

# PET Packaging Resin Towards Maturity – The Shakedown

PET DAY 2009 Artimino, Italy, 8 October 2009

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## PET DAY 2009

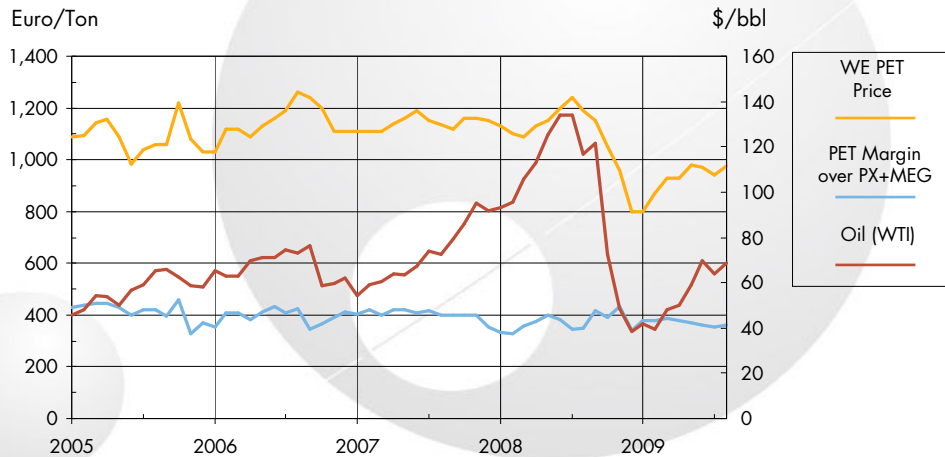
### PET PACKAGING RESIN - MARKET DRIVERS 2009

- **Economic Downturn** - Reduced consumer spending
- **Credit Crunch** - Restricted corporate credit from Banks  
- End of easy money for funding acquisitions
- **Consumer Behaviour** - Changing Western soft drinks preferences - slowdown in water sector  
- Growing maturity of PET Packaging itself as less opportunity for substitution of alternatives
- **Environmental /Green Issues** - Brand-owners' requirement for RPET
- **Light-Weighting** - As a continuing cost saving measure
- **New Entrants** - In the Middle East, (South America?)

Source: Tecnon OrbiChem

## PET DAY 2009

### WEST EUROPE PET PRICE, MARGIN over PX+MEG & RESPONSE to OIL PRICE



Source: Tecnon OrbiChem

## PET DAY 2009

### UNPROFITABILITY FORCES RESTRUCTURING 2007-9

- **US Majors Retrench to US**
  - Eastman, Wellman & Invista – but DAK extends in Latin America
- **Consolidation in Europe**
  - LSB/AdvanSa, Indorama/Eastman, Invista Offenbach closure
  - But now Artenius debt problem...
- **Vertical Integration**
  - **Upstream**
    - LSB (PTA),
    - Retal/Neopet, Plastipak (Italpet & Cobarr)
    - K-Dow (failed)
  - **Downstream**
  - LSB (Amcor)
- **Lower Cost Technology**
  - Bigger Scale & Simplification: IntegRex, M&G, Inventa .....but not in the EU
- **Closures**
  - Braskem, Kimex, Elana, Init, Wellman Palmetto, Eastman (Kingsport, TN & part of Columbia, SC), Invista Greer, Ontario, & Offenbach, SANS, Artenius Wilton
- **For Sale**
  - Tergal (now MBO?), Equipolymer Ottana, & 4 non-Spanish Artenius plants

Source: Tecnon OrbiChem

**PET DAY 2009**  
**PET RESIN CAPACITY RANKINGS**  
**(ktpa & % of Total)**

	2006			Mid 2009		
<b>Eastman</b>	1,545	10.1%	<b>1</b>	M&G	1,717	9.4%
M&G	1,319	8.7%	<b>2</b>	<b>Indorama</b>	1,352	7.3%
<b>Invista</b>	1,095	7.2%	<b>3</b>	FET	890	4.9%
Nan Ya	785	5.1%	<b>4</b>	DAK	840	4.6%
Wellman	639	4.2%	<b>5</b>	<b>LSB/Artenius*</b>	830	4.5%
FET	610	4.0%	<b>6</b>	<b>Eastman</b>	800	4.4%
<b>LSB</b>	500	3.3%	<b>7</b>	Nan Ya	785	4.3%
Equipolymer	465	3.1%	<b>8</b>	SFX	750	4.1%
SFX	450	3.0%	<b>9</b>	<b>Invista</b>	675	3.7%
<b>Indorama</b>	401	2.6%	<b>10</b>	Equipolymer	525	2.3%
	<b>7,809</b>	<b>51.3%</b>			<b>9,164</b>	<b>50.2%</b>

