

Global Polyethylene Outlook

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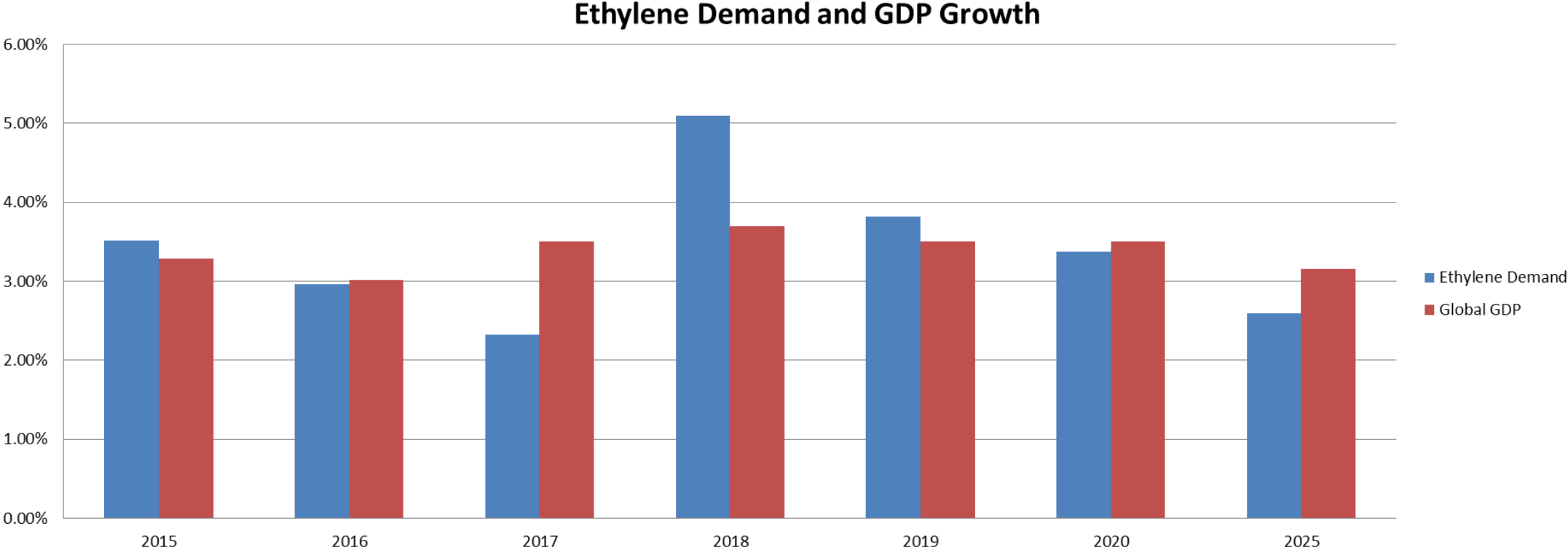
Short-term plastic surpluses, but long-term need for more capacity



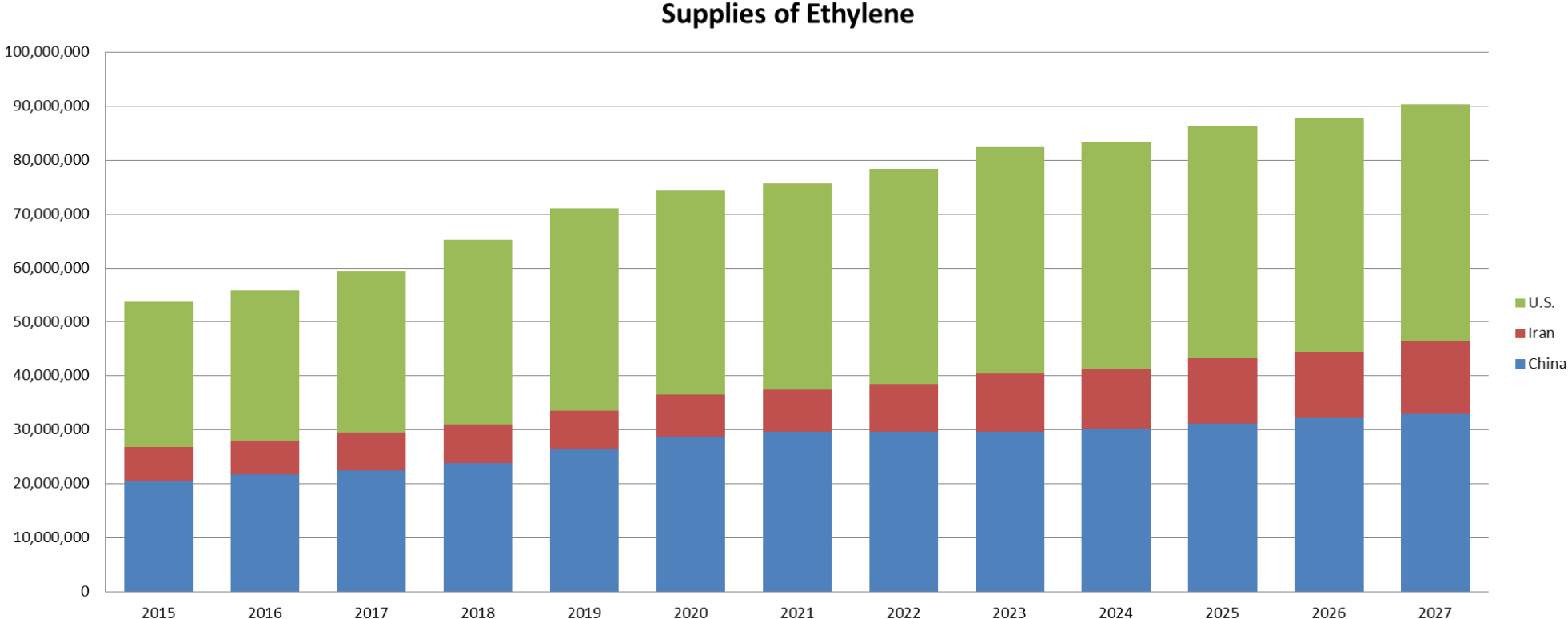
Key Agenda Items and Takeaways

- 1 Global PE expansions:** Capacity additions to continue, led by the US, Asia and the Middle East
- 2 Per capita demand patterns:** India and China to lead the way: China to try to stimulate growth through the One Belt, One Road initiative (OBOR)
- 3 Global demand:** HDPE and LLDPE to be the fastest growing and take up the largest share of PE consumption
- 4 Global/regional balances:** North America to grow export surplus, Middle East to maintain lead in export position, Asia, Western Europe and Africa to grow in deficit. Speculative capacity needed post 2024 for market to find balance, with US, Iran and Asia possible locations
- 5 When will the next trough be?:** Operating rates will have to fall back to 82/83% globally for market to find balance between 2017-2020 as global surpluses ensue, if rationalisation does not occur.
- 6 PE Price and margin outlook:** Reflecting the fundamentals, global prices and margins to go through a bearish period from 2018 through to 2020. Post 2021 prices and margins to show recovery as demand catches up with supply

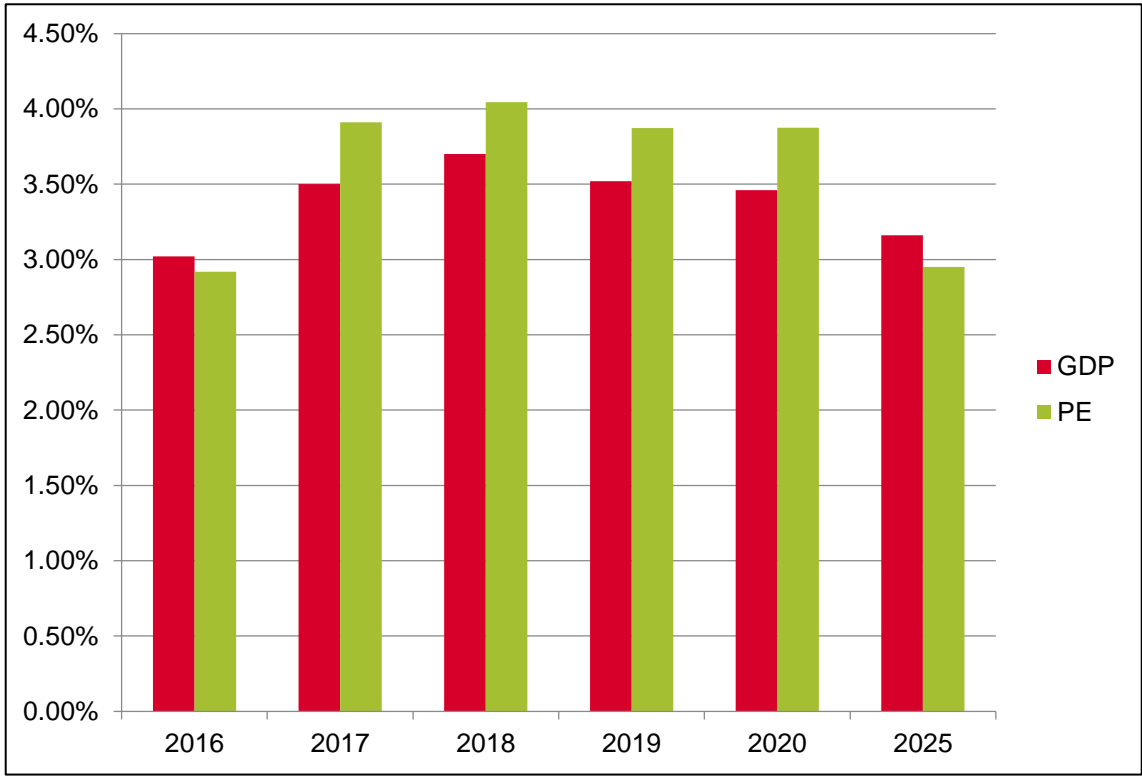
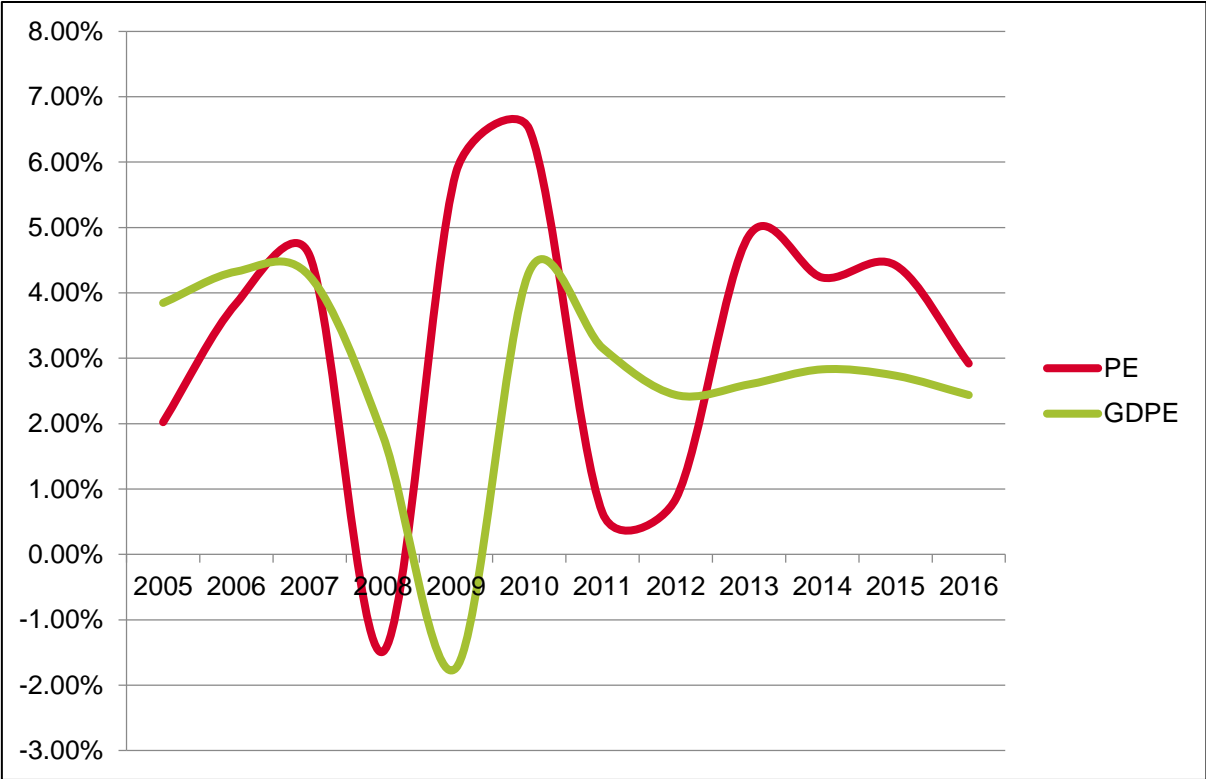
Global ethylene demand is growing



