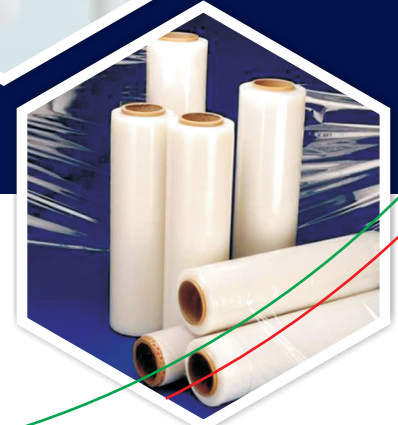




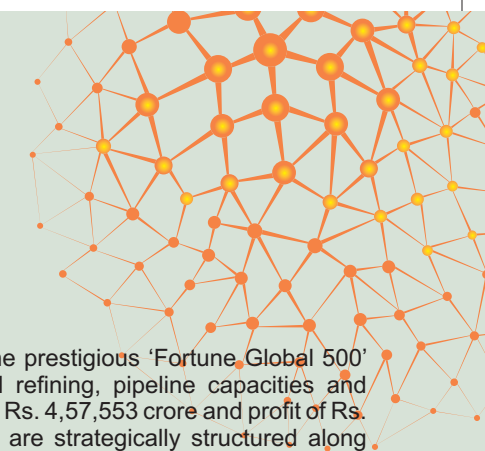
innovating solutions



# PETROCHEMICALS







# About



## IndianOil - The Energy of India

IndianOil is the highest ranked (96th) Indian corporate in the prestigious 'Fortune Global 500' listing in the year 2014. With dominant share of national refining, pipeline capacities and petroleum products' marketing, IndianOil recorded a turnover Rs. 4,57,553 crore and profit of Rs. 7,019 crore for the year 2013-14. At IndianOil, operations are strategically structured along business verticals - Refineries, Pipelines, Marketing, R&D Centre and Business Development – E&P, Petrochemicals, Marketing of fuels and Natural Gas. To achieve the next level of growth, IndianOil is currently forging ahead on a well laid-out road map through vertical integration - upstream into oil exploration & production (E&P) and downstream into petrochemicals – and diversification into natural gas marketing and alternative energy, besides globalisation of its downstream operations. Having set up subsidiaries in Sri Lanka, Mauritius and the United Arab Emirates (UAE), IndianOil is simultaneously scouting for new business opportunities in the energy markets of Asia and Africa.

### India's Downstream Major

IndianOil is the 'Leading Refiner' in the country, achieving a combined crude oil throughput of 53.13 million tonnes during the year. The refineries achieved the combined distillate yield of 78.1 wt% during the year and also recorded the lowest ever specific energy consumption of 55.8 MBN\*(MBTU/BBL/NRGF) and registered a gross refining margin of \$ 4.24/bbl during the year.

[\*MBN–Thousand British Thermal Unit / Barrel / Energy Factor (MBTU/BBL/NRGF)]

Nine new crude oil grades (including high-TAN crudes such as Marlim and Dalia) were processed by the Corporation's refineries for the first time during 2013-14. 26 new crudes were introduced during the year which widened the crude basket to 168 for de-risking supply sources and to improve the margins. Global benchmarking study was undertaken through Solomon Associates to enhance operational efficiency. The 15 MMTPA state-of-the-art Paradip Refinery is nearing completion and would be commissioned in phases from March 2015 onwards. IndianOil owns and operates around 11,214 Kms of crude oil, product and gas pipelines. The pipelines network achieved a throughput of 73.07 million tonnes in 2013-14.

