



INDIA: MAKING THE MOST OF LOW OIL PRICES

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Since the start of 2016 global financial markets have weakened, shaken by concerns over the slowing growth of the Chinese economy, persistently low oil prices and capital flight caused by currencies devaluing against a strong US dollar. Natural resource economies have slumped as Chinese demand for metals and fuels is slowing. Many oil exporting countries, including most OPEC countries, have slipped into recession. Rising interest rates in the US have pulled capital out of developing markets as investors and speculators seek a safer return on capital in US markets. This also places pressure on countries with dollar-denominated debt. Against this backdrop of growing concern over the soundness of the global economy, India stands out as a bright spot for global growth. Alone among the so-called BRIC countries, India is experiencing a robust upturn in economic activity.



China's growth has slowed from the white-hot pace of the last decade, with growth forecast around 6.5 – 7.0 percent in 2016 and actual growth possibly half this much. As the Chinese economy deals with overcapacity and transitions from manufacturing and exporting to a consuming stance, its rate of growth is believed to have peaked for the medium term. Russia and Brazil are both in strong recession, with Russia nearly totally dependent on oil exports for foreign currency earnings and Brazil suffering from economic mismanagement, political uncertainty and a financial scandal that has rocked its national oil company, Petrobras. Growth in Brazil's upstream oil industry – a key driver of the industrial economy – has been curtailed by high costs and low prices.

In fact, the BRIC economies were never truly aligned, and today's market climate highlights the different trajectories of these four massive developing economies. But India, which is a net importer of oil and other fuels, has seen a clear benefit to the low price environment and little impact to the downside. Oil imports of nearly 4 million bpd have dropped in price by \$70/bbl, resulting in a cost savings of around \$100 billion per year. Structural reforms being slowly implemented by the pro-business Modi government are starting to drive new economic activity (though political hurdles remain), while foreign direct investment in India has been rising, leading the global league table in 1H15 according to the Financial Times, in spite of the weakening rupee and continued restrictions on foreign ownership in some key industries. The government is working to unlock a backlog of hundreds of desperately needed major infrastructure schemes. The net result of all of these changes is an Indian economy bootstrapping itself into an era of more robust economic growth, which is resulting in stronger demand for energy, steel and other infrastructure inputs such as cement and petrochemicals.

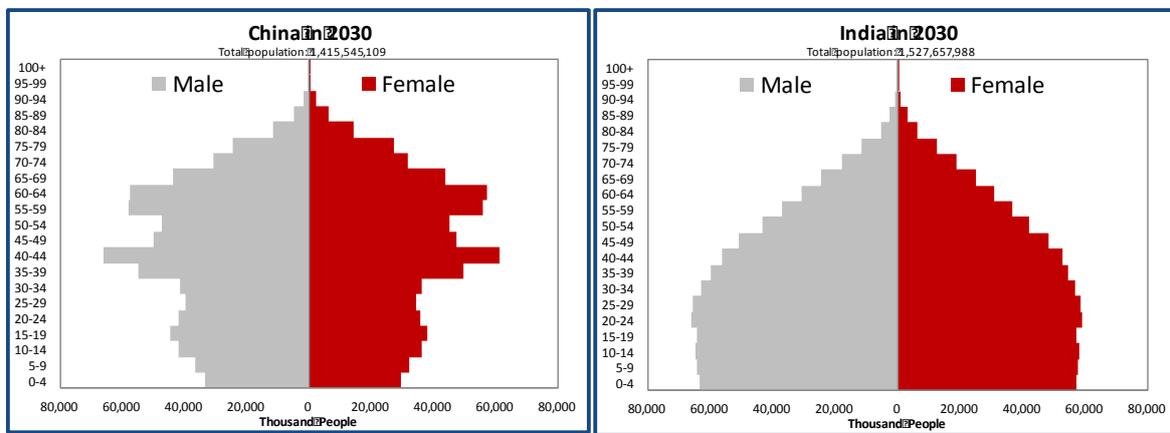


Low oil prices have proven a key boost to the Indian economy. Low pump prices have proven a spur to domestic transport fuel demand, which has seen demand both for gasoline and diesel surge over recent years. An economy that used to grow modestly without much boost in demand for hydrocarbons is seeing a transformation as India’s consumption is rising quickly, fuelled by consumer and industrial spending. Car sales are at a record level in India, with the roads growing increasingly crowded with larger and more modern vehicles. These are signals of a surge in economic activity, though they do have a downside in perennial traffic jams and the world’s top four most polluted cities.¹

Future Growth Beckons

Similarities between India and China often prompt comment about why India’s economic growth and energy demand do not mirror China’s. With similar population levels (China 1.37 billion; India 1.31 billion people at 2015), China’s oil demand is more than three times greater than India’s. The greater level of economic activity and energy demand growth in China is often attributed to its more planned industrial economy, versus India’s “messy democracy”. But demographics are also important. China’s population is older, and is expected to peak before 2030 at just over 1.4 billion people, while India’s population is remarkably young and is expected to continue to grow for at least the next 50 years. By 2050, India’s population will increase by an additional 400 million people.