Supplies in low cost regions



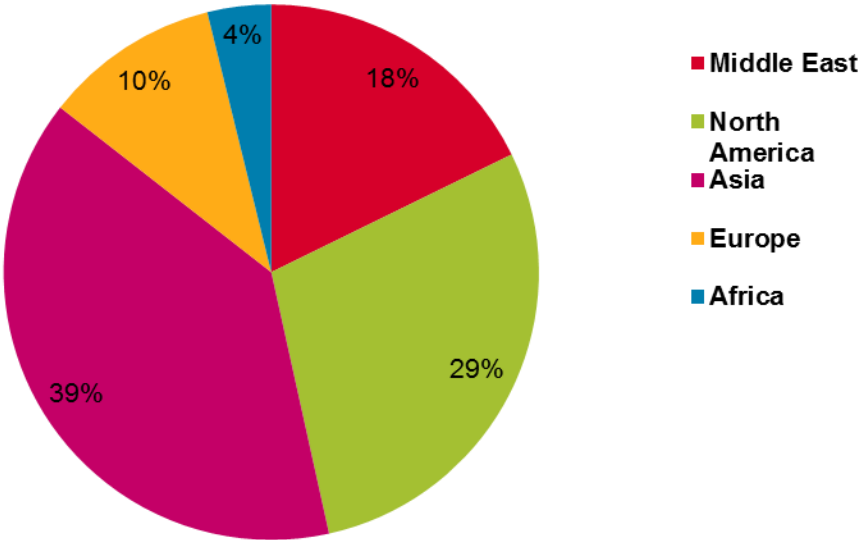
Global PE demand and GDP growth



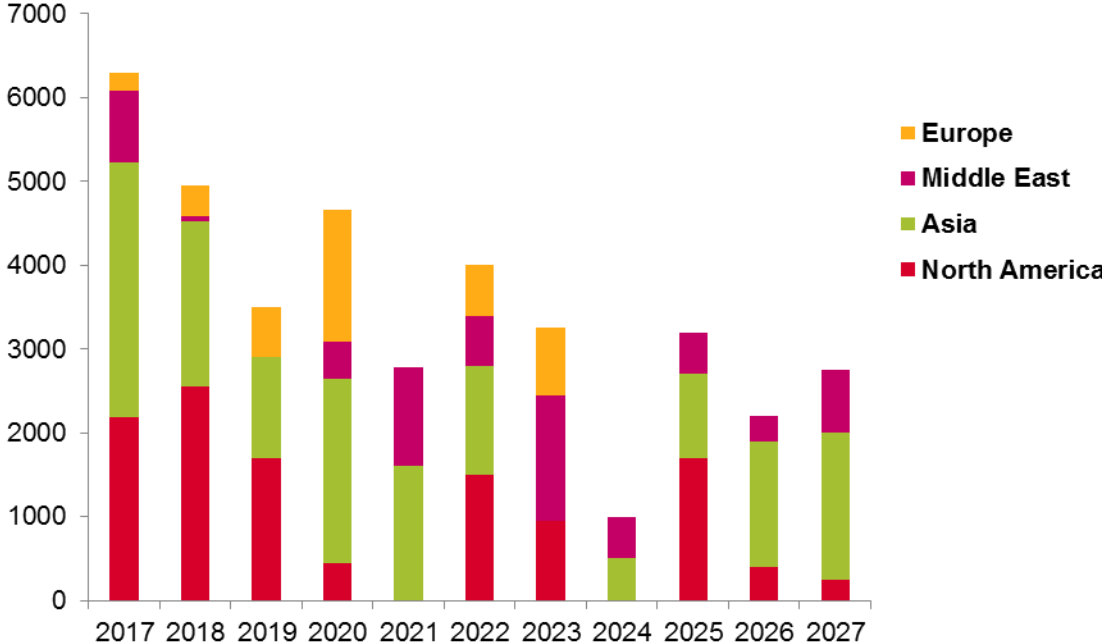
Polyethylene expansions: Where are they taking place?

Close to **40 million mt** to come on stream over the next ten years of which **11.2 million** is speculative

Global PE Investments by Region 2017-2027

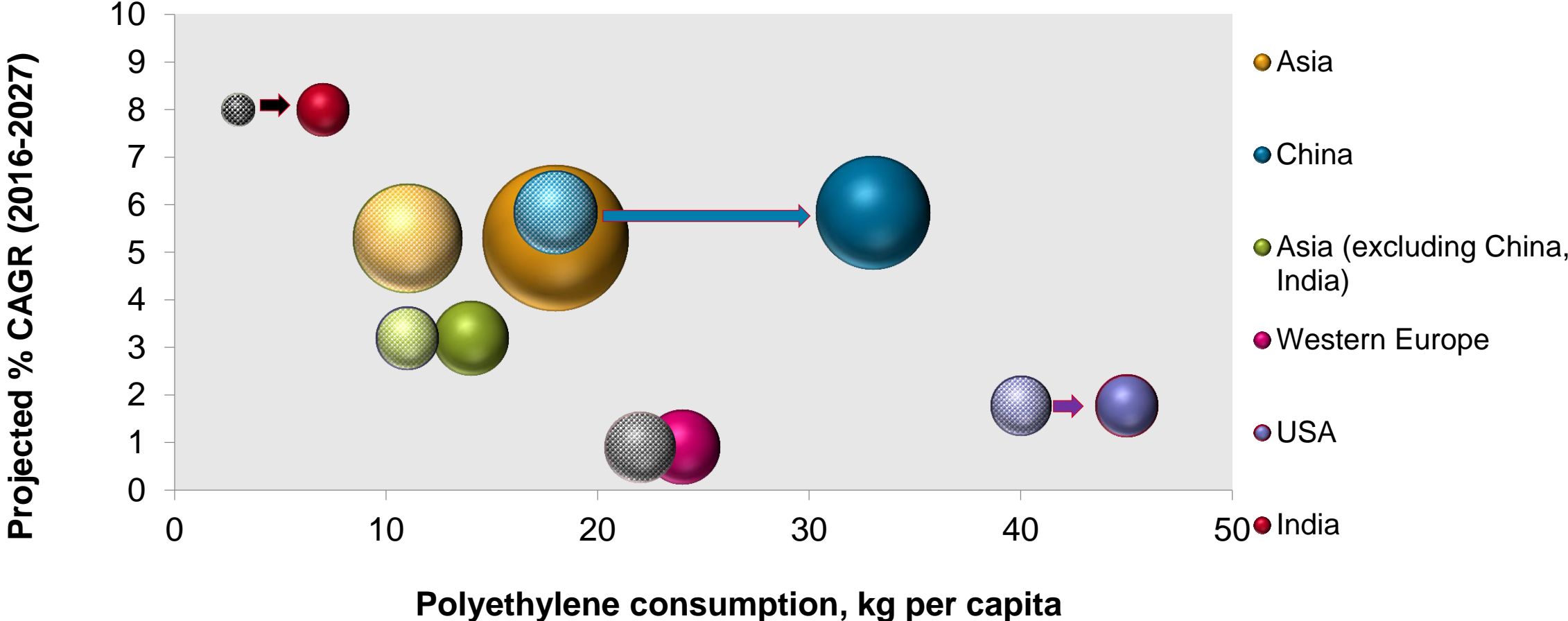


Regional Capacity Additions 2017-2027 Firm and speculative (000 mt)



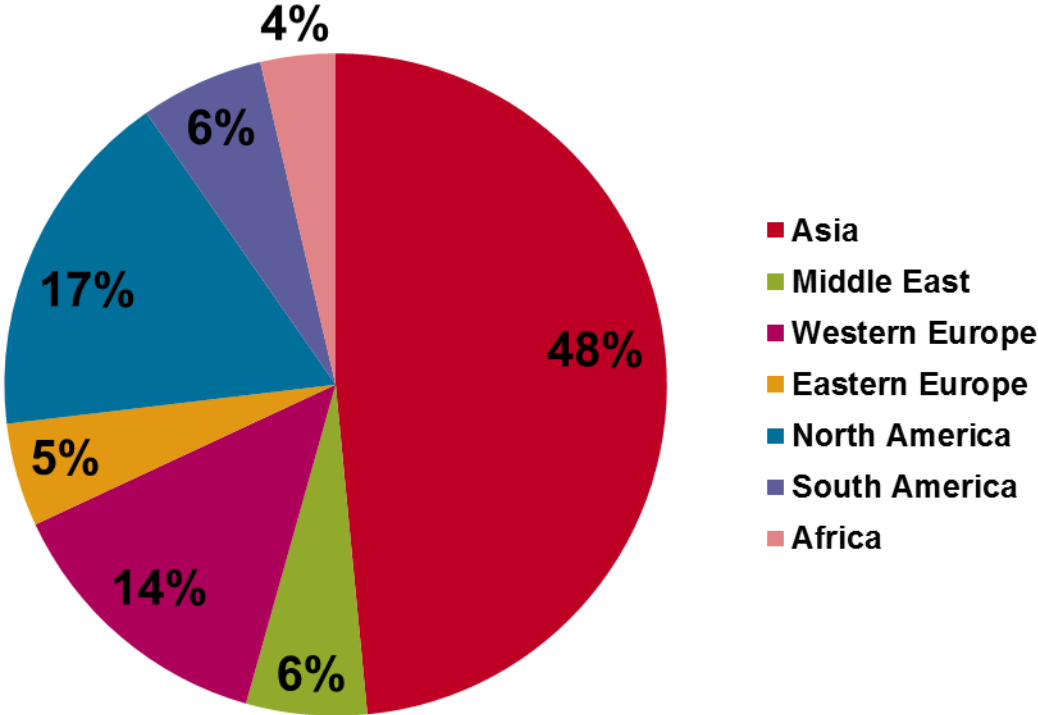
PE demand growth: Per capita consumption to increase in developing economies

