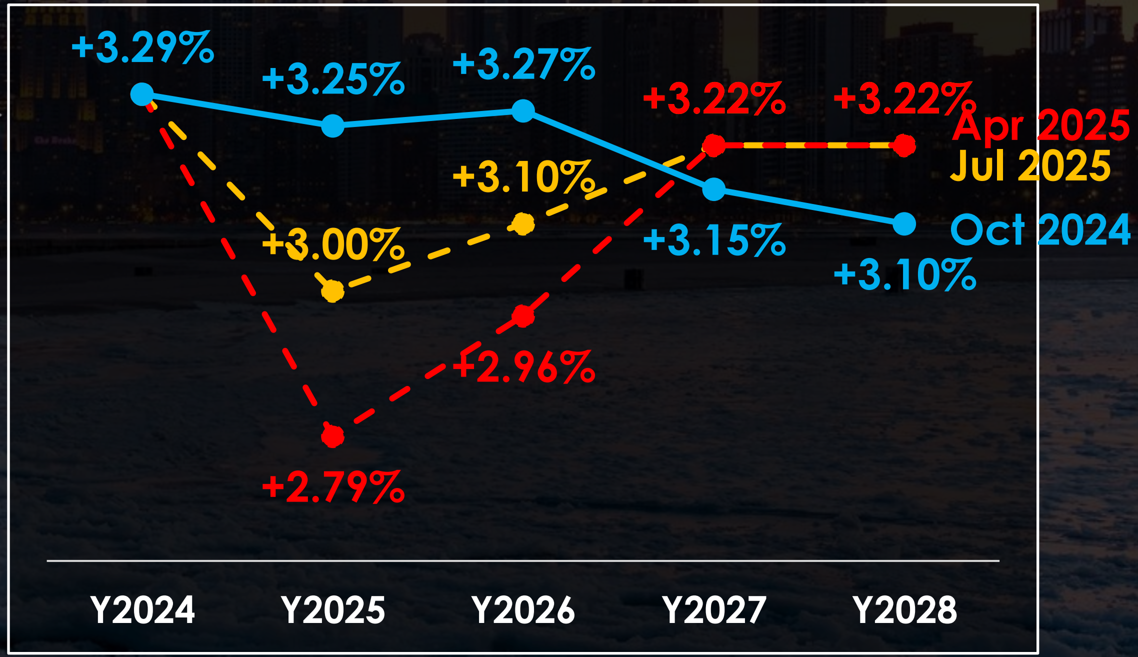
Source: GC Commercial Excellence Analysis 2025

THE ECONOMIC FALLOUT: GLOBAL GDP CONSEQUENCES

Downgrade of Global GDP Following US Tariff Announcements and International Countermeasures

Global GDP Growth Projections (%)





Source: IMF, GC Commercial Excellence Analysis 2025

GLOBAL PE & PP DEMAND (WITH TARIFF)

