INTEGRATION OF PETROCHEMICALS INTO THE GLOBAL MARKET

INTRODUCTION

Exhibit 1 presents the current and future growth of the global petrochemical industry. The world is following a natural growth pattern - of people, resources, and living standards - speeded up by the IT revolution. There are no winners or losers but just the dynamic changes. Organizations that adapt to changes will always thrive.

The industry players have two choices - Just join in the bandwagon. Or end up cleaning the confetti after the parade leaves the town. The choice is left to the individual organizations.

The major changes in the global petrochemical industry are attributed to the following:

- **Changes in Natural Gas/Naphtha per BTU Value**
- **The developments in resource-rich nations that are permitting them to capture more value**
- **The changing global political and demographic trends**

All three have a major impact on the future product process migration trends globally.

As Exhibit 1 presents, China has been the country/region of interest for the whole world in the last decade - because of the unprecedented growth in consumption pattern brought on by the political changes. Factors such as (1) large population, (2) desire to improve the living standards and (3) the governmental actions resulting in the liberalization, have all helped China and in turn the whole world progress.

The next region poised for growth is INDIA. India represents, like China: (1) a large market for consumer products, (2) demographic changes that are accelerating the increase in disposable income, and (3) increasing industrialization and globalization.

Besides these similarities, India presents several additional advantages: (1) over 300 million strong middle income consumer base that represents one of the most educated groups in the world, importantly - speaking English - the Global Language by default, (2) Indian population is the most scientifically educated and prone to work with brains rather than hands - thus embracing the IT revolution - the new driving factor for the Global growth.
Indian petrochemical industry has been progressing very well in the past 15 years and at a faster pace than ever before, but not at the speed of information technology and service industries.

Most of the world translates the progress and growth in the Indian Information Technology directly to all industrial sectors including petrochemicals – which is far from truth.

India is essentially a land of new consumers brought on by the information technology revolution – but not manufacturing. Unlike China, India does not yet have the infrastructure, raw materials, industry structure to be the manufacturing region – thus the progress made in information technology cannot be directly translated to capital intensive manufacturing sectors like petrochemicals and plastics.

In this article, we want to put in perspective the Indian petrochemical growth with the current situation and future trends. The analysis is specifically targeted to Global oil/petrochemical/plastics organizations that are planning on developing their newer opportunities for Indian subcontinent at the cracker, cracker plus 2/3 downstream products.

The article will focus on the future opportunities in Indian petrochemicals and plastics and participation options for the Global players.

OBJECTIVES

The overall objectives of this article are to:
1. Present the current progress in India as a precursor to the future petrochemical industry development
2. Present current status and future direction of the cracker and cracker plus 2/3 downstream petrochemical products.
3. Present participation options for Global petrochemical players.
4. Some recommendations for taking the full advantage of the opportunities India has to offer.

BACKGROUND

India is the largest “true” democracy in the world and will remain so for the foreseeable future.

Unlike U.S and England two countries with same heritage separated by a common language – English, India is a group of diverse heritages, with different cultures, habits, dresses, religions – all combined into one great Nation by a common language – English.

The unity in diversity gives India a surefire path to remain democratic – government of the people by the people and for the people – more than any other nation in the world. India is the only country where politics are not restricted to rich and educated - anyone can be a political leader as long as he/she has the political support of the people.

India is a broad combination of a small rich class, medium sized middle class and a large poor class. As a consequence, the real progress made by middle class and rich class is swept under the carpet by the broadly visible poverty – exploited by the rest of the world for donations.

The middle class in India accounts for approximately 300 million people, highly educated, largest concentration of English speaking people in the world.

Like most successful democracies, broad political policy directions in India are unlikely to change – regardless of which
Government is in power – All democratic governments are for the people – with few philosophical differences – that’s the power of democracy.

**CHANGING DEMOGRAPHICS**

India is only 60 years old after its freedom from over 200 years (Bicentennial) of British rule. The first 25 years of Indian independence were used to focus on (1) making India self sufficient in agriculture, (2) feeding the growing population, and (3) fighting three major wars – one with China and two with Pakistan. In the process, India developed the ability to defend itself against all the future aggressors – simultaneously making it self sufficient in both – guns and bread/butter.

