The Global Polyester & Intermediates Industry: Trends & Challenges

Synthetic Fibre Raw Materials Committee Meeting at APIC 2019

Taipei, 17 May 2019

Javier Rivera

Tecnon OrbiChem

petrochemicals marketing and planning consulting service

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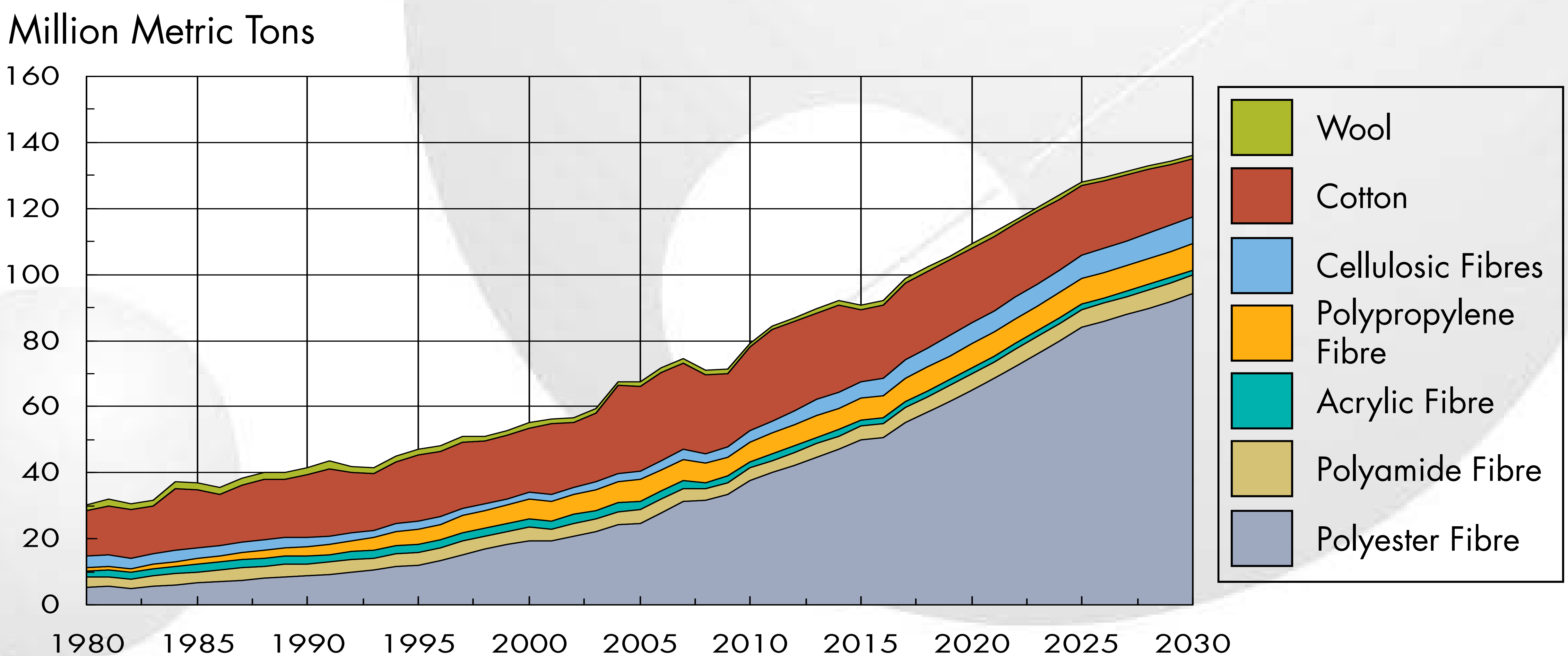
POLYESTER - A WINNING MATERIAL, BUT …

WORLD FIBRE PRODUCTION

- Global fibre production over100 million tons in 2018, BUT …
- Polyester production dominates and is expected to grow @ 5-6%, BUT …
- China dominates polyester fibre production, BUT …
- Polyester growth is guaranteed, BUT …
- Risks to polyester growth are related to global economics rather than product, BUT …



