

World Fibres To 2025 – Acrylic Fibres in Context

12th China International Acrylonitrile • Acrylic Fibre Forum
19-20 March 2015, Shanghai

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Acrylonitrile • Acrylic Fibre 2015

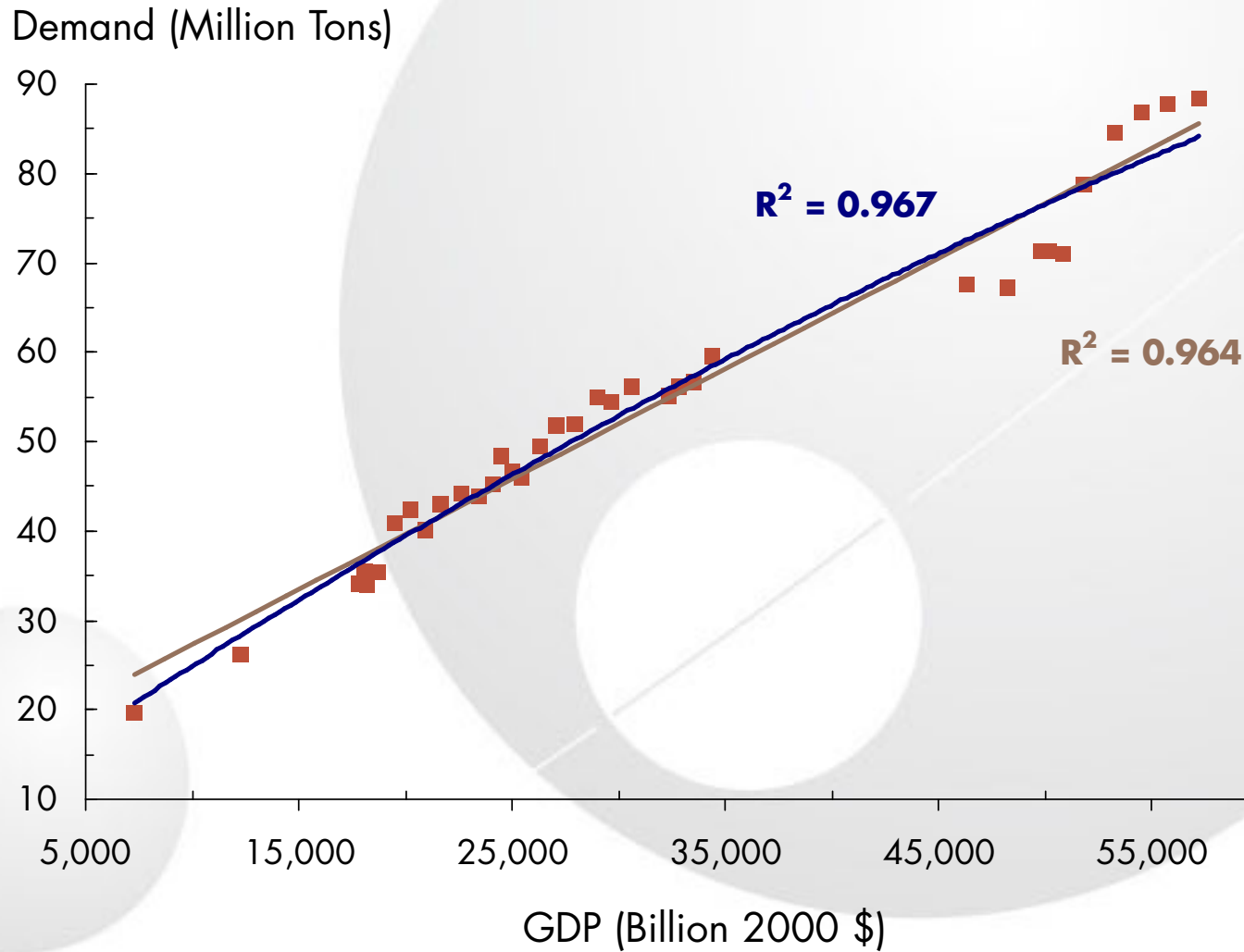
AGENDA

- Historical and Forecast Man Made Fibre Production
- Polyester Market Trends
- Cotton Market Trend
- Cotton-Polyester-Acrylic Market Dynamics
- Other Fibres
- Conclusions