Downgrade of Demand Growth due to Weakening Economic Conditions

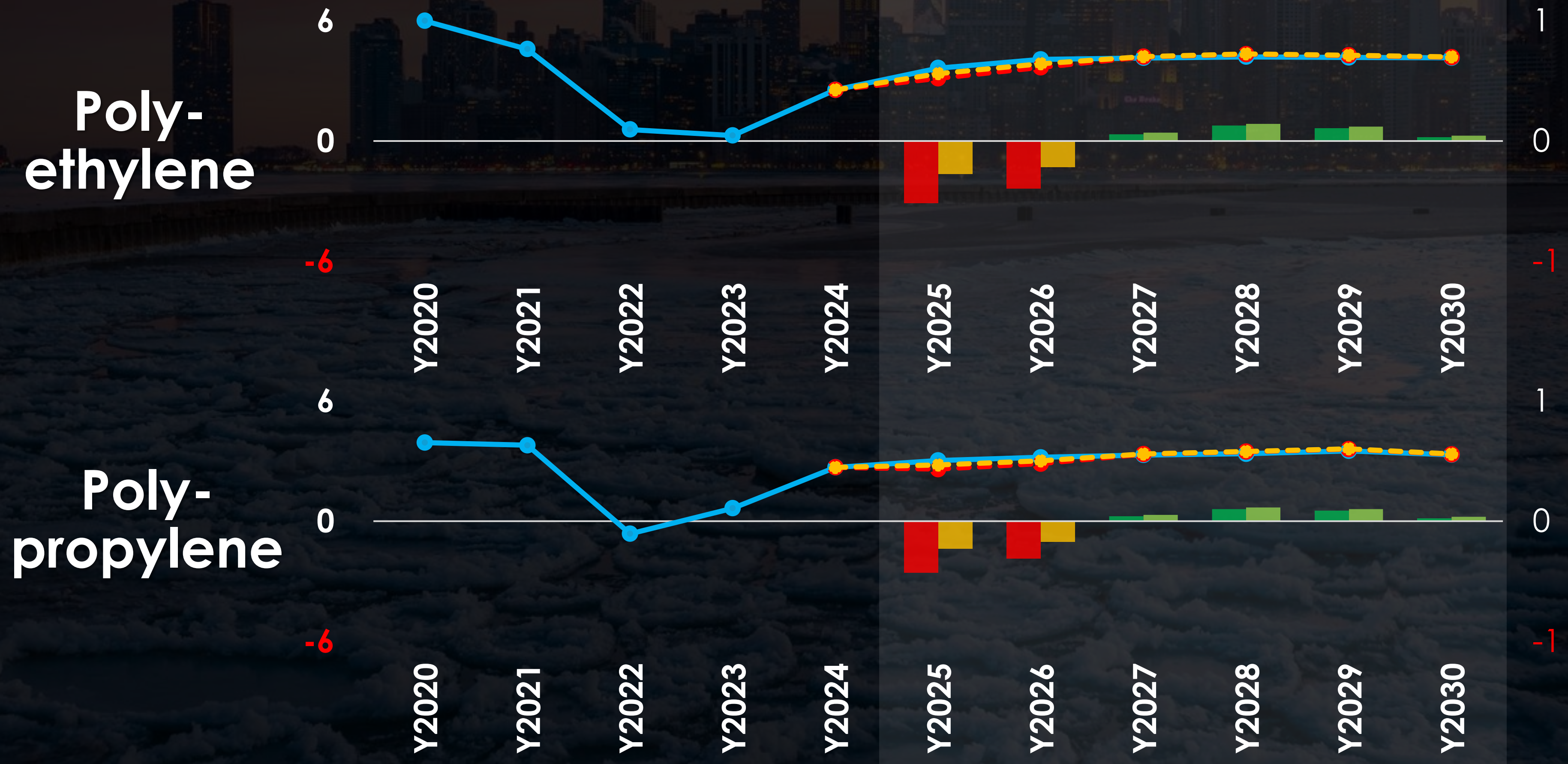
Unit: Mil. MT

Additional Demand before Tariff — Additional Demand after Tariff

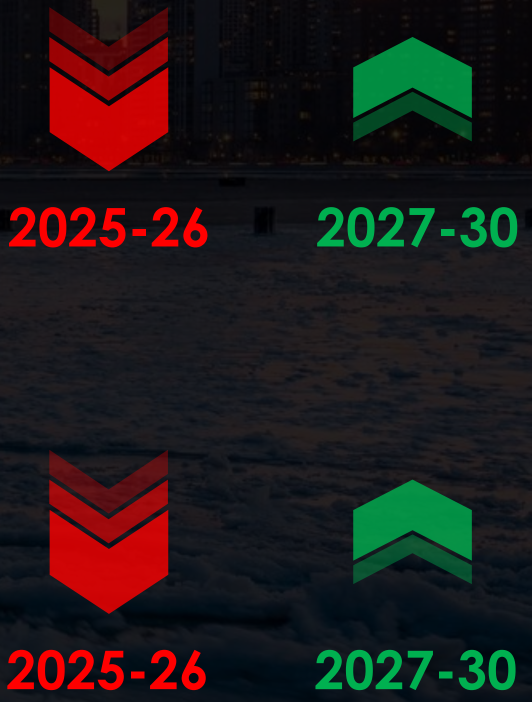
Downgrade/Upgrade of Additional Demand after Tariff in accordance with IMF Apr 2025 (RHS)

Downgrade/Upgrade of Additional Demand after Tariff in accordance with IMF Jul 2025 (RHS)

Global Additional *Demand* Projection Pre- VS Post-Tariff



Demand Growth Post-Tariff



Source: GC Commercial Excellence Analysis 2025

When Heat Meets Cold
Thus Becomes A Solid Rock

Source: GC Commercial Excellence Analysis 2025

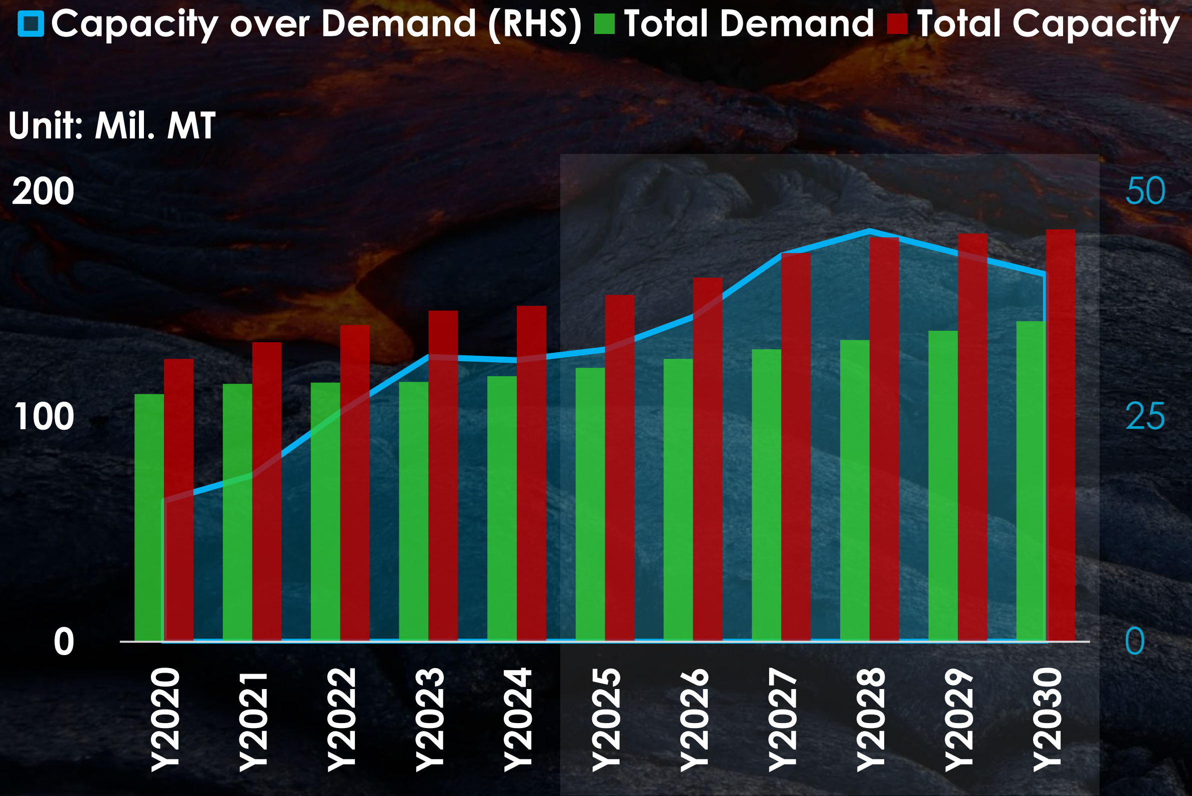
“A Burst of Rock Bottom”
Quenching Force of Oversupply