\*exc. Wilton

Source: Tecnon OrbiChem

**PET DAY 2009**  
**PET PLANTS & PROJECTS 2009 & 2010**

<b>2009 Additions</b>	<b>(ktpa)</b>	<b>2010 Additions</b>	<b>(ktpa)</b>
Octal, Oman	300	Alco-Naphtha, Kaliningrad	240
Ibn Rushd, Saudi	257 fbc	M&G, Brazil	200 d
M&G, Brazil	100 e		
M&G, Mexico	40 e		
Meltem, Turkey	40	<b>Unconfirmed</b>	
Ningbo-SK, China	150 fbc	SK-Saisheng, China	200 fmc
SFX, China	550	Applecks/Korus 1, Russia	140
		KP Alabuga, Tatarstan	300
<b>2009 Closures</b>			
Invista, Canada	(210)		
Invista, Germany	(210)		
Artenius, UK	(150)		
SANS, South Africa	(85)		
<b>2009 Net Change</b>	<b>1214</b>		

fbc fibre conversion  
fmc film conversion  
e expansion  
d debottleneck

Source: Tecnon OrbiChem



## PET DAY 2009

### PET PACKAGING RESIN PRODUCTION TRENDS

- World production was growing at over 9% per year before the credit crunch.
- Declined to 3.3% in 2008.
- Recovering to 4.4% in 2009, despite flat markets in North America & West Europe.
- Forecast 6.3% in 2010
- Production has shifted from North America and West Europe, which have each lost about 5% points of world production since 2005, to Asia & the Middle East.
- Asia's share of world production is likely to peak at 48-49% over next 2 years
- The EU will require growing imports to meet demand

Source: Tecnon OrbiChem

## PET DAY 2009

### PET PACKAGING RESIN WORLD TRADE 2008

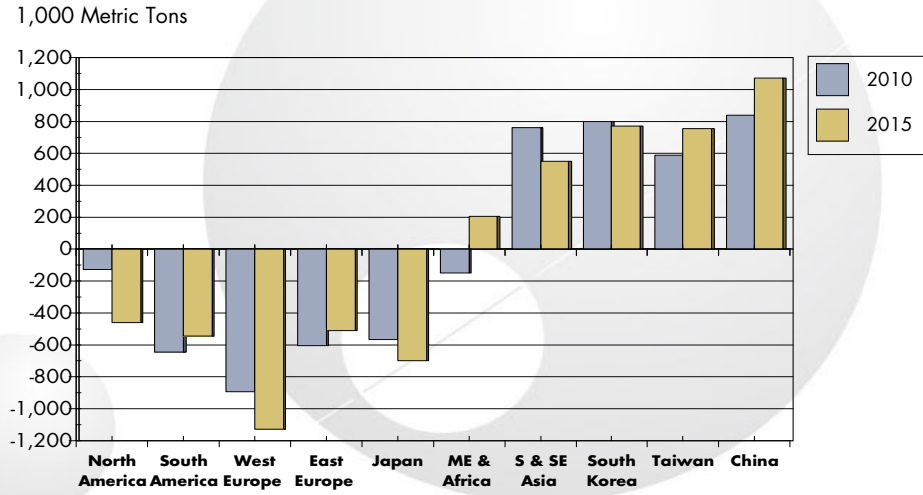
PET PACKAGING RESIN INTER-REGIONAL TRADE 2008 (1,000 Metric Tons)		Exporting Regions								Total Imports
		North America	South America	West Europe	East Europe	Middle East & Africa	South & Southeast Asia	Northeast Asia	China	
Importing Regions	North America		3.0	8.0	-	-	195.0	43.0	99.0	<b>347.0</b>
	South America	244.0		9.0	-	-	35.0	334.0	121.0	<b>744.0</b>
	West Europe	19.0	4.0		18.0	228.0	181.0	228.0	20.0	<b>697.0</b>
	East Europe	-	-	25.0		-	24.0	527.0	379.0	<b>685.0</b>
	Middle East & Africa	1.0	-	39.0	1.0		376.0	200.0	129.0	<b>746.0</b>
	South & Southeast Asia	4.0	-	-	-	25.0		130.0	32.0	<b>191.0</b>
	Northeast Asia	-	-	4.0	-	-	176.0		130.0	<b>314.0</b>
	China	-	-	-	-	-	7.0	26.0		<b>32.0</b>
	<b>Total Exports</b>	<b>272.0</b>	<b>6.0</b>	<b>85.0</b>	<b>19.0</b>	<b>253.0</b>	<b>993.0</b>	<b>1,216.0</b>	<b>910.0</b>	<b>3,755.0</b>