Forecast Polyethylene (2016-2027) Demand Per Capita

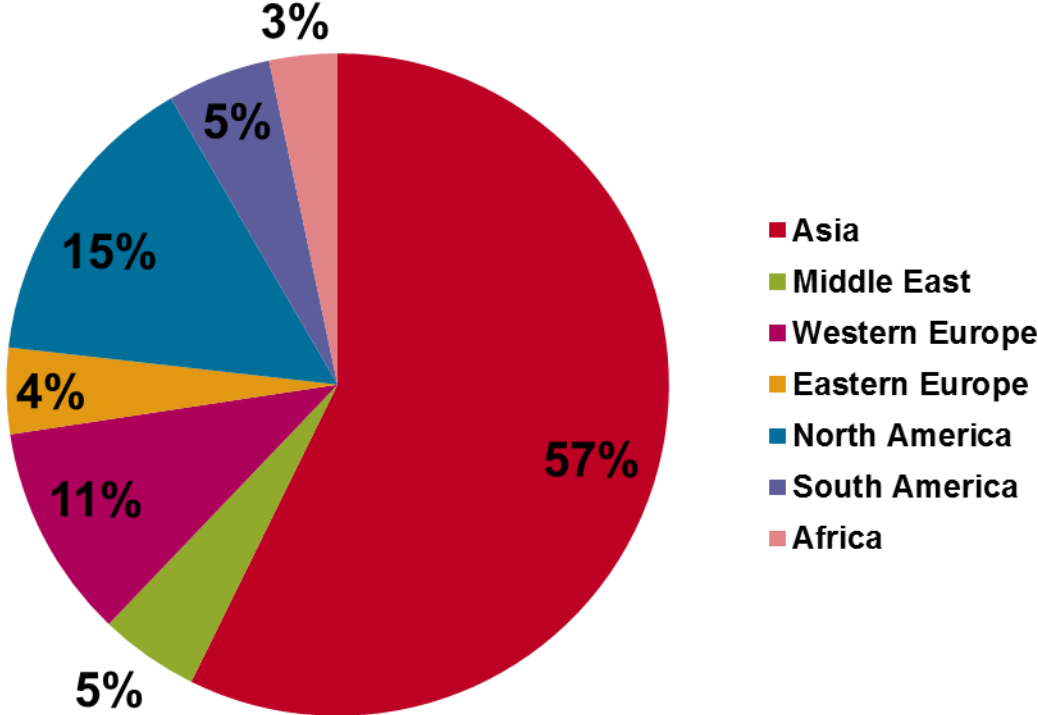


Asia to dominate global demand share

Global PE Demand Breakdown-2017

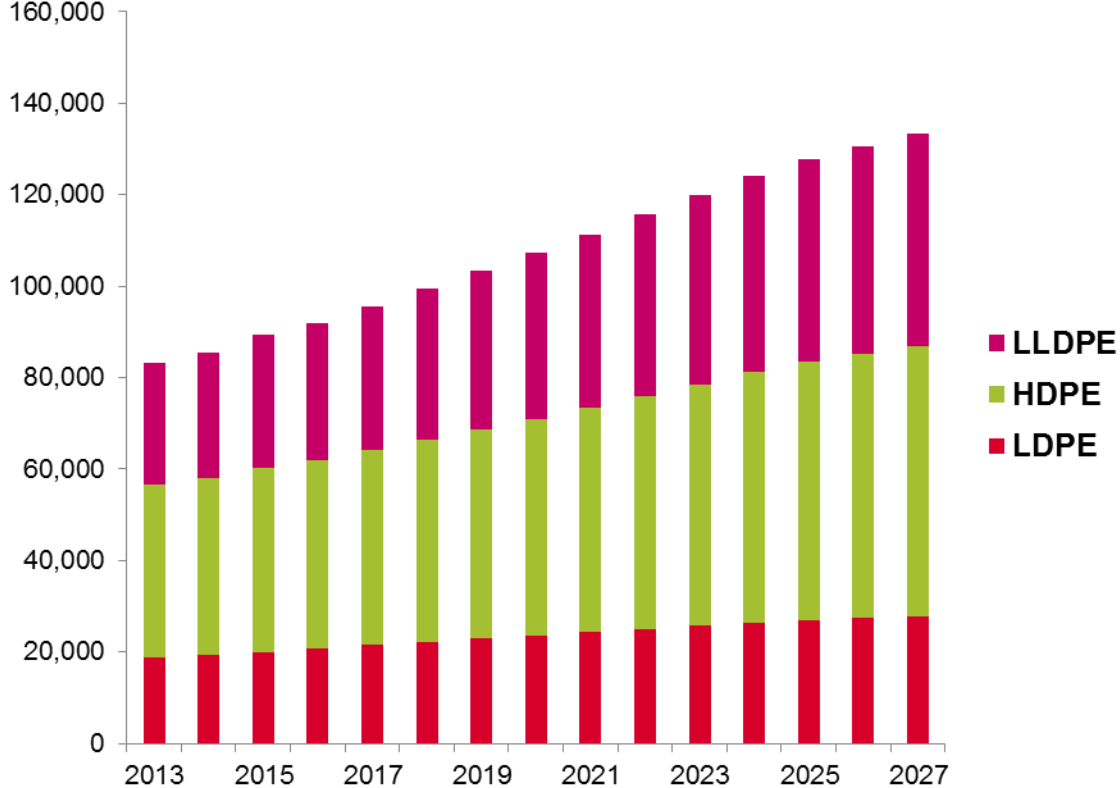


Global PE Demand Breakdown-2027

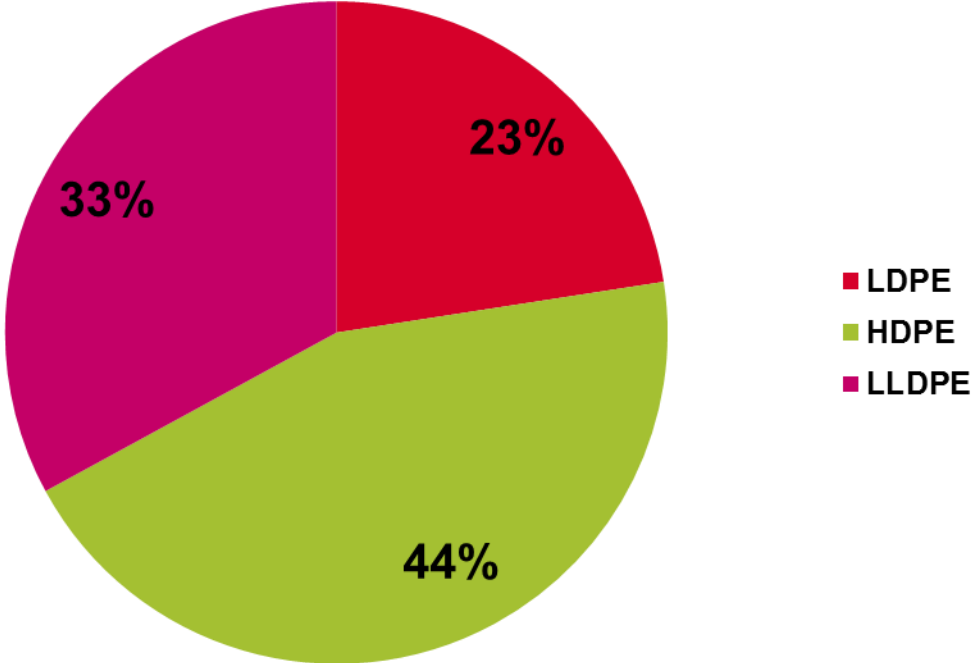


Global demand by grade: HDPE and LLDPE to lead the way

Demand by Grade for PE (000 mt)

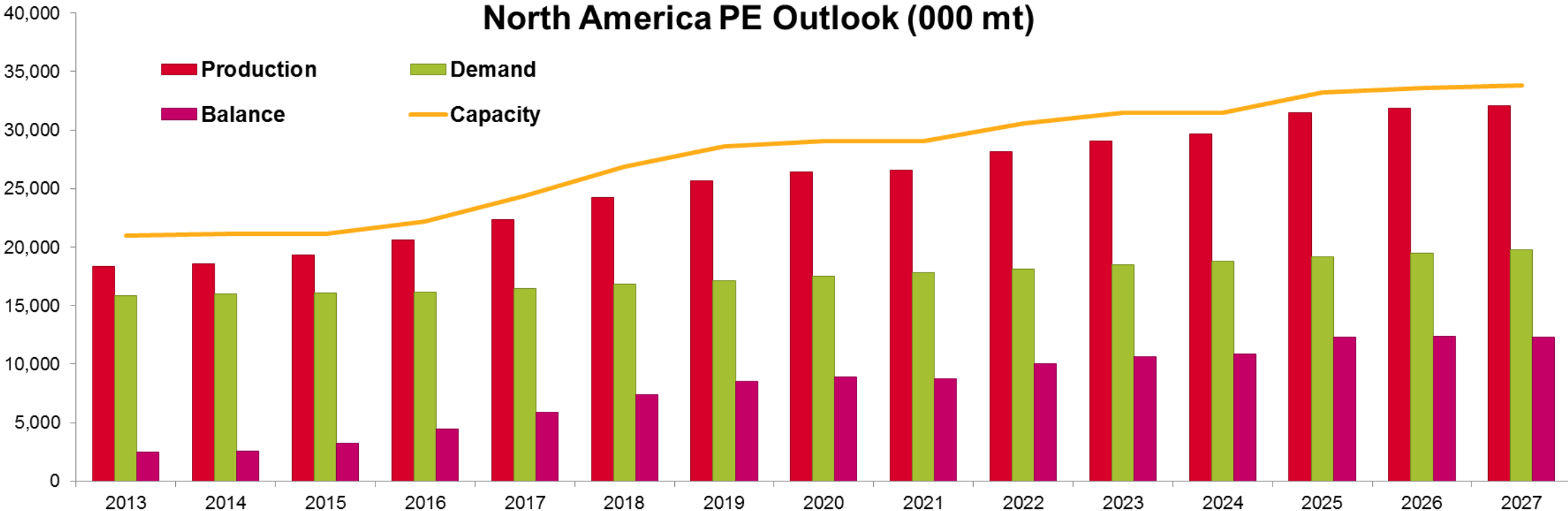


PE Demand Share by Grade (2017)