Source: Tecnon OrbiChem

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WORLD FIBRE DEMAND vs GDP

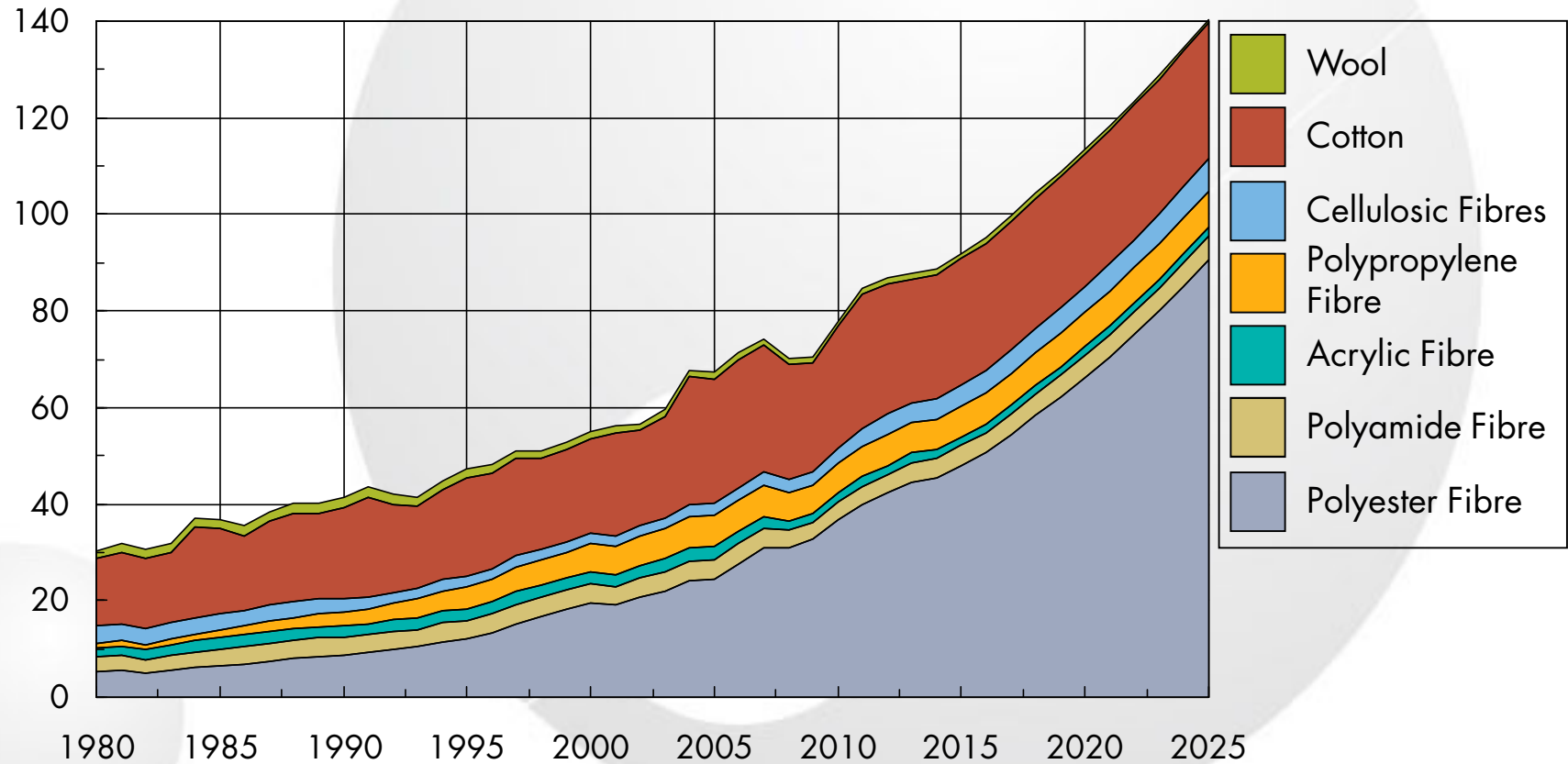


Source: Tecnon OrbiChem

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WORLD FIBRE PRODUCTION 1980-2025

Million Metric Tons



Source: Tecnon OrbiChem

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WORLD FIBRE PRODUCTION TRENDS

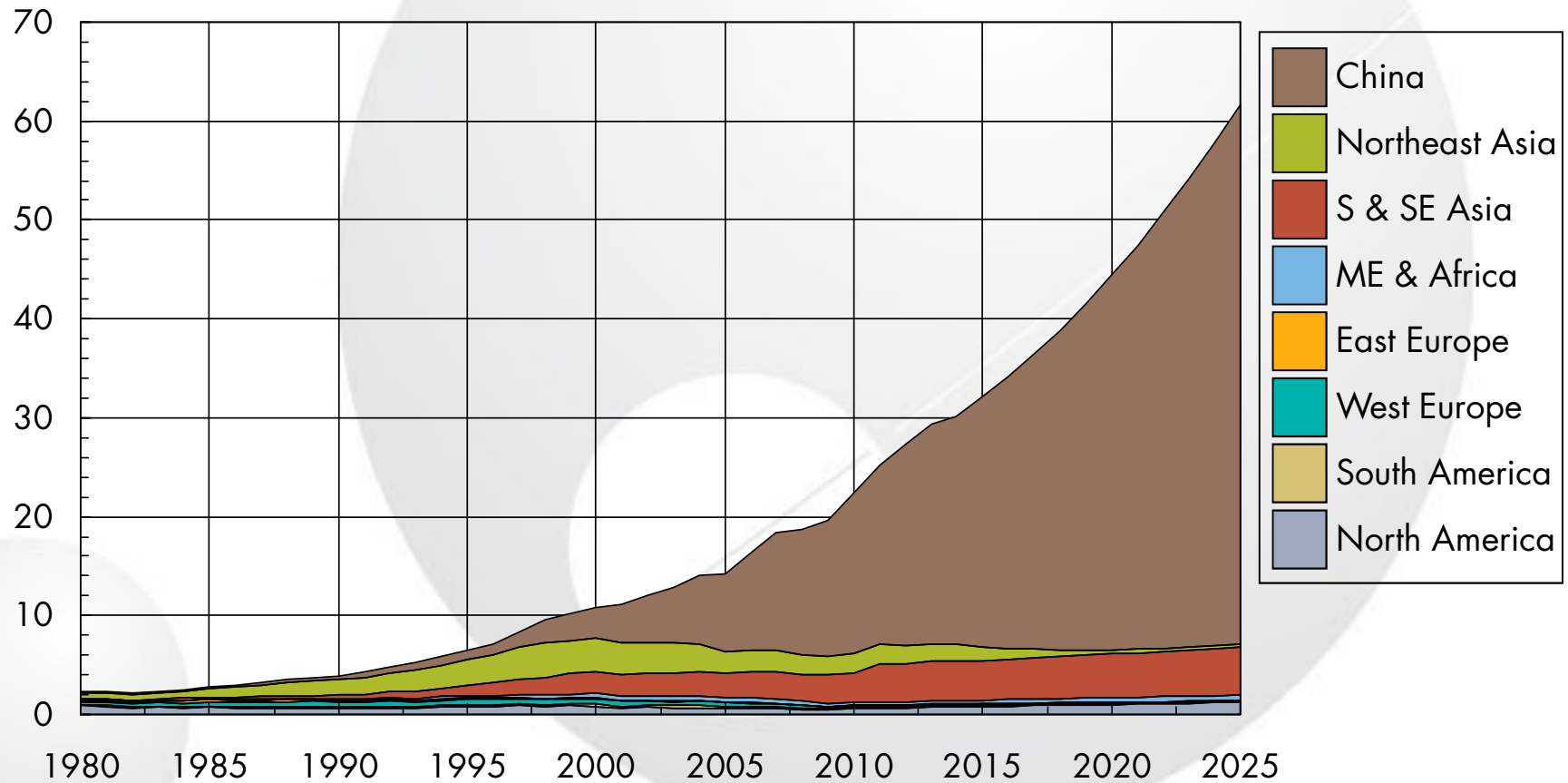
- Although there is an excellent correlation between global GDP and world fibre production over time, 2014 production growth slowed to more than a percent below GDP levels reaching 88.4 million tons
- A key factor in weaker fibre production growth was slowing polyester production in China...the world's polyester driver
- Despite much slower growth for polyester in 2014 (3%), it still continues to grow at about 3x all other fibres
- Cotton production was 25.8 million ton in the 2014/15 season and is expected to decline to 23.8 million tons in 2015/16