Excludes Estimated Fibre & Film chips, PETG & waste

Source: Tecnon OrbiChem

**PET DAY 2009**

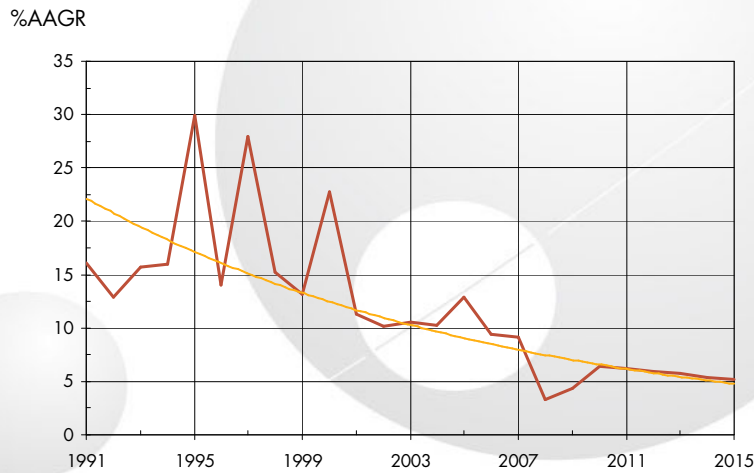
**REGIONAL PET RESIN NET TRADE 2010 & 2015**



