Chapter - III

Growth and Development of Plastic Industry in India
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The economic reforms initiated in 1991 brought major changes in the structure of the domestic petrochemical industry. De-licensing and deregulation allowed the market forces to determine growth and investment. Liberalization of trade policies and lowering of tariffs enabled the domestic industry to compete with the global Petrochemicals industry.

Industrial Policy

The domestic plastic sector has been deregulated and delicensed. Compulsory licensing is required for the following three items only viz. Hydrocyanic acid and its derivatives, Isocyanates and Di-isocyanates and Phosgene and its derivatives, some of which are used in the production of polymers.

100% Foreign Direct Investment (FDI) is allowed through the automatic route without any sectoral cap. Specific approvals are required from Foreign Investment Promotion Board (FIPB) in the following three cases:

a) Proposals which require compulsory license,
b) when the proposed foreign investment is more than 25% in equity capital of a company manufacturing items reserved for the small scale sector; and
c) Proposals relating to the acquisition of existing shares in an Indian company.
Plastic raw materials products are imported freely under Open General Licence (OGL). The prices of plastics are market determined without any regulatory control.

**Structure of Plastic Industry**

The entire chain in the Plastic industry can be classified into (A) manufacturing of Polymers and is called “upstream” and (B) conversion of polymers into plastic articles and is known as “downstream”. The upstream Polymer manufacturers have commissioned globally competitive size plants with imported state-of-art technology from the world leaders. The upstream petrochemicals industries have also witnessed consolidation to remain globally competitive.

The downstream plastic processing industry is highly fragmented and consists of micro, small and medium units. Presently there are about 26,000 registered plastic processing units of which about 75% are in the small-scale sector. The small-scale sector, however, accounts for only about 25% of polymer consumption. The industry also consumes recycled plastic, which constitutes about 30% of total consumption. Plastic processed articles which were earlier exclusively reserved for Small Scale sector has now been de-reserved. The Micro Small and Medium Enterprise (MSME) Act 2006 increased the investment in plant and Machinery to Rs 5 crore and the current exemption on Excise Duty is Rs 1 Crore. This initiative helped the industry to increase competitiveness and meet the global challenges.
Notwithstanding plastic being one of the important foreign exchange earner for the country (Exports - US$ 3.512 Billion during 2007-08 and 3.603 Billion in 2008-09), the share of plastics exports remains at an abysmal 1.2% in the global export market.

Despite the industry’s high growth spanning over a period of over 2 decades and crossing several milestones, Indian plastics industry is yet to realize its full potential. The low level of per capita plastics consumption in India is indicative of the massive growth potential of the plastic industry. Compared to per capita consumption of plastics in USA at 109 Kg, China at 25 Kg and Brazil at 32 Kg, India at 5 Kg is still in nascent stage. USA consumption has reached saturation level, while China’s higher levels of consumption are primarily due to exports. India has the advantage of high population and is expected to maintain high economic growth. This should propel India’s plastics consumption to new levels in coming years.

The domestic downstream industry comprises of 3 broad segments viz. Injection molding, Blow molding and Extrusion and caters to the requirements of a wide array of applications like packaging, automobile, consumer durables, healthcare, etc.

The following table shows the augmentation of processing capacity by the domestic downstream plastic processing industry during the decade between 2001-02 and 2009-10.

As shown in the table, more than 33,000 new machines were installed in the domestic processing sector during the decade. Consequently, processing capacity more than doubled from ~8.2 MMT in 2001-02 to ~19 MMT in 2009-10 adding additional capacity of ~11 MMT during the decade with investments of over Rs 10,000 crores.
New Machine Additions & Investments in Indian Plastic Processing Industry (Table 3.1)

Among the various segments in the processing sector, the Injection molding segment accounted for over 60% of all new machines installed between 2001-02 and 2009-10 with investments of over Rs 5,000 crores. In terms of tonnage, however, Extrusion segment witnessed the maximum increase of over 7.3 MMT accounting for over 68% of the incremental processing capacity.


Additional (Table 1.7) plastic processing machines are expected to be installed by 2014-15 in the Indian Plastic processing Industry. The segment wise break-up is as follows:

<table>
<thead>
<tr>
<th>Segment</th>
<th>Nos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection Moulding</td>
<td>26,700</td>
</tr>
<tr>
<td>Blow moulding</td>
<td>3,900</td>
</tr>
<tr>
<td>Extrusion</td>
<td>10,200</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40,800</strong></td>
</tr>
</tbody>
</table>
Employment Generation Potential

Considering both direct and indirect employment, the industry presently provides employment to 3.3 million people. Depending upon consumption growth within the country, the sector has the potential of generating 3 million additional employment opportunities. Emergence of India as a key exporter of value added plastic products like China, can hasten the process.

Profile of Plastic Recycling Industry in India

Central Pollution Control Board (CPCB) and State Pollution Control Boards, being the registering authorities for the recycling industry, have been disseminating information on the status of Plastic Recycling Industry in the country. As per CPCB Report, there were 2079 Plastic Recycling Units in India as on December 2006.