Source: GC Commercial Excellence Analysis 2025

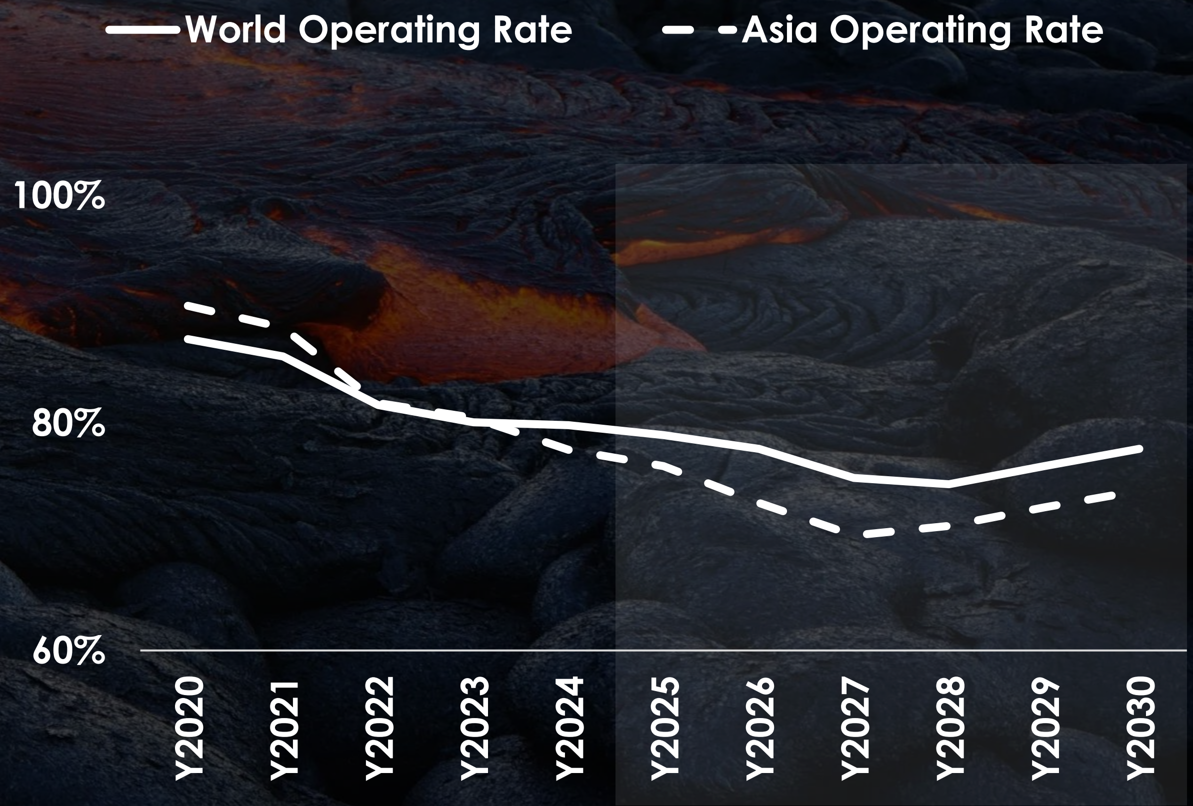
POLYETHYLENE MARKET

In the Midst of a Prolonged Cycle Downturn

Global PE Total Capacity & Demand



Global PE Operating Rates

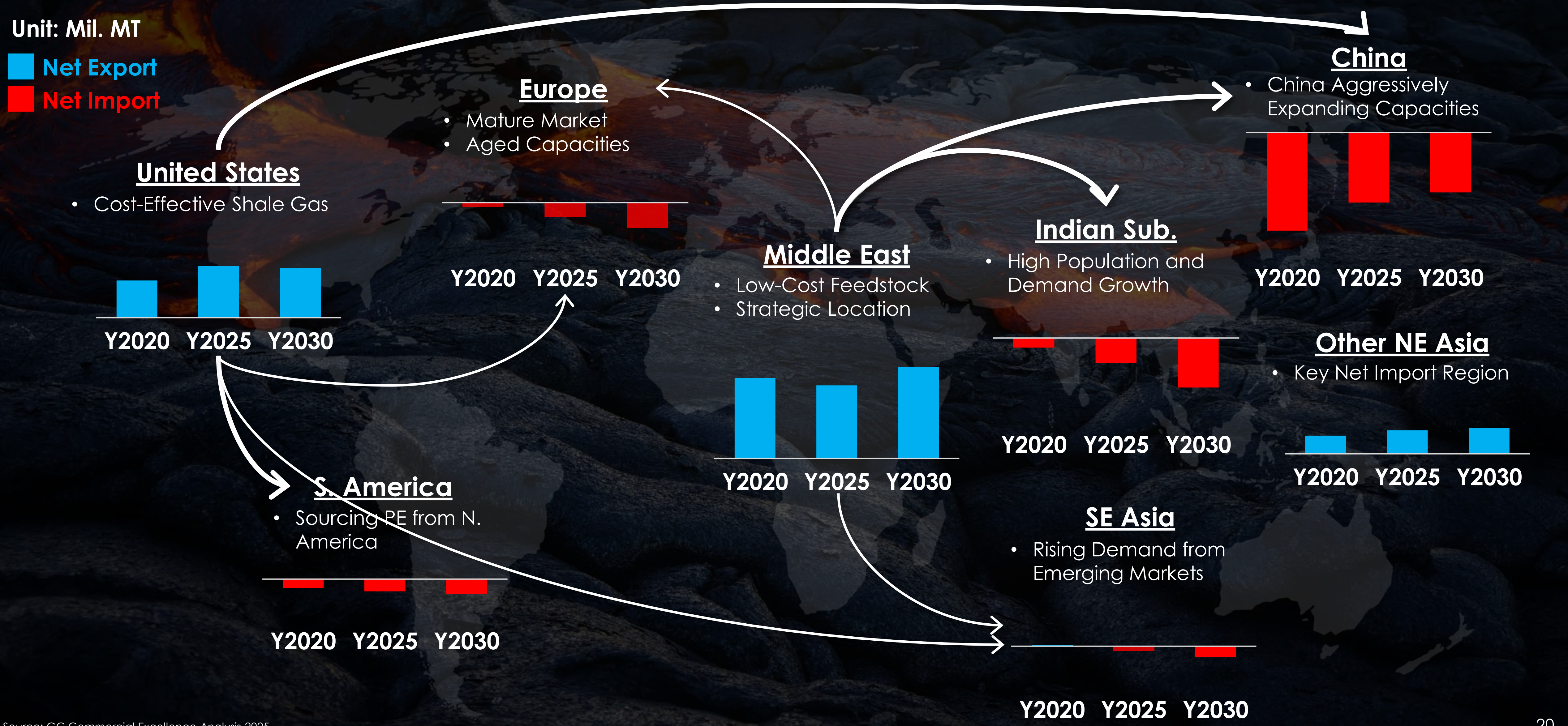


Global operating rate has reduced by almost 10% over the past 5 years. As China added massive amounts of new capacities. A significant recovery is not expected until the end 2020s.

Source: GC Commercial Excellence Analysis 2025

POLYETHYLENE TRADE FLOW

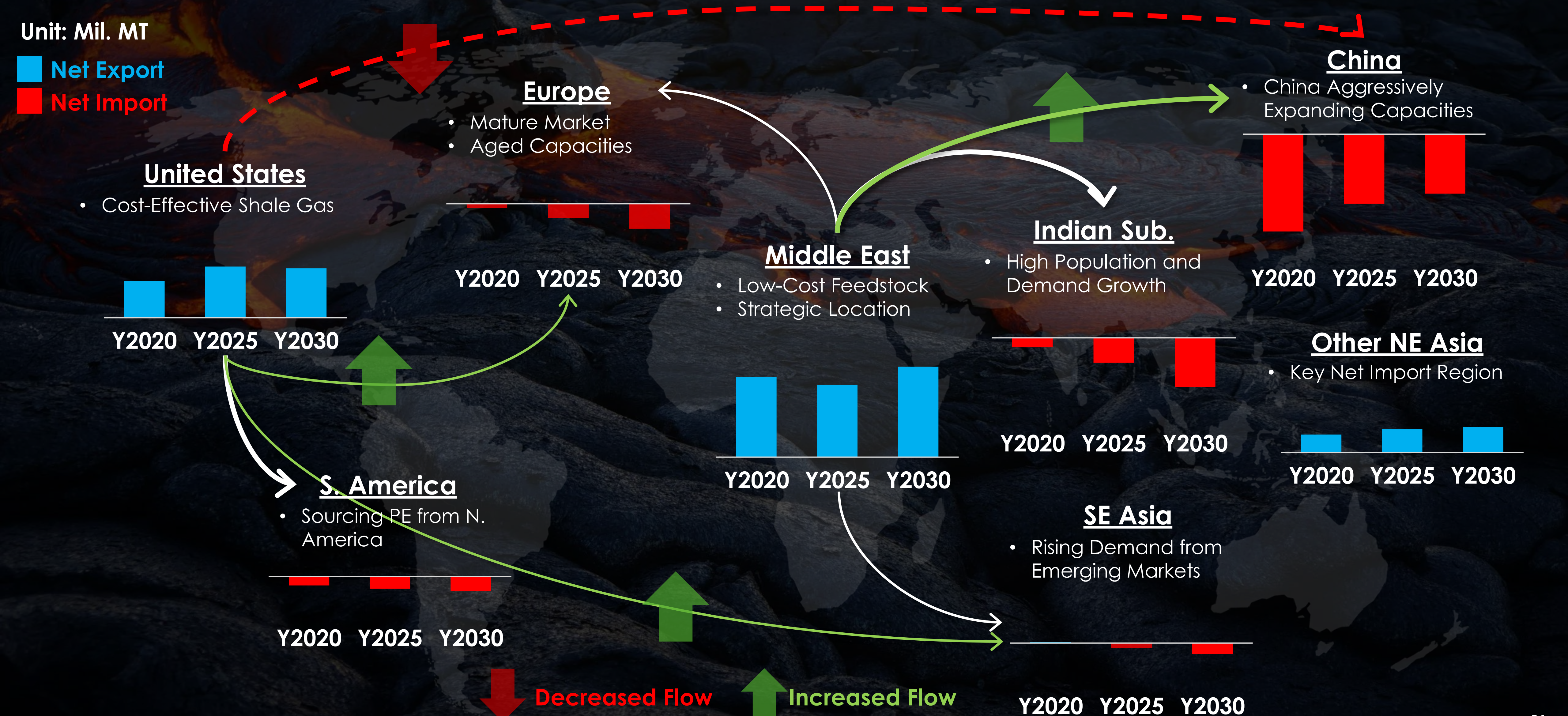
Mounting Pressure on Trade Flows from China's Self Sufficiency and Low-Cost Expansion