Source: Tecnon OrbiChem

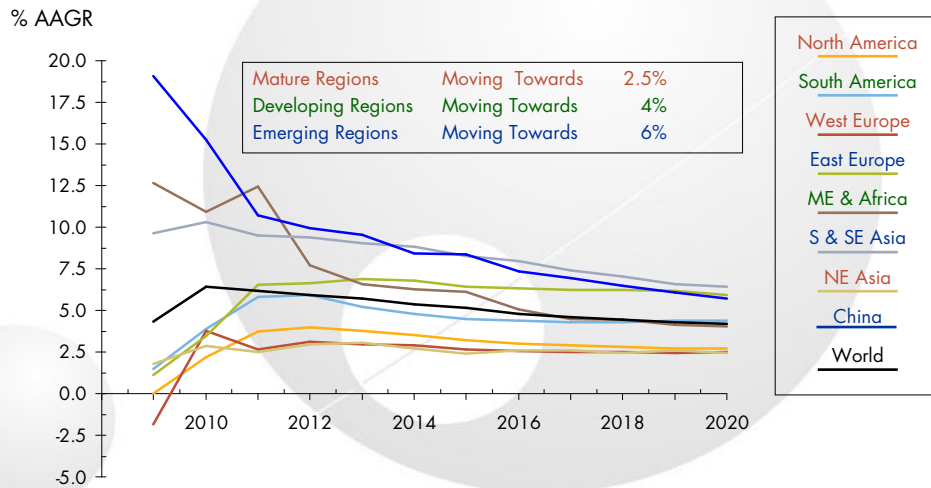
**PET DAY 2009**

**WORLD PET PACKAGING RESIN DEMAND GROWTH - the days of double digit growth are over!**



Source: Tecnon OrbiChem

## PET DAY 2009 REGIONAL PET RESIN DEMAND GROWTH

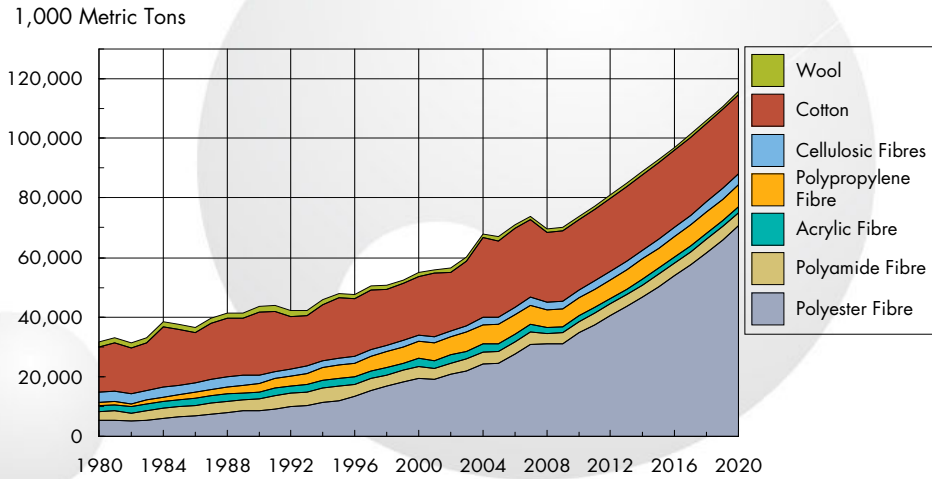


## PET DAY 2009 PET PACKAGING RESIN DEMAND TRENDS

- 2009 - Depth of global recession?
- 2010 - Beginning of recovery? Positive GDP growth and a pick up in consumer spending?
- Slowing global growth (for PET). Maturity of Western CSD & water markets – and of PET itself?
- Changes and limitations to soft drink preferences
- Dampening effects of light-weighting & growing RPET