Apart from the information provided by CPCB, CIPET had undertaken a field survey of plastics waste management in 60 Indian cities. As per the draft of the survey report (yet to be formally released), the key statistics for plastic recycling industry in the country are as follows.

- Numbers of Organised Recycling Units: 3500.
- Numbers of Unorganised Recycling Units: 4000.
- Major Types of Plastics Recycled: PE, PP, PVC, PET, PS, ABS, and PMMA Manpower directly involved in Plastics Recycling: around 6,00,000
- Manpower indirectly involved in Plastics Recycling: around 10,00,000.
• Quantum of Plastics Recycled per annum: 36,00,000 Tons (3.6 Million Tons).

• Estimated Investment in indigenous Plant & Machinery for Recycling Industries (Mostly Tier – I): about Rs. 150.00 Crores.

• Future growth Trends in Recycling Technology for Plastics:
  i) PET Bottle Recycling (Conversion in Flake, Pellets and products like box strapping, Fibre, injection moulded products, Extruded sheets, etc.

  ii) Recycling of Automotive parts and reuse as blend with virgin material.

  iii) Recycling of E-Waste (Electrical / Electronic / Computers parts.

  iv) Recycling route for Plastics Waste to Fuel.

  v) Energy recovery route from plastics waste (incineration).

  vi) Mixed waste recycling.

  vii) Use of PE & PP waste for Road construction (Concept of bitumen modification by Polymer).

**Status of Polymer (Plastic) Industry**

**Polymers (Plastic) Demand growth in India**

Polymers registered rapid growth in 1970s, 1980s and 1990s growing at the rate of 2-2.5 times the GDP growth. The huge demand attracted investment, which led to massive increase in the capacity within the country and thus progressively reduced our dependence on imports.
In the first decade of the 21st Century (i.e. between 2000-01 and 2009-10), the demand for plastic raw material got more than doubled from 3.3 Million Metric Ton to 6.8 Million Metric Tons. The demand witnessed (CARG of 13 %) during 1995-96 to 2000-01 could not be sustained in the first five years of the current decade and the CARG went down to 5.7 %. However, the demand has now picked up and has averaged 12 % between 2006-07 and 2009-10.

Figure 3.1

![Polymer Demand Graph](image)

**Capacity growth in India**

1990s witnessed rapid growth in capacity with the entry of major domestic players in Polyvinyl Chloride (PVC) and subsequently in Polypropylene & Polyethylene. The scope for application of plastics increased significantly and more and more sectors in the economy
started using plastics on account of their multiple benefits. Today, petrochemicals are vital inputs to all critical sectors of the economy including agriculture, infrastructure, automobile, construction, consumer goods, telecommunication, packaging and healthcare.

Figure 3.2

![Polymer Production Chart]

Over the years the main polymer production capacities have come up in the western part of India in Gujarat and Maharashtra (RIL & IPCL), though there are production facilities in other parts of the country as well like HPL in the East, GAIL in the North and Chemplast in the South.

Taking advantage of liberalization, the Indian petrochemical industry invested approximately Rs.350 billion in the 1990s, raising the domestic polymer capacity from less than 0.5 Million Metric Tons in
1990 to 4.2 Million Metric Tons in 2000-01. Subsequently, the second phase of polymer capacity expansion (post 2001) raised the country’s total capacity to 5.6 Million Metric Tons in 2008-09. Currently polymer capacity in the country has reached 6.8 Million Metric Tons (2009-10) and after commissioning of IOC, Panipet, Haryana and OPal, Dahej, Gujarat (Unit of ONGC) plants, it is expected to increase to 8.2 Million Metric Tons by end 2010-11.

**Polymer Capacities (Table 3.2)**

<table>
<thead>
<tr>
<th>Polymers</th>
<th>Capacity in kilo tonnes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density polyethylene (LDPE)</td>
<td>205</td>
</tr>
<tr>
<td>High Density polyethylene (HDPE) / Linear Low Density Polyethylene (LLDPE)</td>
<td>1870</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>2905</td>
</tr>
<tr>
<td>Polystyrene (PS)/ Expandable Polystyrene (EPS)</td>
<td>452</td>
</tr>
<tr>
<td>Poly Vinyl Chloride (PVC)</td>
<td>1321</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6753</strong> <em>(say 680)</em></td>
</tr>
</tbody>
</table>

**Capacity Additions by 2010-11 (Table 3.3)**

<table>
<thead>
<tr>
<th>Polymers</th>
<th>Capacity in kilo tonnes</th>
<th>Capacity additions by 2010-11</th>
<th>Anticipated Capacity in 2010-11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Density polyethylene (LDPE)</td>
<td>205</td>
<td>0</td>
<td>205</td>
</tr>
<tr>
<td>High Density polyethylene (HDPE) / Linear Low Density Polyethylene (LLDPE)</td>
<td>1870</td>
<td>770</td>
<td>2640</td>
</tr>
<tr>
<td>Polypropylene</td>
<td>2905</td>
<td>670</td>
<td>3575</td>
</tr>
<tr>
<td>Polystyrene (PS)/ Expandable Polystyrene (EPS)</td>
<td>452</td>
<td>0</td>
<td>452</td>
</tr>
<tr>
<td>Poly Vinyl Chloride (PVC)</td>
<td>1321</td>
<td>0</td>
<td>1321</td>
</tr>
</tbody>
</table>

