Fibers Update – 2019
Laura Murphy – Wood Mackenzie Chemicals

Wood Mackenzie Chemicals

• Verisk Analytics (NASDAQ:VRSK)
• Was PCI (Alasdair Carmichael)
• Services:
  • Asia Weekly
  • Global Monthly
  • Technical Fibers Monthly
  • Annual global supply demand report
  • Bespoke reports and studies
  • Raw materials

Coal
Natural Gas
Fibers
Crude Oil
Nylon 6,6 Supply Chain Issues

- Force majeure declarations
- Adiponitrile (ADN) Supply
- A major, large scale plants
- Difficult to justify new plant (But Ascend and Invista have just announced new capacities – for 2022-2023)
- Capacity increases
  - 2016 – Invista @ Orange, TX
  - 2018 – Ascend @ Decatur, AL
  - 2019 – Invista/Solvay @ Butachimie, France
  - 2020 – Invista @ Victoria, TX
- 2018 Polymer Price Increases
  - +5-25 c/lb for Q1
  - +25-38 c/lb for Q2/Q3
  - More expected for next year

Nylon 6,6 Forces Majeure

Nylon 6,6 Supply Chain Issues

- Force majeure declarations
- Adiponitrile (ADN) Supply
- A major, large scale plants in the world
- Difficult to justify new plant (But Ascend and Invista have just announced new capacities – for 2022-2023)
- Capacity increases
  - 2016 – Invista @ Orange, TX
  - 2018 – Ascend @ Decatur, AL
  - 2019 – Invista/Solvay @ Butachimie, France
  - 2020 – Invista @ Victoria, TX
- 2018 Polymer Price Increases
  - +5 - 25 c/lb for Q1
  - +25 - 38 c/lb for Q2/Q3
  - +10 - 25 c/lb for Q1 2019
Crude Oil – 2019 forecast

Apparently no critical problems from the crude oil side

Source: Wood Mackenzie

Raw Materials – Nylon 6,6

Benzene, Propylene, Butadiene: Price forecast

Source: Wood Mackenzie Chemicals
Polyester Raw Materials

Source: Wood Mackenzie Chemicals

Polyester Supply Chain – Bankruptcies and Forces Majeures

- M&G, or Mossi & Ghisolfi (PTA and resin)
  - Bankruptcy 10/2017
  - Bought by Far Eastern and restarted
- M&G, or Mossi & Ghisolfi (PTA and resin)
  - Bankruptcy 9/2017
  - Salisbury, NC (high denier) – closed
  - Grover, NC (fine denier) – Fiber Innovators International
  - Winnabow, SC, (tire cord fabric) – Indorama
- Fires and Forces Majeures in 2018 reduced available fiber and raws
  - Apak Mexico – down for 6+ weeks after fire in structural area
  - Equipment issues and hurricanes plagued PSF
Polyester Supply Chain - Investments

- Huvis Indorama JV (low melt) - Spartanburg
  - 60 kt
- Far Eastern purchase of M&G’s Apple Grove resin plant - $34M
- JV of Indorama, Alpek, and Far Eastern purchase of Corpus Christi @ $1.1B
- FTC approved JV purchase on 12/24/2018 – Happy Holidays!
  - Estimated startup 2020 for resin, PTA to be 18 months after
- Fiber Industries restart of Wellman plant (staple)
- Parkdale / Intrinsic Textiles JV to develop CiCLO (biodegradable) technology
- Unifi / Polartec recent announcement to use CiCLO in fleece production
- Indorama/Loop Industries JV to begin US production of 100% sustainably produced resin and fiber in Q1 2020
- Indorama and DAK just bought rPET plants
Fine Denier Staple
- ADD + CVD
- Filed 5/2017
- China, India, Korea, Taiwan,
- 0 – 220%
- Spared: Toray - Korea and
  Tainan Spinning – Taiwan