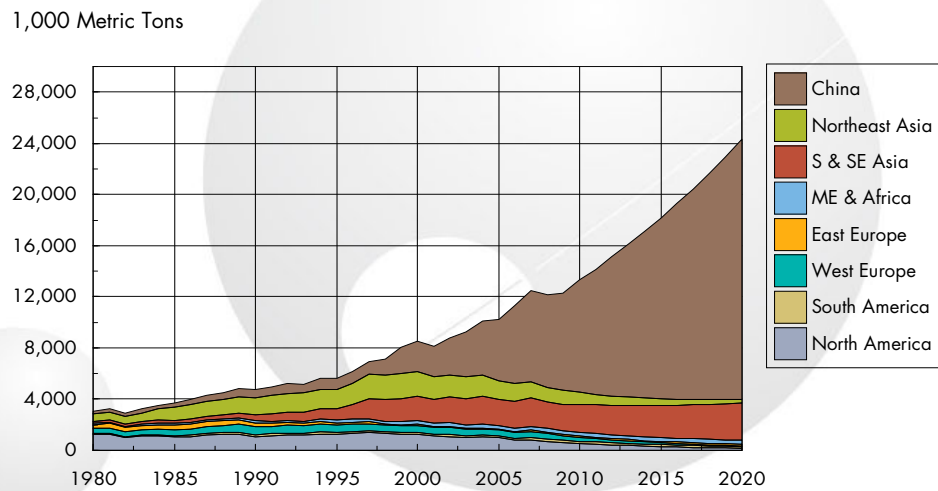
Source: Tecnon OrbiChem

**PET DAY 2009**  
**WORLD FIBRE PRODUCTION 1980-2020**



Source: Tecnon OrbiChem

**PET DAY 2009**  
**WORLD POLYESTER STAPLE PRODUCTION**

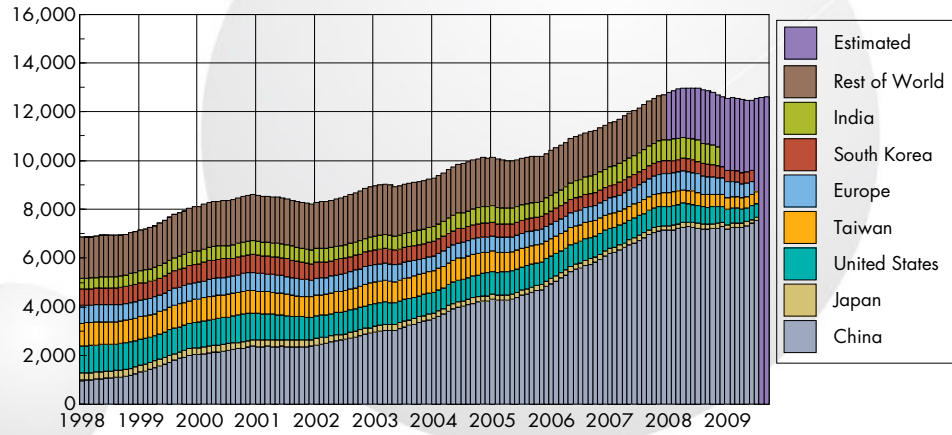


Source: Tecnon OrbiChem

**PET DAY 2009**

**POLYESTER STAPLE WORLD PRODUCTION  
12 MONTH RUNNING TOTAL**

1,000 Metric Tons

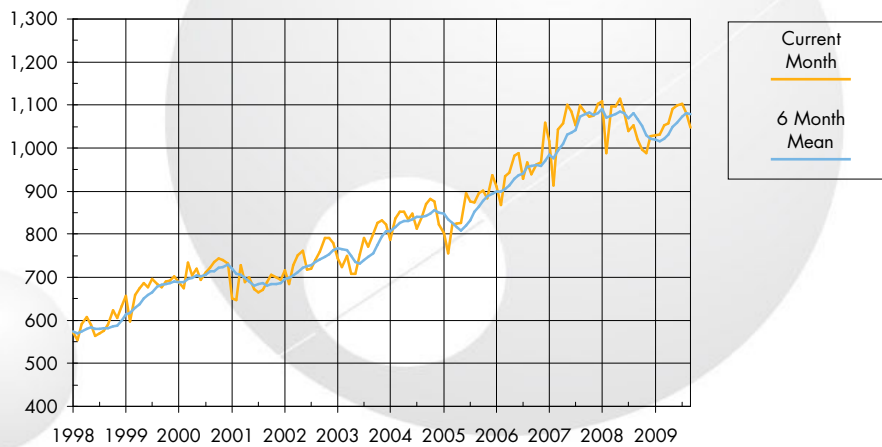


Source: Tecnon OrbiChem

**PET DAY 2009**

**POLYESTER STAPLE WORLD MONTHLY PRODUCTION  
With 6 Month Running Averages**

1,000 Metric Tons



Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER STAPLE PRODUCTION TRENDS

- World production of polyester staple fell by 2.6% in 2008
  - to 12.2 million tons, representing 17.5% of total global fibre production
- A small increase of around 1.1% is forecast for 2009
  - driven by a strong first half-year recovery in output in China
- In 2005, Asia accounted for 81% of global polyester staple production
  - by 2010 this figure is expected to rise to 89%
- World production in 2010 is forecast to rise by around 8.4%
  - when polyester staple will account for 18.1% of global fibre output.

Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER STAPLE WORLD TRADE 2008

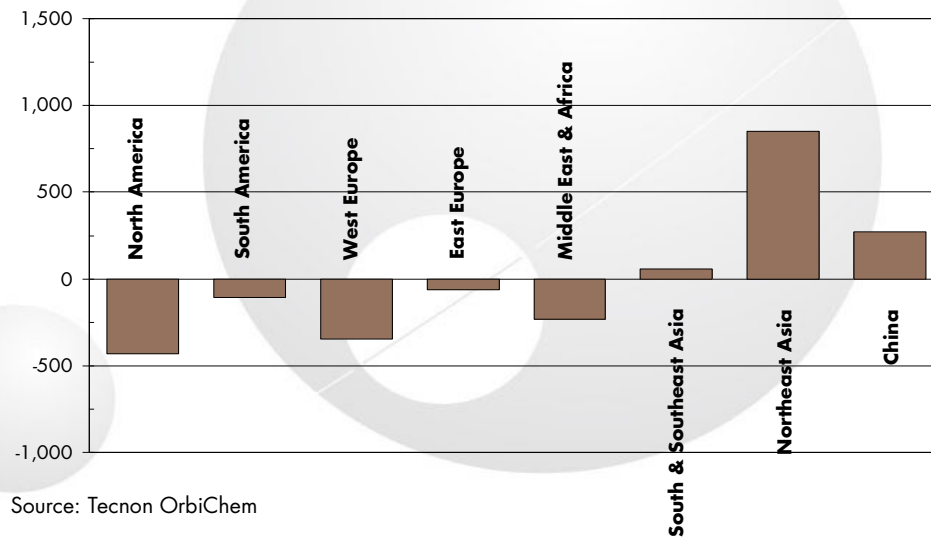
POLYESTER STAPLE INTER-REGIONAL TRADE 2008 (1,000 Metric Tons)		Exporting Regions								Total Imports
		North America	South America	West Europe	East Europe	Middle East & Africa	South & Southeast Asia	Northeast Asia	China	
Importing Regions	North America		4.0	11.0	2.0	-	90.0	185.0	164.0	<b>456.0</b>
	South America	10.0		-	-	-	17.0	46.0	38.0	<b>111.0</b>
	West Europe	13.0	-		26.0	43.0	89.0	213.0	12.0	<b>396.0</b>
	East Europe	-	-	5.0		-	-	51.0	13.0	<b>69.0</b>
	Middle East & Africa	-	-	4.0	1.0		89.0	101.0	80.0	<b>275.0</b>
	South & Southeast Asia	-	-	2.0	-	-		165.0	108.0	<b>275.0</b>
	Northeast Asia	-	-	1.0	-	-	12.0		11.0	<b>24.0</b>
	China	3.0	-	2.0	-	-	37.0	112.0		<b>154.0</b>
	<b>Total Exports</b>	<b>26.0</b>	<b>4.0</b>	<b>25.0</b>	<b>29.0</b>	<b>43.0</b>	<b>334.0</b>	<b>873.0</b>	<b>426.0</b>	<b>1,760.0</b>

Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER STAPLE REGIONAL NET TRADE 2008

1,000 Metric Tons



Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER STAPLE DEMAND TRENDS

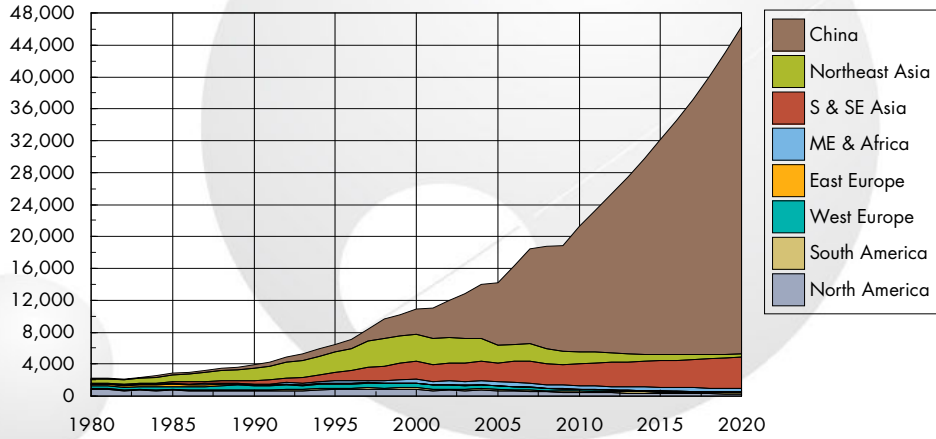
- Blend levels of polyester staple in apparel and home furnishings impacted by relative difference of polyester staple and cotton prices
- Short term trend has favoured cotton but long term trend should benefit polyester
- While polyester staple usage in nonwovens is relatively small in China, it is a significant percentage of polyester staple production in the US and Europe
- In nonwovens, polyester competes primarily with polypropylene and viscose and blend levels in some applications can shift based on the fibre price – future trend will be based on relative difference between paraxylene, propylene, and viscose economics
- Use of polyester staple in carpets is expected to decline and be replaced primarily by polyester bulked continuous filament (BCF)
- Use of polyester recycle, while small in most applications except carpeting and filling is expected to grow in importance in other traditional polyester staple markets.