Source: Tecnon OrbiChem

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WORLD POLYESTER FILAMENT PRODUCTION

Million Metric Tons

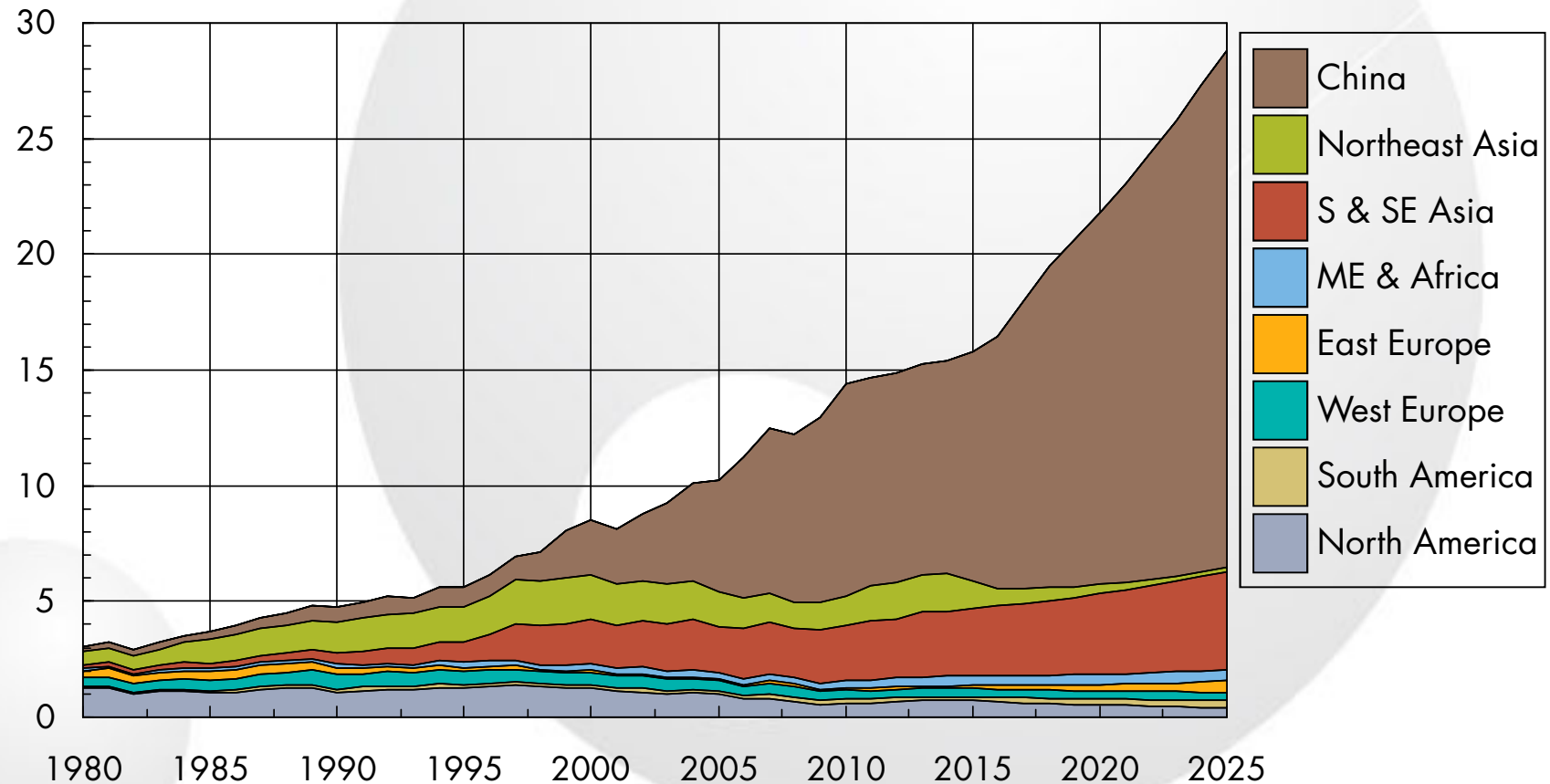


Source: Tecnon OrbiChem

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WORLD POLYESTER STAPLE PRODUCTION

Million Metric Tons



Source: Tecnon OrbiChem

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WORLD POLYESTER PRODUCTION TRENDS