Source: Tecnon OrbiChem

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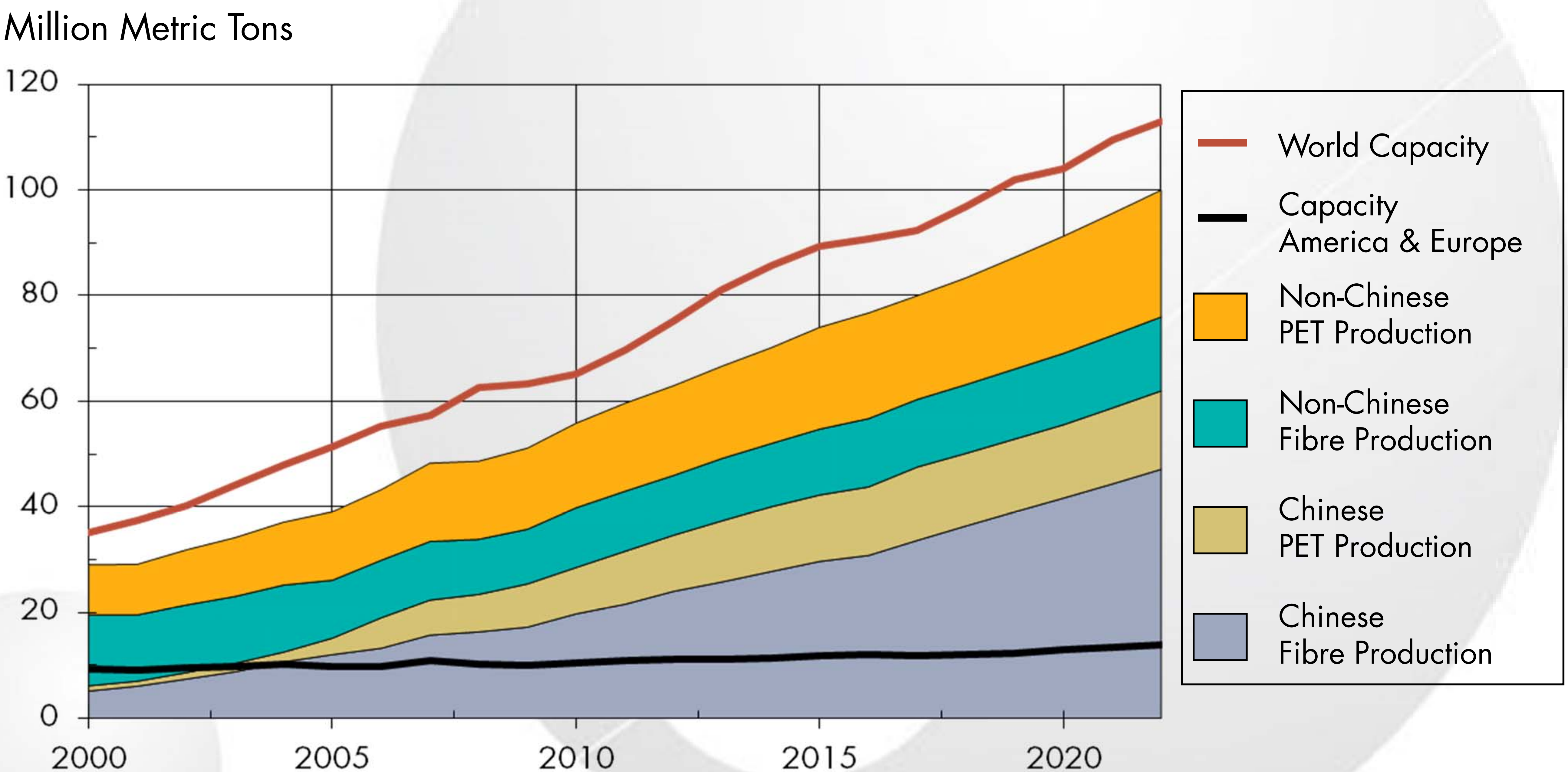
POLYESTER CHAIN - CHINA TRENDS (FIBRES & PET)

- In the past 10 years China has accounted for >100% of world polyester growth



- China is the main producer, BUT …
- Fibres are the main application, BUT …
- America & Europe are relatively important, BUT…

Source: Tecnon OrbiChem

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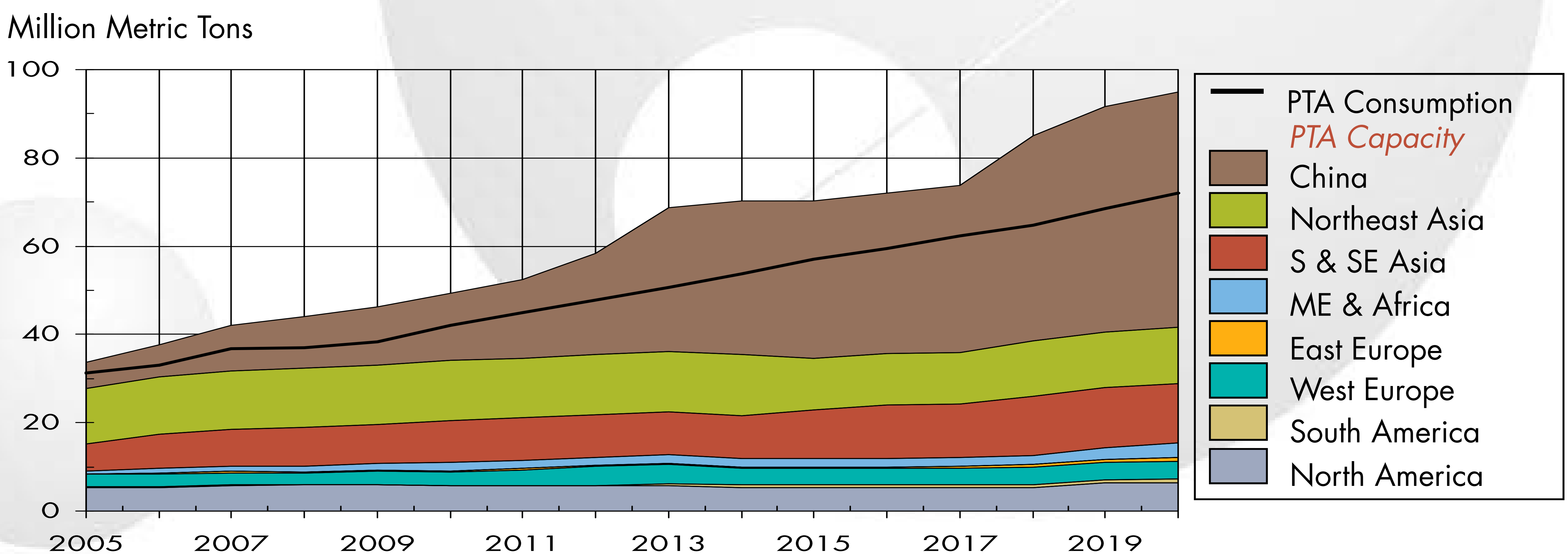
POLYESTER CHAIN – CHINA TRENDS

- China will maintain its position as the **main polyester producer**, but higher labour costs and the Belt & Road Initiative (BRI), involving logistics and trade agreements might see relocation of PX, MEG, textile and garment factories
- There is a need to raise the influence of both the private sector and middle class consumption (monetary stimulus, VAT reduction, export rebates)
- The aim of **self-sufficiency** or a net export position for PET, PTA and fibre as a result of the monetary stimulus to chemicals **will continue** for PX and MEG

What's Next for PX and MEG? Impact? The PTA Example.