Source: Tecnon OrbiChem

**PET DAY 2009**

**WORLD POLYESTER FILAMENT PRODUCTION**

1,000 Metric Tons

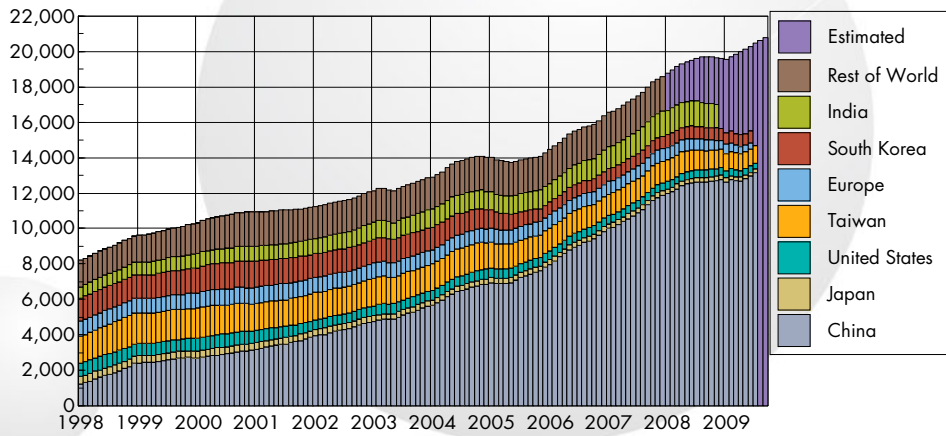


Source: Tecnon OrbiChem

**PET DAY 2009**

**POLYESTER FILAMENT WORLD PRODUCTION  
12 MONTH RUNNING TOTAL**

1,000 Metric Tons

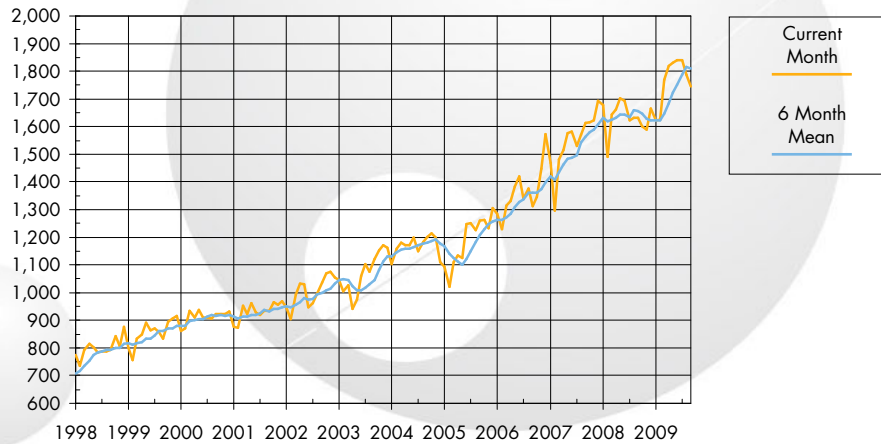


Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER FILAMENT WORLD MONTHLY PRODUCTION With 6 Month Running Averages

1,000 Metric Tons



Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER FILAMENT PRODUCTION TRENDS

- World production of polyester filament rose by 1.8% in 2008
  - to 18.7 million tons, 26.9% of total global fibre output.
- An even smaller rise of around 0.75% is forecast for 2009
  - As with staple, boosted by a strong first half-year recovery in China
  - but production has declined
- In 2005, Asia accounted for 88% of global polyester filament production
  - by 2010 this figure is expected to have risen to 94%
- Global production in 2010 is forecast to rise by around 12.9%
  - when polyester filament will account for 28.9% of global fibre output

