Polyester has today become an inseparable part of our daily lives, across all regions and social strata. China has dominated the growth in this industry in the past 20 years and alone accounts for more than 70% of the global market share. The textile industry is labor intensive and low wages and high productivity attracted invested in China. On the other have, bottle grade PET production costs are more or less same across the world, but the fast demand growth and easy availability of raw materials has helped drive most of the new investments into Asia.

Although bulk of the industry in now in Asia, its integration with other streams like olefins and refining means that any changes in polyester outlook continues to have global ramifications. The global integration is not only on the upstream side, but even in the downstream, PET recycling has now become a globally integrated industry, with China accounting processing almost 75% of global PET waste.

The industry saw sub-par demand growth between 2012 and 2016 leading to the poor margins for a considerable period of time. However, with crude oil prices bottoming out through 2015 and continuing to move up over the last 2 years, the industry is witnessing a strong rebound in demand as well as margins. China’s new policy on imports of PET waste has put extra pressure in virgin polyester fibers, but is also expected to put pressure on global recyclers now.

Polyester industry is set for a strong 2018 – both for demand and margins, but there are developing mid term concerns which one needs to watch out!
Polyester has seen anaemic growth rates in past 5 years

Questions raised as confidence shaken
- Short-term phenomenon or new trend line?
- Reasons for slowdown
- Did market overestimate polyester potential?
- Has demand moved back to cotton?
Polyester businesses passed through an extended downturn

- Investments plans made at start of decade - when margins & demand were strong

- Rise of PTA MegaTON in 2012 weighed down margins, not only for PTA but also polyester
Signs of recovery were already evident in early 2017
What we’ll cover today

- Polyester fiber
- PET
- Recycling
PET recycling

*Chinese National Sword policy has a global impact*
PET growth attractive; *but handling waste is growing concern*

<table>
<thead>
<tr>
<th>Million Metric Tons</th>
<th>PET Bottle Collection</th>
<th>PET Consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>40%</td>
<td></td>
</tr>
<tr>
<td>2017</td>
<td>46%</td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td>50%</td>
<td></td>
</tr>
</tbody>
</table>

Globally - waste collection has grown faster than virgin PET demand

Source: IHS Markit

© 2018 IHS Markit
Brand leaders continue to set big recycling goals

Some legislation also promotes “Bottle to Bottle” recycling

Costs currently prohibiting big growth in this field

Recycling back into fibers tends to be most cost effective way to recycle post-consumer waste of polyester

Fiber takes lion’s share in recycling

Recycling demand segments

- Staple
- Textile Filament
- BCF
- Spunbond
- Industrial Filament
- Film
- PET Resin
- Other Recycle Demand

2017 global demand: 7.2 million metric tons

Source: IHS Markit © 2018 IHS Markit
Polyester recycling – caught between economics & regulation

**PET recylate processed in China**

- Domestic: 57%
- Imports: 43%

2017 estimated processed volume: 5.1 million metric tons

**China’s own recycling standards faltering!**

- Domestic PET Consumption
- Recylate Collection

Source: IHS Markit © 2018 IHS Markit

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Economic incentive – primary driver for consuming fibers from recycle

Discounts over virgin PSF dropped to lowest levels after China’s ban on imports of PET waste as supply has tightened

China - Polyester chip price: Virgin vs recycle

Source: IHS Markit

Economic incentive – primary driver for consuming fibers from recycle

Discounts over virgin PSF dropped to lowest levels after China’s ban on imports of PET waste as supply has tightened.
Recycled polyester has become an important source for staple fiber
China’s ban on import of polyester waste expected to benefit virgin fiber industry in 2018

Global PSF Production: Virgin vs recycled

Source: IHS Markit

© 2018 IHS Markit
Policy measures delay growth of recycling, but economics favors more recycling

Global Fiber supply growth: Virgin vs. recycled

Source: IHS Markit © 2018 IHS Markit
PET

*Most producers see better days, as few majors falter*
PET is globally well spread out, with most regions having the flexibility to meet own demand regionally.
...yet PET remains a widely traded product

- Asia continues to be in surplus, led by continued capacity growth in China
- Latest technology and integration with upstream helped Asian producers remain cost competitive in global surplus market
- Tariff and non-tariff trade barriers most actively used against PET trade in past few years
- Barriers will alter trade flows – but not reduce it in long term
North America & Europe supply faced disruptions in 2H 2017
Temporary stoppages as 2 largest producers face bankruptcies; operations remain below capacity until today

North America: PET bottle resin producers
- DAK Americas 35%
- Mossi & Ghisolfi 28%
- Nan Ya 8%
- Indorama Ventures 29%
Capacity = 4.8 Million Metric Tons

West Europe: PET bottle resin producers
- JBF RAK LLC 15%
- Indorama Ventures 23%
- Others 19%
- Lotte Chemicals UK 14%
- Equipolymers 13%
- Novapet 9%
- M & G Polimeri 7%
Capacity = 2.6 Million Metric Tons

Source: IHS Markit © 2018 IHS Markit
Asian exporters have benefitted from global supply disruptions

Trade barriers altering trade flows, overall trade volumes still increasing
Global supply disruptions have pushed up spreads since late 2017

- European and US spot margins spiked in 2H 2017 as significant capacity outages led to shortages during the peak demand period
- Europe & US markets primarily trade against annual contracts, agreed pricing formulas for 2018 indicate a healthy increase in spreads
- Asian export spreads are usually at cash break-even levels, but these have also increased through 2017
- Domestic spreads tend to be higher, due to tariffs and non-tariff barriers
PET: All developing markets continue to show strong demand growth

PET: Per capita consumption vs demand growth

Source: IHS Markit
PET capacity addition accelerates in China

- In past couple years, demand has increased faster than capacity.
- In 2018, expected capacity addition to far outweigh projected demand growth!