**Import Growth**

Polymer imports sharply declined in 90’s on account of reduced dependence on imports due to capacity additions in 1990’s. There is surge in the imports in 2008-09 to around 1.1 Million Metric Tons, out of which, Polyvinyl chloride (PVC) accounts for 0.36 Million Metric Tons, Polypropylene (PP) 0.27 Million Metric Tons and Polyethylene (PE) 0.46 Million Metric Tons. The quantum of imports increased further to 1.8 MMT in 2009-10 with imports of Polyvinyl chloride (PVC), Polypropylene (PP) and Polyethylene (PE) rising to 0.70, 0.43 and 0.62 MMT respectively.

The average growth of imports increased from 15% between 2001-02 and 2005-06, to 36% between 2006-07 and 2009-10. In fact, polymer imports have been on an upward trend since 2006-07. With Reliance, commencing operation in Jamnagar, Gujarat for PP and IOC, commissioning its plant in Panipet, Haryana for PP and PEs, it is expected the demand supply situation will be balanced for Polyethylenes (PE) and there will be surplus for PP in FY 2010-11. However, the capacity is still expected to be short for Polyvinyl Chloride (PVC) and the deficit is likely to continue for some more years.
Export growth

Most of the capacity additions through commissioning of new plants and debottlenecking of existing facilities in India have essentially been to meet rising demand. From time to time, when domestic production exceeds the demand in the domestic market either due to higher imports or due to increased inventories, the surplus is exported. In recent years India has exported significant amount of PP. Going forward, India will be in a position to export more than a million tons of PP in the international market which will account for over 10% of PP’s global trade.
Import Duty structure

Accelerated reduction in import tariff on polymers from 40% in 2001-02 to 5% in 2007-08 has increased stiff competition from imports.

The imposition of 5% import duty on Naphtha feedstock for production of polymers has reduced the differential between upstream and downstream (Polymers) to zero, whereas in other countries in the region and even in developed economies, this differential is 6.5%. Import tariff on other key petrochemical inputs like Propane, catalysts, capital goods, etc. further reduces the competitiveness of domestic petrochemical industry

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India: Trends in Import Duties (Table 3.6)


Future demand-supply scenario

Even with the current global slowdown, Indian petrochemical demand is expected to show strong growth in years to come. There will be strong deficit across all product categories.

Demand – Supply Balance in India (Table 3.7)
New capacities in India

Most of the private sector capacities are on hold due to current downturn.

Assam Gas Cracker Project – The Government has approved the Assam Gas Cracker Project at the cost of Rs.5460.61 Crores, which is located at Dibrugarh, Assam. Brahmaputra Cracker & Polymer Limited, has been formed to implement the Assam Gas Cracker Project. The Complex will produce 2.2 lakhs tone of Polyethylene (LLDPE / HDPE) and 60,000 tonnes of Polypropylene per annum. The project is likely to be on stream by first quarter, 2012.

Plastics Industry

Figures always say it better than words. As such, consider this: The Indian plastics industry is all set to grow between 10 to 12 per cent in this decade. The present per capita consumption of 5 kg is likely to grow beyond 7 kg by 2010 and according to an industry report, the consumption level, which is expected to reach 8 million tonnes by 2010, could even touch 10 million tonnes provided some of the constraints and challenges facing the industry are removed. And further, according to the government's Department of Petrochemicals, the consumption could reach a high of 12 million tonnes by 2012. That's reason enough for those in the plastics industry to cheer. The report further states that PET, PP and PE (LLDPE, LDPE and HDPE) would be the three dominant plastic materials in the world for the converters as well as end users.

Besides, the government's current emphasis on infrastructure development will witness a further increase in demand for plastics, not
to forget the fact that consumer electronics and automobiles have surfaced as the major consumer of components made out of plastic. Healthcare is yet another sector that uses plastic in a big way for packaging. Similarly, moulded furniture, especially tables, chairs and storage racks made out of plastic, is becoming increasingly popular, thereby contributing in a big way to the demand and use of plastics. Given the various uses of plastics, the industry is therefore no longer restricted to simple processing. And as M T Thomas, President, Kerala Plastics Manufacturing Association, puts it, "The focus is now on manufacturing specialty and high-performance products."

In fact, India is expected to turn into an export hub for processed plastic goods. The reason, as experts point out, is primarily due to the low cost of labour that makes plastics products that much more affordable in the global market. According to certain estimates, exports of finished plastic goods from India could reach USD 200 billion by 2012, in addition to the domestic market of USD 300 billion. That India could well become the next big destination for plastics processing is evident enough from the interest of the US plastics industry in India. In a recent meeting between Society of the Plastics Industry (SPI), USA and Plastindia Foundation, it was decided that both these organisations would work together to create a common platform for the plastics fraternities of both the countries to meet and develop mutually beneficial ventures.