With a market share of 47.1%, IndianOil has maintained its leadership position for the year 2013-14 with domestic sales of 67.14 million tonnes of petroleum products. To keep pace with the high growth in the retail business, IndianOil has further fortified its presence in retail segment with commissioning of 1,717 retail outlets, including 764 Kisan Seva Kendra Outlets, raising total number of Retail Outlets to 23,993. IndianOil KSK bouquet includes a network of over 6000 outlets. In the LPG segment, IndianOil increased its market share during the year and released a record number of new connections, besides augmenting its bottling and storage capacities and expanding its distributorship network, especially in the rural areas. New initiatives, such as portability of LPG connections within and across companies, and sale of 5-kg free-trade LPG cylinders through select ROs and kirana stores were also launched to enhance product availability and customer convenience. IndianOil's Aviation Service maintained its leadership position during the year by improving its market share to an all-time high of 64.5 per cent. SERVO brand remains the market leader in the domestic Lubes market.

### World Class R&D centre

IndianOil's state-of-the-art R&D Centre at Faridabad is a pioneer in the development of lubricant formulations, refinery processes, pipeline transportation technologies and alternative fuels. The Centre expanded the OEM approval base of SERVO lubricants with the development of new formulations of low-viscosity and energy-efficient lubricants. The IndMax technology developed by the Centre is being actively considered by refineries of other Oil Companies besides the 4.17 million tonnes per annum IndMax unit at your Corporation's Paradip Refinery. The R&D Centre has developed a process "OCTAMAX" for upgradation of C4 hydrocarbons from refinery LPG stream to high-octane gasoline blending stock. Initiatives are being taken for setting up of an IndianOil Centre for Renewable Energy (i-CARE) at Manesar. The Centre will focus upon gasification technology, solar, thermal, hydrogen including fuel cells and Bio-energy. With 292 patents to its credit, more than half of them registered overseas, including the US, the Centre aspires to emerge as a world-class technology solutions provider in the petroleum sector.

### Widening Horizons

IndianOil has a portfolio of 3 Producing blocks and 20 exploratory blocks. In Petrochemicals, IndianOil offers a full slate of products including Linear Alkyl Benzene (LAB), Purified Terephthalic Acid (PTA) and an extensive range of polymers.

IndianOil has signed Heads of Agreement with TIDCO and DPCL for LNG plants at Ennore and Dhamra respectively. The Company has also joined the consortium of GSPL, BPCL and HPCL to build three cross country gas pipelines which will have a combined length of 4,150 kms and an initial gross capacity of 96 MMSCMD.