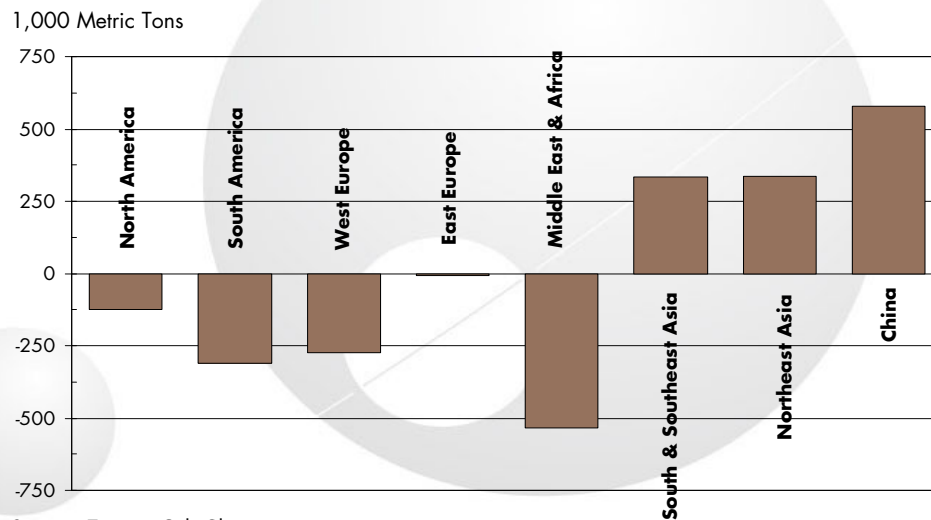
Source: Tecnon OrbiChem

**PET DAY 2009**  
**POLYESTER FILAMENT WORLD TRADE 2008**

POLYESTER FILAMENT INTER-REGIONAL TRADE 2008 (1,000 Metric Tons)		Exporting Regions								Total Imports
		North America	South America	West Europe	East Europe	Middle East & Africa	South & Southeast Asia	Northeast Asia	China	
Importing Regions	North America		-	7.0	-	-	59.0	56.0	41.0	<b>163.0</b>
	South America	15.0		2.0	-	1.0	183.0	35.0	75.0	<b>311.0</b>
	West Europe	4.0	-		14.0	17.0	77.0	89.0	119.0	<b>320.0</b>
	East Europe	-	-	3.0		1.0	2.0	-	12.0	<b>18.0</b>
	Middle East & Africa	-	-	25.0	1.0		206.0	54.0	267.0	<b>553.0</b>
	South & Southeast Asia	3.0	-	5.0	-	1.0		92.0	170.0	<b>271.0</b>
	Northeast Asia	-	-	-	-	-	58.0		78.0	<b>136.0</b>
	China	16.0	-	-	-	-	20.0	148.0		<b>184.0</b>
	<b>Total Exports</b>	<b>38.0</b>	<b>-</b>	<b>42.0</b>	<b>15.0</b>	<b>20.0</b>	<b>605.0</b>	<b>474.0</b>	<b>762.0</b>	<b>1,956.0</b>

Source: Tecnon OrbiChem

**PET DAY 2009**  
**POLYESTER FILAMENT REGIONAL NET TRADE 2008**



Source: Tecnon OrbiChem

## PET DAY 2009

### POLYESTER FILAMENT DEMAND TRENDS

- Use of polyester filament in apparel applications (vs. polyester staple and/or cotton) is fashion dependent and shifts with fashion trends
- Polyester filament usage in industrial applications is relatively steady (vs. other fibre competition) and will grow based on final market consumption
- Polyester filament (BCF) is gaining share in carpeting vs. polyester, polypropylene, and polyamide and is the only synthetic fibre production growing in North America
- As with staple, post consumer recycled polyester filament, particularly in carpets, is expected to be a major future trend.

Source: Tecnon OrbiChem

## PET DAY 2009

### CONCLUSIONS

#### **Polyester Fibre**

- Polyester continues to be the preferred fibre and will return to its historical growth rates (based on GDP) as the world exits the current recessionary climate. Growth will be greatly facilitated by the rapidly growing use of polyester BCF in carpet applications (primarily in the US).

#### **PET Packaging Resin**

- Growing maturity with modest future growth (GDP only) in advanced economies
- Continuing impact of light-weighting & RPET
- Shake-out continues. More rationalisation and plant closures
- Future EU producer line-up uncertain. Price setting and supply balancing with the importers
- Growing importance of Middle East supply sources
- Opportunities for integration – acquisition of PTA businesses

Source: Tecnon OrbiChem



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