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POLYESTER CHAIN – 2018 to 2020

Supply & Demand

- Already in 2018
- 2019-2020

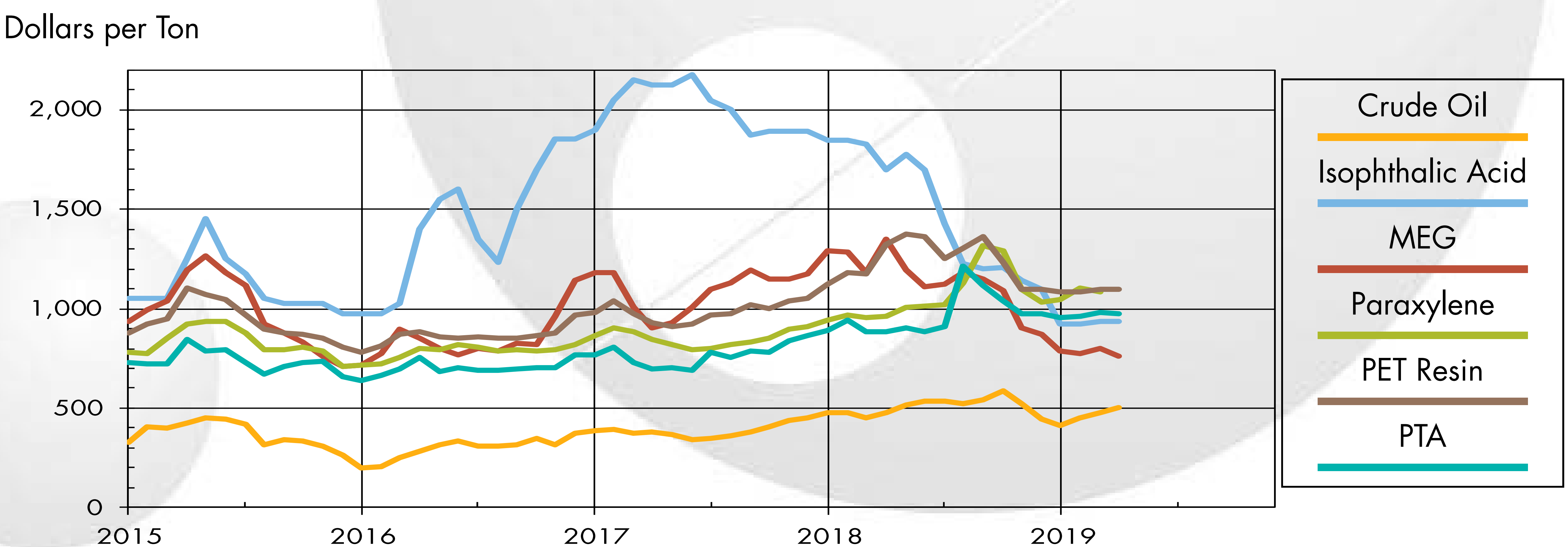
Global over-capacity in most parts of the chain

What happened ? From an oversupplied global situation to local shortages of raw materials and PET

What is the difference ?

Costs

- Relatively stable crude oil prices until 2018 with regional variations and volatility
- **Volatility.** Is here again to remain ? Analysis of cost and margins



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POLYESTER CHAIN – WHAT'S HAPPENING ?

- Many **oil companies** are considering ways to **integrate downstream into chemicals** so as to diversify and protect demand for petroleum products. One route is the building of huge refineries that are designed to maximise conversion of crude oil to chemicals – so-called COTC refineries.
- Conversely, **polyester fibre producers are integrating upstream into COTC refineries**. Owners having access to cheap crude oil, or having a large domestic market for chemicals, will have a significant competitive advantage & value oriented.
- Polyester fibre demand growth in China and South & Southeast Asia.
- Global economic situation and **Trade barriers** will have a major impact on trade flows for all products in the chain. China is the major exporter of PET fibres. Growth in PET.
- Lower integration in some part of the chain PX, PTA, MEG.
- **PET production more regionalised,** but with global participants - multiple sites. PET to extend upstream and downstream integration.
- **Sustainability** is impacting the polyester chain in different and multiple aspects. From environmental regulations affecting production, to supply/demand balances (recycle), to a way to differentiate, add value and gain market share for all.