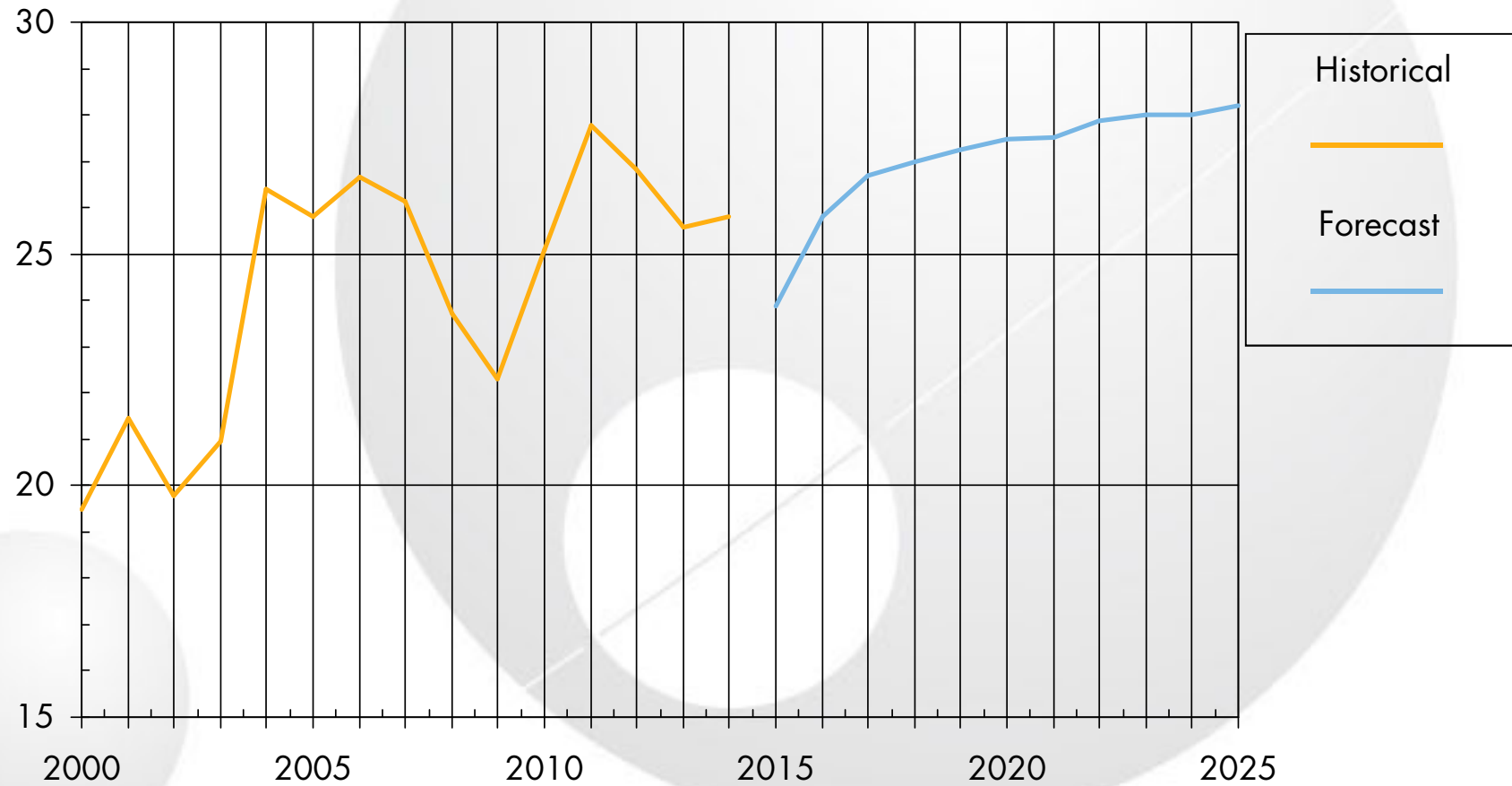
- Polyester filament production growth fell to 3% in 2014 due to Chinese growth weakening to 4%
- Over the past five years polyester filament production growth was 8.3%
- Growth is expected to slow to 6.5% per annum over the next 10 years
- Polyester staple production growth during the last five years was a more modest 3.1% per year
- Production growth in the next 10 years is expected to increase to 5% due to lower cotton production