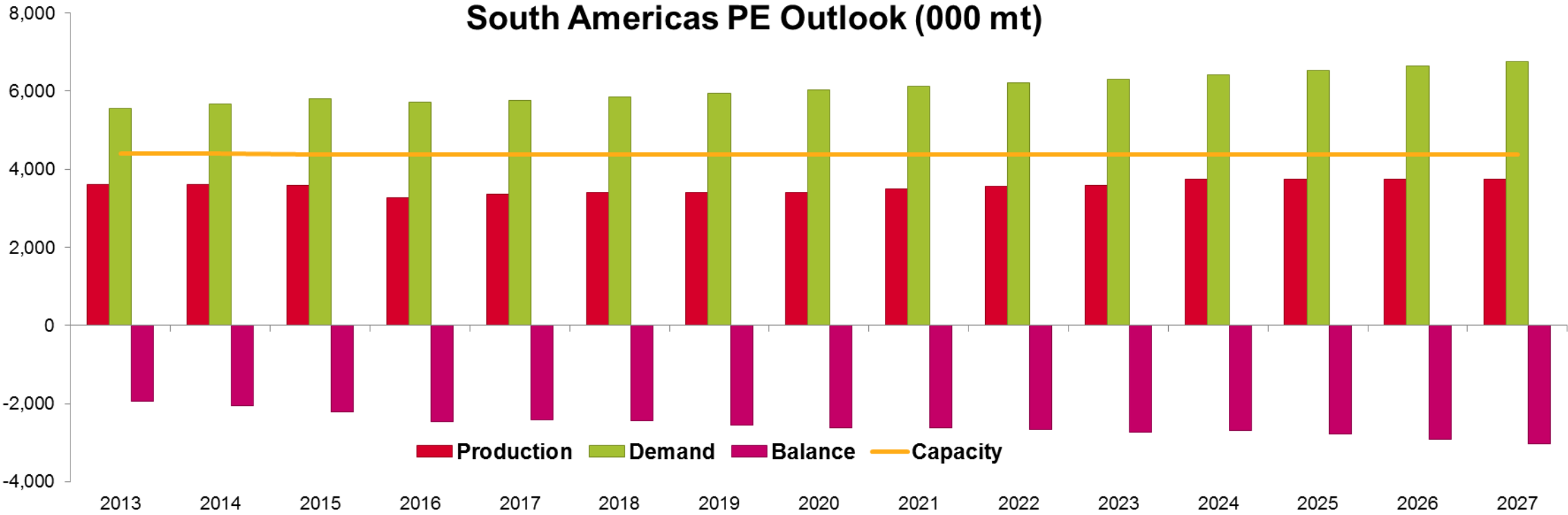
North America to grow in PE surplus

Shale boom has led to major expansions in the US



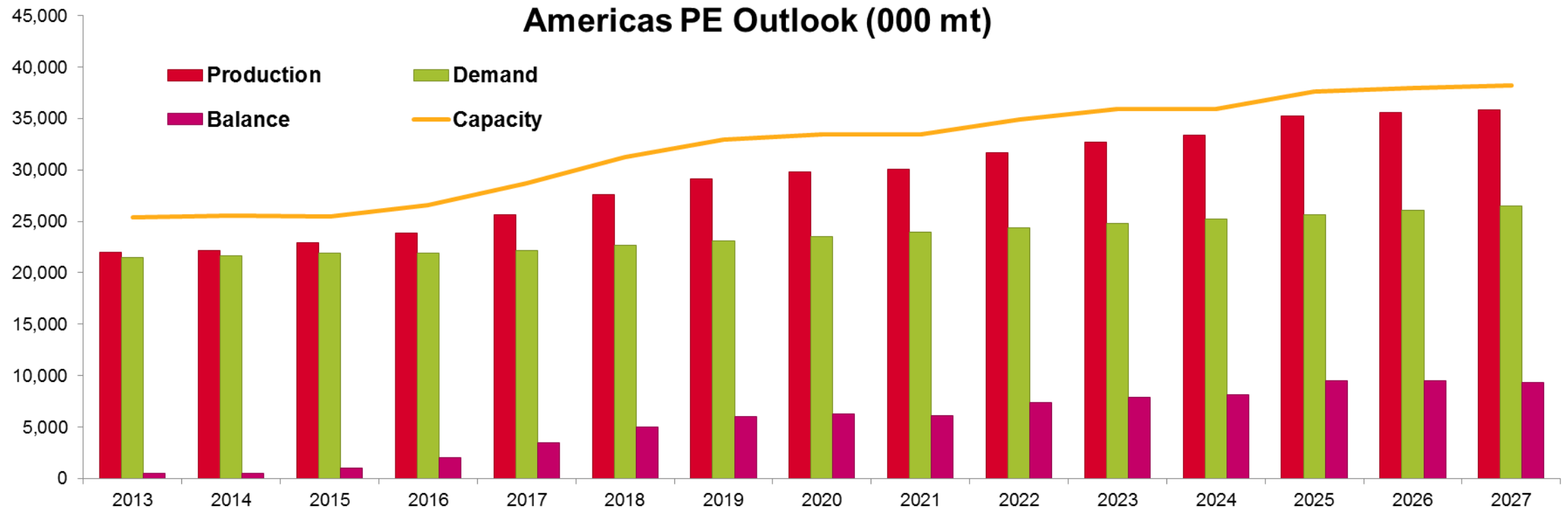
South America PE to remain in deficit

The Southern Americas, a partial relief valve for North American product



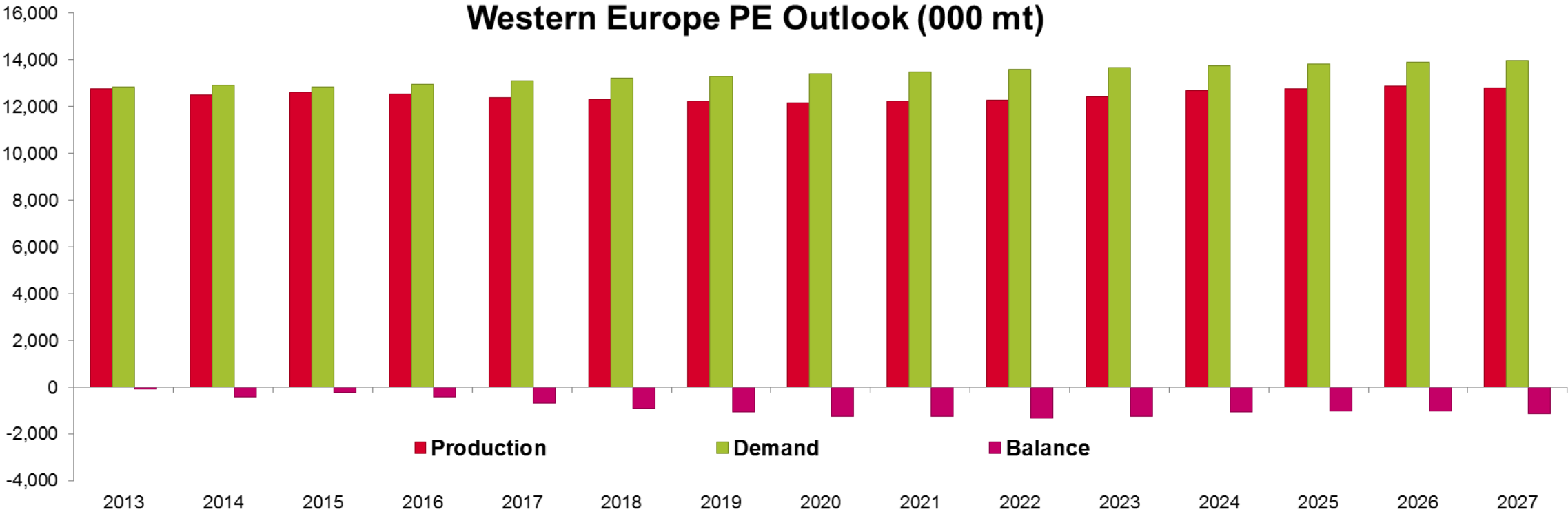
Total Americas to grow in surplus: Asia and Europe will be destinations for these exports

The US to become a major PE exporter



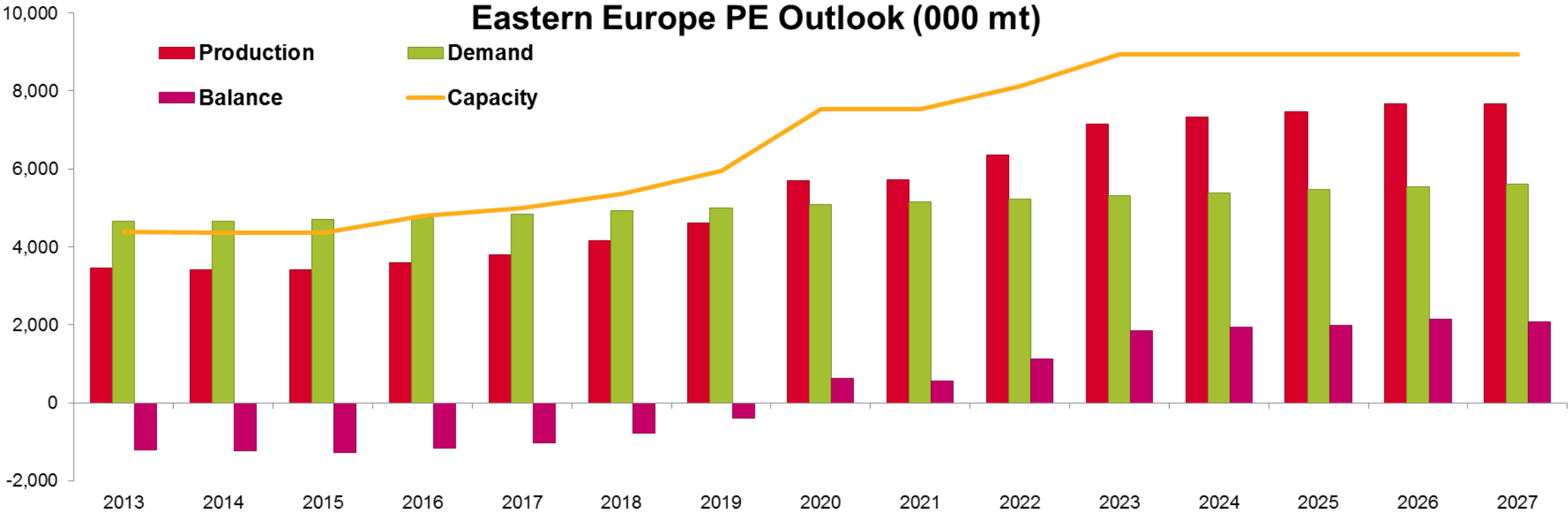
Western Europe to grow in PE deficit

Everybody building around Western Europe, the region will be subject to more imports and potential rationalisation