Source: Tecnon OrbiChem

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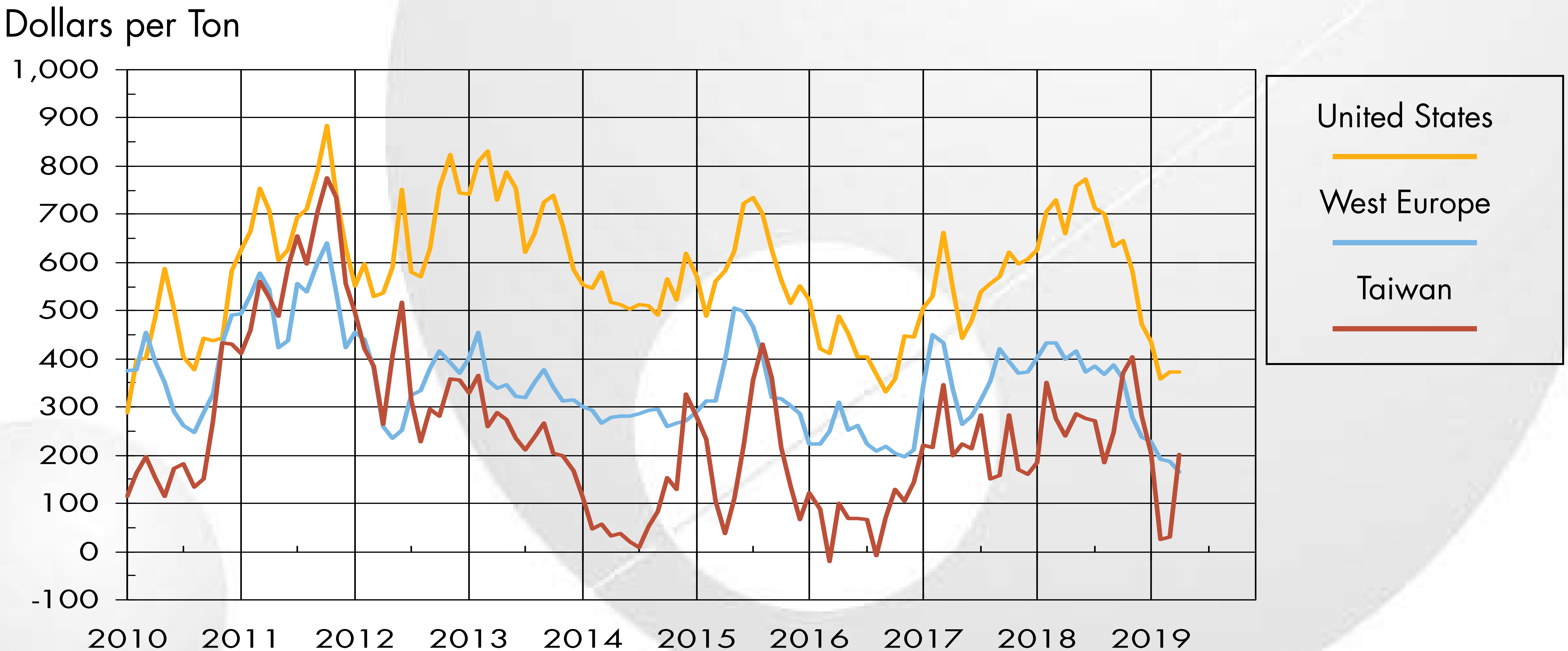
GLYCOLS TRENDS

From balanced-to-tight in 2016-18 to slightly long in 2019. 2020 ...

UNITED STATES, WEST EUROPE & TAIWAN
MEG CONTRACT MARGINS over 0.60 x ETHYLENE PRICE



- High volatility in margins.

Source: Tecnon OrbiChem

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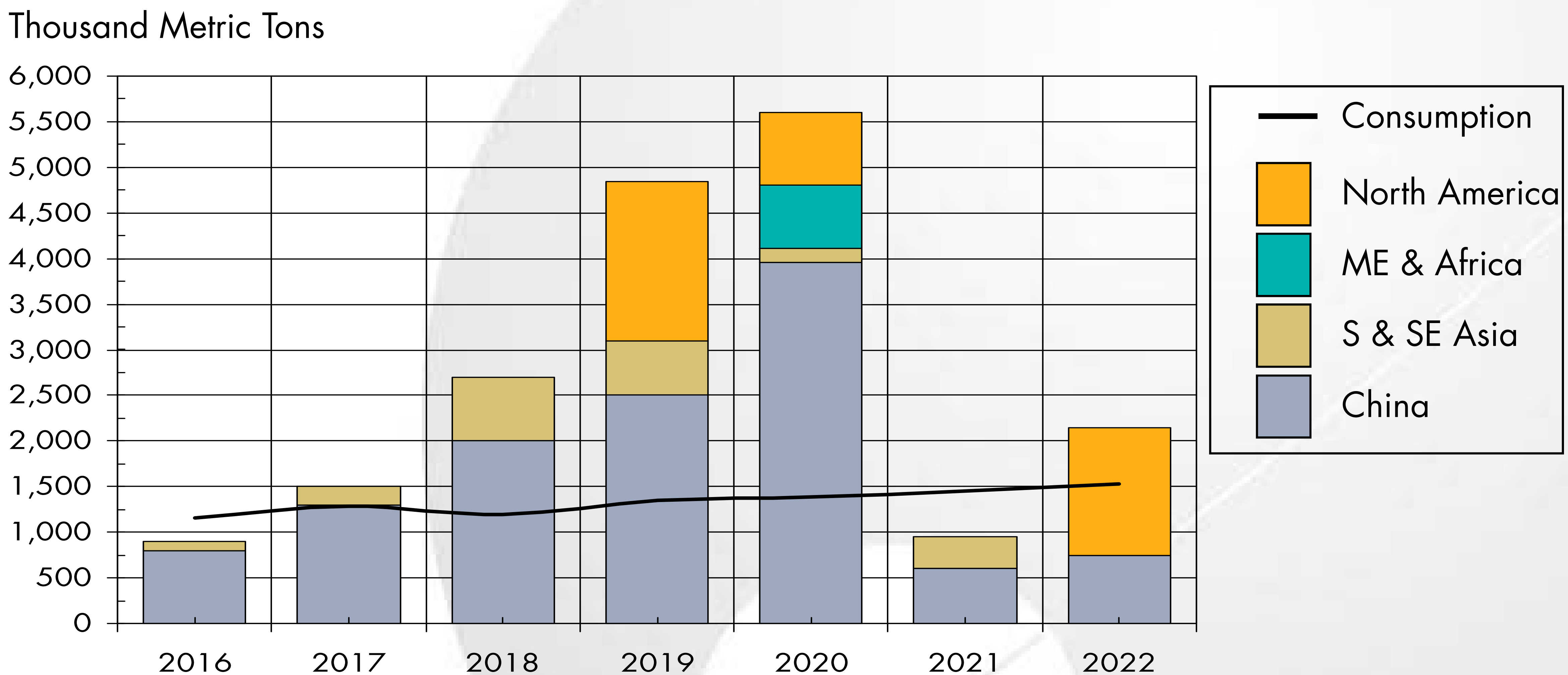
GLYCOLS TRENDS - NEW CAPACITIES



- **In the USA** New export oriented (foreign) investments based on cheap ethane
- **In Europe** Imports are and will be needed. The ECP equilibrium.
- **In China** How to approach self-sufficiency? Coal / Petrochemicals / Integration
  Has the peak for Coal-to-MEG arrived?
- Isolated projects in the **Middle East** and **South & Southeast Asia**
- Impact of margins? Who and where are the most competitive producers?