Source: Tecnon OrbiChem

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WORLD COTTON PRODUCTION

Million Metric Tons

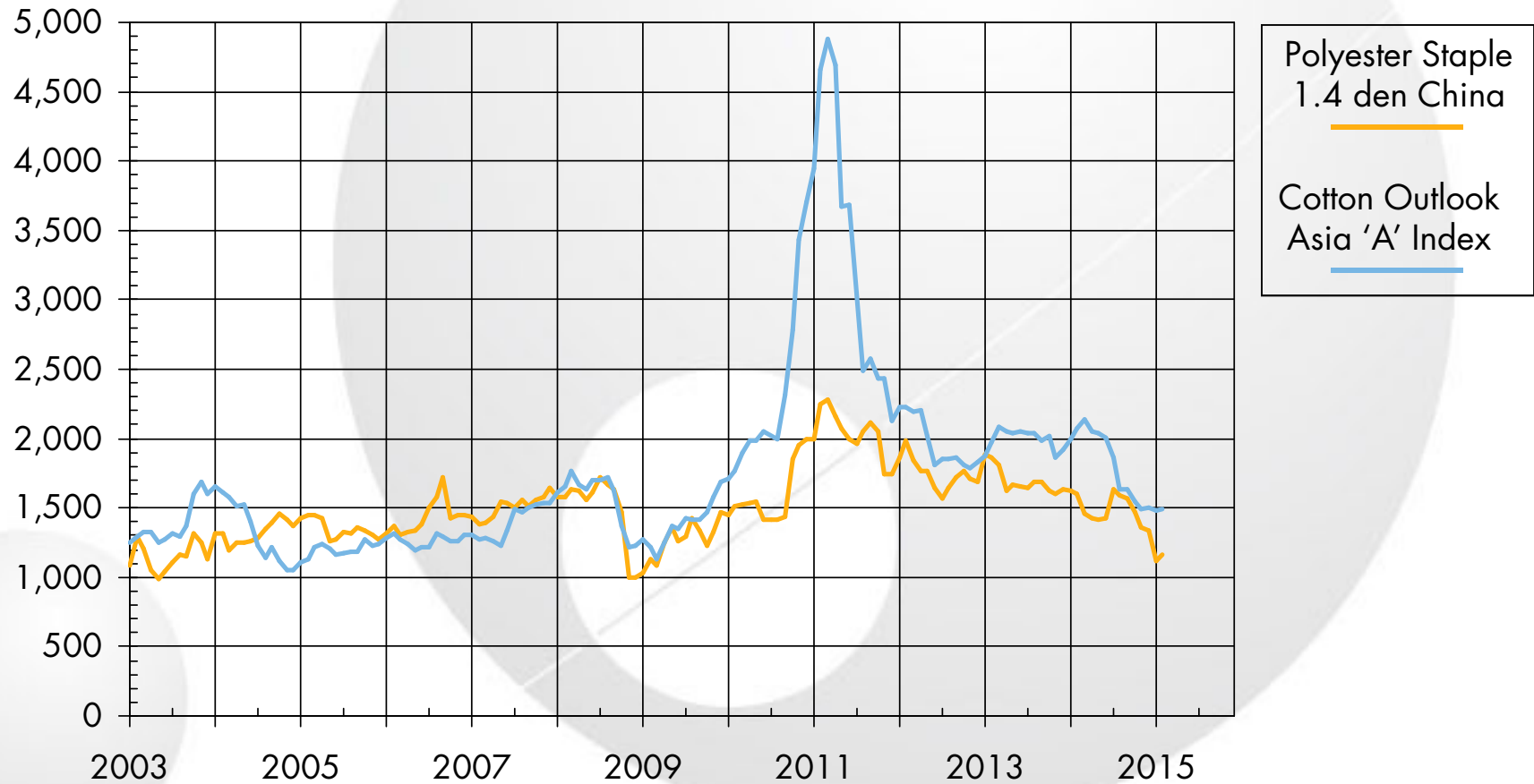


Source: ICAC

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COTTON vs POLYESTER STAPLE PRICES

Dollars per Ton



Source: Tecnon OrbiChem & Cotton Outlook

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COTTON TRENDS

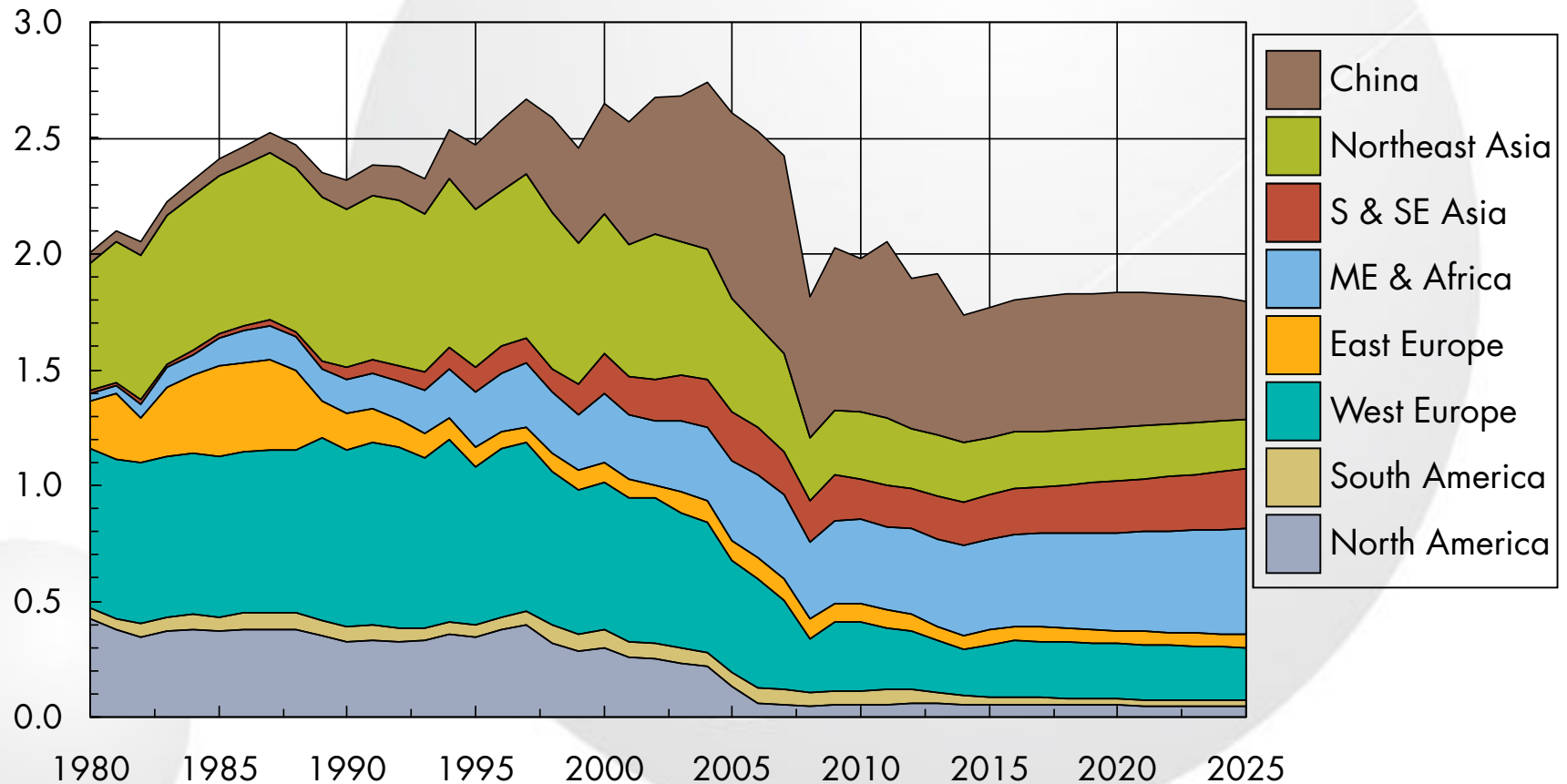
- Cotton production has limited upside due to competition for land and water resources and limited potential for yield improvement
- Cotton production in 2014/15 season was 25.8 million tons and is expected to decline to 23.8 million tons next season
- Cotton price volatility pushed retailers and brand houses to polyester substitution in the past 2-3 years
- Limited production growth and higher costs are expected to put upwards on pressure cotton prices in the longer term

Source: Tecnon OrbiChem

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WORLD ACRYLIC FIBRE PRODUCTION

Million Metric Tons



Source: Tecnon OrbiChem

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WORLD ACRYLIC FIBRE PRODUCTION TRENDS

