THE GLOBAL VISCOSE FIBRE INDUSTRY IN THE 21\textsuperscript{ST} CENTURY – THE FIRST 10 YEARS

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The viscose fibre industry is the oldest man-made fibre business in the world with its roots stretching back to the late 19\textsuperscript{th} century, although commercial production did not begin until 1905 when Courtaulds opened its first filament plant. Initially the industry enjoyed a period of substantial growth which was followed by an equally dramatic decline in the face of competition from the newer synthetic fibres. However, in more recent times the industry has shown signs of recovery, driven primarily by the commissioning of new plants in Asia. At the same time some factories in the western world and elsewhere have struggled to compete, with many closing down and others running at reduced capacity utilisation. This paper highlights developments in the latest chapter of the global viscose fibre industry by examining the regional changes that have taken place during the first ten years of the 21\textsuperscript{st} century. It shows that far from being in decline, the viscose fibre business is in a healthy state with annual average growth rates exceeding many other fibres including polyester staple. Finally, and in conclusion, the prospects for the second ten years of the 21\textsuperscript{st} century are reviewed.

Keywords: viscose, market, trends

Introduction

The first ten years of the 21\textsuperscript{st} century have witnessed a resurgence in the global viscose fibre industry as production has continued to increase, following a trend first evident in only some regions of the world during the latter part of the 1900s. In the late 20\textsuperscript{th} century however, the regional upward trend, which was driven by the developing industry in Asia, was masked by the more significant and frequent closure of older, less environmentally friendly plants in the western world, particularly in Eastern Europe. Now, at the end of the first decade in the 21\textsuperscript{st} century with that programme of plant closures effectively finished, the previously obscured underlying trend has become clear (Figure 1).

The net result of the two opposing trends in Asia and East Europe towards the end of the 20\textsuperscript{th} century was an overall net decrease in global manufacturing capacity of around 600 kt, to approximately 2.0 million tonnes by the year 2000.

![Global Capacity of Viscose Fibre](image)

**Figure 1.** Global Capacity of Viscose Staple, 1985 – 2010.

During this time, more than 800 kt of capacity was lost in Eastern Europe with a further 300 kt closing in West Europe and
other smaller losses recorded in Japan and North America. However, at the same time capacity in China was increasing by more than 400 kt with a similar increase occurring in South and Southeast Asia. So, whilst the global headline figure was suggesting a decline in capacity with all the connotations of an industry in terminal decline and the associated negative public perception, a closer examination of the situation revealed an industry which far from dying was in reality growing significantly, particularly in Asia. By the end of the first decade of the 21st century, closures of viscose staple plants had slowed almost to zero and the underlying growth pattern had become much clearer. In fact, during the first ten years of the 21st century global viscose staple capacity increased by around 1.5 million tonnes (an average of 7.7 % per annum) to more than 3.5 million tonnes, an all time record high. At the same time, production of viscose staple also increased, albeit at the more modest average pace, of 6.7 % per annum.

Increased capacity in the industry was driven by the strengthening global demand for viscose staple, not only in textile applications concentrated mostly in Asia, but also in the more technical demanding and fast expanding nonwovens industry concentrated in the West where viscose staple is the preferred fibre in many applications including wet wipes, hygiene products and surgical applications. Thus, long gone is the once popular perception that viscose staple is a cheap filler fibre to be found only in budget priced apparel – it is now in demand for the positive contribution it makes to the finished product whether that be in the more traditional textile industry or in nonwoven applications. Indeed, the old textile mills of Eastern Europe which traditionally produced large quantities of low grade textile materials mainly for domestic consumption have long since given way to the new highly automated and in many cases vertically integrated textile conglomerates located chiefly in Asia. It is no surprise therefore that high grade fibre making capacity has migrated to those markets where the textile industry has been growing fastest.

Whilst the rapid increase in capacity has been taking place in Asia, viscose staple producers in the West have taken stock and become stronger and better able to cope with competition from the newer low cost producers. Today many of the remaining producers outside Asia are reaping the benefits of decisions taken in the latter part of the 20th century to move production away from commodities towards speciality products. The continuing trend towards research driven developments of new fibre variants offering a wide range of properties to the market place is set to continue – indeed survival of the industry in West Europe and elsewhere depends an innovative approach. Never has the saying been truer than it is now – “today’s speciality is tomorrow’s commodity”.