India developed the five year plans to modernize itself from the long neglect and dilapidation by two centuries of Colonial rule. India instituted first, second and third five year plans to modernize the agriculture and defense. By the time India reached the late seventies the direction of the growth had to change and transition to more wealth growth and took a major transition. The eighties essentially represented a period of confusion and transition for the Indian economy in terms of developing new objectives.

The economic reforms of the early nineties buoyed by the great Information Technology catapulted India into the World economy as a formidable player with great potential.

In the last decade, India transformed itself into the new growth engine for the world. India’s work ethics, emphasis on technical education, English language, entrepreneurial and competitive spirit have carved its undeniable future position in the Global Economy.

The following factors highlight India’s current demographic position:

- India has 1.1 billion people growing at 1.4% per annum
- The total GDP of $790 billion growing at an average of 7-8% p.a
- Young Nation with an average age of 28 years, with 35% of the population below 15; 50% of the population below 25 – and second largest group of people in the age group 25-34
- Most educated among the adult groups in the world with great income potential
- Over 3 million college graduates per year - #1 in the world
- Slowing population growth 1951-1980 – 2.2% - baby boom generation 2001-2010 - 1.5%
- Increasing literacy rate - 950–17%; 2000-65%; 2010 – 80% approximately on 800 million educated people with higher than average education.
- Middle Class is Exploding – 1980 – 65 million; 2000- 220 million; 2010-368 million
- Poverty is declining – 1980 -46%; 2000-26%; 2010– 16%
- Productivity is rising - 30% to 40% of GDP growth is due to rising productivity
- Per capita income gains – 1980 - $1178; 2000- $3051
- India is now the 4th largest economy - will cross Japan by 2012

All of the above factors will culminate into the future growth of India. Of special importance are the economic reforms undertaken by the then Indian government to propel Indian economy by making Rupee (Indian currency) fully convertible with the world economy – a timely move, so India could use the past to become self sufficient in both guns and butter.
INDIAN CHEMICAL INDUSTRY
OVERVIEW

India historically been an agricultural country focused on feeding its masses simultaneously fighting wars with the unfriendly neighbors. A major portion of India’s chemical industry was oriented towards fertilizers and dyes stuffs.

With no abundant sources of naphtha and natural gas the industry was always planned and controlled by the government to assure equal distribution to benefits to everyone alike (like any democratic government should).

Nationalized Indian petrochemicals were operated to provide low cost kerosene to general people, taxing gasoline and other plastics as a luxury items. Most of the petrochemicals were under heavy tariffs to encourage domestic developments.

MODERNIZATION

With the 1990s economic reforms India could freely enter most of the petrochemicals with gradual reductions in the tariffs. Petrochemicals were removed from the list of industries reserved for the public sector.

Several 100% Foreign Direct Investment is currently permitted with profits and dividends that can be repatriated. Special economic zones are set up for export oriented units and industrial parks. All these issues are India’s way of spreading a red carpet for foreign direct investment into Indian petrochemicals and plastics.

Most of the cracker capacity in India is equally distributed between ethane and naphtha. India is currently a net exporter of naphtha after naphtha was deregulated in 1998. Even today, nearly 31% of the naphtha is used for producing fertilizers to support the agricultural needs.

Exhibit 2 presents the locations of the new refineries and new exploration sites in India.

Exhibit 3 presents the locations of Indian petrochemical complexes.

The new developments in the gas explorations and the natural gas prices at $4/MMBTU are competitive with US, but are still higher than Middle East prices (at least until 2012 – when Middle East is expected to reach parity with the rest of the World). Thus the feedstock prices are advantageous for local producers, but not for outsiders.
The states of Maharashtra (Bombay) and Gujarat (home of Reliance) have always been in the forefront of chemical industry in India and remain so.

**INDIAN PETROCHEMICALS AND PLASTICS (CRACKER PLUS 2/3) STATUS**

There have been very few changes in the Indian petrochemicals and plastics in the last two decades. But, the few changes that did take place had a Global impact on the petrochemicals and plastics industry.