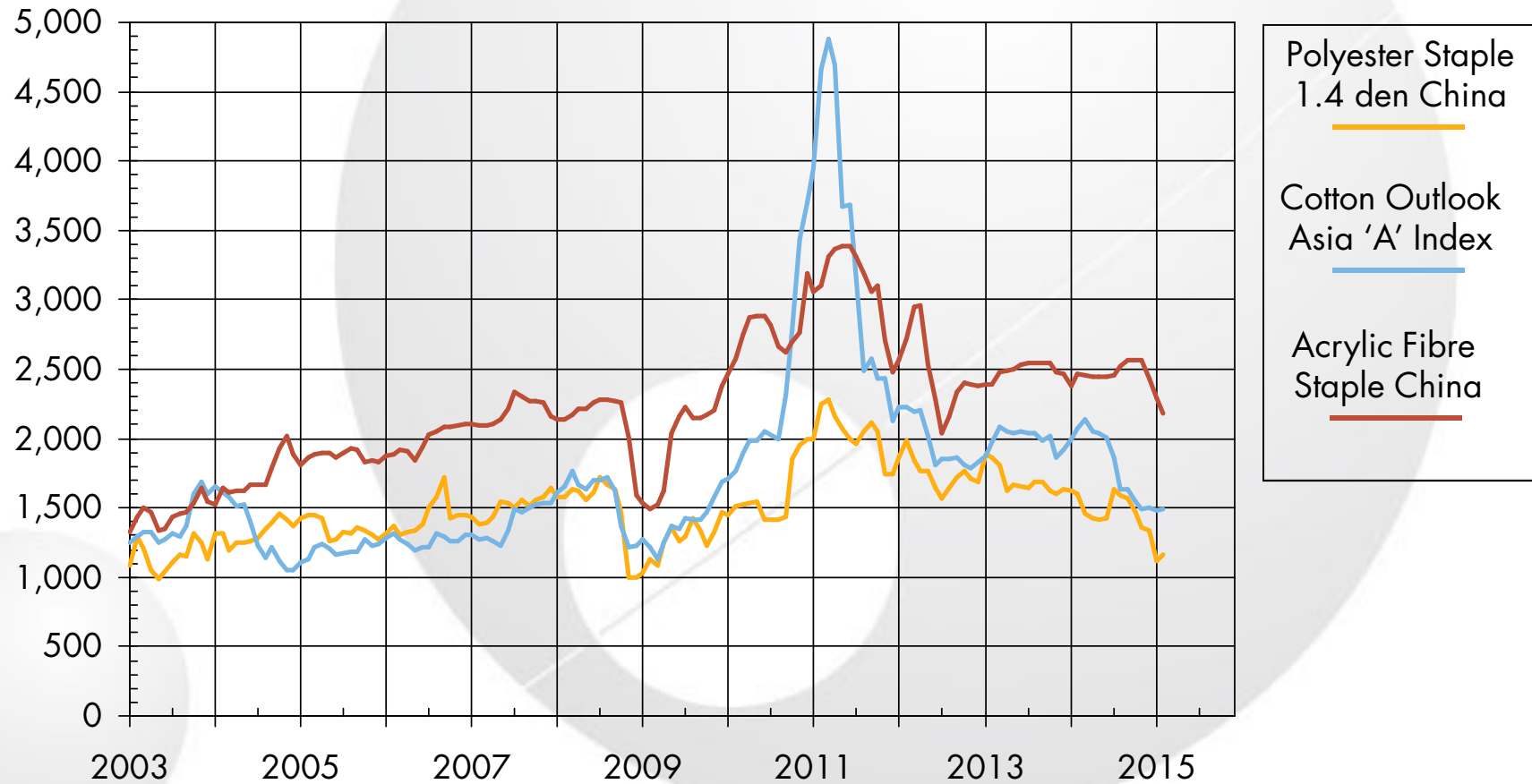
- Global acrylic fibre production has declined by an average 5% per year during the last five years
- Production in 2014 was 1.735 million tons registering the first year on year growth (0.9%) during the last five years
- Acrylic fibre costs continue to suffer from propylene prices and high acrylonitrile conversion costs
- Despite a sharp fall in production over the past 10 years, Tecnon OrbiChem expects modest (0.4%) production growth in the next 10 years, due to weak supplies of wool and cotton and continuing technical advantages for acrylic fibre in certain markets

Source: Tecnon OrbiChem

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COTTON vs POLYESTER STAPLE PRICES

Dollars per Ton



Source: Tecnon OrbiChem & Cotton Outlook

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COTTON/POLYESTER/ACRYLIC DYNAMICS

