



IndianOil Start-up Fund
Fuelling the Future

IndianOil has launched a start-up fund scheme to promote promising start-ups and nurture an eco-system conducive for innovations in the domestic hydrocarbons sector. Driven by IndianOil's Research & Development Centre based at Faridabad, the scheme will support projects that aim to establish innovative technology and business process re-engineering ideas with significant business potential, social relevance and focused on environment-protection.

The start-up fund scheme will be administered through a dedicated online portal and shall facilitate the community of technology and business-process innovators and entrepreneurs in pursuing their promising re-engineering ideas to the stage of validated Proof of Concept (PoC) by way of funding the incubation ecosystem and intellectual mentoring. Entities having PoCs will not be entitled for funding under the scheme.

The scheme aims to support innovative ideas that have significant business potential, social relevance and/or are focused on environment-protection. Further, such validated PoCs may be supported for commercialisation through equity participation.

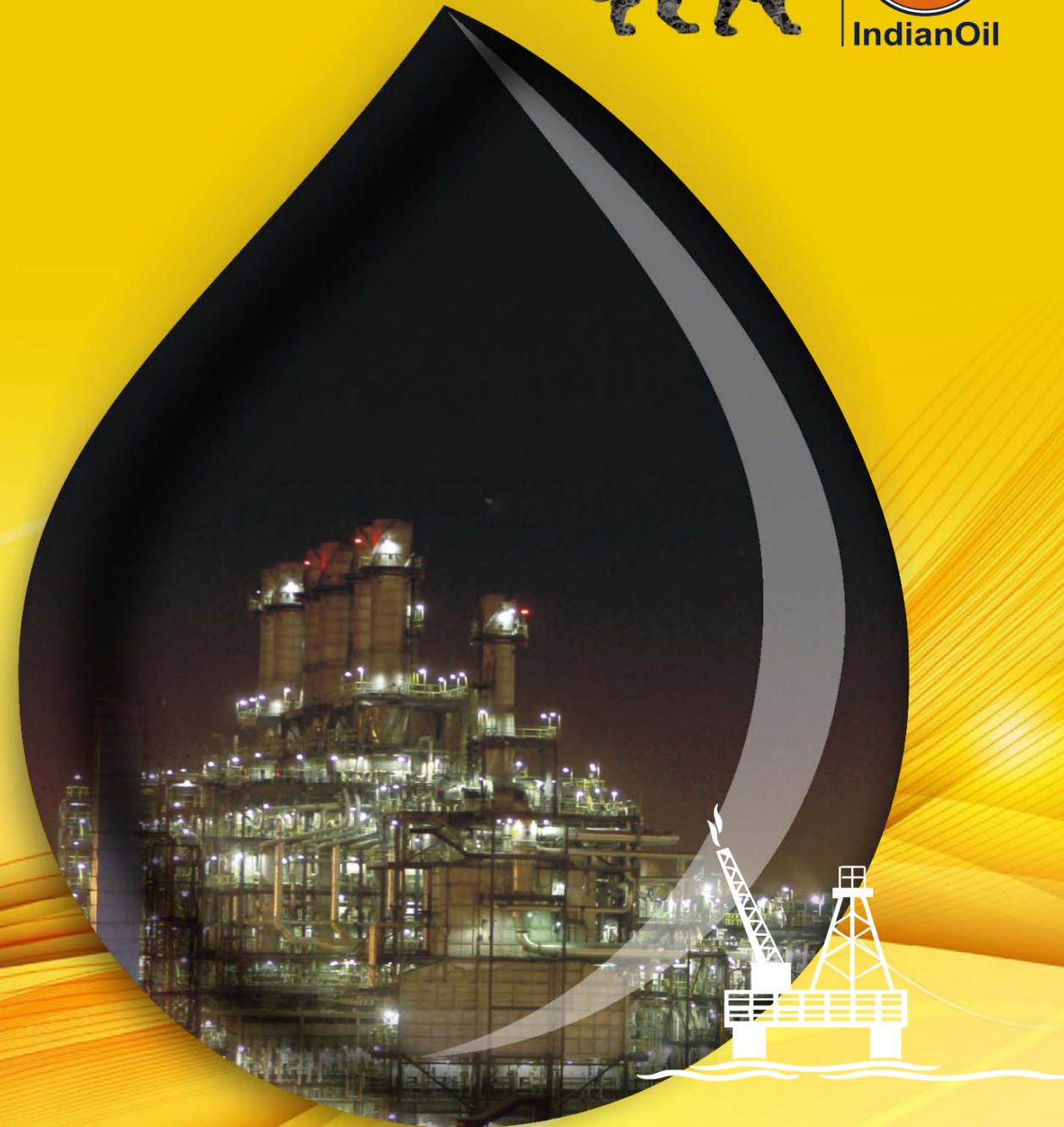
As a first step, IndianOil Open Innovation Challenge solicits ideas in the domains of Technology Process Re-engineering (TPRE) as well as Business Process Re-engineering (BPRE).