Historically, Indian cracker plus 2/3 industry has been owned and operated by public sector units – IPCL (Indian Petrochemicals Ltd); GAIL (Gas Authority of India Ltd. ); NOCIL (National Organic Chemicals India Ltd). These organizations still account for major portion of the petrochemicals today including the planned operations of ONGC (Oil and Gas Commission of India).

The two significant privately held organizations that had a major impact on the Indian petrochemicals scenery include: (1) Haldia Petrochemicals and (2) Reliance. Together, Haldia and Reliance account for 86% of ethylene and 87% of the propylene making the private sector’s domination of the petrochemicals.

Nearly 100% of the polyolefins and 65% of the PVC are owned by the integrated players with no significant non-integrated players in India – limiting the options for participation in Indian cracker plus 2/3 participation options.

Haldia Petrochemicals today accounts for approximately 18% of the ethylene and 14% of the propylene capacity in India. Reliance Industries on the other hand accounts for approximately 68% of the ethylene capacity and 73% of the propylene capacity in India. Thus demonstrating an undeniable domination of Reliance Industries on the Indian petrochemical scenery.

**Reliance Industries Ltd.**

Reliance Industries is the largest private sector organization in India (2.8% of India’s GDP). Reliance’s exceptionally Backward vertical integration strategy helped it achieve such a phenomenal growth.

Unlike most petrochemical and plastics organizations in the world, Reliance started its growth strategy from its textile and polyester operations and vertically integrated backwards into crackers for their EG production then moved into polyolefins and plastics - an unique/exceptional strategy in the world.

Because of complete understanding of the consumer and markets and supply chains, they have accomplished the feet of being among the top ten global players (in all of their core businesses)

Reliance is the largest player in the Indian petrochemical industry - (acquired assets of NOCIL and IPCL, previously Govt. operations). It is a common occurrence in India for the government operated industrial organizations to be declared economically sick and sold to private firms at bargain prices both at state and central government levels.

Reliance is based in Western India (Maharashtra & Gujarat). Reliance is soon to start up the world’s largest refinery Increasing global presence – plus Indian domination. With oil/gas energy operations and expansions into downstream markets including communications, groceries, beauty salons, and vegetables Reliance has its hands on the pulse of India,

The major strategic advantages of Reliance including - Access to capital, low-cost labor; supply chain synergies – history of all or
nothing., have made them a household name in India and worldwide.

Gas Authority of India Ltd (GAIL)

GAIL is India’s public sector flagship natural gas company. It entered the petrochemicals sector in 1999 extending its operations from gas processing and supply. GAIL caters to about a fifth of polymers demand in India – mainly focused on HDPE/LLDPE.

Located in North India, GAIL has plans for 1000, 280 and 400 KTPY petrochemical complexes (in Andhra Pradesh, Assam and Kerala). GAIL is undertaking feasibility studies for a 3000 KTPY plant in IRAN.

When all the plans come to fruition, GAIL will be a major contributor to Indian plastics.

Haldia Petrochemicals Limited

Haldia was jointly promoted by West Bengal Industrial Development Corporation, The Chatterjee Petrochem (Mauritius) Co. Ltd. and the Tata Group. Located in Eastern India (West Bengal), is currently the second largest private enterprise with a capacity of 520 KTPY of polyolefins. Haldia is essentially a small cash strapped regional player with little/no Global impact

Oil & Natural Gas Commission (ONGC) and IOC

Both are public sector organizations in the energy sectors and are newcomers to the petrochemicals sectors with announced future plans for the participation.

With the exception of these top players, the Indian chemical industry dominated by smaller regional players in the downstream operations.

Comparison of China versus India

A comparison of India and China (Exhibit 4) is a valuable from the viewpoints of understanding the future competitiveness of India and also fine tuning the participation options.

Indian economy buoyed by the developments in information technology is oriented towards service and knowledge economies with great consumption opportunities. India has never been a manufacturing economy and compared to other Global options offer few advantages.

China on the other had is heavy manufacturing oriented economy with labor, infrastructure oriented economy in addition to domestic consumption of cracker plus 2.

As illustrated in the exhibit, Indian industry’s downstream processing industry (or lack of it) will be the major bottle-neck for the foreseeable future.