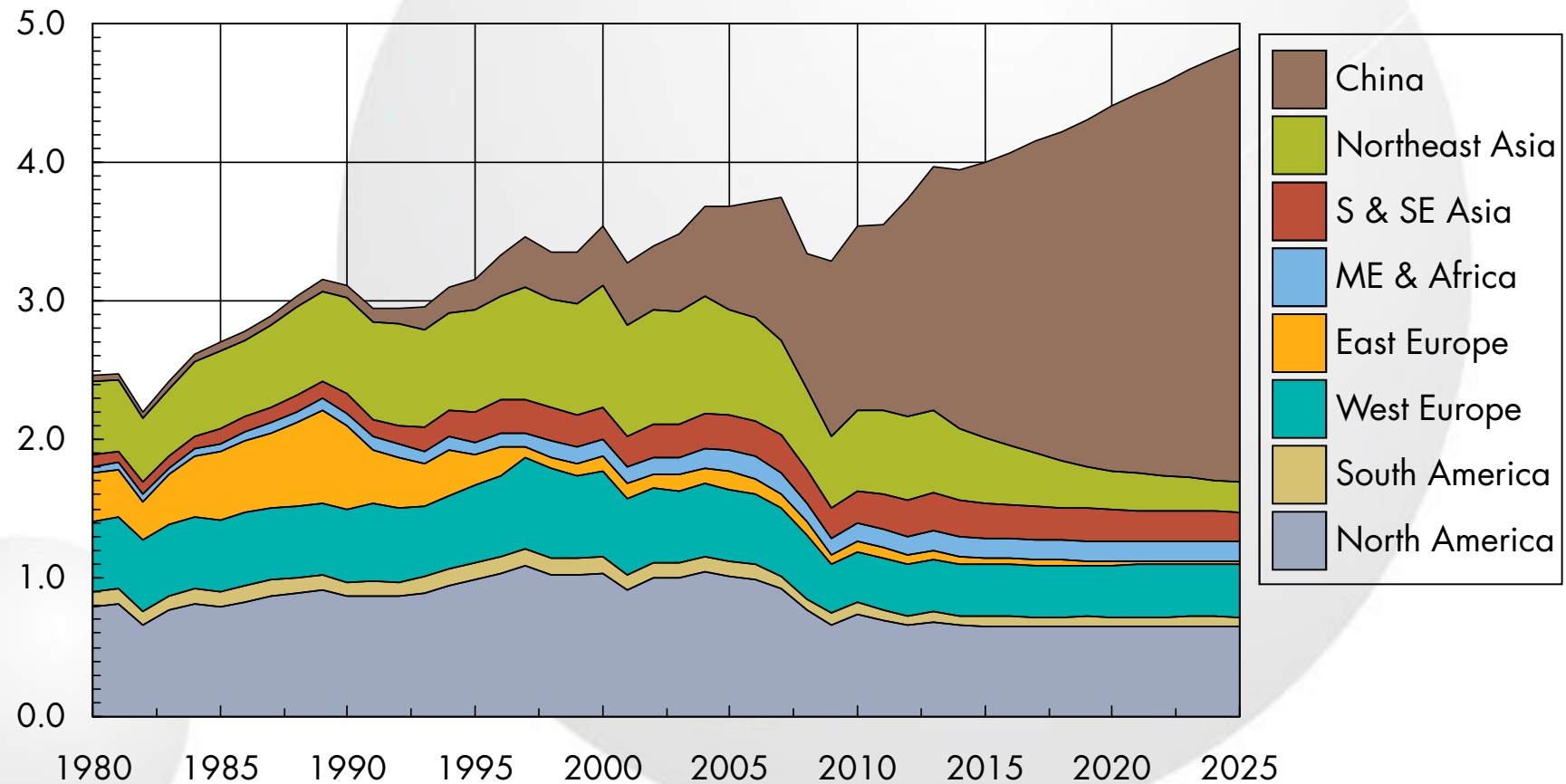
- Cotton prices are expected to increase long term due to limited yield opportunities and competition with food crops
- Propylene and acrylonitrile conversion costs are expected to hold steady to modestly improve (at steady oil prices) due to move to propane dehydrogenation
- Polyester costs continues to dominate allowing additional penetration wherever product function allows
- Acrylic fibre will hold market sectors where it maintains a cost advantage (vs. wool) or in markets where it maintains technical superiority (vs. polyester) in outdoor furniture, awnings and car/boat covers

Source: Tecnon OrbiChem

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WORLD POLYAMIDE FILAMENT PRODUCTION

Million Metric Tons



Source: Tecnon OrbiChem

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WORLD POLYAMIDE FILAMENT PRODUCTION TRENDS

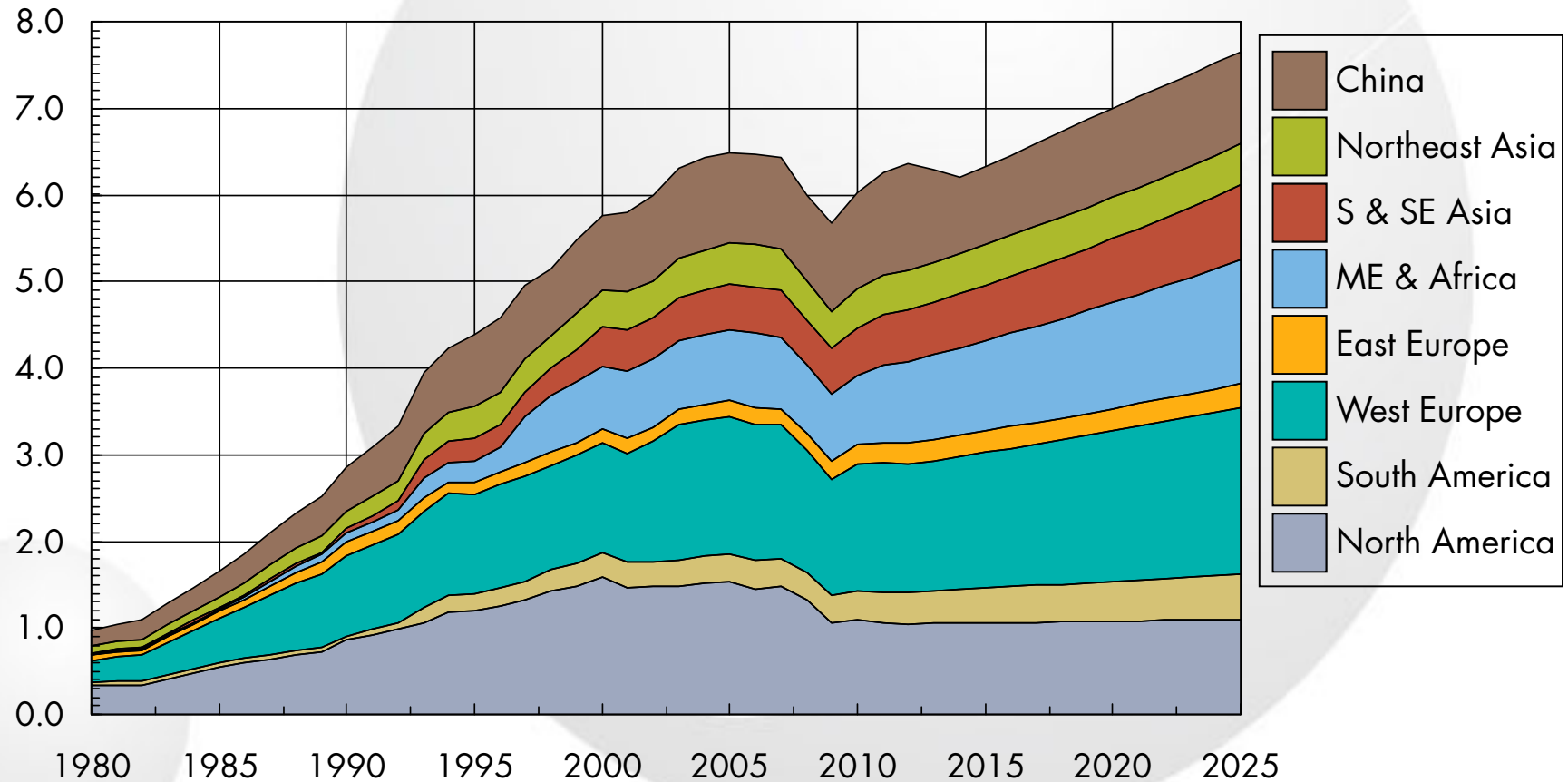
- Polyamide production growth has been approximately 1% per year during the last 10 years
- Production growth has been limited to China over the past five years with declines of 2-7% experienced in all other regions
- Polyamide filament production growth is expected to remain in the 1-1.5% range limited by polyester substitution in carpeting and industrial applications