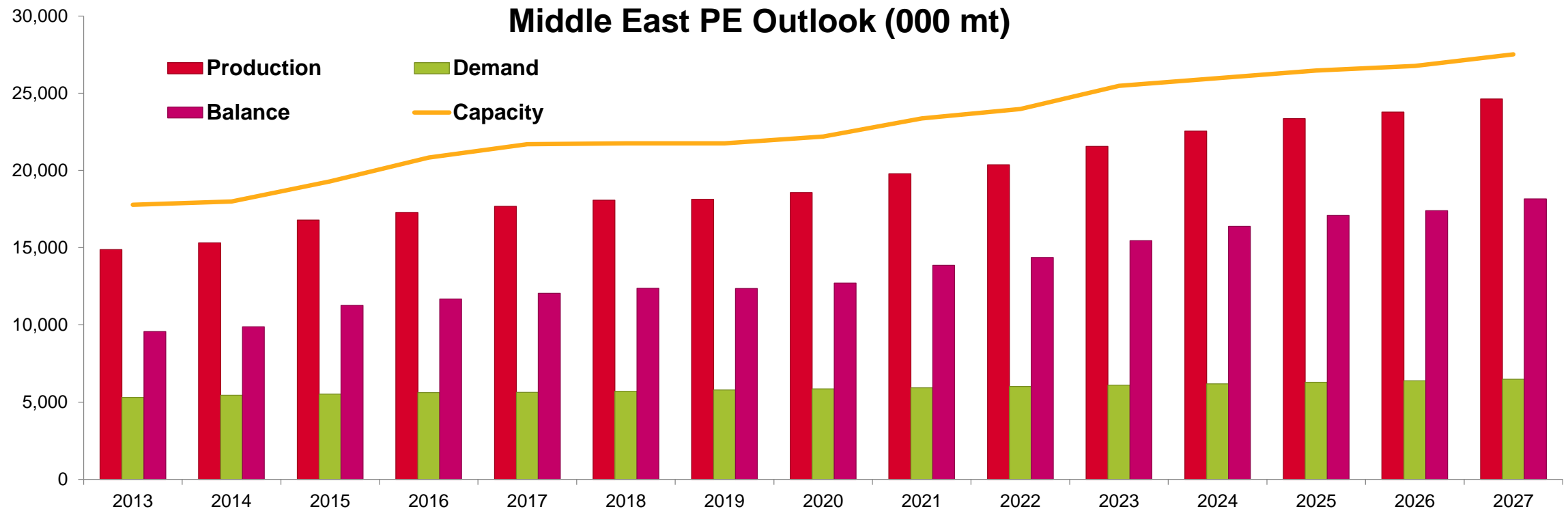
Eastern Europe will turn to surplus if projects go ahead as planned

Russia and other parts of the Former Soviet Union is where the capacity is to materialise



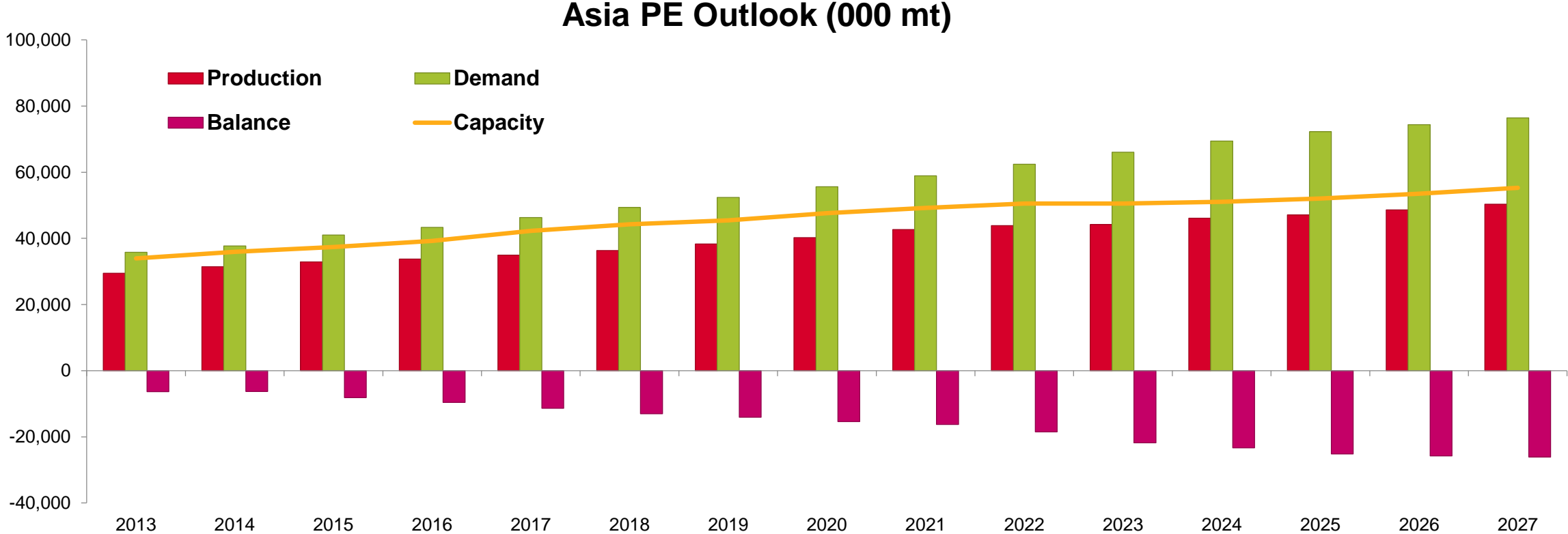
Middle East will remain a dominant exporter: Iranian investments to dominate

The GCC and Iran to face competition from the US for importing markets such as Asia and Europe



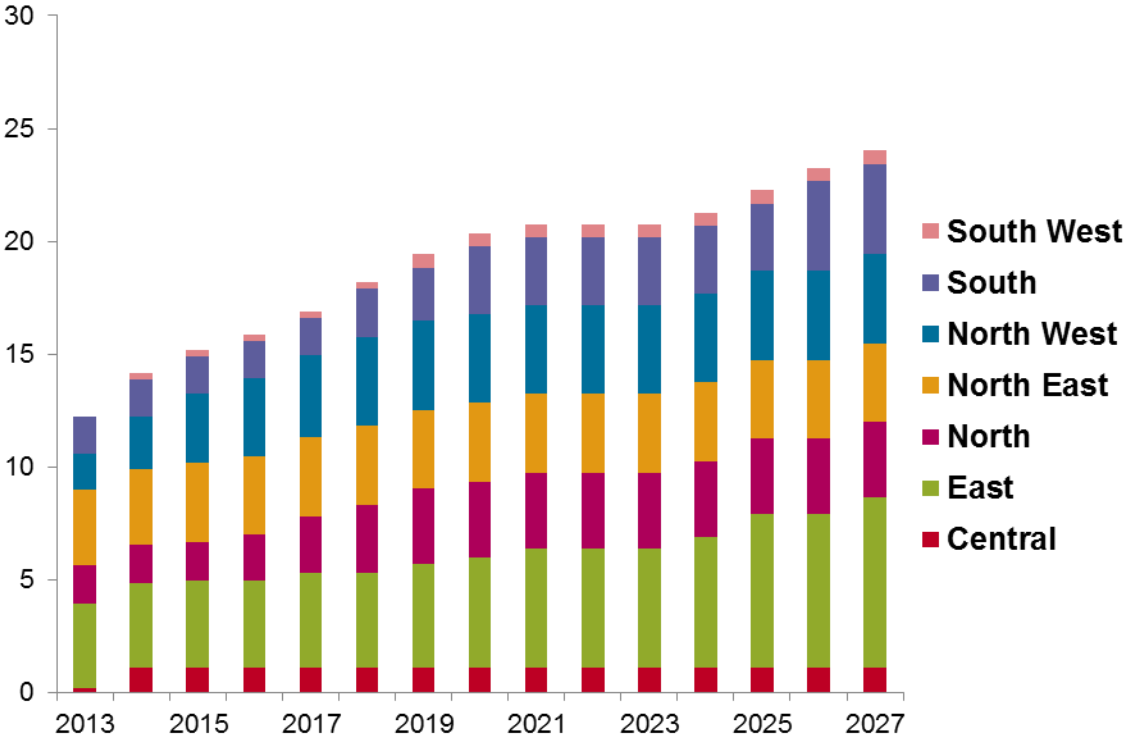
Asian PE import requirement to increase, but stabilise in the medium term

All hinges on Chinese economic remaining stable. India to achieve highest growth rate for PE