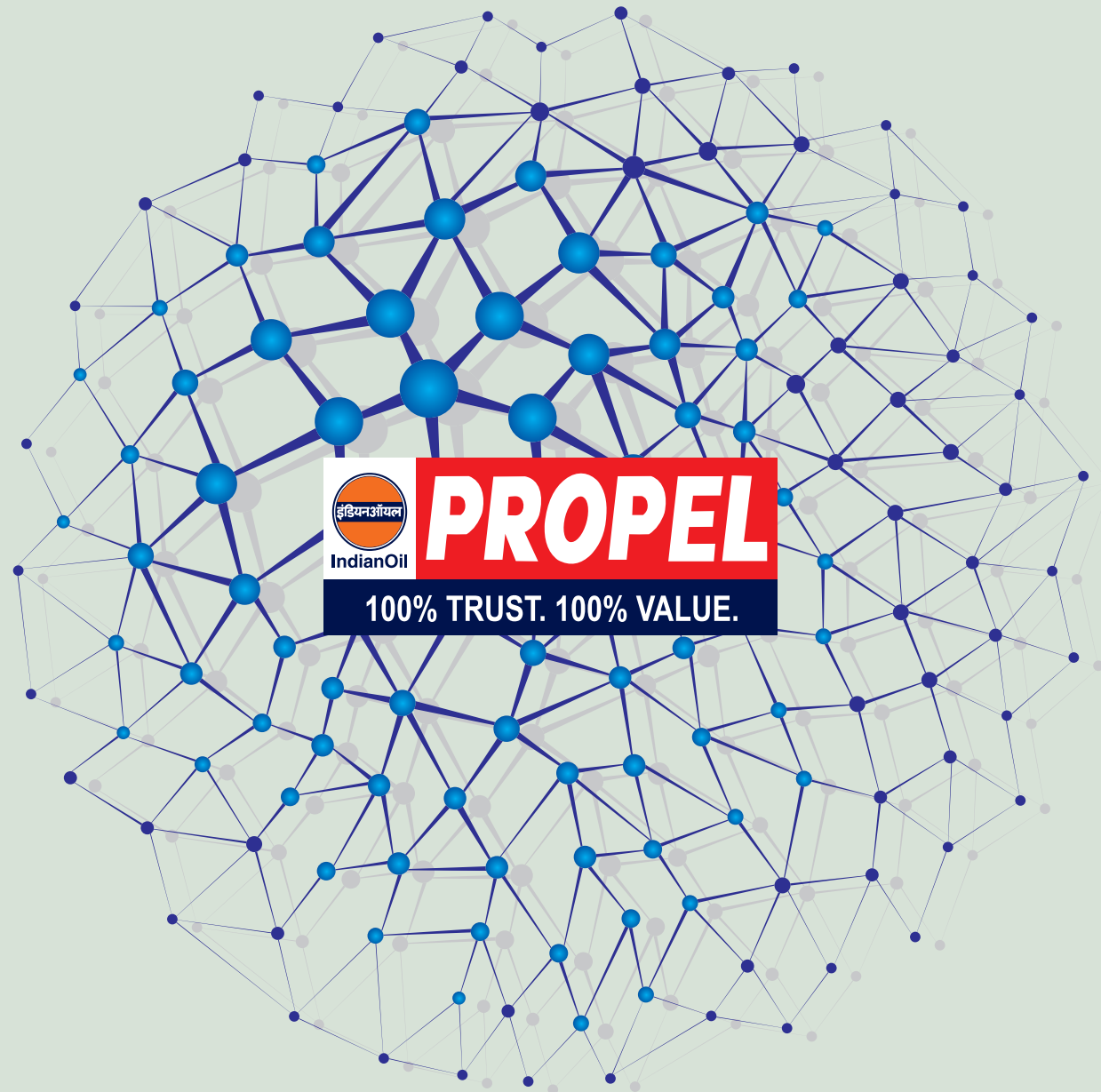
Apart from diversifying into solar and wind power streams, IndianOil has also forayed into Nuclear power and has formed a JV, NINECL (NPCL-IndianOil Nuclear Power corporation of India) to set up 2x700 MW Nuclear Power Plant at RAWATBHATA, Rajasthan.

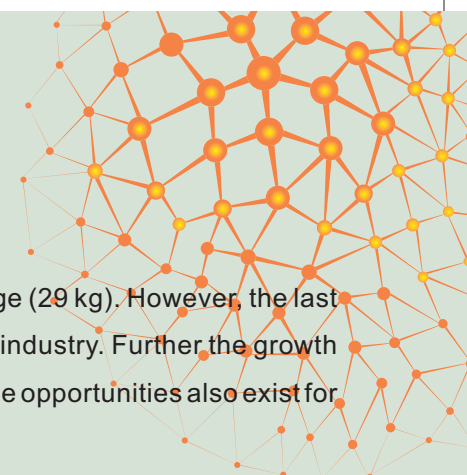
### Serving the Core ... and more....

IndianOil spends upto 2% of its retained profit of the previous year on CSR activities through a multi faceted approach. In the past five decades, IndianOil has supported several social and community initiatives in India ranging from environmental and healthcare projects to social, cultural and educational programmes.

The IndianOil Scholarship programme provides scholarships to 2600 bright students selected on a 'merit-cum-means' basis. For promotion of sports and games, IndianOil provides scholarships to 150 promising sports persons.

IndianOil has launched its Rural Mobile Healthcare scheme, Sachal Swasthya Sewa, in association with Wockhardt Foundation in Andhra Pradesh and Uttar Pradesh. The health scheme is centred around Kisan Sewa Kendra and provides free primary healthcare to residents.