The potential for the international reach of the Indian plastics industry was also borne out by the Indo-China summit held at Plastindia-2009, an event that promotes the plastics sector. Here,
representatives of both the countries discussed the various business opportunities and trade complementation with the focus being on strengthening the trade in plastics between the two countries from USD 38.7 billion in 2007 to USD 60 billion by the end of 2010. Speaking on the occasion, Minister of State for Chemicals, Fertilisers and Mines, B K Handique, who was the chief guest, said that the time has come for the two countries to play a more coordinated role for the further growth of the industry. "In the plastics industry, India and China are playing the role of torch-bearers to be followed by the rest. To me, the most encouraging recent developments in India-China ties is the rapid increase in bilateral trade, with a more healthy contribution from the Indian plastics sector," he said.

The one area of concern, however, is the dumping of plastics, which poses a danger to the environment. The solution lies in the reprocessing or recycling of plastics. "An effective plastics waste management can be successful if the government's policy making, plastics industry bodies, municipalities and the citizens work closely together. The employment generation by the plastics recycling industry is significant and it employs people mostly from the lower strata of society," opines Neelkamal Darbari, Joint Secretary, Department of Chemicals & Petrochemicals. Plastics recycling is the process of recovering scrap or waste plastics and reprocessing the material into useful products. However, compared to glass or metallic materials, plastic poses unique challenges.

Due to the massive number of types of plastics, they each carry a resin identification code, and must be sorted before they can be
recycled. This can be costly. While metals can be sorted using electromagnets, no such 'easy sorting' capability exists for plastics. While major cities like New York and San Francisco have shown that plastics recycling can be done successfully on a large scale, fueled by recycling educational programmes and environmental pride, many municipalities across the world are still falling far short of their desired recycling goals. Financial concerns, technological difficulties, and stiff competition for raw materials by recyclers at home and abroad are among the combined challenges facing the plastics recycling industry. Meanwhile, across the globe, scientists are working hard on discovering new processes for recycling plastics. Scientists in Japan, for instance, have developed a process that breaks certain plastics down into their original chemical ingredients, which can be reused to make new, high quality plastics. That approach fostered recycling of beverage cans, scrap steel, and glass containers, which are melted to produce aluminum, glass and steel. Akio Kamimura and Shigehiro Yamamoto reported the invention of an efficient new method to depolymerize polyamide plastics. The technology, still at the laboratory stage, does not require costly pressure chambers, extreme temperatures, or high energy inputs. Rather, it uses ordinary laboratory glassware.

In the future, researchers intend to recycle other types of plastics from cars in addition to the polyolefins - perhaps by combining the methods for recovering styrene copolymers and polyolefins. Eventually, according to Dr Martin Schlummer, Project Manager, Fraunhofer Institute for Process Engineering and Packaging, Germany, it will be possible to make optimum use even of plastics from
shredding plants where refrigerators, kitchen ranges and cars are all shredded together. Meanwhile, a study has been conducted in China to focus on decreasing environmental pollution through resource preservation, and re-using fibers and resins of waste printed circuit boards (PCBs) that were thought worthless to produce a variety of high-strength materials. In India, research and development on biodegradable polymer is taking momentum and the industry players are joining hands with leading R & D institutions to keep the environment free of plastic waste.

**Rubber Industry**

Like plastics, the Indian rubber industry is one of the fastest growing industries. According to a survey conducted last year, there are more than 6,000 rubber manufacturing units across the country which, together, produce rubber items in excess of 35,000. These include natural rubber, reclaim rubber, carbon black, synthetic rubber, fatty acids, rubber chemicals, rayon, etc. Latex products, auto tyres, tubes, belting, hoses, automobile parts, cable and wires are some of the products created in huge quantities by rubber products' distributors. India is, in fact, the third largest rubber producer of the world and the products manufactured here are not only for domestic consumption but are also exported to foreign countries such as the United Arab Emirates, France, Italy, Germany, USA, UK, Saudi Arabia, Africa and Bangladesh, among others.

Playing a crucial role in Indian economy with a turnover of more than Rs 200 billion, the rubber industry caters to a wide circle of such sectors as engineering, aviation, aeronautics, pharmaceuticals, steel
plants, railways, mines, textiles etc. Of course, the recession phase has impacted the rubber industry as well. According to the latest Rubber Statistical Bulletin and Rubber Industry Report now available from the International Rubber Study Group (IRSG), global rubber consumption was 20.8 million tonnes in the year to June 2009, its lowest level since May 2005, while year-on-year consumption growth at the same point was (-)12.3 per cent. This compares to a growth rate of (-)3.5 per cent reached in March 2002, at the height of the last global economic downturn. Global synthetic rubber (SR) production declined by 13.7 per cent in year-on-year terms in June 2009, while global natural rubber (NR) production fell by 3.7 per cent.