The Viscose Industry in Perspective

The pattern of growth in the viscose fibre industry during the past twenty years outlined above took place against a background of strengthening demand for almost all other fibre types. Thus, viscose staple was out of step in the context of other mainstream fibres because whilst production of all fibres, including wool and cotton, rose by an average annual rate of almost 3.3 % during the final decade of the 20th century, global output of viscose staple fibre declined at an average rate of -1.4 % per annum (Figure 2).

Global Growth in Fibre Production

Figure 2. Global Growth in Fibre Production, 1990 – 2010.

By the beginning of this century, total fibre production had reached more than
55 million tonnes, driven particularly by higher production of polyester filament and staple which grew at average annual rates of 17.9 % and 8.0 %, respectively. Indeed the only other fibres apart from viscose that failed to increase production during the last decade of the previous century were polyamide staple (average annual decline of -3.0 %) and wool (-3.2 %).

In the first ten years of the 21st century however, the picture was very different with the previous decline in viscose staple production reversed and growing at an average annual rate of 6.7 %, well above the all fibre average of 4.1 % per annum. In fact, the rate of growth of viscose fibre production was exceeded only by that of polyester filament which increased at an average annual rate of 10.7 %. Perhaps rather surprisingly, the growth in production of viscose staple was slightly higher than that of polyester staple (6.6 % per annum) and was well ahead of acrylic staple which went into decline at an average rate of 2.5 % per annum. By comparison, the cotton crop increased at an average annual rate of 2.8 % per annum during the same period whilst production of both wool and polyamide staple continued to decline as in the previous decade.

Regional Trends in the Viscose Fibre Industry

China

As noted above, the global viscose fibre industry grew at an average annual rate of 7.7 % (in terms of capacity to produce) during the first decade of the 21st century, driven primarily by expansion in Asian countries. Most notable amongst them was China where capacity increased by more than 1.5 million tonnes. The rate of growth of the viscose fibre industry in China has been remarkable such that today it dominates the global scene with a 58 % share of total world capacity. Only twenty years ago, that share was 8 % (Figure 3).

Historically, all producers in China were indigenous, with many using cotton linters as their raw material in plants some of which had a capacity of 10 ktpa or less. However, in more recent times as demand for viscose staple strengthened, other producers have been attracted to the market such that now the two major global players – Lenzing and Birla – both have plants in the country, as does Säteri. Although many of the smaller plants have closed, new ones have been built and older ones expanded. Thus, during the first decade of the 21st century, a total of nine new plants were opened in China with a combined capacity of 800 ktpa, the largest of which was the 180 ktpa XiaoShan Fulida plant. Also, new lines were commissioned at a further 12 plants with a combined total of around 800 ktpa, with the largest being more than 200 ktpa at Shangdon Helon. At the same time, eight plants with an average capacity of 11 ktpa ceased production. So, whereas in 2000 there were 26 plants in China with an average capacity of 20 ktpa (the largest plant having a capacity of 40 kt), by 2010 although there was only one more plant, the average capacity had increased to 75 ktpa with the largest plant being 230 ktpa. The rapid increase in capacity has been driven by strengthening demand for viscose staple in China from the fast expanding domestic textile industry which in turn has been feeding strong demand in export markets including Western Europe and North America.

However, despite the rapid expansion in capacity, production has failed to keep pace with strengthening demand with the result that imports have been increasing.
Whilst some fibre imports have been 
commodity products, much is speciality 
fibre not produced locally but demanded in 
textile products destined for export to the 
more sophisticated textile markets, 
particularly those in the West. 
Viscose staple capacity is expected to 
continue expanding in China during this 
decade with both new plants and 
expansions continuing to be announced. 
For example, both Lenzing and Birla have 
announced plans to increase the size of 
their plants at Nanjing and Xiangfan, 
respectively whilst Xinjiang Faluda has 
announced a tripling of capacity to 
300 ktpa and Shandong Yamei is reported 
to have plans for an additional 200 ktpa to 
its existing 60 ktpa plant. At the same 
time, Anhui Shumeite has announced plans 
to build a brand new 180 ktpa plant whilst 
Säteri are rumored to have plans for a new 
200 ktpa plant. 