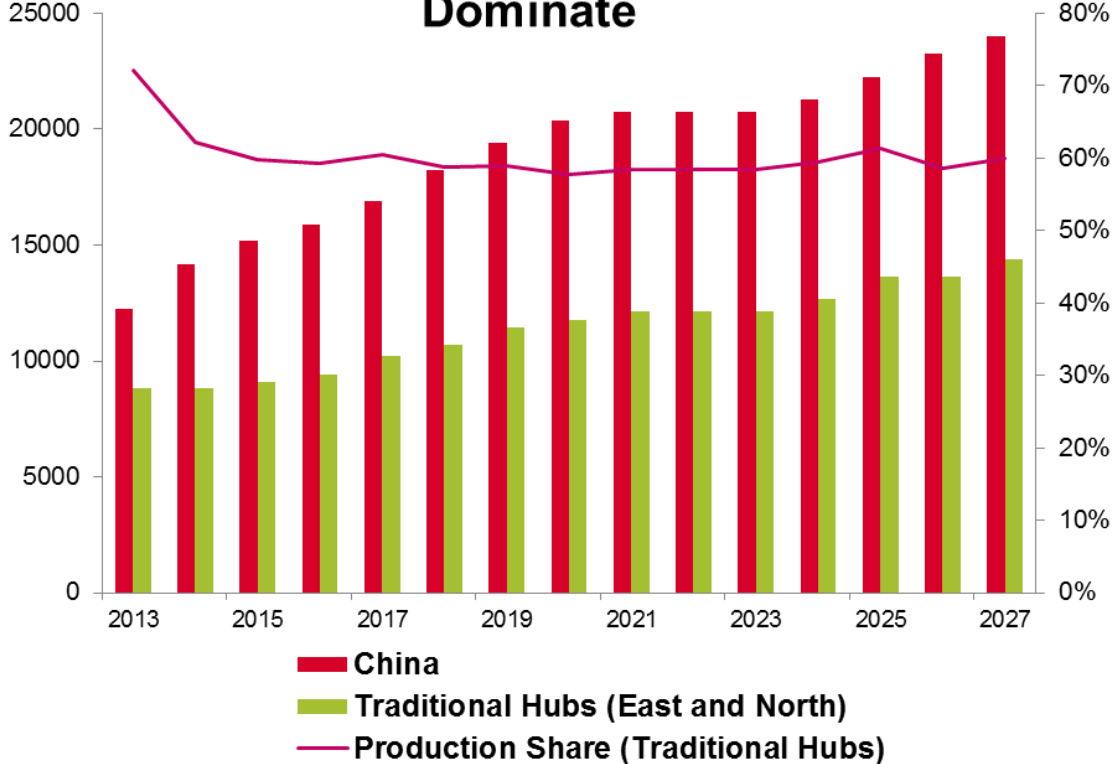


China's One Belt, One Road (OBOR) ambitions

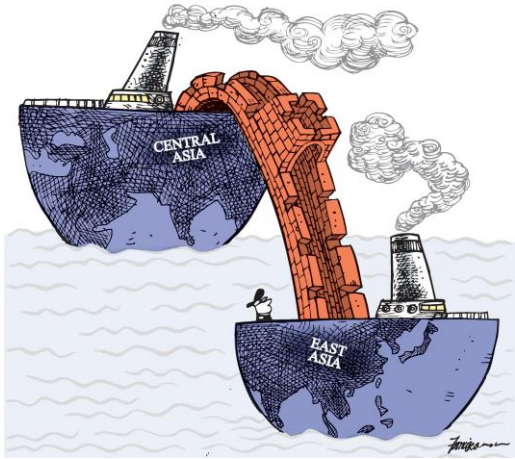
China PE Regional Capacity Build-up



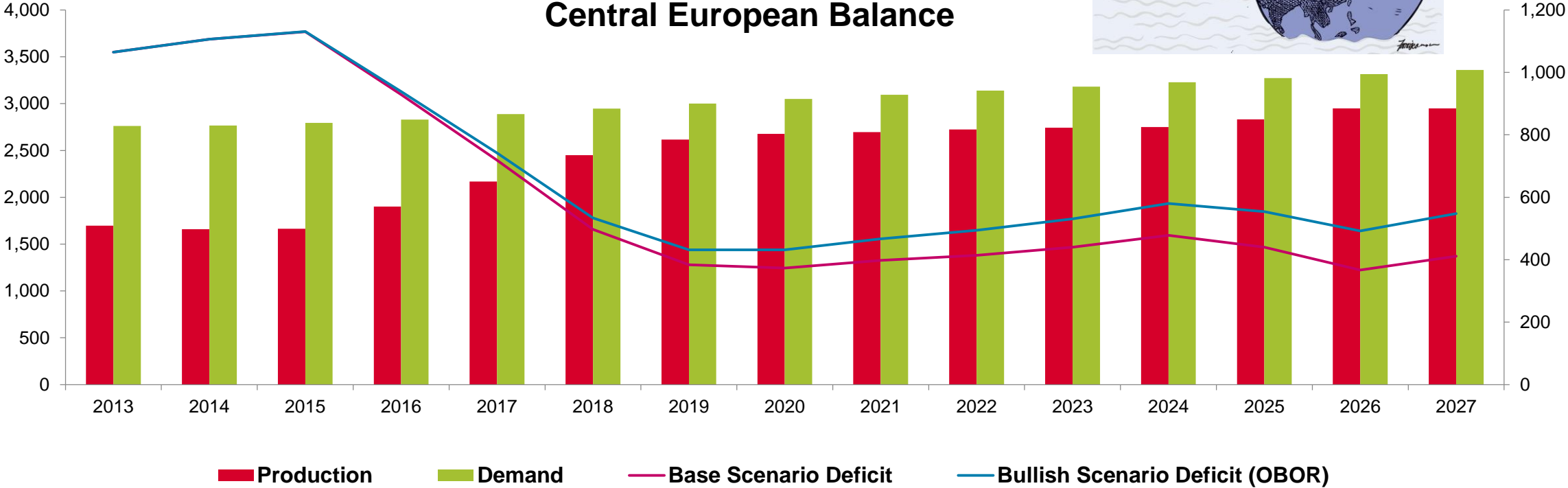
New Inland China PE Investments Dominate



China's One Belt, One Road (OBOR) ambitions

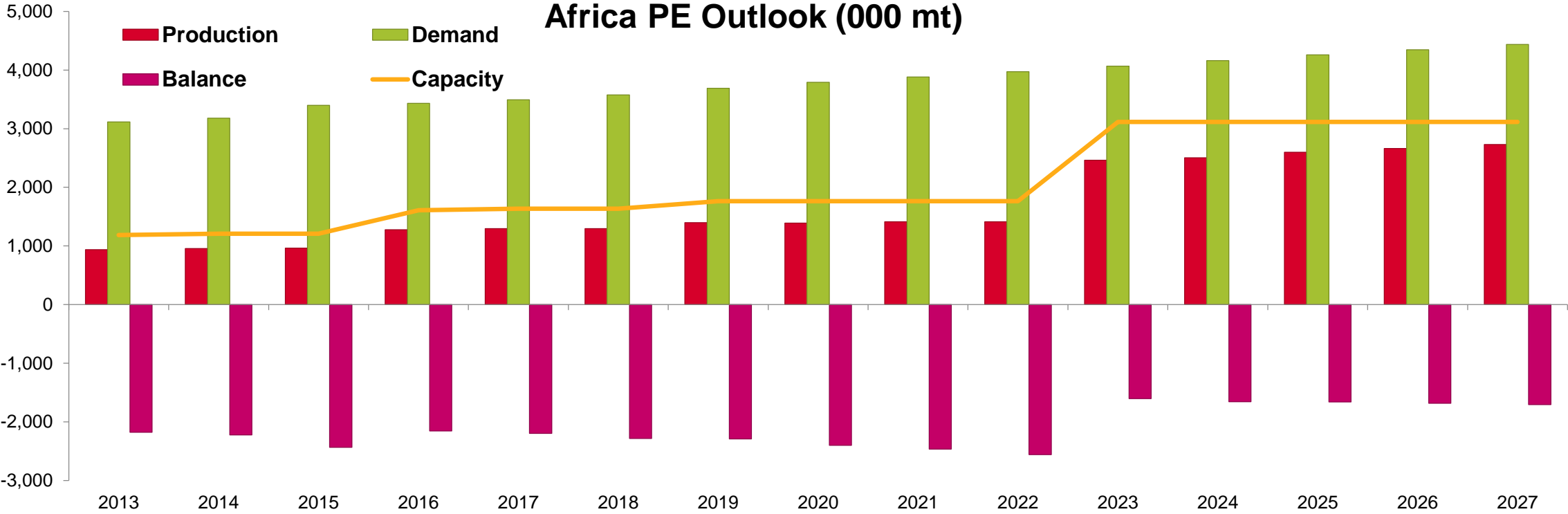


Positioned to enhance Euro-Asia trade routes



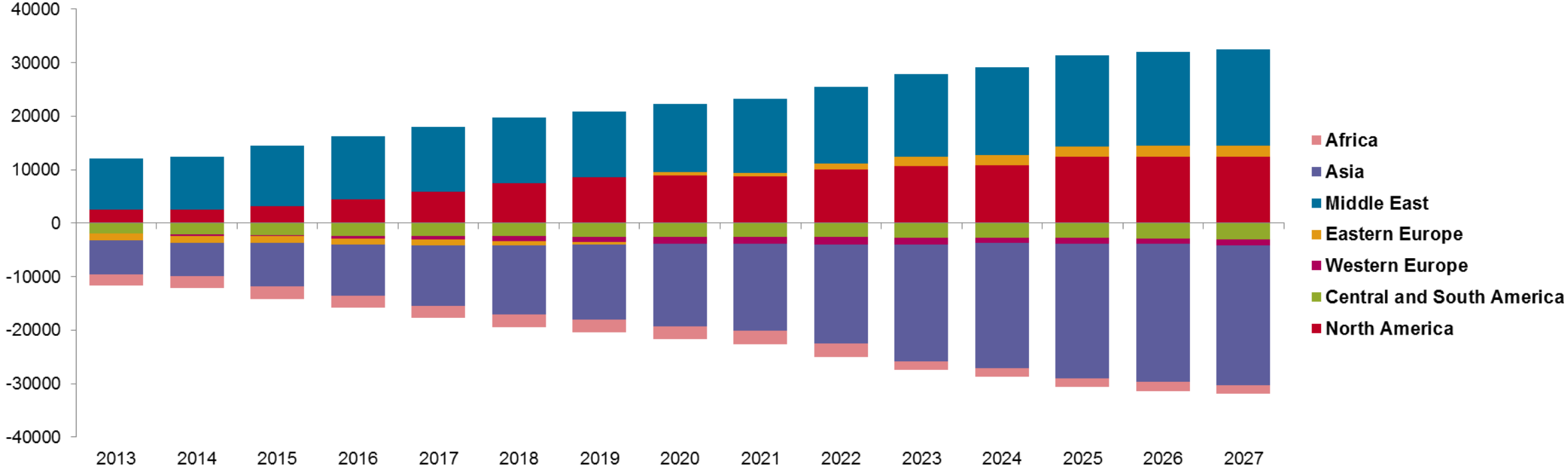
China's efforts to maintain and strengthen Asian growth through the New Silk Road Initiative

African PE balance to narrow if projects materialise

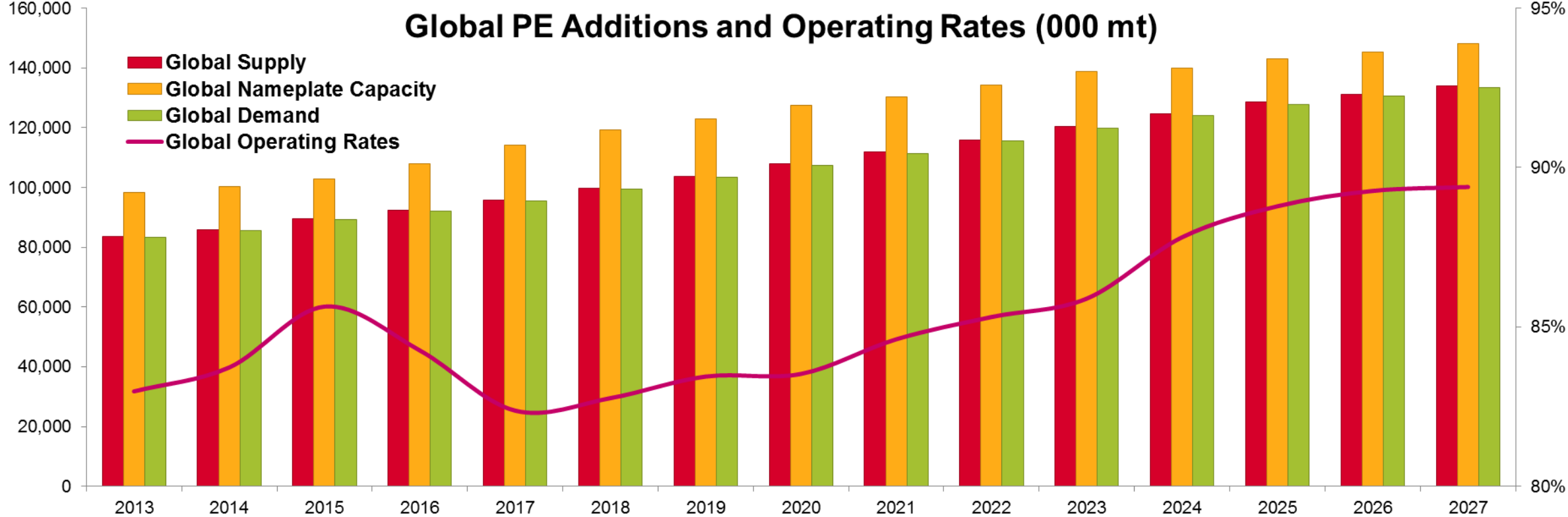


Regional net trade patterns: US to join Middle East in feeding the ever growing Asian net import requirement