Source: GC Commercial Excellence Analysis 2025

POLYETHYLENE TRADE FLOW CHANGE AFTER TARIFF

Trade Flows Realignment after Tariff Enforcement

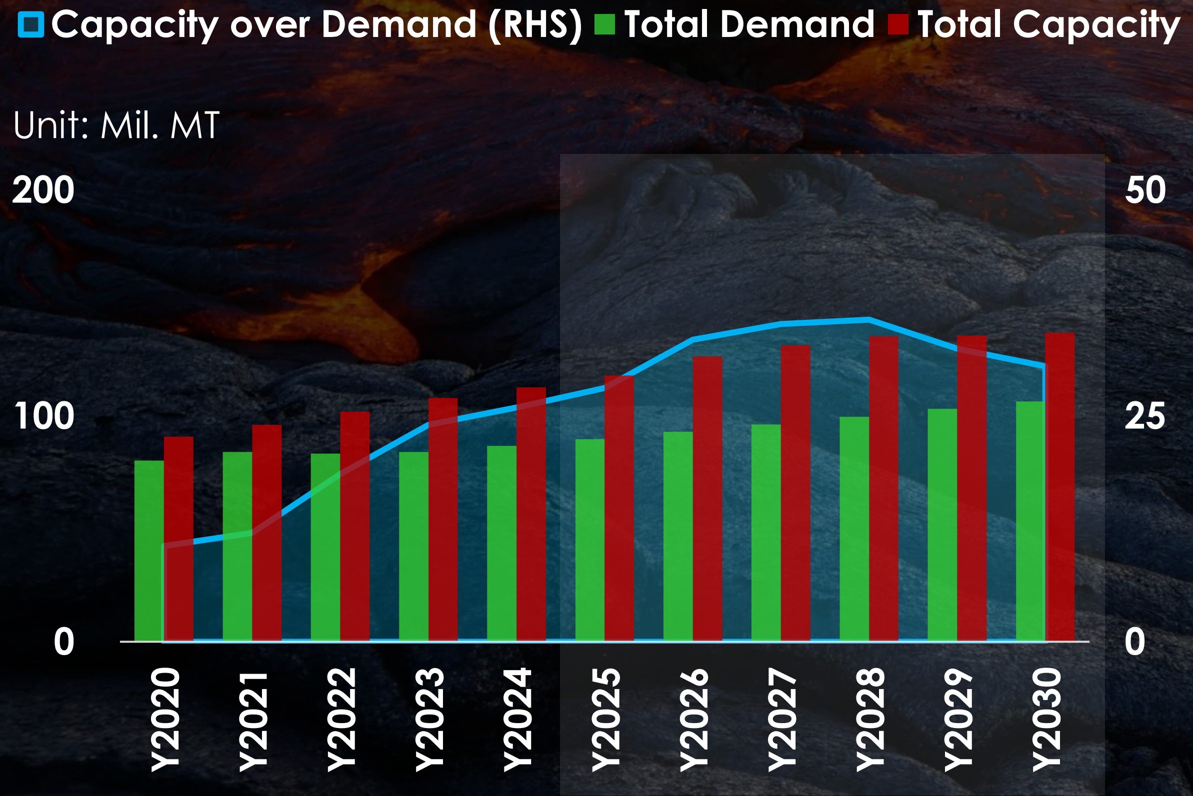


Source: GC Commercial Excellence Analysis 2025

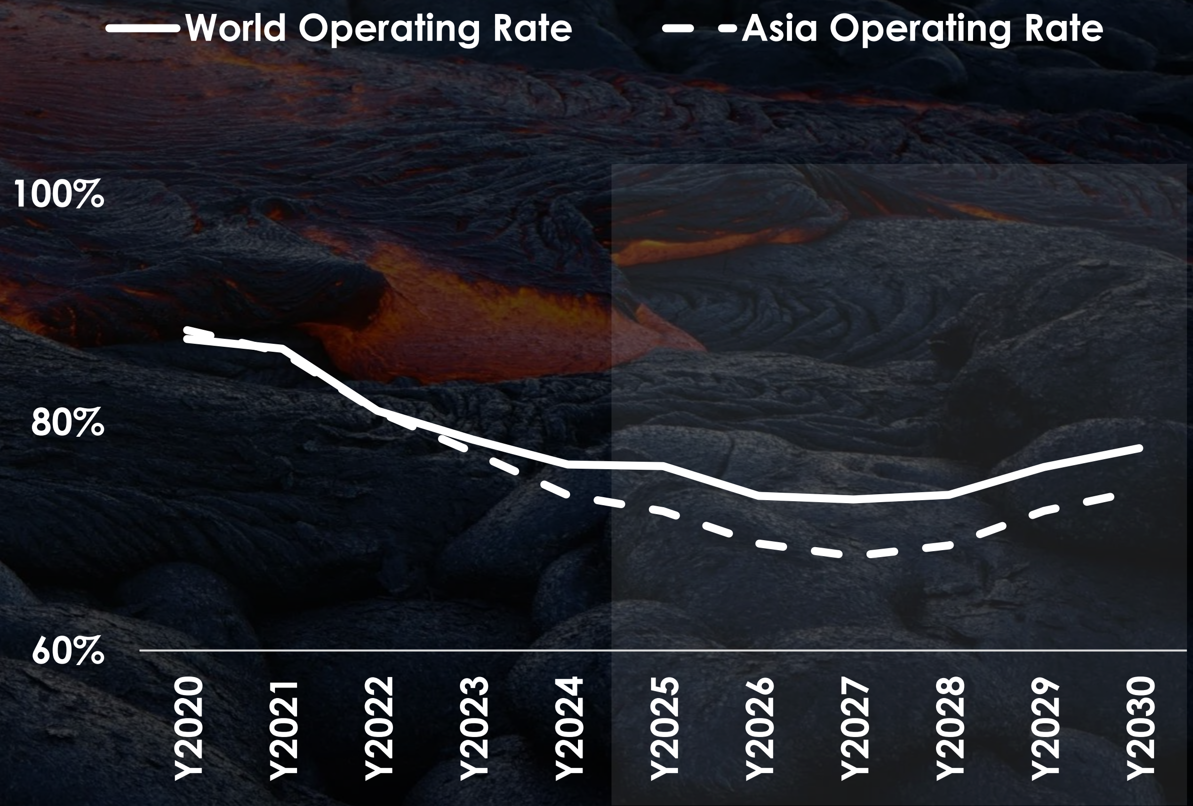
POLYPROPYLENE MARKET

Supply and Demand Imbalance to Cause Higher Excess Supply

Global PP Total Capacity & Demand