## PETROCHEMICALS

The per capita consumption of plastics in India~(7 kg) is far below the world's average (29 kg). However, the last two decades have seen an average growth of 13-15% in the Indian petrochemicals industry. Further the growth momentum is expected to be sustained, offering large potential for the future. Sizeable opportunities also exist for the export of petrochemicals in the Asian region.

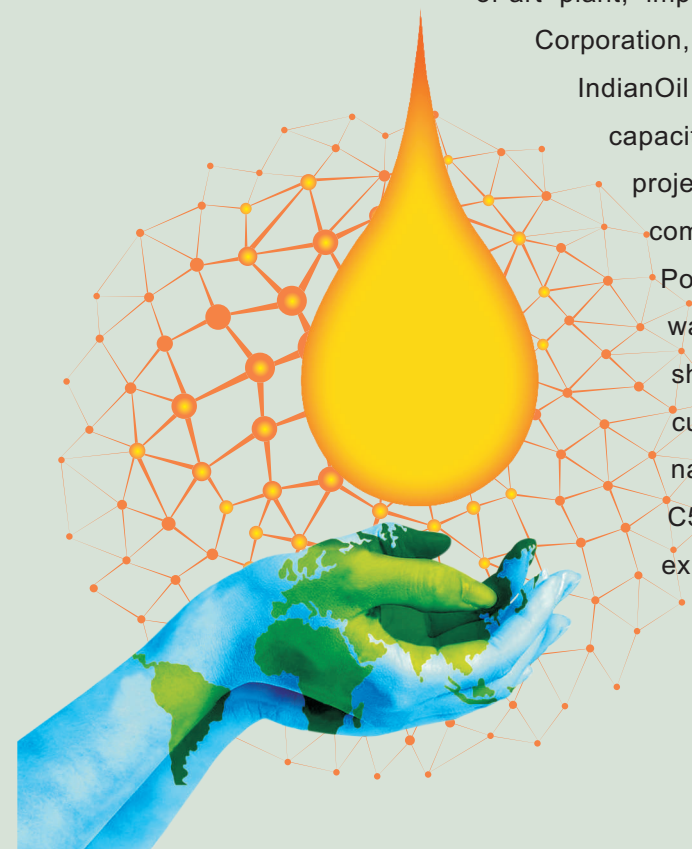
IndianOil's Petrochemicals plan has steadily taken shape, both in terms of creation of infrastructure and marketing. IndianOil has implemented Petrochemical projects worth around Rs. 20,500 Crore up to 2013-14. Further plans are on the anvil for various petrochemicals projects worth approx. Rs. 34,000 Crore to be launched by 2021-22.

The world's largest single train Linear Alkyl Benzene (LAB) Plant at Gujarat Refinery was commissioned in Aug' 2004. The plant is based on the latest UOP DETAL technology with a designed capacity of 120 TMT per annum. The fully integrated Paraxylene and Purified Terephthalic Acid (PTA) plant was commissioned at Panipat Refinery in June' 2006: The PX plant of 360 TMT capacity is based on UOP technology & PTA plant of 553 TMT capacity is based on Invista technology.

The world-class Naphtha Cracker Complex at Panipat built in March 2010 is the largest operating Cracker in India, producing over 857 TMT of Ethylene and 650 TMT of Propylene. Downstream units comprise of Polypropylene plant with 2 lines of capacity 300 TMT each, producing Homo Polymers, Block Co-Polymers & Random Co-Polymers; Dedicated High Density Polyethylene (HDPE) plant of capacity 300 TMT; Swing plant for LLDPE/HDPE of capacity 350 TMT and Mono Ethylene Glycol plant of capacity 300 TMT.

Further, IndianOil has entered in elastomer segment in Naphtha 2013 with the commissioning of a world scale India's first SBR plant having capacity 120 KTA based on the Butadiene streams available from the Panipat Naphtha cracker complex (PNCC) at Panipat. As a linked project, 140 KTA Butadiene Extraction Unit (BDEU) has been also commissioned in Oct' 2013 within the PNCC. The SBR project is the first state-of-art plant, implemented in joint venture with TSRC, Taiwan and Marubeni Corporation, Japan, in the name of Indian Synthetic Rubber Limited (ISRL).