Source: Tecnon OrbiChem

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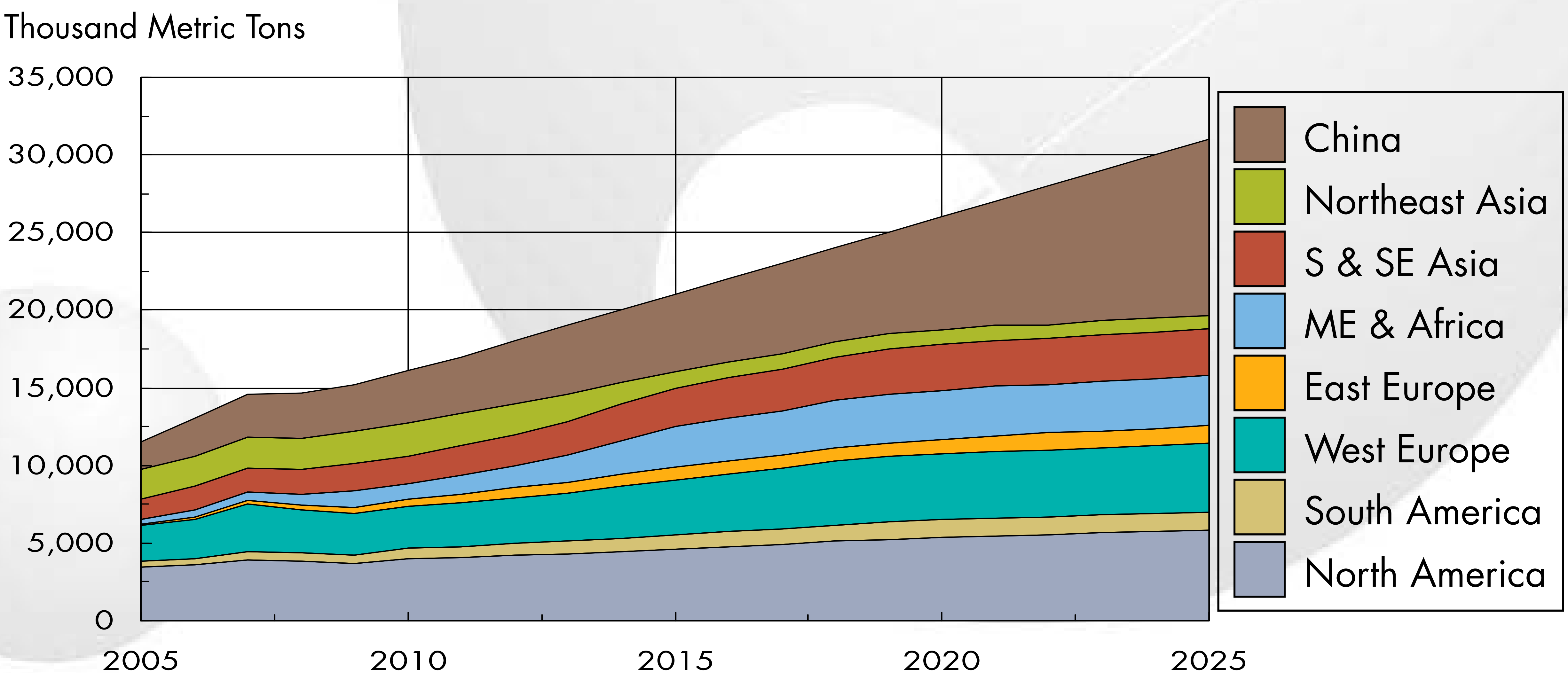
WORLD PET RESIN PRODUCTION BY REGION

Regionalised Production

- PET Resin growth1-2% above global GDP projections. Regional differences
- Growth in China and Asia (domestic demand and exports),
- Mature markets in Europe and the USA with associated problems
  - Margins, financials, fight for market share and new outlets
  - Rationalisation / reorganisation