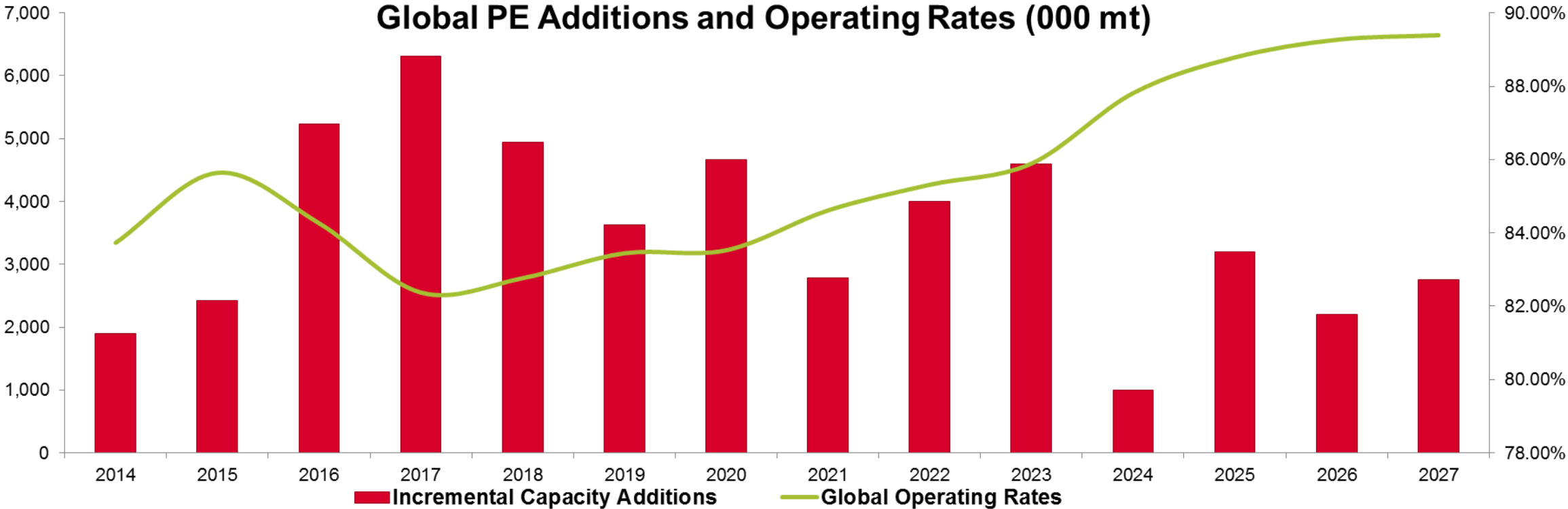
Regional PE Net Trade (000 mt)



Overall global PE supply and demand balance: Around 11 million mt of speculative capacity required for market balance

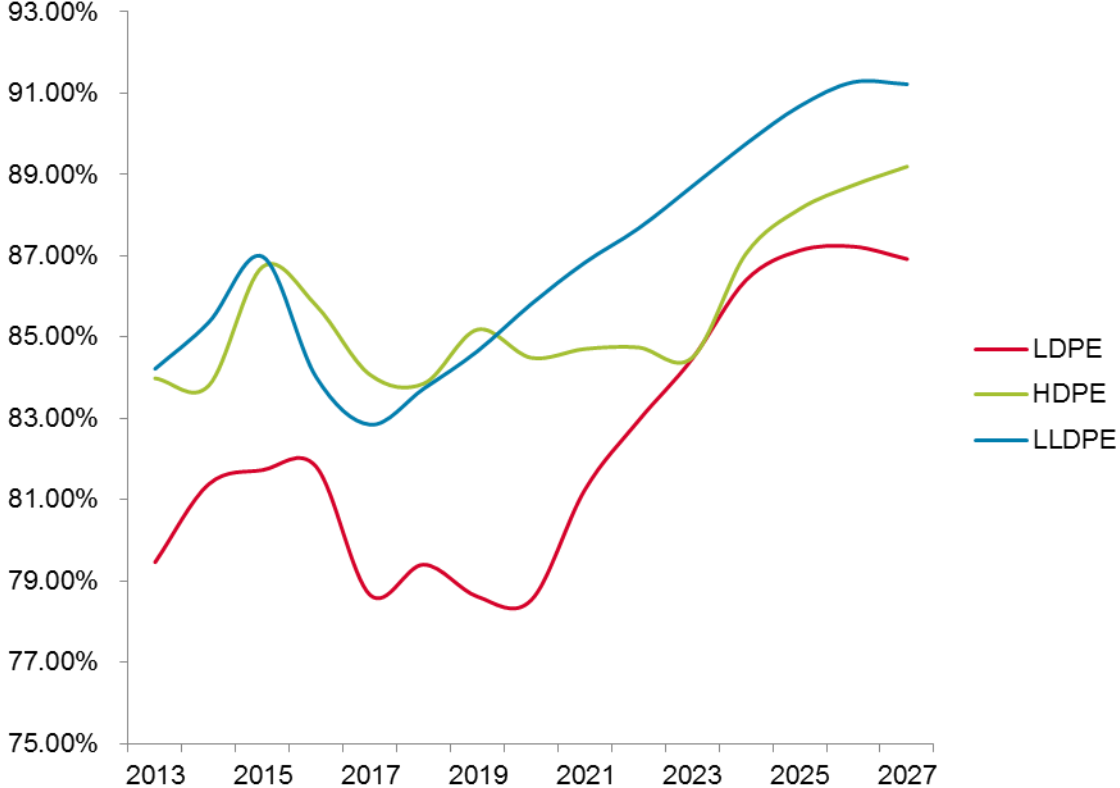


Operating rates expected to suffer and blood bath of PE could ensue leading to a trough through 2020

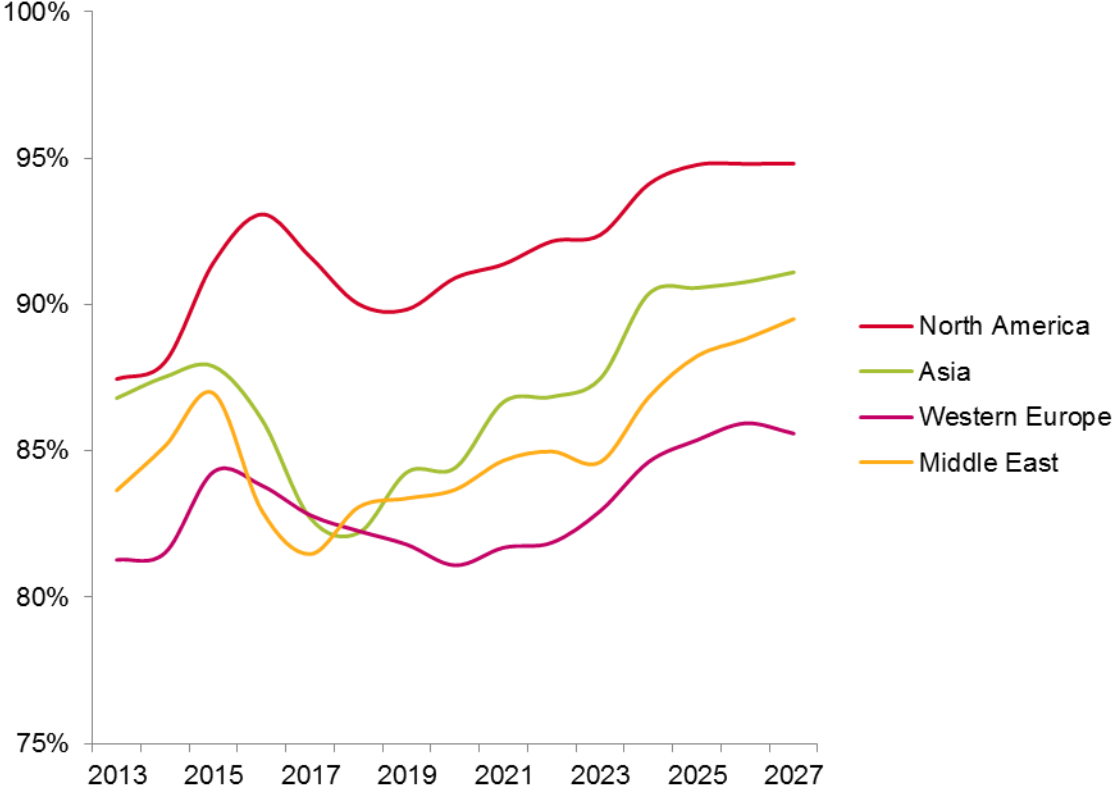


Global and regional operating rates: HDPE and LLDPE rates to be highest and regional rates led by the US