The more pronounced decline in global consumption compared to global production has moved the NR market into modest surplus in the year to June 2009. Global NR consumption is projected to fall by 5.5 per cent in the 2009 calendar year, while SR demand is forecast to decline by 7.3 per cent. Meanwhile, global NR production is projected to fall by 4.8 per cent in 2009. Using a more pessimistic global economic growth scenario, with 2009 and 2010 growth rates set at 0.4 per cent below those forecast by the IMF, which form the base scenario, results in 0.9-1.9 per cent lower rubber consumption over the period. Under a more optimistic scenario, in which global growth in 2010 recovers to its 2008 level, rubber consumption would be 0.7-2.1 per cent higher than the base scenario.

Discounting the lean phase, as an industry observer points out, the rubber industry in India has largely benefited due to certain significant factors such as the extensive plantation sector, availability
of raw material in abundance, ever-increasing domestic market, the
development of India as an automobile hub, availability of cheap
labour, training provided by technical institutes, on-going economic
reforms and improving lifestyles of the masses. In recent years, the
Indian rubber industry has experienced a growth of 8 per cent. Some of
the rubber products that have witnessed a remarkable spurt in growth
include automotive tyres and tubes, belts and beltings, latex items,
conveyor V belts, rubber canvas and footwear, machinery and testing
equipment, pharmaceutical products, hoses, cots, aprons, sports goods
and sheeting.

As per information provided by the Rubber Board, functioning
under the Ministry of Commerce and Industry, India is the third largest
producer, fourth largest consumer of natural rubber and fifth largest
consumer of natural rubber and synthetic rubber together in the world.
Besides, India is the world's largest manufacturer of reclaim rubber. In
fact, India and China are the only two countries in the world, which
have the capacity to consume the entire indigenous production of
natural rubber and therefore not depend on export of surplus quantity of
natural rubber. However, the per capita consumption of rubber in India
is only 800 grams against 12 to 14 kilos in Japan, USA and Europe.
"This implies that there are tremendous growth prospects of the
industry in the years to come as since India has not attained any
saturation level so far," an official states.

The rubber industry in India is essentially divided into two
sectors - tyre and non-tyre. The non-tyre sector comprises the medium
scale and small scale units, most of which are engaged in the business
of producing sophisticated industrial products. The small-scale sector accounts for over 50 per cent of production of rubber goods in the non-tyre sector. What also places India's rubber industry in a prime position is that all the world's natural rubber is grown in the South East Asian region of Thailand, Indonesia, India, Malaysia and Sri Lanka.

**Malaysia is the fastest growing economies in the world.**

Meanwhile, since environmental pollution is a danger posed by the rubber industry as well, it is significant to mention here a report prepared by James Jacob, Deputy Director (Plant Physiology), Rubber Research Institute of India, Kottayam, which highlights the various aspects of the Kyoto Protocol and the Indian rubber industry. India is rated as one of the top clean development mechanism (CDM) host countries because of our stable political and economic environment, sound infrastructure and human resources. India expects to achieve 10 per cent share of the global CDM market and this can lead to a cash flow of several hundred million US dollars into the country. The major operators of carbon funds in the Indian CDM market are the EEU, World Bank, Rabo Bank, International Finance Corporation, Ecossecurities and Standard Bank London, KFW Germany and Japan Carbon Fund.

"The possibility of cultivating natural rubber as part of reforestation activity in a degraded region with the exclusive aim of supplying the rubber produced from there into the market where it will directly substitute synthetic rubber is yet another potential opportunity that is worth exploring under an ambitious CDM project. Such a project would generate CERs as a result of the carbon sequestration by the
plants. Additionally, the carbon dioxide equivalent of the amount of synthetic rubber displaced and the carbon dioxide equivalent of the energy that was required to synthesize that much amount of synthetic rubber will earn clean and strong CERs in the CDM market. Both in terms of the sale of the CERs and the rubber, such a project will ensure a captive and pre-determined market with due financial security from the start. In the fast changing global economic scenario, financing natural rubber cultivation from internally generated cash flows such as from CDM needs to be explored on a priority basis."

Growth in the European flexible packaging market is continuing despite economic and financial upheaval in some countries, as per PCI Films Consulting. The report points to a sales upswing of 4.7% in 2010 to just over EUR 12.3 bln, with the 6.2% growth in Eastern Europe outpacing Western Europe's 4.4% improvement. Much of the higher sales total is attributed to “escalating” raw materials and energy costs, which converters for the most part passed on to customers. Assuming lower prices for starting materials, the consultants expect 2011 to see a more moderate sales upturn, of 3% on the whole. A decline in real terms is forecast for Portugal and Greece. Consumption is predicted to increase by 1-1.5% this year, boosted by demand for packaging used in pet food, pharmaceuticals, beverage and a number of human food applications. Converted materials accounted for EUR 11 bln of flexible packaging sales in 2010, with 60% of European demand concentrated in six end-use categories: confectionery; fresh and processed meat; cheese and dairy; coffee, dried foods and cereals; baked goods and medical pharmaceutical. Output rose by nearly 4%, with more than
55% of production concentrated in four countries – Germany, France, Italy and the UK. About 8% of production, worth EUR 890 mln, was exported. Imports from outside Europe, worth EUR 273 mln, accounted for only 2% of European demand.