However, with only China adding capacity, will it be able to meet growing demand in other regions?
US PET trade story – from deficit to surplus

PET: US exports & imports

Source: IHS Markit © 2018 IHS Markit
Polyester fibers

*Broad-based economic growth leads to revival in fibers demand*
Economic growth drives fiber demand – polyester takes largest share of growth

Total fiber demand is estimated to have increased by 6% in 2017, fastest since 2010

Fiber: World demand vs global GDP

Source: IHS Markit © 2018 IHS Markit

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Global Fibers mix – dominated by polyester & cotton

<table>
<thead>
<tr>
<th>Fiber Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyester</td>
<td>49%</td>
</tr>
<tr>
<td>Cotton</td>
<td>26%</td>
</tr>
<tr>
<td>Olefin</td>
<td>10%</td>
</tr>
<tr>
<td>Cellulosic</td>
<td>6%</td>
</tr>
<tr>
<td>Nylon</td>
<td>4%</td>
</tr>
<tr>
<td>Acrylic</td>
<td>2%</td>
</tr>
<tr>
<td>Other Synthetic Fibers</td>
<td>1%</td>
</tr>
<tr>
<td>Wool, Silk &amp; Linen</td>
<td>2%</td>
</tr>
<tr>
<td>2017 total fiber demand</td>
<td>101.7 Million Metric Tons</td>
</tr>
</tbody>
</table>

Source: IHS Markit

© 2018 IHS Markit
Fibers provide one of the basic necessities

Fiber: World demand 2017 (by application)

- Apparel: 51%
- Home Furnishings: 25%
- Industrial: 12%
- Non-woven: 12%

2017 total fiber demand: 101.7 Million Metric Tons

Source: IHS Markit © 2018 IHS Markit
Polyester fibers demand...heavily skewed towards China

- In 2017, China alone accounts for
  - 66% of global demand
  - 71% of global production
  - up from a 25% share in the year 2000
- In total, Asia accounts for 86% of global demand.
- Lower labor costs initially attracted investments in the textile sector in Asia.
- Fast developing economies, rapid urbanization and strong growth in disposable income is now sustaining the growth in regional textile industry.
Investments run counter cyclical to margins

- Excessive capacity growth between 2011 and 2016 put severe pressure on polyester margins
- Demand accelerated in 2017 as capacity growth stagnated, resulting in a quick increase in product margins
- 2018 outlook is anticipated to be similarly positive, but continued profitability is expected to result in excess capacity buildup again!
Polyester growth bounces back in 2017
Aided by healthy economic conditions, growth expected to be strong in 2018, but eventually slow down to trend line

<table>
<thead>
<tr>
<th>Year</th>
<th>N. America</th>
<th>S. America</th>
<th>W. Europe</th>
<th>C. Europe</th>
<th>CIS &amp; Baltics</th>
<th>Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>11%</td>
<td>12%</td>
<td>15%</td>
<td>16%</td>
<td>17%</td>
<td>18%</td>
</tr>
<tr>
<td>2017</td>
<td>5%</td>
<td>5%</td>
<td>4%</td>
<td>8%</td>
<td>6%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: IHS Markit

World: Total polyester fiber demand growth (2012-2022)

- Polyester growth bounces back in 2017
- Aided by healthy economic conditions, growth expected to be strong in 2018, but eventually slow down to trend line

Source: IHS Markit
Polyester expected to show strongest growth, others grow moderately

**Fiber: 2017-2022 demand growth**

- **Polyester**: Highest demand growth, likely due to its wide application in various industries.
- **Cotton**: Moderate growth, possibly due to its natural properties and sustainable sourcing.
- **Nylon**: Growth in the middle range, reflecting its use in high-performance textiles.
- **Olefin**: Lower demand growth, indicating a more limited application compared to polyester.
- **Cellulosic**: Significant growth potential highlighted by its eco-friendliness.
- **Acrylic**: Growth below average, possibly due to competition from other synthetic fibers.
- **Wool, Silk & Linen**: Lowest growth, emphasizing the niche nature of these materials.

![Graph showing demand growth](chart)

*Source: IHS Markit*
Textile industry on the move to lower costs

- Labour, not raw material, accounts for largest costs in a finished garment
- China’s labour costs are no longer at lowest levels and continue to increase rapidly
- Downstream industry already started to move to low cost areas
- Will not be surprised to see new polyester investments in under-developed regions

![Labor cost change (2012, 2017 and 2022)](source: IHS Markit)
**Key takeaways**

**PET**
- Markets expected to remain tight through 2018
- Increasing brand owner focus on recycling

**Recycling**
- Sudden policy changes affect short-term growth
- Newer recycling avenues expected in longer term

**Polyester fibers**
- Demand growth expected to be strong in 2018
- Fastest growing fiber for many years to come
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