Source: Tecnon OrbiChem

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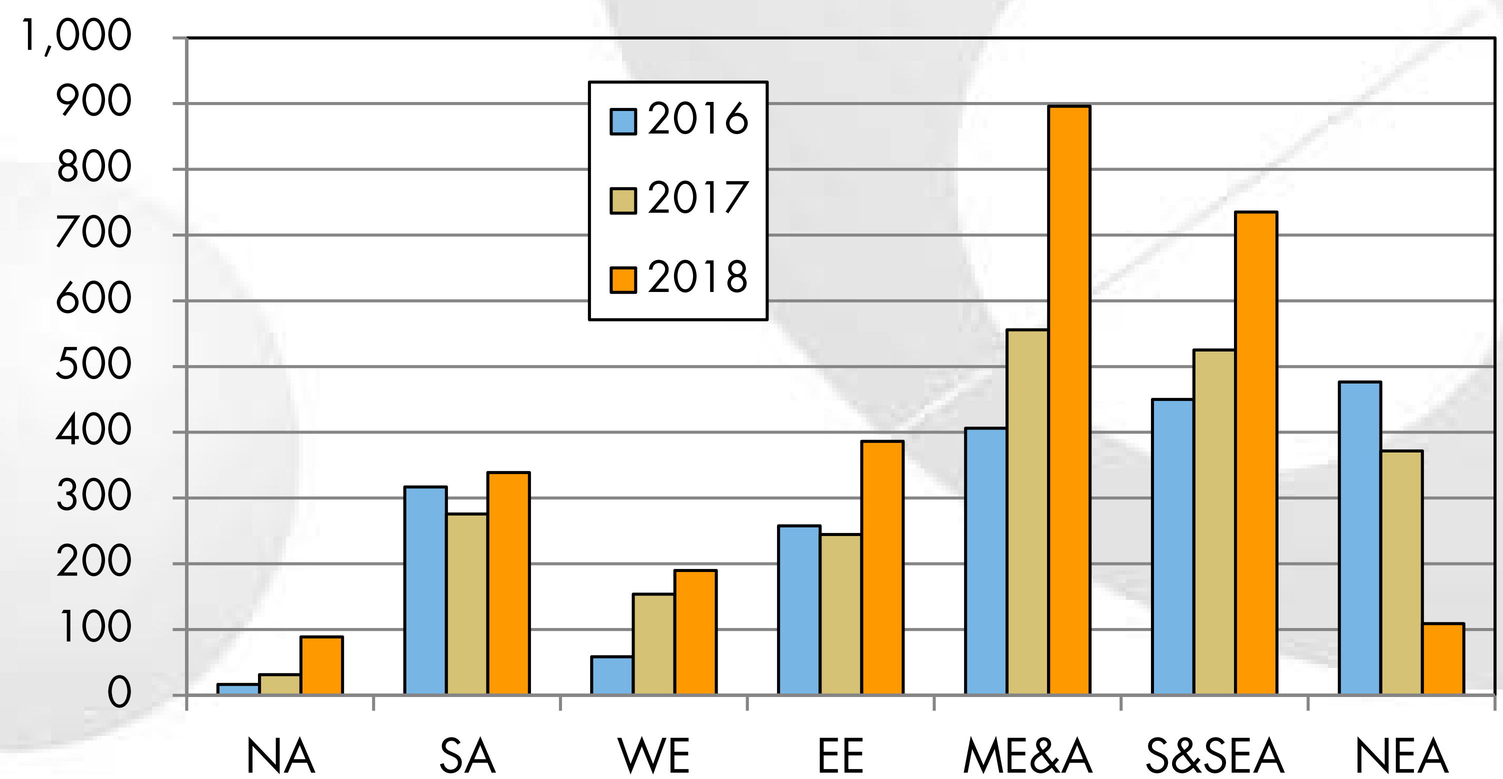
WORLD PET – NEW PLANTS, CHINA EXPORTS

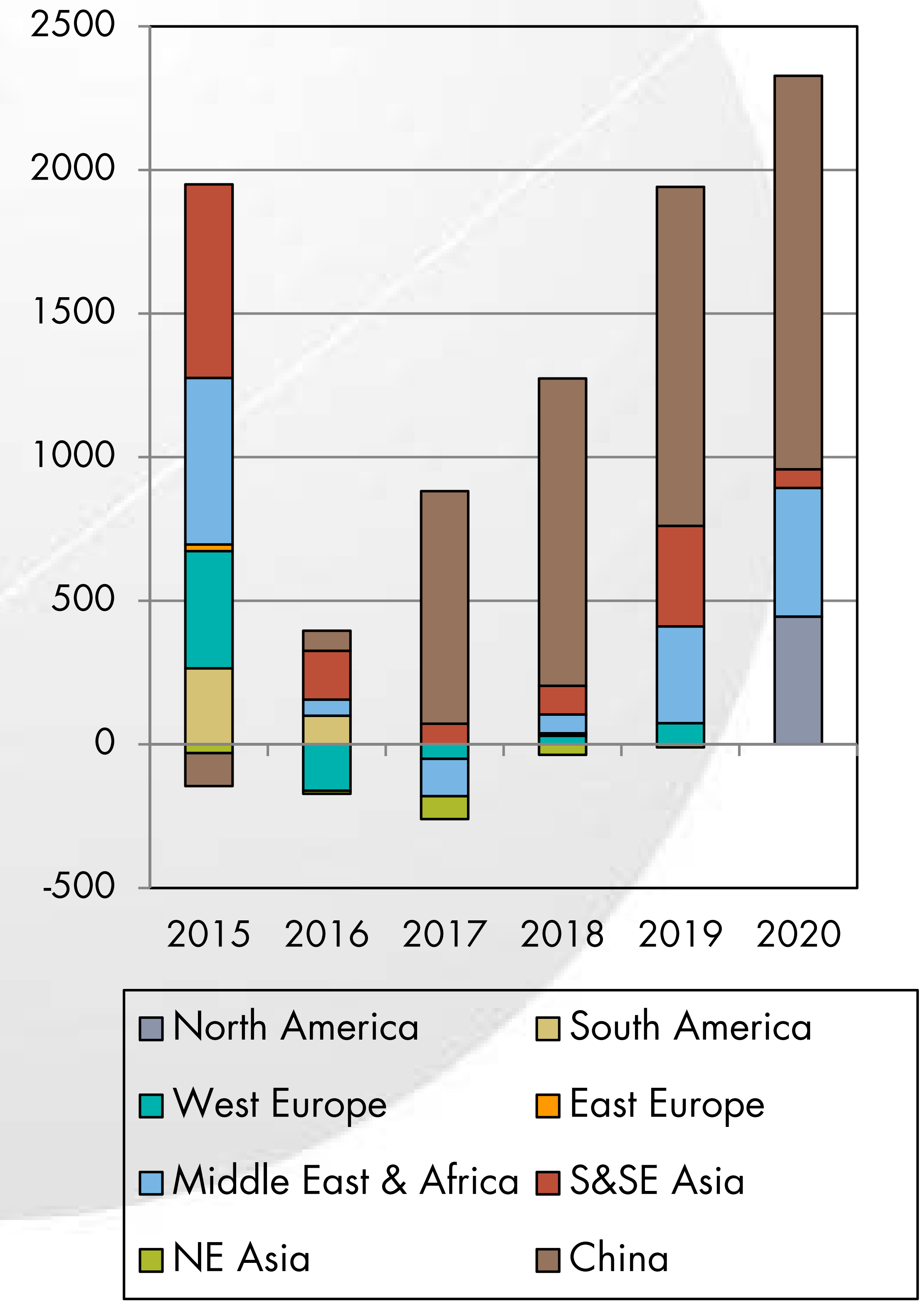
- New Chinese PET Production
- Global reorganisation, large global players
- New export-oriented units
- Trade barriers - existing and new
- Logistical & commercial flexibility
- Improved competitiveness and differentiation
- 2019: largest global traded PET volume?
- Others: Taiwan, Korea, India, Vietnam, Thailand