These shall be screened for shortlisting by a Level-1 committee through a structured evaluation matrix. The shortlisted proposals of Level-1 shall be further reviewed by a Level-2 committee through presentations and personal interactions with the applicants.

The selected proposals shall be incubated by IndianOil till they reach PoC stage, with the required physical and intellectual support. Besides financial support, mentor support and specific technical assistance in terms of guidance or testing on need-basis will be provided. Nominal charges may apply for testing.

Funding will be provided over a period of 36 months for TPRE projects and for 18 months for BPRE projects in instalments against agreed/accepted milestones. Fund disbursement will be based on the milestones achieved. No royalty will be charged on the funds disbursed under the scheme.

IndianOil may further aid in the commercialisation of select validated PoCs through equity participation. Citizens of Indian origin willing to work in India, besides individuals affiliated to academic institutions having incubation centres approved by the Central Government, or intrapreneurs from IndianOil can apply under the scheme.



Transforming India into a manufacturing hub

IndianOil supports 'Make in India'



Indian Oil Corporation Limited

www.iocl.com

Corporate Office : Plot No. 3079/3, Sadiq Nagar, J.B. Tito Marg, New Delhi-110 049

Follow us on /indianoilcorporplimited | /indianoilcl | /indianoilcorporationlimited | /indianoilcorp/

As India stands poised to transform into a major economic power, we at IndianOil envision to be **'The Energy of India'** and to become 'A globally admired company,' fuelling a better tomorrow.

IndianOil-The Energy of India



IndianOil Fuelling
India's energy requirements for over five decades

Indian Oil Corporation (IndianOil) is India's largest commercial enterprise, with a sales turnover of Rs. 3,99,601 crore (US\$ 61 billion) and profits of Rs. 10,399 crore (US\$ 1,589 million) for the year 2015-16. IndianOil is ranked 161st among the world's largest corporates (and first among Indian enterprises) in the prestigious *Fortune 'Global 500'* listing for the year 2016.

IndianOil's business interests straddle the entire hydrocarbon value-chain, i.e., refining, pipeline transportation, marketing of petroleum products, downstream R&D, exploration & production of crude oil & gas, petrochemicals – production & marketing, marketing of natural gas and renewable energy.

IndianOil's constant endeavour is to expand its business verticals to make India energy efficient.

The Make in India initiative, launched by the Hon'ble Prime Minister in Sept. 2014 as part of a wider set of nation-building initiatives, is set to transform India into a global design and manufacturing hub.



IndianOil's cross-country network of crude and product pipelines

IndianOil has the largest petroleum marketing and distribution networks in Asia, with over 43,000 marketing touch points. Several landmark surveys continue to rate IndianOil as the dominant energy brand in the country and an enduring symbol for high quality petroleum products and services. The heritage and iconic association that the brand invokes has been built over five decades of commitment to uninterrupted supply line of petroleum products to every part of the country, and unique products that cater not only to the functional requirements but also the aspirational needs of millions of customers.