Consolidation in the industry continues, propelled by private equity transactions. Additionally, total demand for flexible packaging in the Middle East & Africa in 2010 approached US$3.5 bln, representing 5% of world flexible packaging sales. This still represents consumption of less than US$3 per capita. Overall flexible packaging demand in the region grew by 7% in 2010, with sales having recovered from more modest growth in 2008 and 2009 when the market was most affected by the global economic downturn. Over 45% of regional demand was accounted for by South Africa, Iran, Nigeria and Egypt with most rapid growth seen in Nigeria, Egypt and Kenya.

The region’s largest national markets are fairly self-contained, while smaller countries such as the UAE that have heavily invested in new capacity have a high proportion of output exported. The top 20 converters account for around 40% of total regional sales. With few exceptions, most of these companies are locally owned. Intra-regional trade has been growing, with 15% traded between countries within the region. Significant volumes are exported to Africa from Middle Eastern countries. Exports to other regions have been increasing with Israel alone accounting for over 40% of the export total. Imports from outside the region have been growing and currently account for 14% of regional consumption mostly sourced from Europe, India and China.
Dried and dehydrated foods which includes pasta, staples such as salt, sugar and rice, milk powder and other powdered foods such as soup mixes accounts for a fifth of total demand. Despite economic and political challenges, overall regional consumption of flexible packaging is expected to see steady growth of 4.5% pa overall across the region. Another report by PCI shows, India represents a US$3 bln market that is expected to continue growing at around 15% pa until 2015, but businesses and investors need to understand the business environment before they can expect to be successful here. India is, in flexible packaging as in so many other things, a land of opportunity. With a middle class the size of Europe, Indian consumers have the purchasing power to match their counterparts in the West, and the Indian retail sector is rushing to satisfy them. India is poised for huge growth within the retail sector, as well-developed, major retailing expands within Indian cities. With only 5% of food currently packaged, and WalMart only last year allowed to move into retail, the opportunities in flexible packaging are clearly enormous. Added to that, are large, mostly coastal, government-supported food manufacturers manufacturing cash crops for export throughout Asia and beyond.

The Indian converting industry is distinctly two-tiered: serving the major food producers are very well developed converters producing European standard flexible packaging with German and Italian equipment. Outside the main centres, there is a less organised market, with a large number of small converters producing flexible packaging of generally lower quality. International groups are almost missing, with Huhtamaki the only substantial player. Indian export trade in converted flexible packaging has been growing, with long-run customers across Africa, the Middle East, USA, Asia and Europe.
recognizing the high quality available from the major contractors. Some of the end-users are rather unfamiliar to Western converters.

By some estimates, for example, 25% of all laminate sales are accounted for by small sachets of chewing tobacco, although they are the subject of Indian government legislation to combat litter. Pack sizes are generally smaller to match consumer purchasing power. Many commentators have expressed the view that the Indian flexible packaging market will develop on the same lines as the Chinese. As the report demonstrates, however, the dynamics of the two territories are completely different.

A bureaucratic and challenging political landscape, an increasing focus on environmental issues and the presence of established players, sometimes owned by the very manufacturers they supply, means that, while it may well be time to ‘dip a toe’ in the Indian market, there are still substantial hurdles to clear.

<table>
<thead>
<tr>
<th>Leading Indian Flexible Packaging Converters (Table 3.8)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company</strong></td>
</tr>
<tr>
<td>Uflex Industries</td>
</tr>
<tr>
<td>The Paper Products</td>
</tr>
<tr>
<td>Positive Packaging</td>
</tr>
<tr>
<td>ITC</td>
</tr>
<tr>
<td>Parle Products</td>
</tr>
</tbody>
</table>

The growth of the flexible packaging industry in India is being spurred, as most would guess, by the rapid growth of the country's middle (consuming) class. With a middle class the size of Europe, Indian consumers now have the purchasing power to match their counterparts in the West, and the Indian retail sector is rushing to
satisfy them, note the authors. To date only 5% of food sold in India is packaged, with farmers' open markets still a major market force, but change is occurring rapidly. According to PCI, the Indian packaging converting industry is two-tiered: serving the major food producers are converters producing European standard flexible packaging with equipment sourced from German and Italian equipment manufacturers.

US flexible-packaging demand is expected to top US$18 bln in 2015, as per a report by Freedonia. Demand for converted flexible packaging is projected to increase 3.8% annually to US$18.2 bln in 2015. Gains will be similar to the pace of the 2005-2010 period based on the now more well-established presence of pouches in a number of food and nonfood markets coupled with overall decline in raw material price growth. Converted flexible packaging’s source reduction capabilities will be increasingly advantageous in light of initiatives by major retailers and packaged goods firms to evaluate their packaging in terms of eco-friendliness and cost reduction. Pouches will experience above-average advances, with demand expected to increase 4.6% yearly to US$8 bln in 2015.