Indian downstream processing industry was positioned to be a small scale sector by the Indian Government to encourage poorer populations. The industry is currently facing an uphill task to change the prior position and move to large scale industry.
One major converter coming into India can/will disrupt the industry and political situation for ever – move that requires nimble strategy.

**INDIAN PETROCHEMICALS AS A PART OF GROWING REGIONS**

The Global developments in the petrochemicals can be summarized as follows:

1. **Movement of commodity chemicals and plastics** to regions that have a real/apparent feedstock advantage
2. **Organizations becoming global** with emphasis on service/value added petrochemicals in the current regions with low GDP growth
3. **Global organizations planning to develop asset light strategies** and shift the production to low cost/low labor regions of the world.
4. **Focus on growth regions in the order of priority**: China, India, Middle East, Sub Saharan Africa and South America

These strategies in general represent the appropriate generalizations for Global players to pursue.

This will result in:

1. Increased emphasis on consumption in the developing nations
2. A new and renewed Global race for specialty value added petrochemicals products
3. Increased emphasis on R&D and innovation using the knowledge advantaged Nations

India fits very well into these strategies.

**What can India Offer?**

1. Indian offers the growing consumer markets – unparalleled in the Global growth
2. India offers Knowledge based advantages with the higher education with technical emphasis
3. Proximity to low cost feedstocks in middle east and China (assuming oil, natural gas and coal will remain the leading energy drivers)

Indian cracker plus 2/3 option is complicated with regional issues;

The current situation in India provides lower feedstock advantage for locals only, thus, making competition for outsiders tough. India can/will be an excellent addition to the regional strategy of production focused in the Middle East and Africa, with its knowledge based industry.

The major viable options for Global petrochemical organizations in India's prosperity include:

**Option - 1**
Participate with Cracker plus 2/3

**Option - 2**
Participate with cracker plus 2/3 as a part of Middle East/Africa Strategy

**Option - 3**
Participate as a supplier of feedstock (e.g., Gas)

**Option – 4**
Participate to develop service/innovation for future growth - noting Innovation is not R&D, Innovation is beyond R&D

The specific strategy for the organization will depend upon the individual situation. However here are the caveats to watch in each situation.

**Options 1 and 2 - Participate in Cracker plus 2/3**

As indicated in the diagram, cracker plus 2/3 is complicated and crowded. With so many new announcements from Reliance
and the public sector organizations, who have an advantaged feedstock position in India, participation as an outsider will be more complicated.

The choices will whittle down to: (1) with Reliance or without Reliance; (2) With public sector organization and/or (3) with another major multinational or alone.

Each of these strategies come with their own limitations. Reliance has never had a successful multinational joint venture in petrochemicals and plastics, in spite of all the discussions. Reliance always maintained all or nothing attitude in all of their operations. A jv strategy, though possible, will require additional analysis. Participating without Reliance in India will be an uphill task because of their superior positioning and downstream supply chain position.

Most of the public sector organizations just announced new capacities and are in initial stages. However, if IPCL is an example of the future to come, the future is non-specific. Again, competing against Reliance will be an uphill task with or without public sector cooperation.

Participating alone and/or with another multinational corporation will be tough because of no feedstock advantage and potential compaction with public sector/Reliance alone and/or together.

**Option 3 - Participate as a supplier of feedstock (e.g., Gas)**

The current situation of feedstock supply, especially for gas and/or naphtha will be advantageous, especially if done in combination with Middle East sources. The oil and gas exploration activity in India, especially by Reliance and other new comers will be formidable competition to watch.

---

**Option 4 - Participate to develop service/innovation for future growth**

One of the specific strategies now being followed by several multinational petrochemical organizations, albeit a successful one.

It is important to differentiate the R&D into several parts: (1) Technical services, (2) Product development specific to customers, (3) Product development for long term product offering, (4) basic R&D and (5) Innovation. Each of these functions have specific requirements that may or may not match what India has to offer.

A careful selection of specific strategy will help the organizations help in a long term. Chemical Market Resources can assist the organizations in accomplishing and achieving their goals.

*Please call 281-557-3320 for more information.*