Source: Tecnon OrbiChem

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WORLD POLYPROPYLENE FIBRE PRODUCTION

Million Metric Tons



Source: Tecnon OrbiChem

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WORLD POLYPROPYLENE FIBRE PRODUCTION TRENDS

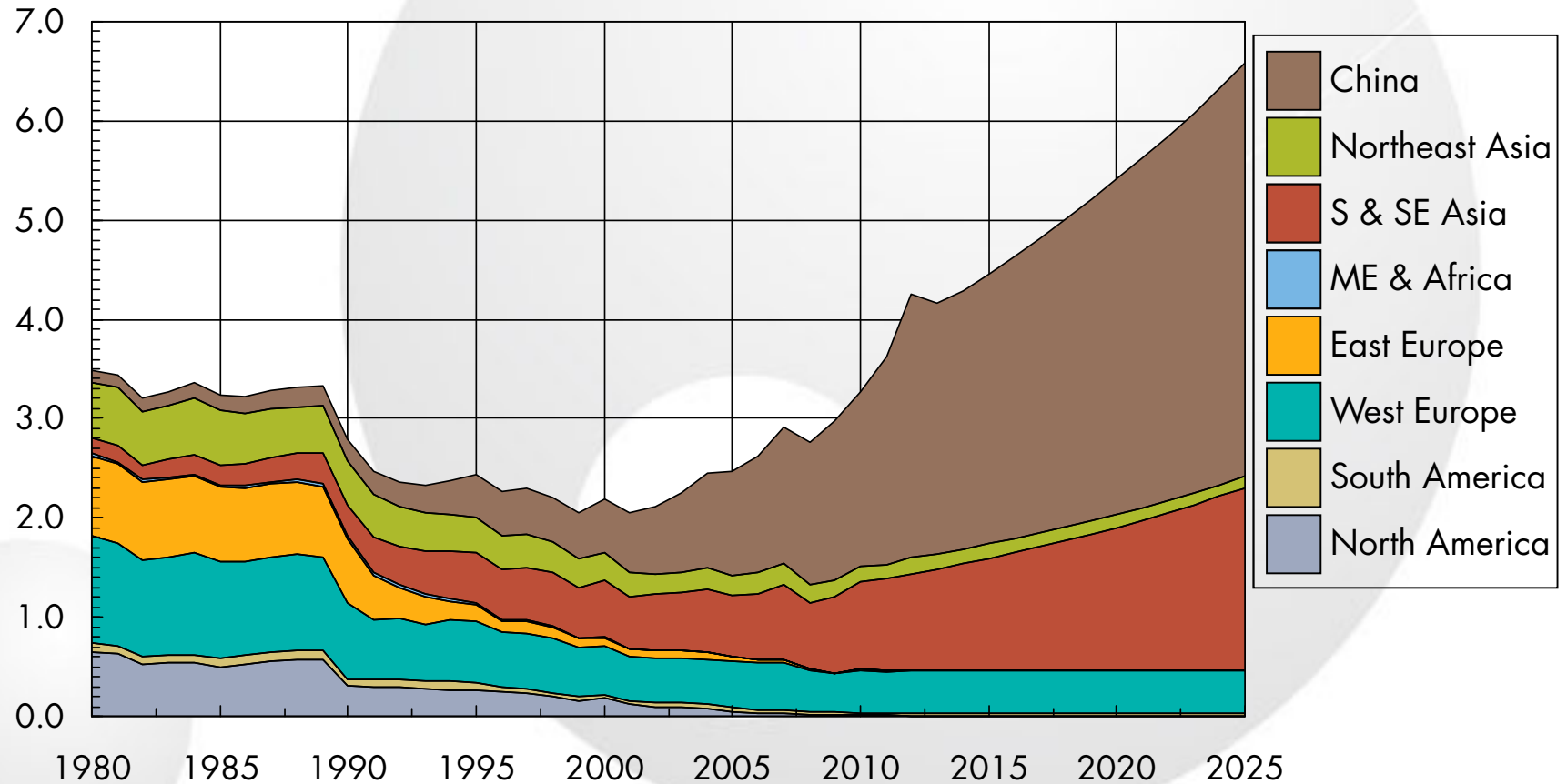
- Global polypropylene fibre production has fallen 1% per annum in the last five years due to volatile propylene costs. This has facilitated polyester substitution in some markets
- More stable propylene costs as a result of increased propane dehydrogenation and growing nonwovens' markets are expected to reverse recent trends and result in a 1-2% growth in polypropylene fibre production during the forecast period

Source: Tecnon OrbiChem

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WORLD CELLULOSIC FIBRE PRODUCTION

Million Metric Tons



Source: Tecnon OrbiChem

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WORLD CELLULOSIC FIBRE PRODUCTION TRENDS

- Global production of cellulosic fibre has grown 7.9% per annum over the last five years, underpinned by Chinese production growth and relatively high cotton costs
- 2014 production increased to 4.3 million ton (3.2% above 2013)
- Slower projected growth of 3.4% per annum is expected for the forecast period

Source: Tecnon OrbiChem

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CONCLUSIONS

- Polyester fibre (both staple and filament) continues to outpace growth for all other synthetic fibres
- Cotton production limitations over the forecast period will primarily benefit polyester (although viscose and acrylic fibre will gain modestly as well)
- Reducing propylene to its traditional cost structure through propane dehydrogenation will be the key to above forecast growth for acrylic fibre

Source: Tecnon OrbiChem



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