Global PP Operating Rates

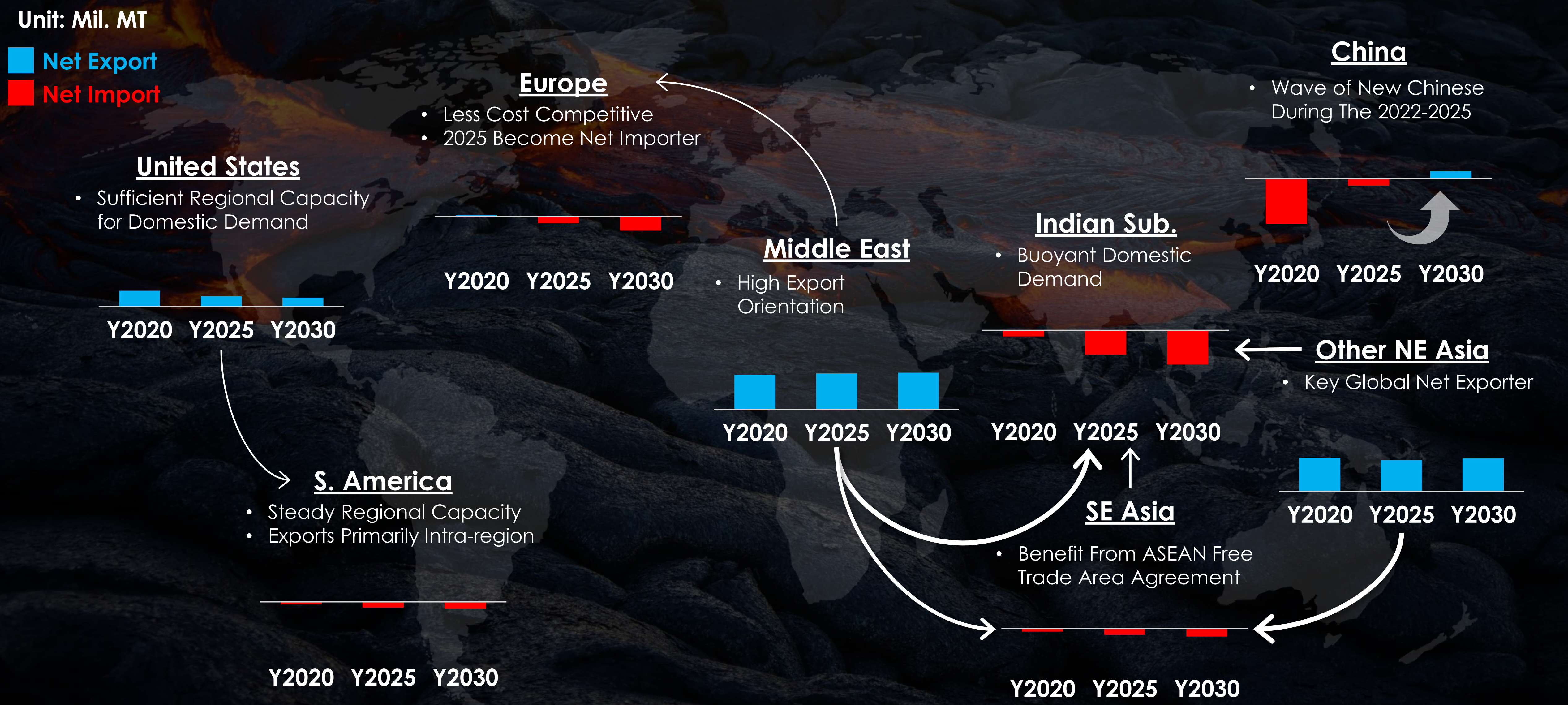


A demand slowdown coincides with record-high PP capacity growth in China, widening the supply-demand gap. Global operating rate will bottom in 2027-28.

Source: GC Commercial Excellence Analysis 2025

POLYPROPYLENE TRADE FLOW

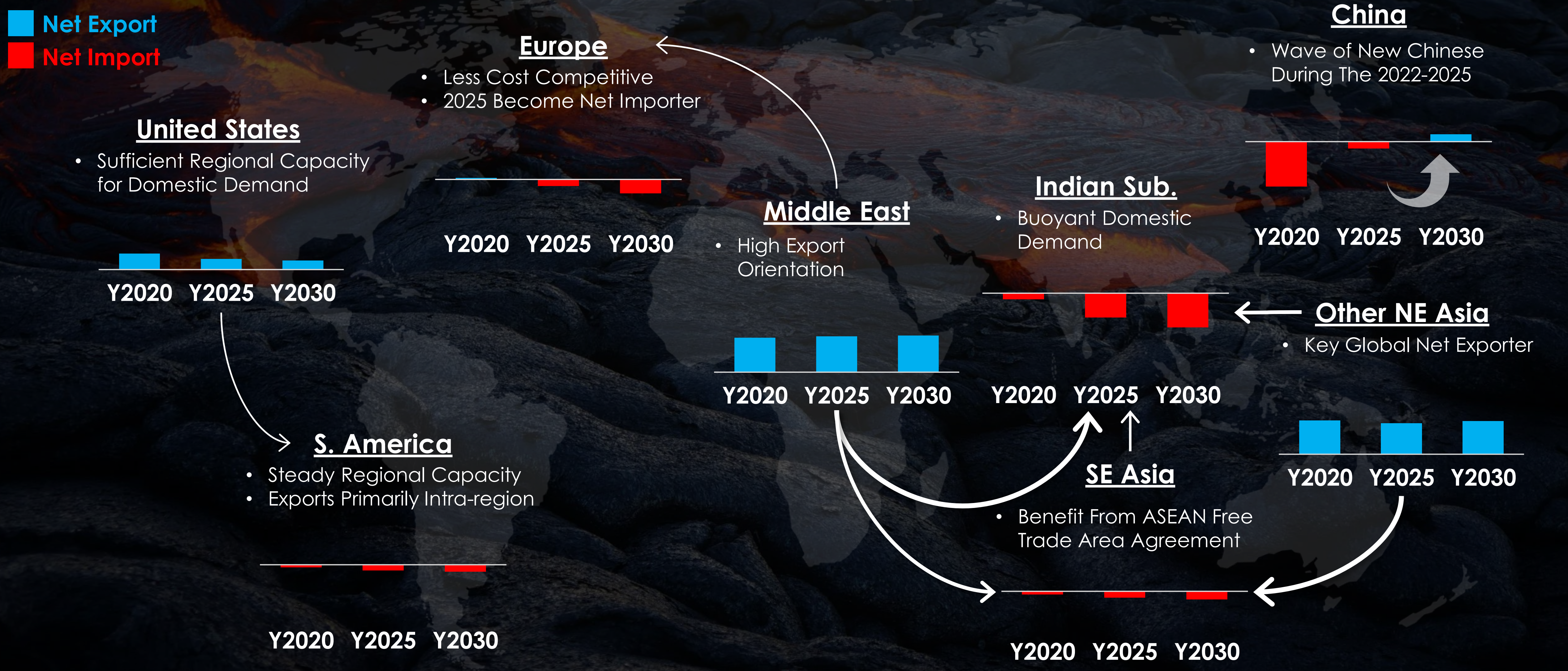
Shifting Trade Patterns from China's Self Sufficiency