Demographic Differences in Chinese and Indian Population at 2030



India’s youthful population will grow up and grow wealthier during this period, with the driving-age population expected to increase by 200 million people between now and 2030. Seeking better opportunities, these people will also increasingly concentrate in cities. India’s population urbanisation will accelerate through this period, with up to 250 million more people expected to move to cities between 2010-2030 according to a World Bank study².

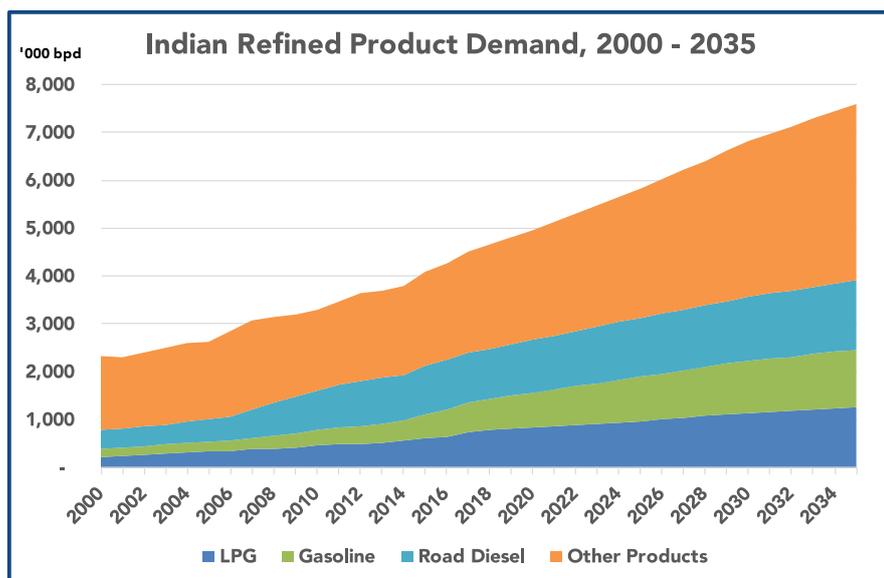
These forces cannot be ignored. India’s economy must respond with infrastructure, transport links and job creation. All of this will lead to energy demand growth for power, for heavy industry and for private and public transportation. India’s government and industry will need to invest to support growth and opportunity for this burgeoning population. India’s energy needs will continue to grow. Providing for these needs domestically is a huge opportunity for economic development and job creation.

Oil Demand Will Nearly Double by 2035

India’s oil demand touched 4 million bpd for the first time in 2015. Demand was driven upward by a weak monsoon and strong gasoline demand as new private car sales exceeded 2 million units for the first time in history. Steady demand for these key products and surging demand for petrochemicals are set to drive India’s demand to nearly 8 million bpd by 2035 in spite of energy efficiency improvements.

¹ A World Health Organization (WHO) study published in February 2016 noted that India has the world’s four most polluted cities – Delhi, Patna, Gwalior and Raipur – with three Pakistani cities in fifth to seventh position.

² <http://www.worldbank.org/en/news/feature/2013/10/21/india-urbanisation-report-beyond-sustainable-cities>



Over the past 20 years, Indian refiners have invested in capacity at a rate that outpaced oil demand growth. This export hub strategy has left India with a refined product surplus for all products except LPG and some speciality products. Going forward, this gap will close as demand increases faster than firm planned refining capacity, squeezing export volumes, especially during times of seasonal demand strength. New capacity plans by both public sector undertakings (PSUs) and private refiners will be needed to keep pace with India's demand growth. The timing and location of these expansions will be dependent on the pace of economic development, population dynamics and corporate strategy.

Challenges for the Oil & Gas Industry

As India's economy shifts into high gear, its energy sector will face calls to modernise and become more efficient and competitive.

Downstream, India's refining industry needs to respond to domestic demand and environmental pressures, the global requirements to cap carbon emissions, and an increasingly competitive market East of Suez. India's investment climate has seen its refining industry expand to serve as a regional hub for exports. This pro-growth stance has seen India thrive where others in the region have failed even to get started, but it will need to continually reinvent itself to maintain its competitive advantage in the Asia-Pacific market.