Whilst export demand for textile products 
from China is likely to remain high, the 
pattern of trade is forecast to change, and 
at the same time domestic demand is 
expected to grow. The rate of growth in 
demand from western markets for Chinese 
exports is expected to slow for logistical 
reasons as the fashion market is 
increasingly demanding fast response 
times from garment manufacturers. 
Consequently, retailers in the West are 
increasingly turning to suppliers closer to 
home for the supply of fashion goods, a 
move that has stimulated demand in 
Turkey, East Europe and North Africa. 

South & South East Asia 
After China, South and Southeast Asia is 
the largest producing region in the world 
with plants in Indonesia (two producers 
with a combined capacity in 2010 of 412 
ktpa), India (three plants, with a total 
capacity of 312 ktpa) and Thailand (a 
single plant of 142 ktpa). Together in 
2010, capacity of all six plants accounted 
for almost 25 % of the global total 
compared with 28 % at the turn of the 
century (Figure 4).

Thus, compared with China growth has 
been slower but nevertheless capacity has 
increased by almost 300 kt to 
approximately 900 ktpa. 
This region is the heartland of activity for 
the Indian producer Birla which together 
with Lenzing claims to be the largest 
producer in the world. Birla owns all but 
one of the plants in the region – the 
exception being South Pacific Viscose 
(SPV) in Indonesia which is owned by 
Lenzing. Thus, Birla has a capacity in the 
region of more than 650 ktpa and Lenzing 
a little over 200 ktpa. Since 2000, capacity 
in India has grown relatively modestly by 
60 ktpa, though a further 230 ktpa is 
planned by the end of this decade as Birla 
opens a new 120 ktpa plant at Vilayat and 
Lenzing begins production at an 80 ktpa 
facility in Patalganga. 

Development of the industry in Indonesia 
has been faster than in India with almost 
200 ktpa of capacity commissioned during 
the past decade and both Lenzing and Birla 
planning further expansion there such that 
by the end of the present decade a further 
200 ktpa could be on stream. In Thailand, 
Birla has almost doubled the size of its 
plant in the past decade to 142 ktpa though 
no further expansion plans have been 
published. 
During the past decade, demand for 
viscose staple in the region has grown at a 
little over half the rate of production as 
textile companies have struggled to 
compete with their lower cost competitors 
in China, suffering the consequences of 
failing to invest in more modern high 
speed spinning equipment in older less
well-equipped mills. Consequently, producers in the region have found it necessary to increase exports by around 170 ktpa, with Turkey the main market although significant trade has been developed elsewhere around the world including China and Western Europe. With China continuing to pose a significant threat to local textile businesses, fibre exporting is expected to continue to form an important part of the sales portfolio of producers in the region. Such is the rate of increase in export sales, that in 2011 South and Southeast Asia became the largest exporting region in the world, taking over from West Europe which had held that position for many decades.

**West Europe**

Despite the rapid expansion of capacity in parts of Asia described above, Western Europe has continued to hold a significant place in the league table of world viscose staple producers though in terms of volume, its importance has diminished in recent years. Nevertheless, capacity remained essentially unchanged during the first decade of the 21st century at around 370 ktpa though share of global capacity almost halved to 10% during that time (Figure 5).

**Growth in Capacity - W Europe**

![Figure 5. Growth in Capacity – West Europe.](image)

Although total capacity in the region remained unchanged, three plants did close but others expanded. Thus, the first decade of this century saw Acordis (formerly Courtaulds) close its Grimsby plant in the UK and Svenska cease production in Sweden before Kiutu (formerly known as Kemira) ceased operations at its plant in Finland. However, on the positive side, Lenzing expanded its plant in Austria by more than 100 ktpa by debottlenecking and adding an extra line, and there is some suggestion that Kiutu may resume production again though the situation there remains uncertain. Although as stated above, capacity and production in the region were essentially unchanged during the decade, the same was not true of demand that weakened by more than a third as the textile industry in the region suffered from the effects of competition, not only from Asia but also closer to home in Turkey. The decline in the West European textile market would have been significantly more difficult to manage by viscose staple producers however had it not been for the continuing growth of the domestic nonwovens market which by the year 2010 accounted for two thirds of total demand in the region. Thus, those producers who in the latter part of the 20th century had taken steps through research and development to engineer fibres tailor made to meet the requirements of the large multinational nonwoven companies, were able to reap the benefits of their vision whilst others found it more difficult to compete. However, although an innovatative approach to product development proved to be an important element in a robust long term business strategy for viscose staple producers in West Europe, in itself it was not enough to ensure success – it was important also to have a good understanding of world exports markets and the products required to build market share there. That producers were successful in achieving that objective can be judged from the fact that during the first decade of this century, export trade almost tripled as business grew with nations across the globe, including Turkey, the Americas, Asia (including China) and East Europe. In many instances, exported fibre found its way back into the West European market in the form of various textile goods which formerly would have been manufactured by local industries. However, being unable to compete with...
low cost producers both in Asia and closer to home in Turkey and East Europe, the spinning and fabric manufacturing industries have migrated out of the region. Looking ahead, demand is expected to continue its slow decline as the textile industry in the region contracts further, offset to a degree by continuing growth in nonwoven applications. However, demand for locally produced fibre in export markets is expected to remain strong resulting in a positive outlook for the viscose fibre industry in the region.