CHINESE PET EXPORTS
Thousand Metric Tons



Source: Tecnon OrbiChem

PET CAPACITY ADDITIONS
Thousand Metric Tons



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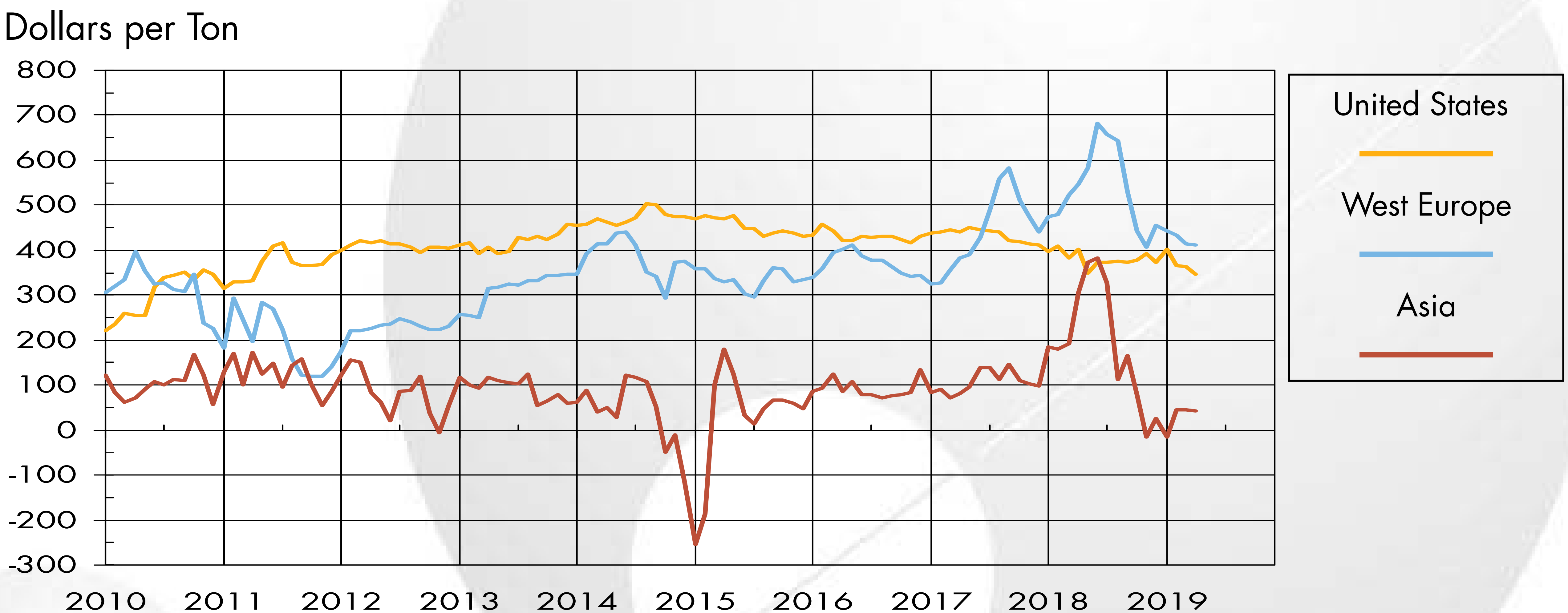
WORLD PET RESIN – ECONOMICS

UNITED STATES, WEST EUROPE & ASIA
PET RESIN MARGINS over 0.865 x PTA + 0.350 x MEG



- Raw materials and PET availability should not be a problem
- Chinese and Asian export versus export-oriented units
- Most, if not all, PET plants are running in Europe and the US. Some new ones
- Participants have different commercial approaches. Sellers and buyers
- Upstream and downstream integration will continue. As will Recycling