Source: GC Commercial Excellence Analysis 2025

POLYPROPYLENE TRADE FLOW CHANGE AFTER TARIFF

Balanced US PP Market, China as a Minor US PP Supplier; Limited Direct Impact from Tariff



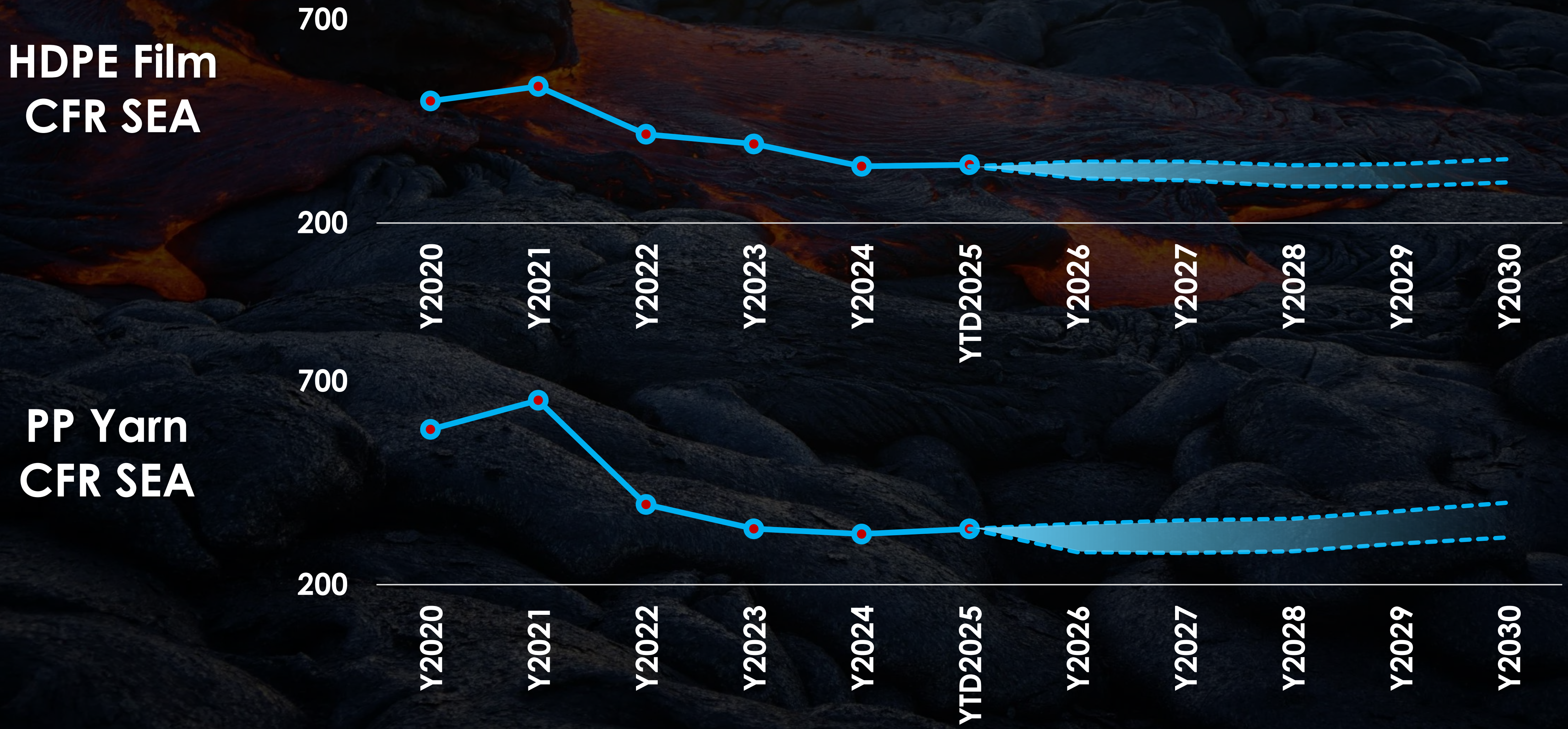
Source: GC Commercial Excellence Analysis 2025

FUTURE PE & PP SPREAD PATTERNS

Prices and Spreads under the Irreversible Outcome of Oversupply Era

Unit: USD/MT

Spread Range of PE & PP Prices over Naphtha MOPJ



Source: GC Commercial Excellence Analysis 2025

“Volcanic Capacity”

Chinese Capacity Expansion under Self-Reliance Scheme

Rise in Feedstock-Advantaged Capacity

“Cooling Demand”

Suppressed Demand Growth Post-Pandemic

Asia as the Frontrunner in Global Demand Growth

Tariff Uncertainties to Cloud Demand Recovery

“A Rock Bottom”