Rest of the World
China, South and Southeast Asia and West Europe accounted for almost 93 % of total world production of viscose staple in 2010, an increase of 23 % on a decade earlier. Elsewhere, production continues in other parts of Asia (Taiwan and Japan) and South America (Brazil) but during the first ten years of this century output ceased in East Europe and North America (Figure 6).

![Growth in Capacity - Rest of World](image)

**Figure 6.** Growth in Capacity – Rest of the World.

Production of viscose staple in Japan, which is modest by global standards, fell by more than a half during the first decade of this century and led to the closure of three relatively small plants – Fuji Spinning, Toho Rayon and Toyobo. The closures were the result of a combination of weakening domestic demand and increased imports of viscose rayon fibre particularly from Indonesia but also of speciality fibre from West Europe. At the same time, export opportunities dwindled early in the decade but have begun to recover more recently as business in speciality fibre has grown in North America and more latterly in Asia. Although average plant utilisation in the country is below the global average and the market outlook is not good, the fact that Japan relies on sales of a high proportion of speciality fibres means that margins are good and the future more secure than if commodity fibres were the basis of the business.

Production of viscose staple by the Formosa Chemical and Fibre Company in Taiwan, the sole producer in the rest of Asia, a region that also includes South Korea, has been trending downwards during the past decade with utilisation (based on nameplate capacity) falling by 26 % to 60 % during that time. Weakening local demand in the region has been the main factor behind the decline which is the result of increasing competition in textile markets from lower cost producers in the region. The situation has been compounded by increasing imports of commodity products from close neighbours China and Indonesia and also of speciality fibres from West Europe. Furthermore, a failure to exploit fully the potential for increasing exports, particularly to Pakistan, Iran and to a lesser extent Vietnam, has contributed to the situation. With little signs of a reversal in the trends of recent years with regards to demand and export opportunities, the business situation is likely to remain tough in the short term.

The only other region in the world where the viscose fibre industry continues to have a presence is South America where Fibra produce from a single 53 ktpa plant in Brazil. During the first decade of the 21st century, production was limited with plant utilisation never exceeding 75 % and falling to a low of less than 40 % in 2010 as market opportunities diminished. Although demand for viscose staple in South America has been essentially stable during the ten year period, imports have continued to rise forcing the local producer to search for opportunities in export markets with varying degrees of success. Turkey has been the main target with the other markets in West Europe, North
America and Africa also explored. Overall though, export volumes have been small. Conversely, imports have grown as producers in South and Southeast Asia (Indonesia) and West Europe (Germany and Austria) have built stronger positions in the market.

With the economy in Brazil growing fast and expected to continue so, demand for viscose staple fibre is expected to strengthen during the present decade, though based on recent experience, it seems unlikely that the domestic producer will be in a position to satisfy the increased requirement. Rather, it is more likely that imports will continue to increase.

At the turn of the century, the industry had a significant presence in both North America and East Europe but 10 years later production in both regions had ceased. Capacity in the once powerful East Europe, which at its peak during the previous century produced almost a million tonnes of viscose staple per annum, had by the beginning of the 21st century been reduced to a total of four plants, three in Russia and one in Serbia, with a total capacity of a little over 150 ktpa.

Under political and economic pressures, the Serbian plant at Loznica closed early in the decade only to reopen three years later with the aid of new funds pumped into the business. However, the revival was short lived with the plant closing for good in 2005 but not before it had caused considerable disruption in export markets where, in an attempt to build a position, fibre was sold at low prices.