Talking about refining, IndianOil has gathered a luminous legacy of more than 100 years of accumulated experiences in all areas of petroleum refining by taking into its fold, the Digboi Refinery commissioned in 1901. IndianOil

controls 11 of India's 23 refineries. The group refining capacity is 80.7 million metric tonnes per annum (MMTPA) - the largest share among refining companies in India. It accounts for 35% share of national refining capacity.

The strength of IndianOil springs from its experience of operating the largest number of refineries in India and adapting to a variety of refining processes along the way. The basket of technologies, which are in operation in IndianOil refineries include: Atmospheric/Vacuum Distillation, Distillate FCC/Resid FCC, Hydrocracking, Catalytic Reforming, Hydrogen Generation, Delayed Coking, Lube Processing Units, Visbreakingm Merox Treatment, Hydrodesulphurisation of Kerosene & Gasoil streams, Sulphur recovery, Dewaxing, Wax Hydro finishing; Coke Calcining, etc.

The Corporation has commissioned several grassroots refineries and modern process units. Procedures for commissioning and start-up of individual units and the refinery have been well laid out and enshrined in various customised operating manuals, which are continually updated.

IndianOil believes that to be a market leader and ensure availability of clean, reliable and affordable energy in the countries, innovation is of key importance. To encourage innovation and the concept of Make in India, IndianOil has developed several in-house technologies that are being used and recognised across the industry.

IndianOil has a sprawling world-class R&D Centre that is perhaps Asia's finest. This Centre is India's foremost commercial centre of research excellence in the areas of lubricants, refinery processes, pipeline transportation, alternative fuels fuel additives, engine testing, materials sciences and environmental sciences. The Centre holds 533 active patents, including 344 international patents.

IndianOil's Research & Development Centre at Faridabad



IndianOil's state-of-the-art R&D Centre

Our R&D team plays a key role in developing indigenous, economical, environmentally and socially responsible technology solutions, which include-

INDMAX Technology



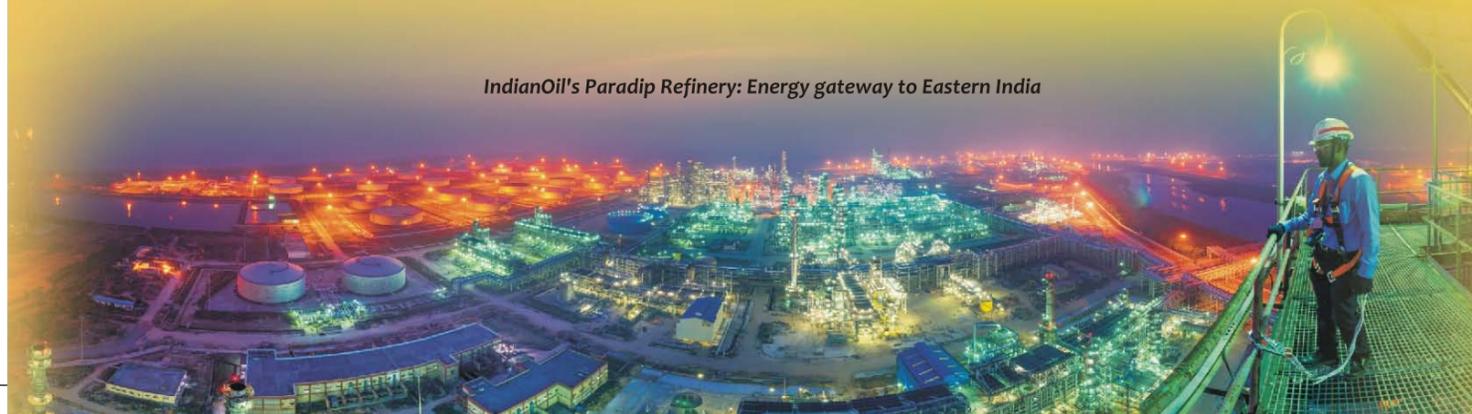
IndianOil's indigenous technology to boot LPG production