IndianOil is presently implementing a new Polypropylene plant of 680 KTA capacity at Paradip at an estimated investment of Rs. 3150 crore. The project is expected to be commissioned by Sept' 2017. With the commissioning of PP unit, opportunities unfold for developing Polypropylene based downstream industry namely furniture, House wares, flexible packaging, bags for packaging cement & fertilizers, shopping bags, medical disposables, textile packaging, disposable cups etc. in Odisha. Further, feasibility study of various projects namely ethylene glycol at Paradip, Oxo/AA project at Gujarat, C4 & C5 derivatives at Panipat etc. are being evaluated to add value in the existing streams.




# DELIVERING EXCELLENCE, PROPELLING INDIA'S PROGRESS



## PRESENTING PROPEL

With the Indian economy poised to grow by around 9% over the long term, there will be an overwhelming demand for petrochemical products, which are the building blocks of our economy, which IndianOil is proud to present under the brand PROPEL, a range of petrochemical products to cater to applications ranging from packaging to agriculture and healthcare.

While substantial investments in state-of-the-art facilities will bring you the entire range of products, a separate Strategic Business Unit with a robust logistics model will cater to your needs across the length and breadth of the country. Furthermore, our Technical Services will help you resolve issues and provide support in the usage of newer product grades and in exploring new applications.

### PROPEL from IndianOil - Ready to fast forward a nation that's already surging ahead

Under the umbrella brand PROPEL, IndianOil offers a full range of products covering all segments of petrochemicals viz. Linear Alkyl Benzene (LAB), Purified Terephthalic Acid (PTA), Paraxylene (PX), Mono Ethylene Glycol (MEG), Polypropylene (PP), Linear Low Density Polyethylene (LLDPE), High Density Polyethylene (HDPE) etc.

The brand name PROPEL implies propulsion or impetus with promise of growth to our customers' business. More than just a word, it imbibes the commitment that IndianOil puts into this business.

The brand name PROPEL denotes 100% trust and 100% value.

## MEGA PROJECTS, MEGA PLANTS

### Building Blocks for the Polyester Industry

Designed to mark IndianOil's first major step towards forward integration in the hydrocarbon value chain, the most technologically advanced PX/PTA (Paraxylene/Purified Terephthalic Acid) plant has been built at Panipat Refinery. It manufactures PX from captive Naphtha and converts it to PTA. The PX plant, designed by UOP, processes 500 KTA of heart-cut naphtha to produce about 360 KTA of PX. The Invista-designed PTA plant has a rated capacity of 553 KTA.

The fibre intermediate product PTA is the feedstock for a range of products like Polyester Staple Fibre (PSF), Polyester Filament Yarn (PFY), Partially Oriented Yarn (POY), Polyethylene Terephthalate (PET) chips, etc., PSF, PFY and POY find diverse applications in the manufacture of textiles, carpets and other products of household use. PET chips are widely used for conversion into PET bottles of varying shapes and colours. IndianOil's PTA is being successfully marketed to major customers in India, and is catalyzing the growth of the downstream industries.

### World-class Naphtha Cracker Complex

A world-class Naphtha Cracker and downstream polymer units have been set up at IndianOil's Panipat Refinery. The Naphtha Cracker Unit was commissioned on 11th March, 2010. This plant is designed to produce 857 KTA of Ethylene and 650 KTA of Propylene, using technology from ABB Lummus, USA.

Based on this mother unit, other downstream polymer units have been set up at Panipat Refinery to produce Linear Low Density Polyethylene, High Density Polyethylene, Polypropylene and Mono Ethylene Glycol (MEG). World class technologies - for that can produce products ranging from commodity to niche grades - are selected for Naphtha Cracker and Down Stream Polymer units.