Although demand for viscose staple remained stable in East Europe, it was not sufficient to support production of the Russian plants which relied heavily on export markets, particularly Turkey. Thus, the Balacovo plant was able to stay open until 2008 when it finally closed, though prior to that utilisation had been poor, never rising much above 60% during the decade. Meanwhile, a second plant at Ryazan operated close to capacity until 2004 when an inability to supply export markets forced it to close the following year, whilst the only other plant operational in Russia at the turn of the century, at Krasnoyarsk, operated on an intermittent basis during the first half of the decade, but after downsizing in 2000, closing and reopening, it finally ceased production for good in 2004.

At the turn of the century in North America there were two plants operational, one owned by Courtaulds at Mobile Alabama and the other by Lenzing at Lowland Tennessee with a combined capacity of 110 ktpa. In the face of weakening domestic demand and limited export opportunities, the Courtaulds plant was forced to close in 2001. Similarly, the Lowland plant, which continued to operate under difficult market conditions, was also forced to close four years later marking the end of viscose staple production in the region.

Although there was limited production of viscose staple from a very small plant in Iraq in the early part of this century, historically the industry has had no significant presence in the Near East or in Africa. However, the situation is set to change with the announcement that Birla are planning to build a plant in Egypt as part of its long term plan to increase global production of viscose staple to one million tonnes by the end of the current decade.

Turkey has no indigenous viscose industry, relying exclusively on imports for supply of the market. With demand strengthening during the decade, tripling to almost 200 ktpa by 2010, it provided an attractive prospect for viscose staple exporters.

Towards the end of the last century, it was European (West and East) producers that dominated the market with some plants in Russia directing the major part of their output there. However, early in the last decade, quality issues precluded the Russians from the market (being an important factor in demise of the industry in Russia), thereby providing an opportunity for producers in West Europe and South and Southeast Asia to strengthen their positions. Indeed, it is the expanding market in Turkey that has been
of fundamental importance in producers in South and Southeast Asia taking over from West Europe the position of the world’s largest exporting region. Indonesia, Thailand and India have all made significant advances in the market with the former principal supplier, Austria, being forced into third place behind Indonesia and China. Demand in Turkey is forecast to continue strengthening, partly as a result of a shift in the supply chain of the European textile fashion industry in favour of local suppliers for logistical reasons. So although not a producer, Turkey is expected to play an important role in the future development of the global viscose fibre industry.

Future Prospects

Traditionally, and because viscose and cotton have a unique portfolio of characteristics particularly with regard to moisture absorbency and other aesthetic properties, cellulosic fibres have become the preferred option in specific sectors of the global fibres market. Late in the 20th century, approximately 50 % of total world fibre consumption was made up of cellulosic fibres but during recent times the figure has fallen, reaching 40 % at the turn of the century and 35 % by 2010. The main reason for the decline in share has been the size of the cotton crop which has been limited in recent years by various factors, including competition for the use of land from other crops including food and bio fuels and limitations in the extent and use of genetic engineering to improve yields. At the same time, the production of man-made fibres has increased rapidly. That the size of the cotton crop has been constrained has resulted in increased demand for other fibres to fill the “cellulose gap” and viscose, having similar characteristics to cotton, has been one of the fibres of choice. It is common to blend the two fibre types together in many textile applications and as long as the size of the cotton crop is constrained, viscose with its unique combination of moisture absorbency, softness and vibrancy of colour together with its green credentials can increasingly be expected to be in demand.

Related to the size of the cotton crop has been price and recent events in the futures market only serve to demonstrate the increasing volatility of commodity product prices in global markets. With demand for cotton forecast to increase during this decade, particularly in China, it is unlikely that the price of cotton will return to its long time average of around 65 c/lb, a situation that is also likely to benefit viscose and other fibres including lyocell and polyester staple.

But perhaps the most significance factor in determining the future prospects for the global viscose fibre industry will be the growth in total fibre demand, which itself is linked closely to world Gross Domestic Product (GDP). Latest forecasts suggest that by the end of this decade, total fibre demand, including natural fibres, will have risen by approximately 35 million tonnes to around 115 million tonnes, representing an average growth rate of 4.7 % per annum, slightly faster than during the first decade of the 21st century when the rate was 4.1 % per annum.

Given the cotton situation and the projected long term increase in demand for all fibres, the indicators for the viscose industry in the second decade of the 21st century are positive. However, it remains a challenge for individual viscose producers to ensure that the potential for growth is turned into reality.