Record-Level Overcapacity

A Bottoming of Business Cycle

Recovering Spread in the Late 2020s

Source: GC Commercial Excellence Analysis 2025

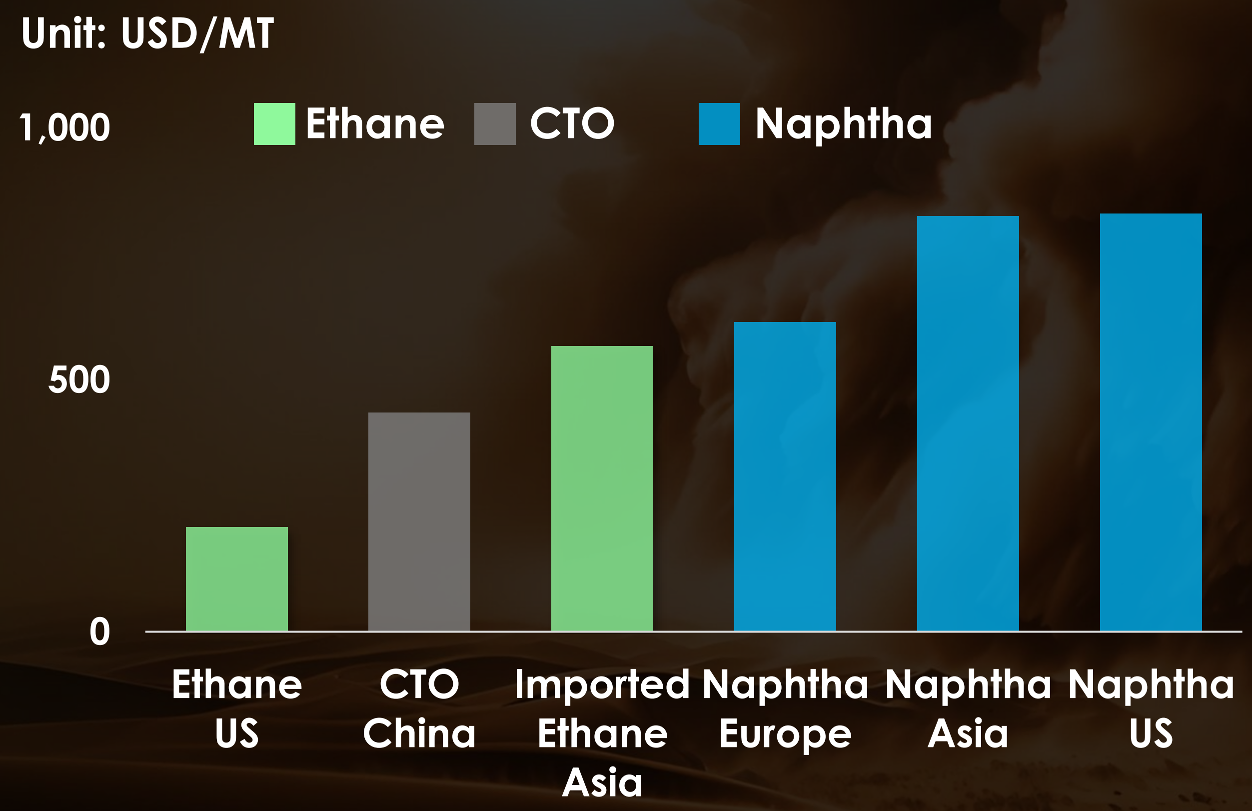
“Surviving the Desert”
Thriving on Cost Competitiveness and Business Reformation

Source: GC Commercial Excellence Analysis 2025

COST ADVANTAGE IS THE NEW LIFELINE

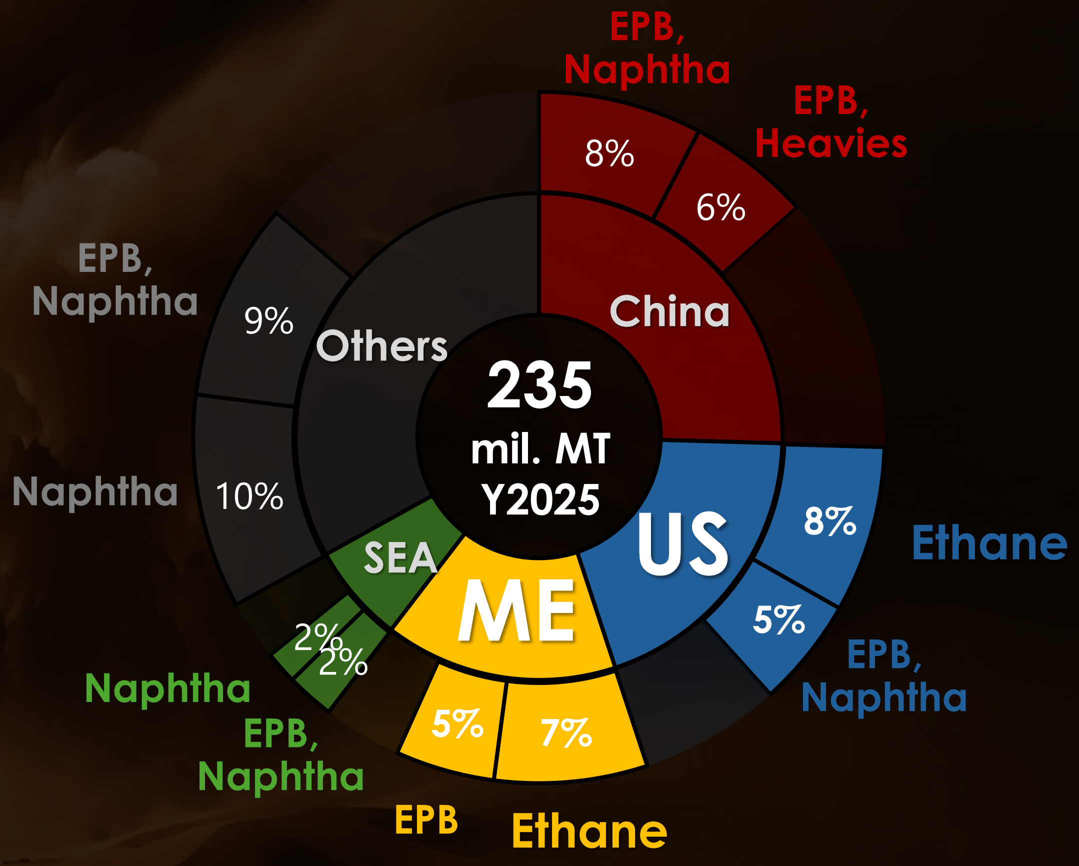
Feedstock Advantage and Versatility as Pillars of Cost Competitiveness