- For converting heavy distillate and residue into LPG/light distillate products
- Implemented at IndianOil's Guwahati and Paradip Refineries, under implementation at Bongaigaon Refinery
- Technology being licensed by Lummus worldwide

Hexane Hydrogenation Technology

- For production of food-grade Hexane (WHO-grade quality) with indigenous catalyst
- Implemented at Gujarat Refinery

IndianOil's Paradip Refinery: Energy gateway to Eastern India



Diesel Hydrotreatment Technology

- For producing superior quality diesel
- Licenced jointly with EIL, implemented at Bongaigaon Refinery

Isomerisation Technology 'ZEOSOM'



Isomerisation Micro-reactor unit

- For producing superior quality petrol
- Licenced jointly with EIL, implemented at Bongaigaon Refinery

INDAdeptG Technology

- For desulphurisation of cracked gasoline feedstock
- Demonstration unit of 35,000 metric tonnes per annum being set up at IndianOil's Guwahati Refinery

Octamax Technology

- For production of high-octane gasoline blending stream from refinery LPG streams
- Being implemented at IndianOil's Mathura Refinery

INDJet Technology

- For production of jet fuel
- Under consideration for implementation at IndianOil's Barauni Refinery

INDSelect Technology

- For selective di-olefin saturation of coker naphtha and FCC
- Under consideration for implementation in IndianOil refineries

Catalysts & Additives

- IndVi – A novel metal passivation additive capable of handling heavier hydrocarbon feedstock (high CCR, Ni & V) in the R-FCC unit
- DHDS/DHDT catalysts – Suitable for production of diesel with sulphur content of 10 to 50 ppm

Bioremediation

- An enzyme-mediated oxidation process, conducted by microbes
- Harnessed by introducing the selected biological agents into the contaminants to consume organic compounds or assimilate heavy metals

Drag Reducing Agents

- Additives that reduce turbulence in oil pipelines, enhance oil flow and increase throughput capacity

Poly Alpha Olefins

- Performance-enhancing oils that offer outstanding protection to motor engine, prolonging its life
- **SERVO Futura Synth** meets the most advanced performance level standards of API SN, with 5W-50 viscometrics, ensuring better mileage and better performance

Instrumented Pipeline Inspection Gauges

- I-PIG, a joint initiative with BARC, has an automated software component for quick & accurate analysis of pipeline inspection data
- Magnetic flux leakage-based tools of 12", 14", 18" and 24" sizes at par with international standards
- Developed from the fundamental design of magnetic circuits; mechanical and electronic components capable of enduring in-service inspection of pipelines

Indane NANOCUT



Indane Nanocut a superior LPG metal cutting solution

- A high-therm cutting gas for industrial applications in metal cutting segment; cost-effective and environment-friendly
- Technically superior with high flame-temperature advantage, and a much safer option within the industry segment

Bitumen

- Bitumen refineries at Panipat, Mathura, Koyali, Haldia and Chennai
- Modified CRMB and Emulsion marketed in bulk and packed in steel drums
- Caters to various applications:
 - o Constructions of roads, runways and platforms
 - o Water-proofing to prevent water seepage
 - o Mastic floors for factories and warehouses
 - o Canal lining to prevent erosion
 - o Dump-proof courses for masonry
 - o Tank foundation
 - o Joint filling material in masonry
 - o The recently commissioned 302 km long six lane Agra-Lucknow expressway has been made using VG-40 grade Bitumen from IndianOil's Mathura Refinery.

Focus areas for the future

- Development & demonstration of refinery process technologies
- Licencing & commercialisation of in-house developed technologies