Source: Tecnon OrbiChem

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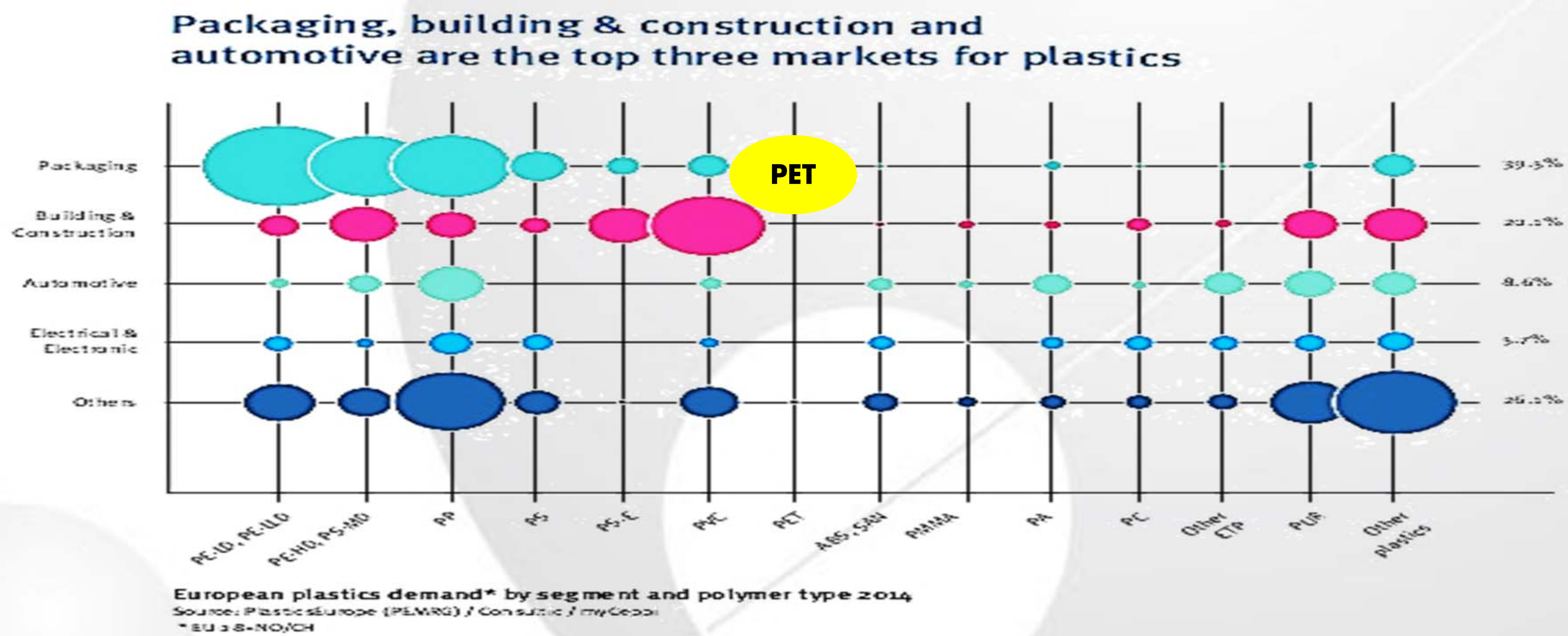
PET PACKAGING RESIN

- PET is **the best option for packaging** and the **most cost effective** polymer
- The industry needs to **defend all its advantages**
- Different growth in different regions. All polymers fighting for market



- A lot of alternatives (technology) but **no real/ready alternatives for PET**
- Relatively small/marginal growth **... Can PET grow ? Recyclability**
- Actions for/against PET

Source: Tecnon OrbiChem

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THE IMAGE OF PET

The Image of Plastic

- Not only affecting PET
- A problem that needs a solution
- Impacting the whole polyester chain.
- Despite PET being a very good material
- Recycled as feedstock

Sustainability is a Mega-Trend in Packaging & Textiles

• Legislation	The Circular Economy / Collection
• Marketing	Differentiation
• Business	Waste Management / Recycling
• Research	Bio-based / Technology
• Education	Benefits. How to use it?

What is the approach of each company in the chain towards sustainability?

Source: Tecnon OrbiChem

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PET CHAIN – APROACH TO SUSTAINABILITY

- **There have been different approaches** towards sustainability in the industry. For both raw materials and PET - Environmental regulations, LCA, CO_2 emissions, landfill reduction, bio-based, light-weighting, design, recycling, refillable bottles, RSC, etc.
- How to approach and implement sustainability **has become a priority** for countries, industries, companies within and without the chain - and consumers.
- **At all steps within the chain (textiles, PET)** and within the company.
- It has become **a way of clear differentiation – Targets, measures**
- **The Bio alternative**, although existing, has been surpassed by recycling
- Most packaging companies have announced **aggressive targets for recycling content** with precise percentages and dates - Easy to control/audit.
- **Recycling.** How it is **organised and controlled** (collection, flake/pellet production, industrial application) in **each different area** (local collection, politics, different drivers for recovery) **for what final application** (fibres, bottles, food applications, sheet, others), **technologies** (mechanical, chemical)
- Impact on technology, trade flows, raw materials
- Polyester raw materials (MEG, PTA), packaging (film, bottle), textiles (consumer brands) and distribution channels have been among the most active

Source: Tecnon OrbiChem

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CONCLUSIONS – SITUATIONS & OPORTUNITIES

• Trend to overcapacity for MEG, PX, PET, PTA & Fibres	
Cost	BE competitive
Strategy of China as how to approach self-sufficiency	BE smart
• Overall cost increases in China and potential relocation	
Market reorganisation	BE in the market
• Politics (trade barriers) will change trade flows … and GDP	BE flexible
• EU & USA. Financials & market reorganisation	BE healthy
• EU & USA. Limited number of players and associated risks	BE reliable
• Natural disasters	BE lucky
• Image of plastics! How to approach Sustainability	
The Circular Economy, Waste Management,	BE creative
Collection Systems, Recycling Technologies,	BE cooperative
RPET usage in all applications,	BE sustainable
Environmental Measures from refinery to final products	BE innovative
• Where are you? Where is the demand and cost advantage?	Choose where to BE
• Importance of logistics. Regional differences	BE global
• Trend to integration (upstream - downstream)	BE integrated
• What industrial clients – consumers want/need	BE value-oriented

Source: Tecnon OrbiChem

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