## DOWNSTREAM UNITS

### Polypropylene

The Polypropylene (PP) plant has two trains of 300 KTA capacity each. The plant is capable of producing homo-polymers, block copolymers and random polymers, including ter-polymers, and is based on the renowned Spheripol-II Technology of LyondellBasell, Italy. The PP plant can produce grades having a broad range of MFI (0.3 to 100) with lower Oligomers and with superior Organoleptic properties. It can produce reactor grades with very high flexural modulus (exceeding 2000 MPa), controlled rheology grades, impact co-polymer grades with an optimum combination of easy processing, stiffness and impact properties.

PP is used for making flat tapes, woven sacks, fibrillated yarn and mono filaments for ropes and twines, strapping, tubular quenched and bi-axially oriented films, pipes and sheets, household items, products for medical and hospital use, blow-moulded bottles and moulded luggage, moulded Industrial products, including automotive components like bumpers, dashboards, doorframes, batteries, household furniture, non-woven fabrics, etc.

### High Density Polyethylene

The dedicated High Density Polyethylene (HDPE) plant, with a capacity of 300 KTA, is based on state-of-the-art low pressure STHD Slurry Process Technology (Hostalene) from LyondellBasell, Germany. It has two reactors in series to produce bi-modal Molecular Weight Distribution (MWD), which offers an excellent combination of mechanical properties and processability. It can produce grades with MFI range of 0.1 to 52, and a density range of 0.940 to 0.965, with the ability to produce pipe grades with PE-100 rating.

HDPE is used for making injection moulded caps, heavy duty crates, containers, bins, textile bobbins, household goods, luggage ware, storage bins, pressure pipes (for gas and water), high molecular weight films, woven sacks, small blow-moulded bottles, L-ring drums, jerry-cans, mono filaments, etc.



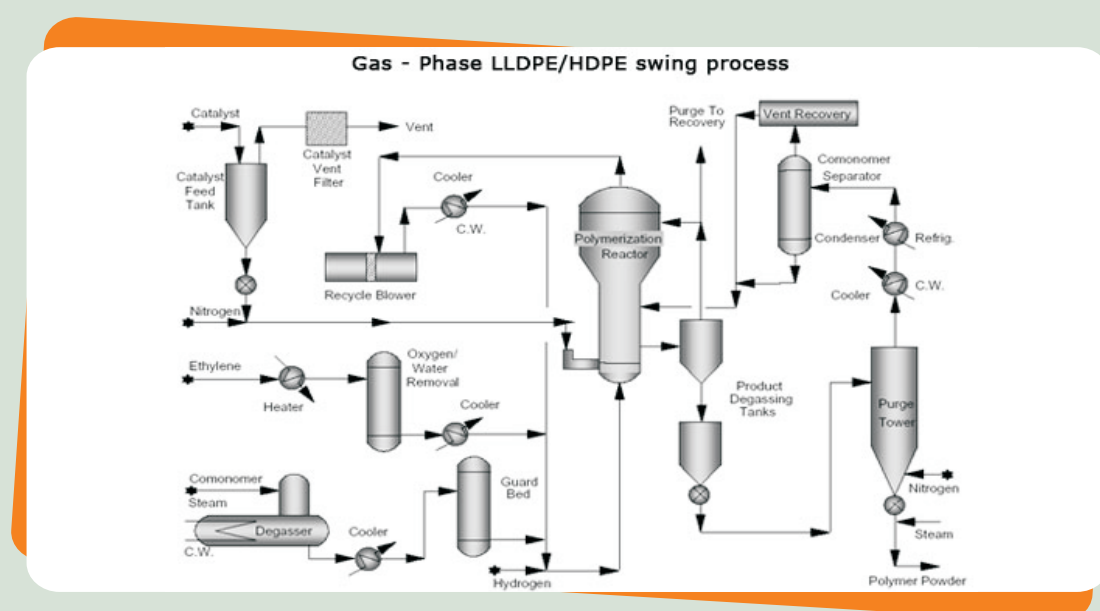
## DOWNSTREAM UNITS

### Swing Unit for LLDPE and HDPE

The Swing Polyethylene plant, with a capacity of 350 KTA, is based on the state-of-the-art solution process technology (Sclairtech) of Nova Chemicals, Canada. The plant has the capacity to produce both Linear Low Density Polyethylene (LLDPE) and HDPE.