Growth will be driven by continued conversions to stand-up pouches and healthy gains for flat pouches in a number of markets, along with a smaller environmental footprint due to light weight and reduced material use, which also holds down shipping costs. Additionally, the ageing of rigid packaging equipment will create openings for replacements by pouch packaging equipment over the coming decade. Gains for bags will be moderated by the maturity of many applications along with competition from pouches and rigid packaging. Still, advances will represent an improvement from the
2005-2010 performance based on the expected recovery in the US economy. Plastic bag demand will outpace that of paper bags due to cost and performance advantages, along with widespread usage in baked goods, produce, meat, frozen food and grain mill product applications. However, growing efforts by packaged goods firms to demonstrate their commitment to sustainability will lead to some degree of renewed interest in paper, which possesses such qualities as renewability, recyclability and compostability.

Converted flexible packaging demand in food applications is projected to climb 4% pa to US$12.9 bln in 2015. Advances will be driven by favorable demographics and rising demand for convenience-oriented and other processed food items, which often use more costly higher barrier packaging materials for extended shelf life. The fastest gains are anticipated in beverage, meat and related products, and snack food applications. Demand in nonfood markets is projected to increase 3.2% per year. Advances will be led by above-average gains in the pharmaceutical and medical product markets.

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INDIA- one of the fastest growing economies of the world, is all set to attain the premier status along with China. India is a favoured destination for overseas investors and offers the advantages of an open economy, increasing liberalization, a stable democratic political scenario, highly skilled work force with fluency in English. Various overseas players wish to explore the Indian market and invest in opportunities thrown open by the country, projected to be world number 3 in plastics consumption by 2010. This seems a very achievable position as since the past decade, the Indian plastics industry continues to grow at double digit figures. A plethora of queries plague the investor who wishes to tap the Indian market. Few of these queries from overseas include:

- The raw material scenario: demand and supply.
- Plastics machinery sector : present technology levels and demand.
- Finished products : Export potential.
- The major overseas players with base in India.
- Current consumption, projected growth of the Indian plastics industry.

**Role of the Indian Government in promoting :**

- Overseas investments.
- The Indian plastics industry in general.
The Indian plastics industry functions with its unique market dynamics, of which, www.plastemart.com has been a successful part. www.plastemart.com has attempted to address these queries in "Synopsis of the Indian Plastics Industry : 1992-2010" ; the past 18 years and what the future holds for the overseas investors.

After liberalization of the economy in 1992, the Government of India has been quite supportive of industry in general, taking many steps over the years for the conducive growth of business. These measures favouring economic growth, are being continuously taken by the Indian Government, irrespective of the change in power. The Government of India is endeavouring to achieve GDP growth of more than 7% in the next 10 years. It is quite possible that plastics could grow at 14%, based on historical performance.

The Petrochemical Department of the Government of India is in the process of setting up a development council to promote the development of downstream sectors in India. This clearly illustrates that the Government of India is quite positive and supportive to new investments in India. In fact, many foreign entrepreneurs have been able to set up 100% owned companies in India in the plastics processing and machinery industry sectors. Foreign equity participation in the petrochemical industry has been increased to a 51% stake (a majority stake). However, the polymer manufacturers and other downstream industries are free to set up projects 100% on their own equity.

Some examples of the international companies that have set up projects in India on their own are:
Polymer Manufacturing

- BASF Styrenics
- Bayer ABS
- LG Polymers
- Compounding
- Clariant
- DSM
- Dupont
- GE Plastics
- Multibase- Dow Corning

Converting Industry

- 3 M
- Baxter
- Delphi (Automotive parts)
- Huhtamaki (Plastic film converter)
- Moser Baer
- Visteon (Automotive parts)
- Terumo Penpol
Machinery

- Cincinnati Milacron
- Nissei
- Sidel

The above list is only indicative and not comprehensive. Some of these initially started as joint ventures but later, when the Government of India granted permission, they acquired remaining equity stake from the Indian partners. Additionally, quite a many joint ventures have been formed in India. Some notable joint ventures are: Machino Basell (compounding), Mamta Brampton (Machinery).

The Indian plastics industry, with more than 4 million tons consumption in 2003 is well spread all over India. While it is estimated to be fragmented across more than 20,000 processors, the large processors are less than 100. These 100 have about 35% share of the plastics processing industry. The major sectors in which large processors are present are:

- PVC pipes - the largest producer is Finolex Industries with capacity of 60,000 MT/year.
- BOPP film - the largest producer is Cosmo Films with the capacity reaching almost 60,000 MT in 2004.
- BOPET film - the largest producer is Polypex with the capacity of 80,000 MT out of which 40,000 MT is constructed in Thailand.
Wire & Cable - the largest producer is Finolex Cable with estimated consumption of PVC at 35000 MT/Year and PE at about 5,000 MT/year.

PE/PP raffia (film fiber) generally has larger processors with average capacity of about 10,000 MT/year. Some notable processors are: Jai Corp & Big Bag.

Cast PP film sector has about 7 processors with the total capacity of about 35,000 MT/year.

PP spun fiber has about 10 processors with the total capacity of about 50,000 MT/year.

Calendered PVC film segment is spread among 20 processors with the total capacity of about 150,000 MT/year.

Plastiblends India is the largest masterbatch manufacturer with the capacity of about 20,000 MT/year.