- Health monitoring of secondary units
 - Trouble-shooting, revamp and optimisation for refinery processes
 - Modelling and simulation of refinery processes
 - Technical services to refineries, petrochemicals and pipeline division
 - Crude assay and transportation solutions
 - Catalysts development for refining and petrochemical processes
 - Analytical support for BS-IV/VI gasoline and diesel
 - Bituminous products: PMB & CRMB+
 - Process and catalyst development for petrochemical & polymer application
 - Development of Intelligent and caliper pigs for monitoring health of pipelines.
 - Corrosion, remaining life assessment and material failure analyses,
 - Metal working tribology and boundary lubrication
 - Fuel-efficient lubricants, greases and specialties
 - Development and commercialisation of fuel additives
 - Fuel quality and emission-related studies
 - Biotechnology interventions for refinery effluent treatment plants
 - Development of carbon dioxide to valuable products
 - Alternative fuels: H-CNG, second and third-generation bio-fuels
 - Nano-technological interventions for development of fuels and lubricants
 - Alternative energy: Gasification, Hydrogen, fuel cell and solar
- These are technologies that the Corporation has been working upon over the years.

IndianOil is working in line with 'Make in India' is other business verticals too:

Petrochemicals (Domestic production and export to over 70 countries):

IndianOil is the second largest producer of petrochemicals in India. Several products in this segment have been researched and developed indigenously at the Company's own R&D facilities. The Corporation's thrust on Innovation has enabled India to be amidst the top three players in petrochemicals in Southeast Asia.

Global footprint of PROPEL



Cryogenics



'LNG at doorstep' an initiative to supply LNG to remote areas

IndianOil is the leading manufacturer of vacuum super-insulated cryogenic storage & transport

vessels for laboratories, industrial applications, oil-field service applications and cryobanks.

The Corporation is the largest manufacturer of cryogenic containers in the country and produces pressure vessels for application in refining, fertilisers and gas industries. Pioneered LNG at the doorstep (LNG by road) concept in India which is operational for almost a decade.

IndianOil Business Group (Cryogenics) is a pioneer in multi-layer super insulation products for cryogenic liquids such as liquid Nitrogen, liquid Oxygen, liquid Argon and LNG. The Corporation is the largest manufacturer of liquid Nitrogen containers in India. Its products for liquid Oxygen & liquid Argon are also popular among bulk liquid

gas consumers. Under the Corporation's "Make in India" Initiative, the unit has undertaken development of new products.

- Development of LNG fuel tanks for locomotives & automobiles: IndianOil Cryogenics team has developed a virtual pipeline for supply of Natural Gas by transportation of LNG through cryogenic transport tankers, storage in cryogenic storage tanks, conversion the liquid (LNG) into gas and supply to the burning point.
- IndianOil is developing LNG fuel tanks for locomotives (trains) in two categories. One is for conversion of Diesel – Electric Multiple Unit (DEMUs) into LNG-run engines (local train). The second is for conversion of mainline locomotives such as ALCO into LNG-run long haul engines. Similarly, special fuel tank designs are under approvals for running automobiles (bus/truck) on LNG with on-board LNG storage-cum-conversion kit.
- Containerised tank for storage of aviation fuel for small airports: IndianOil has undertaken design, manufacture, supply, erection & commissioning of double-walled containerised tank for aviation fuel storage purposes. These are stainless steel vessels having carbon steel outer vessel with a

support system. Because of this design, the safety distances are brought down significantly. All the designs are approved by PESO. The tanks are supplied with one micron thick filters and adequate safety inter-locks for filling & withdrawal of aviation fuel. So far, four airports in India have already been provided with the above containerised tanks. Tanks at two airports, viz. Mohali and Shimla in Himachal Pradesh have already been commissioned and others will follow suit shortly.

Explosives

IndianOil's 'Indogel' is the brand leader in India for bulk explosives used in surface mining. 'Indogel' site-mixed bulk explosives are amongst the best researched and developed formulations.

IndianOil JV, Indian Synthetic Rubber Pvt. Ltd. (ISRL) is the first of its kind in India and has enabled India to save precious foreign exchange in import of raw material for production of rubber/tyres. ISRL exports material to Pakistan, Turkey, Malaysia, Taiwan, Philippines, Sri Lanka, Vietnam, Indonesia, Myanmar, Bangladesh and other countries.

IndianOil is on an epoch-making journey to strengthen its reach, reliability and responsiveness, to ensure a progressive path towards Energy Efficiency in India.

For more information visit www.iocl.com