The state-owned refining system will need to up its game, improving yield, margins and energy efficiency and reducing pollution emissions. Margins in the public sector have been low - constrained by a lack of capital investment and a lack of alignment of operational and financial performance. Capital and operating efficiencies will be needed to transform PSUs into efficient and fit-for-purpose modern companies poised to compete in a growing and thriving Indian economy. Competition for talent with the expanding private sector and overseas employment will challenge organisational stability and force reforms in workforce development, retention and rewards.

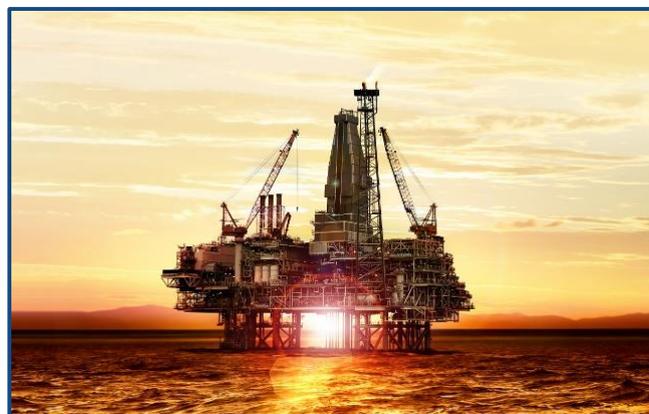
India's private-sector refineries are highly competitive – built with scale, run efficiently and with India's low cost base, they have proven resilient and have especially benefitted from the recent era of higher refining margins caused by strong demand for gasoline. They still face the challenge of debt service and the inevitable return to a more normal margin environment that will trim free cash flow from regular operations. These companies need to design sustainable competitive advantage into their work processes today to ensure they can compete against the continuing wave of export-oriented refineries in the Middle East and a rising tide of Chinese surplus product exports from teapot and coastal export refineries.

Considering future oil demand growth, both private-sector companies and PSUs can look to increase the range of **joint venture partnerships with overseas companies** to expand the refining base. Tying up with crude oil suppliers in the Middle East and Russia could offer attractive value chain synergies that guarantee an export market for crude oil and rising product availability. Joint venture ownership can also extend to India's retail sector, a valuable prize for a country with a growing private transportation market. The opening of India's energy sector to foreign investment and privatisation could free up domestic resources for infrastructure expansion and other national priorities.



Cleaner fuels are propagating throughout the Indian countryside, with many cities currently at the BS-IV level and the countryside expected to follow by 2017. This still requires the implementation of considerable capital investment, which poses a resource challenge for the state sector in particular. While BS-IV will be a massive improvement for India's air quality, a further adjustment to ultra-low sulphur levels (BS-V or BS-VI) will require further investment both from the automotive and refining sectors.

India's upstream will have to compete against cheap and abundant imports of crude oil from the Middle East and increasingly from markets further afield including Russia and Latin America. The Indian government's taxation policy is proving a hindrance to upstream activity. Set at a time of high oil prices, the tax on domestic oil production exceeds the value of the oil, rendering upstream activities uneconomic. A switch to an ad valorem taxation basis would ensure a more sustainable approach to upstream profitability. Planned import duties on crude oil will boost government income, though may have a negative impact on refining margins relative to product imports.



The government is expected to address taxation distortions in the current budget, which should restore some viability to upstream activity, though the government needs to remain responsive, offering a level of taxation on both oil and gas exploration that maintains the profitability of domestic production. Without sufficient incentive, India's upstream will stagnate, leaving the country unable to exploit its hydrocarbon resources and thus more dependent on imports as its economy continues to grow.

As demand grows, guaranteeing supply security will become a higher priority, as can be seen in China over the past decade. Lower crude oil prices create opportunities for **innovative import strategies**. An oversupplied market gives buyers leverage to establish term supply arrangements that could baseload refinery imports. Group purchasing arrangements such as that indicated recently by IOC give buyers leverage with large Middle Eastern suppliers. By expanding the list of term suppliers to include African and Latin American producers, India can play the field, securing competitive pricing for its growing crude oil imports.

The government is considering the **expansion of India's strategic storage assets** in 2016, though this will only give India about a 10-day buffer against supply disruption, compared with a more typical level of 90 days of import requirements. With a refinery surplus at present, it makes sense for India to hold its strategic reserves as crude oil rather than products. An acceleration of construction of strategic storage assets near to the country's refineries would make sense – in real terms, oil prices are very unlikely to be available cheaper than they are in 2016. Strategic storage is an area where effective public-private infrastructure partnerships could play a larger role.

The petrochemicals sector will continue to grow domestically, though it will face competition from imports – especially from low-cost producers in the Middle East. With China increasingly looking to meet its own petrochemical demand, competition for market share between Asian and Middle Eastern producers is certain to drive keen competition in East of Suez markets for both aromatics and olefins. Petrochemicals are likely to remain in oversupply as far out as 2025 if China realises the expansion envisioned in its 13th Five Year Plan.