This plant can produce grades with an MFI range of 0.3 to 55 and a density range of 0.917 to 0.965. It can produce various grades based on butene or octene as co-monomer with controlled MWD, gel free resins with excellent mechanical and sealing properties.

Apart from HDPE grades, the plant can produce LLDPE grades, which are used for making packaging films for packing a variety of products, shopping bags, heavy duty sacks, lamination, films, films for canal lining and other agricultural uses, extrusion coating, wires and cable insulations, household items, toys, flexible pipes, garbage bags, drip laterals, heavy duty film, stretch wrap film, general purpose films, rotational moulded items like overhead tanks, etc.



### By-Products

The Naphtha Cracker Complex also generates by-products such as Benzene, Carbon Black Feedstock (CBFS), Polyethylene Wax (PE-Wax), Diethylene Glycol (DEG), Triethylene Glycol (TEG), etc. suitable for use in the production of various Chemical products.

### Styrene Butadiene Rubber (SBR)

Further downstream to Naphtha cracker, a world scale India's first SBR plant having capacity 120 KTA has been setup at Panipat as a joint venture with TSRC, Taiwan and Marubeni Corporation, Japan. SBR is primarily used for manufacture of automotive tyres, rubber parts/gaskets, adhesives, conveyor belts etc. With rapid development of India's automotive industry, SBR annual demand growth rate is over 15%.

## MARKETING

A separate Petrochemicals Group has been created by IndianOil for the marketing of petrochemicals. This group has five exclusive sub-groups, classified product-wise (LAB, PTA, Polymers) and function-wise (Logistics & Exports) in addition to Zonal/ field set-up, to offer reliable customer service.

In order to provide prompt after sales service and assistance in use of our Polymer grades, apart from the marketing team, a dedicated technical team has been posted at various locations across the country. This technical team consists of qualified personnel with sufficient field experience to resolve customer problems besides offering guidance to the customers in the areas of trying out new grades, Process optimization and entrepreneur development, etc.

This team is backed by Product Application Development Centre (PADC) at Panipat. A state-of-the-art Polymer Physical Lab, Characterisation Lab, Hot Room/Sample Preparation Lab and Processing Shop are part of PADC. This customer centric unit is manned by a highly experienced team of polymer technologist with requisite experience.

### Nurturing a World-class Petrochemicals Hub at Panipat

Panipat is on the springboard of massive industrialization and economic prosperity. The Government of Haryana has conceived an ambitious plan to set up a world-class petrochemicals hub at Panipat. The nucleus of the hub will be IndianOil's PX/PTA Plant, Naphtha Cracker and Polymer units, which are expected to catalyse plastics processing and allied industries in Northern India.





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[www.iocl.com](http://www.iocl.com)




## Moulding India. Propelling Future.

IndianOil is one of the largest player in the petrochemical sector in India. Identifying petrochemicals as one of the prime driver of future growth, the corporation is proud to present under brand **PROPEL**, a range of petrochemical products to cater to applications ranging from textiles to detergents, agriculture to automobiles and healthcare to infrastructure.

LINEAR ALKYL BENZENE (LAB) ♦ PURIFIED TEREPHTHALIC ACID (PTA)  
HIGH DENSITY POLYETHYLENE (HDPE) ♦ LINEAR LOW DENSITY POLYETHYLENE (LLDPE)  
POLYPROPYLENE (PP) ♦ MONO ETHYLENE GLYCOL (MEG)



**PROPEL**  
100% TRUST. 100% VALUE.  
A range of world-class petrochemicals

A wonder material to upgrade your lifestyle <https://propel.indianoil.in>



# PROPEL

100% TRUST. 100% VALUE.