However the most diversified processor, Supreme Industries is expected to process about 100,000 MT/Year in 2004. Supreme Industries processes in various sectors including PVC pipes, PE film, PVC film, PP furniture etc. Moser Baer is the largest processor of CD, DVD etc and consumes about 25,000 MT/year of polymers.

The historical growth of the plastics industry over the last few decades is at an impressive 12-14%, which is twice the GDP growth. The major driver of this growth is the increased standard of living of people in India (housing the second largest population in the world). It is estimated that almost 35% of the 1 billion population has a
purchasing power equivalent to that in European countries. The GDP in 2004 is expected to reach a level of about US$ 3 trillion at the Purchase Power Parity. The GDP could increase further with support from the Indian Government in the form of increased investments in infrastructure.

The Indian plastics industry is quite upbeat about the future potential of plastics in India, believing that the Plastics industry will grow between 10% to 12%, if not higher, in this decade. The present per capita consumption is 5 Kgs, likely to reach beyond 7 Kgs by 2010. Consumption level, which is expected to reach 8 million tons by 2010, could touch 10 million tons, if some of the constraints such as infrastructure etc are eliminated. The department of petrochemicals of the Government of India has projected a level of 12 million tons by 2011/2012.

Polymer producers like Reliance Industries and IPCL take the lead in developing the markets in India aided by the major processors. The present raw material capacity in India is more than adequate to meet the present consumption level of 4 million tons. In fact, 2003 saw an export of about 700,000 MT of polymer material. Some debottlenecking is being effected in the areas of PE, PP, PVC and Polystyrene, resulting in India being a net exporter of raw material up to 2006. Two major petrochemical projects, with a capacity of 1.5-2 million tons of polymers are likely to materialized earliest by 2007. If the execution is in time, India may be self-sufficient up to at least 2010. Raw material supply is no longer a constraint because very large capacities are available either in the Middle East or Far East Asian.
countries such as Singapore, Korea, Thailand etc. These destinations are close to India, and polymer cost is affected only by a surcharge in the form of about US$ 20-25/ton on account of additional freight.

Imports of specialty materials or the grades not manufactured by the Indian raw material manufacturers continue. It is estimated that almost 250,000 MT of polymers was imported in 2003. The tariff barrier is systematically reducing. The present custom duty is 20%. It is expected that it may come down to about 5-6% with in next 3-5 years, if not earlier.

The plastics machinery sector has achieved a sales turnover of more than US$ 200 million in 2003. In fact the positive trends of the overall economy in 2003 had given an impetus to the plastic machinery sector, which grew at 25% in 2003. However, being a cyclical business, such spectacular growth may not be witnessed consistently. The major advantages that India could offer is availability of low cost and higher educated people with knowledge of English language. It is therefore not very surprising that W & P sources the parts of their extrusion machinery from an Indian machinery manufacturer.

Quality of finished goods is definitely very good. Production costs in India are estimated to be 20-25% lower than in USA. Plastics products such as BOPP film, BOPET film, moulded products have a good growth potential for exports from India. There is also a good export potential of CD, DVD etc. K2004 (Plastics Industry’s largest exhibition) to be held in Dusseldorf, will have over 20 exhibitors from India, of which almost half will be machinery manufacturers, and the
others would comprise of additive manufacturers, mould manufacturers along with India’s leading petrochemical manufacturers.

While there was some anxiety among the common mass about the pace of reforms with the change in power, it seems that the present Government cannot stop the pace significantly. The major coalition partner Congress was in power when the economic reforms were initiated. Interestingly the present President and Prime Minister are very highly educated and revered for their contribution to India’s growth. The present Prime Minister was in fact, the writer of the first reforms in 1991. However, it is too early to predict whether the present Government would be as buoyant about reforms as the previous NDA Govt. mainly because the communist party is supporting the present coalition Govt. However, we strongly believe that the growth of plastics would continue at least at 10% if not at 14% despite some deceleration of the reform process.

There is no reason for the foreign investors interested in Indian market at all. While conducting of detailed investment analysis would be of assistance, it should be feasible to achieve at least 10% return on investment (the earning power) if not higher. The return could be higher in the downstream sectors such as processing and machinery. Perhaps the earning power could be lower for the petrochemical sector. It would be a good idea for a new entrepreneur to study the companies listed in the question 1 for developing more confidence.

In our opinion, the following are outstanding features of Indian economy that would have positive impact in 2004.
The reforms may slow down but will not stop despite the change in the Government.

Higher convertibility of Indian currency.

An increasing level of foreign exchange (at present it is US$125 billion) mainly due to influx of foreign money into India.

Major emphasis on the investment in irrigation and other areas to boost the rural economy (consisting of about 70% of population and 35% of the overall economy).

Emphasis on the power generation with the support of the private sector.

An increase in the growth of cement, steel, automobile, etc industries.

Optimism in the industry as can be seen in the stock exchange as well as the first quarterly (April-June 2004) financial results of the Indian industry.

An impressive growth of about 15 % in the total trade expecting to reach a level of about US $130 billion in 2004.

Similar growth of export of plastics and is expected to reach a level of about US $1.25 billion.