India's commitments to the UN climate change convention – COP21 – in Paris, in November 2015 will result in a reduction in the energy intensity of India's economy relative to 2005 levels by up to 33 percent by 2030. This target leaves room for India's economy to continue to grow, while aiming to reduce the per-unit amount of energy required to drive that growth. This will require an efficiency drive and also can help to support faster development of a renewable fuels industry. To date, India has not been able to grow its biofuels industry as fast as it would like. This is a challenge to 2030 and beyond.



Much of **India's growing electricity demand** is currently being met by dirty coal imports from its Asia-Pacific neighbours and South Africa. This will have to change in order for India to stabilise its carbon emissions. A transformation toward natural gas and renewables can help to transform India's industrial economy, though the government needs to ensure sufficient investment incentives are available to foster the development of new industry. In the meantime, domestic coal resources are expected to expand to meet rising demand, though coal for power cannot be seen as a sustainable longer-term trend given the additional CO₂ emissions from coal compared with natural gas and renewables. Without question, India's electricity demand is set to soar as urbanisation continues.

Responding to Key Challenges

How can India navigate this complex landscape – modernising its existing operations, investing for sustainable commercial growth and cleaning up its environment.

First, Indian companies need to ensure their existing facilities are operating with best practices. Many companies purport to have a culture of constant improvement, but to ensure this is really the case they need to constantly look at their operations with a view to eliminating gaps. The first step to developing such a culture is to accept that it is not achieving best practice today and to design an organisation from the ground up – from its 'DNA' – to evolve for continuous improvement.

An **Operational Excellence programme (OpX)** can be implemented – starting with a gap analysis to explore where the organisation is not doing as well as it could. This requires an openness to change and a critical assessment of the real state of an organisation's capacities. Organisations that set targets without aligning, redefining and optimising their own cultures are never going to achieve all of their targets – realised benefits cannot be sustained unless the culture is designed to value and constantly strive for improvements. This culture needs to be developed from the ground up – through operations and maintenance and right through the layers of management to the top – to deliver a production-centred company with a clear focus on availability and profitability. Top-down approaches almost always fail because they fail to concentrate on implementation at a grass-roots level.



Profitability Improvement is about examining an organisation's operations and realising benefits by improving planning objectives, making changes to operating targets and introducing and implementing best practices. Actual performance can be benchmarked against market and peer group financial performance, with gross and net margin targets.

To continue to grow both sustainably and efficiently, a **Capital Excellence (CapX)** strategy should be developed. Capital excellence is about value chain optimisation – making sure the right assets are built in the right places, ensuring they are designed with the future in mind and implemented with the best project management practices. Over the past decade, many

Indian refiners have announced expansion plans, yet many of these projects remain on the drawing board. Too many projects in India today are realised with significant delays – this leads to cost overruns and debt service inefficiency. Other projects have been undertaken without a firm grounding in necessity or market realities, which can result in spending 'regret capital' and leaving stranded assets. A well designed and implemented CapX programme will address these challenges and lead to improved efficiencies that benefit the entire economy.

As economies grow and wages rise, it is no longer practical or affordable to maintain bloated and inefficient organisation structures, but it is sometimes difficult to reform and redesign organisations where this has been the historical experience. Institutional inertia makes it difficult to change 'the way we've always done things' despite the best intentions of management.



WHITE PAPER

March 2016

A **Human Performance Improvement (HPI) programme** develops *and implements* a complete overhaul of an organisation from the grass roots up. Job functions are assessed and descriptions created which align performance to the organisation's objectives – profitability, availability, sustainability. Training in the re-structuring is implemented at all levels of the organisation. Such a programme can only be successful if it is owned and valued by the workforce. Seeing the organisation succeed and improve; making the jobs more value-added and interesting; defining better career trajectories and opportunities for personal growth and development – an HPI programme is about transforming the organisation of today into one that it fit for purpose tomorrow.

By incorporating these approaches – organisation design (HPI), best-in-class operating performance (OpX) and optimal value-chain integration (CapX), India's energy companies can reposition themselves to rise to the challenges of tomorrow – of eliminating practices that are wasteful of money, manpower and energy; of optimising yields of the highest-value products; and of expanding its asset base in line with India's future growth. The billions of dollars freed up by the current low price environment provide an excellent opportunity to invest in the transformation of India's energy sector. Lower prices are likely to persist at least to 2020. Indian companies should take full advantage of this opportunity.

About KBC

KBC Advanced Technologies is a leading consultancy and software provider to the global hydrocarbon processing industry. With over 30 years of experience, KBC combines industry leading technology with experienced engineers and operations personnel using robust methodologies to create personalised, sustainable solutions for its clients.

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