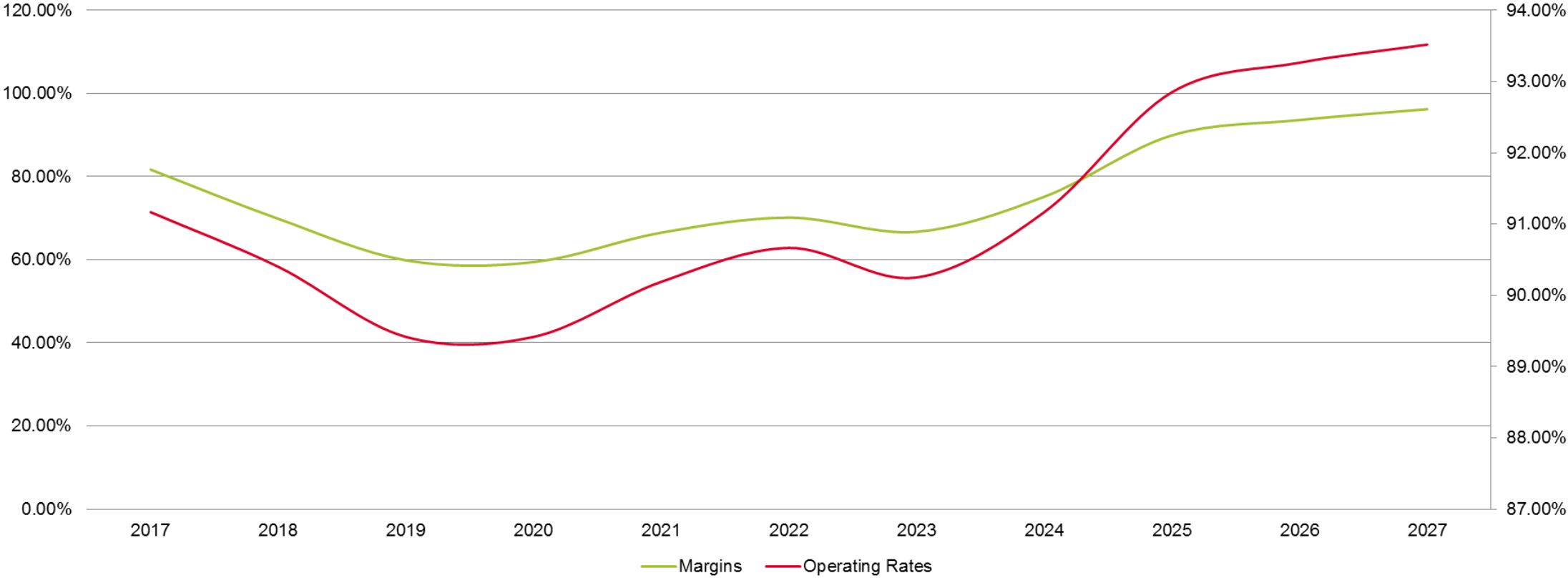
Global PE Operating Rates



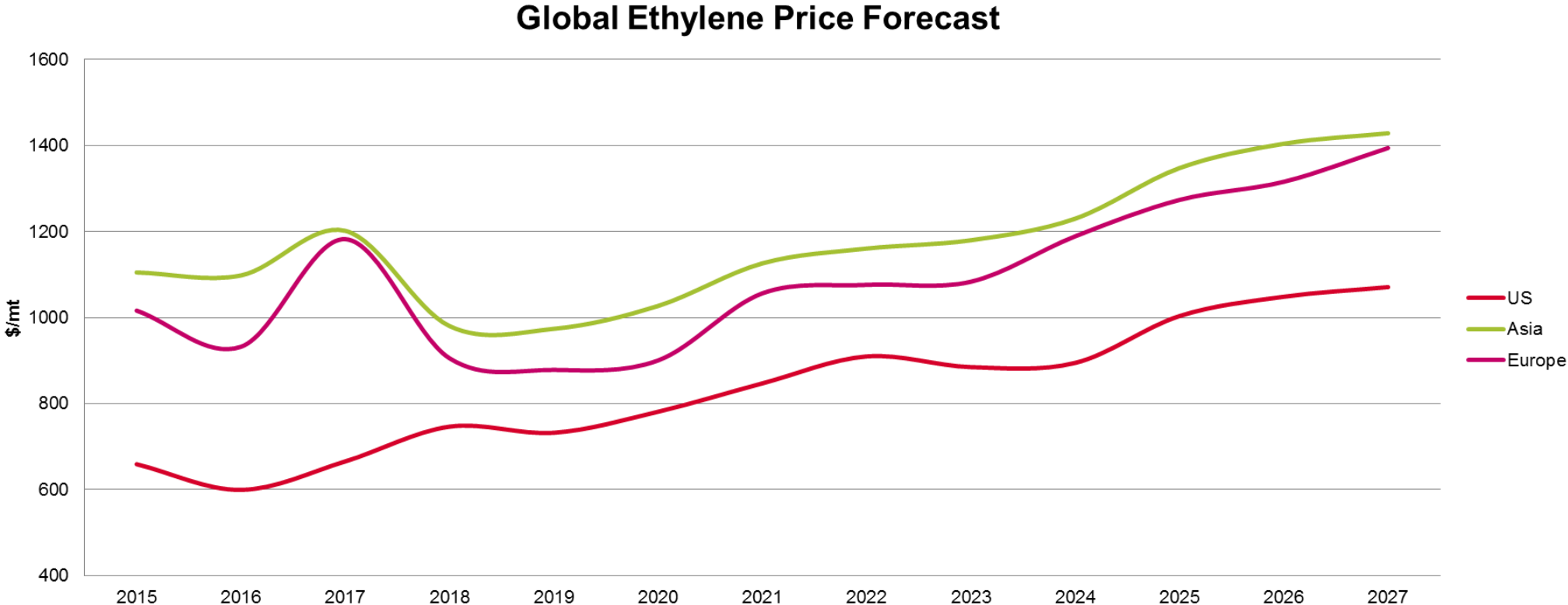
Regional PE Operating Rates



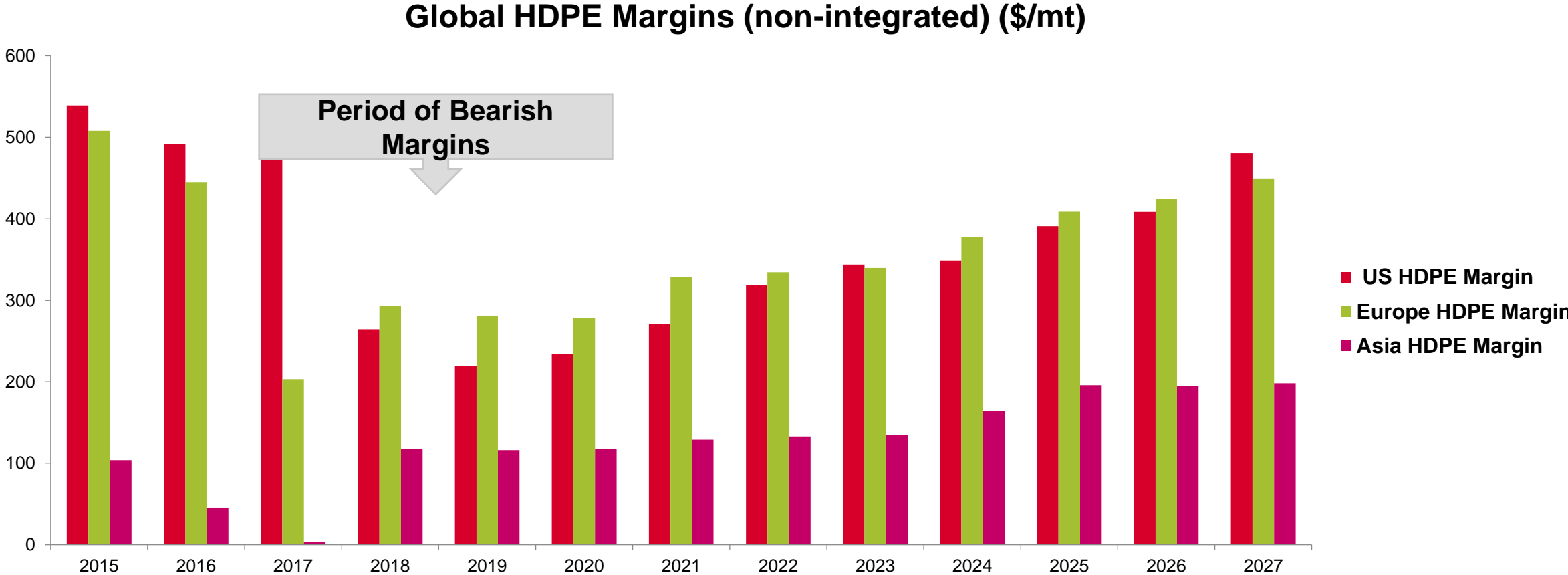
Ethylene margin cycle



Ethylene price outlook

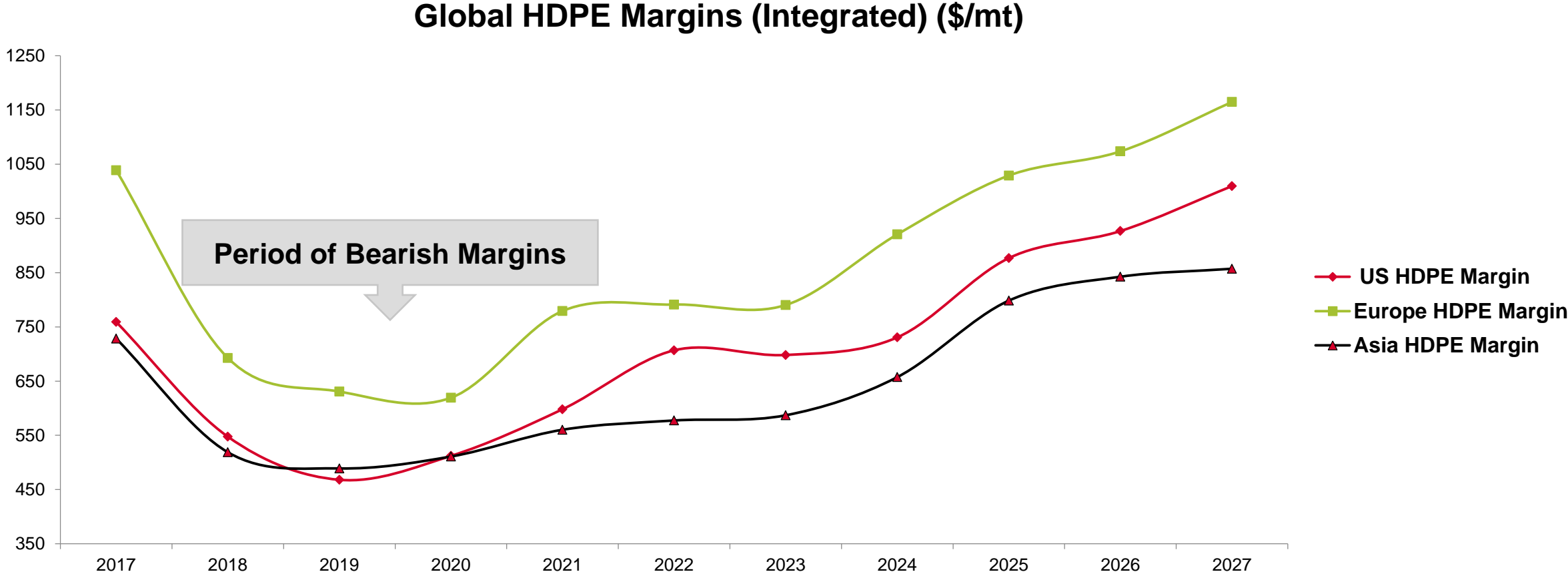


What will be the impact on non-integrated margins going forward?



Based on merchant ethylene feedstock value, the US and Europe to lead the way

What will be the impact on integrated margins going forward?



Based on cash cost ethylene feedstock value, Europe and the US to see best margins

What will be the impact on Global PE prices?