Source: Wood Mackenzie Chemicals
PET Resin
• ADD + CVD
• Filed 3/2015:
  • Canada, China, India, Oman
  • ADD (Filed 9/2017) Brazil, Indonesia, Korea, Pakistan and Taiwan
  • 5 - 276%
  • Dismissed (10/2018) on Brazil, India, Korea, Pakistan, Taiwan

Low Melt Fibers
• ADD
• Filed 6/2017:
  • Korea and Taiwan
  • 0 - 52%
  • Spared: Huvis - Korea

Fine Denier Staple
• ADD + CVD
• Filed 5/2017:
  • China, India, Korea, Taiwan,
  • 0 – 220%
  • Spared: Toray - Korea and Tainan Spinning – Taiwan

DTY Filament
• ADD + CVD
• Filed 10/2018:
  • China, India
  • Beginning stages of investigation
  • 4/2019 – Critical circumstances petition filed – means retroactive penalties potentially

Source: Wood Mackenzie Chemicals
US Polyester Supply Chain – Antidumping and Countervailing

[Bar chart showing US imports from China of youth and adult mattresses made from rubber/plastics, cotton, and other materials.]

Source: USITC

US polymer prices

The outlook for PA66 (nylon) fibres is becoming increasingly difficult

How has demand growth been supplied?

Fiber Demand by Fiber Type, 1980-2018

World fiber demand with estimates through to 2030

Fiber Demand by Type, 1980-2030

How will this new demand be supplied?

The expected breakdown of this new fiber supply, 2018-2030
Global polyester production by region
Global production – ex-China

Source: Wood Mackenzie Chemicals

China jumps from 26% of global polyester production to 71% in 18 years

Source: Wood Mackenzie Chemicals
Global polyester production by region

China jumps from 26% of global polyester production to 71% in 18 years

Source: Wood Mackenzie Chemicals

Global fiber mill consumption

Strong growth for most major fibers

Source: Wood Mackenzie Chemicals, USDA; Cotton is USDA and season 2016/17 is set to calendar 2017

Fibers and the US Economy
Production for fiber, yarn and thread mills has gone down since its peak in 1998.

Downstream mills are showing the same trends as fiber and yarn mills.

Apparel production has fallen off the cliff.
US Economy – Part 4
Since 2012 – some winners and some losers

US Production Index for Other Mills and Apparel (2012=100)

Source: US Federal Reserve

US Economy – Part 5
US Automotive Production

Source: US Federal Reserve
Sustainability and Pollution

- How to satisfy demand in a sustainable way
- Recycled pre- and post-consumer waste volumes are small
- Huge growth from emerging countries
- Population and income growth
- Fast fashion, affordable fashion, rising demand for hygiene products
- Recycling and waste disposal systems are lagging and unprofitable
- Business model is for export to emerging economies
- How to measure environmental and social impact of different fibers?
  - What needs to be measured?
  - How to measure?
- And then, so what?
- Microfiber pollution – who’s problem is it? Does labeling a shirt matter?
There is lots of positive news

- Fiber/Industries restart of the Wellman polyester staple plant
- Investment by PHP and SANS of polyester HDI capacity
- Huvis/Indorama JV for low melt spinning in Spartanburg
- Parkdale / Interma Textiles JV to develop CCKs (biodegradable) technology
- Indorama / Loop Industries JV to begin production of 100% sustainably produced resin and fiber
- Carpet companies upgrading older plants, converting to polyester
- US Auto industry – 4th largest sales year in 2018
- 5% tire capacity increase last year, with more planned through 2022
- Ford cancels Mexico plant, expands US one
- Indorama and DKM bought rPET plants
- New USMCA expected to close some loopholes
- Chinese investment in US spinning mills (Shandong Ruyi in AR, Keer in SC)
- US keeps improving environmental footprint of cotton
- SewBots to for T-shirt production, now available as a rental
- China grows cotton on moon in January – but temperatures kill the budding plant quickly

And I like to end on positive news....