Global Polyethylene Cost Competitiveness



Significantly Lower Production Cost of Ethane than Naphtha Crackers

Global Ethylene Cracker Feed Slate



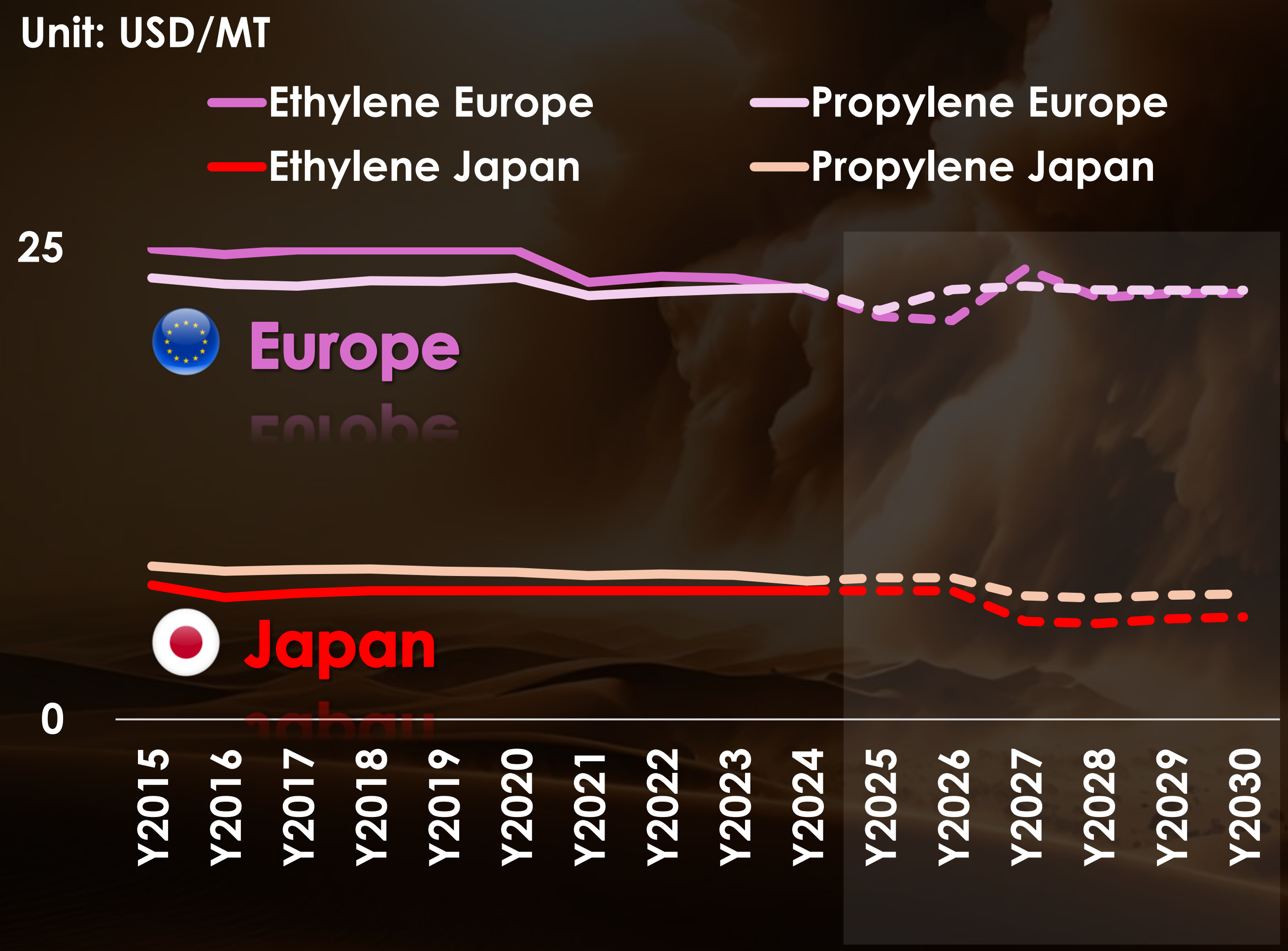
US and **Middle East** to Gain Competitiveness Due to **Ethane** Feedstock Cost Advantage

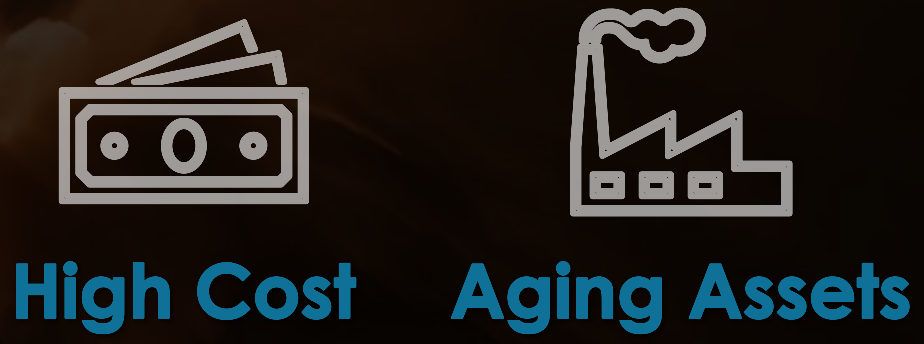
Source: GC Commercial Excellence Analysis 2025

SELF-CORRECTION THROUGH RATIONALIZATION

Paving the Way to Survive through Rationalization

Ethylene and Propylene Capacities





Rationalization is underway in high-cost regions, where aging and small-scale assets are being phased out to improve overall efficiency and competitiveness.

Source: GC Commercial Excellence Analysis 2025

A REVOLUTIONARY PARADIGM SHIFT IN TECHNOLOGY

Maximize High-Value Chemicals through Refinery-Petrochemical Integration

Refining

- **Petrochemical Yield <15%**

Refining Plus

- **Petrochemical Yield 15-20%**
- Refining
  + BTX
  + Propylene

Refining Integration

- **Petrochemical Yield 25-40%**
- Refining
  + Steam Cracking
  + PX Complex

Thermal Crude to Chemicals

- **Petrochemical Yield 40-80%**
- Ultimate Integrated Architecture

Source: GC Commercial Excellence Analysis 2025

STRATEGIC MOVES OF PLAYERS IN NEAR-TERM

Strengthen Competitiveness with Ethane, Voluntary Restructuring and Technological Shift

Canada
New Ethane Cracker
~2 Mil. MT Ethylene

Europe
- **Exit Strategies**
- **New Ethane Cracker**
  ~1.5 Mil. MT Ethylene
  ~50 Kil. MT Propylene

Qatar
New Ethane Cracker
~2 Mil. MT Ethylene

Japan
- **Exit Strategies**
- **Strategic Facilities Consolidation**

United States
New Ethane Cracker
~2 Mil. MT Ethylene

United Arab Emirates
New Ethane Cracker
~1.5 Mil. MT Ethylene

China
Shift to/Increase Ethane Feedstock
~5 Mil. MT Ethylene
~2 Mil. MT Propylene
New Ethane Cracker
~3 Mil. MT Ethylene

Vietnam
Shift to/Increase Ethane Feedstock
~1 Mil. MT Ethylene
~0.4 Mil. MT Propylene

South Korea
- **Strategic Facilities Consolidation**
- **Thermal Crude to Chemicals**

Remark: Volumes are based on confirmed announcements and GC Commercial Excellence estimates, and remain subject to revision.

Source: GC Commercial Excellence Analysis 2025

STRATEGIC MOVES OF PLAYERS IN NEAR-TERM

Strengthen Competitiveness with Ethane, Voluntary Restructuring and Technological Shift

Ethane Feedstock Enhancement Project at the **Long Son Petrochemicals Complex (LSP)** in Vietnam

Idemitsu Kosan and **Mitsui Chemicals** to Begin Mulling the Consolidation of Their Chiba Ethylene Complexes to Optimize Production

S-OIL Flying High With SHAHEEN Project for Expansion into Petrochemicals; The First-ever Commercialization of TC2C Technology

Source: SCG Chemicals, Mitsui Chemicals, S-Oil, GC Commercial Excellence Analysis 2025

“GC on The Horizon of Change”

Source: GC Commercial Excellence Analysis 2025

GC THRIVING ON THE ATLAS OF CHANGES

“Atlas of Changes – Where Challenges Become Our Strategic Edge.”

Cost Efficiency Leadership

Gas Feedstock Cost Advantage and Upcoming of US Ethane-Based Integration

Operational Synergy & Diversified Portfolio

Efficiency Through a Fully Integrated Infrastructure, Enabling Diversification into Downstream Products

High-Value & Sustainable Products

Expand the Portfolio into High Performance Polymers, Recycled, Bio-Based, and Biodegradable Products

Commercial Excellence

Market-Centric, Responsive, and Resilient Sales Strategy in a Changing Environment

Source: GC Commercial Excellence Analysis 2025

THE FINAL COORDINATES

Volcanic Capacity

Cooling Demand

Intense Competition

Survival is now structural, not situational.

Long-term competitiveness is now about whether a company's role fit the new structure.

Source: GC Commercial Excellence Analysis 2025

Source: GC Commercial Excellence Analysis 2025