Needs and availability of energy technologies in conventional and non-conventional sectors

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Presentation Overview

- E&P Technology needs and availability -ONGC
- Collaboration-Key to Technology Challenges/ Innovation

E&P Technology needs & availability - ONGC

- In E&P Industry, research and technology advances are recognized as key driver of success. Research & Development (R&D) plays an important role in the business processes that result in technology bringing new products and services to the market place.

- As a leading E&P enterprise globally, Maharatna ONGC maintains distinction as an integrated company with in-house capabilities in all related scientific and technical domains of hydrocarbon ecosystem.

- Over the years, ONGC has invested significantly in expanding its R&D activities and upskilled innovation capabilities amongst its employees. The Company's mission, *'Dedicated to excellence by leveraging competitive advantages in R&D and technology with involved people',* demonstrates its commitment to driving intellectual value.

- ONGC is also looking to aggressively induct technology across all facets of its business ensuring greater energy efficiency, more productivity and improving safety performance. This focus has only sharpened in the wake of the COVID-19 pandemic and recent volatility due to war induced global supply chain disruption which have reset expectations and priorities of business.

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- Catering to its needs ONGC has set-up 12 world-class Institutes for R&D, technology development and training. Out of these, 10 are R&D institutes.

- Research is primarily undertaken by 10 R&D institutes for providing support to Basins and Assets in their operational bottlenecks.

- 5 Regional Geoscience Laboratories (RGLs) also provide immediate laboratory back-up services to Basins and Assets.

- These institutes and RGLs are recognized R&D centers by the Department of Scientific and Industrial Research (DSIR), under the Ministry of Science and Technology, Government of India.

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Sr.no.	Name of the R&D Institute	Year of establishment
Under the administrative control of Director(Exploration)		
1	Keshava Deva Malaviya Institute of Petroleum Exploration (KDMIPE), Dehradun	1962
2	Institute of Reservoir Studies (IRS), Ahmedabad	1978
3	Geodata Processing and Interpretation Centre (GEOPIC), Dehradun	1987
4	Institute of Biotechnology & Geotectonic Studies (INBIGS), Jorhat	1989
5	Centre for Excellence in Well Logging Technology(CEWELL),Vadodara	2006
6	Gas Hydrate Research & Technology Centre (GHRTC),Panvel	2016
Under the administrative control of Director(T&FS)		
7	Institute of Drilling Technology (IDT), Dehradun	1978
Under the administrative control of Director(Offshore)		
8	Institute of Engineering & Ocean Technology(IEOT), Panvel	1983
9	Institute of Oil and Gas Production Technology(IOGPT), Panvel	1984
Under the administrative control of Director(Onshore)		
10	Institute of Petroleum Safety, Health & Environment Management (IPSHEM), Goa	1989

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- Besides the 10 R&D institutes, ONGC Energy Centre (OEC) takes up R&D on clean renewable energy sources such as hydrogen, bio technology for energy, solar, uranium and geothermal energy etc. in collaboration with national and international academic, research and industrial organizations. Additionally, Centres of Development (CoDs, viz., CoD-Shale Gas, CoD- HPHT and CoD-Basement) also cater to specialized R&D functions of ONGC.

- R&D activities of ONGC are undertaken through R&D Projects in respective domain areas of institutes/ RGLs/ work centres including both conventional as well as unconventional resources such as gas hydrates and Coal Bed methane(CBM).
- The R&D projects/ studies are taken for application in ONGC fields aimed at production enhancement, identification of future areas for exploration, generation of new emerging plays and prospectively, geologically complex & inaccessible terrain exploration, consolidation of plays, new technology and concept development, improved understanding & Risk Reduction, reservoir management, unconventional hydrocarbon research and reduction of environmental footprint.

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- Consistent R&D efforts have resulted in generation of Intellectual Property Rights for ONGC inform of Patents and Copyrights (as on 31.03.2022, 62 patents have been obtained and 43 copy rights are registered).
- R&D scientists of ONGC have been publishing their research paper in national and international journals and presenting in different scientific forums. The achievements from R&D are published as research papers which may be useful for future guidance as well as sharing knowledge. This could result in application of research by other entity/organization with the permission of the author.
- In addition to its in-house R&D capabilities, ONGC actively collaborates with leading national and international academic and research institutions to innovate and design path breaking technologies to drive ONGC's inclusive and holistic growth.

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- Memorandum of Understandings (MoUs) are signed by ONGC from time to time for expanding cooperation in energy-related areas. Examples of few such recent MoUs are as under:
  - ✓ With Solar Energy Corporation of India (SECI) to develop renewable energy-based power for achieving green energy objectives
  - ✓ With Skolkovo Institute of Science and Technology (Skoltech), Moscow for collaborative studies to establish cooperation in the Gas Hydrate Research & Technology applicable to Indian Basins
  - ✓ With Indian Oil Corporation Limited (IOCL) R&D for development of nanoparticles as kinetic inhibitors in the dissociation of gas from gas hydrates under reservoir conditions
  - ✓ With Indian Oil Corporation Limited (IOCL) for CO_2 based Enhanced Oil Recovery (EOR)
  - ✓ With the Ladakh Autonomous Hill Development Council, Leh, on 6 February 2021. Phase-I of the initiative will involve exploratory cum production drilling of wells up to 1000 m depth and the setting up of a Pilot Plant of up to 1 MW power capacity.
  - ✓ With Saudi Aramco to bolster both companies' capabilities by leveraging in-house competencies while creating value for all stakeholders.

Successful Collaboration-key to emerging technology challenges

- The energy industry remains vital to global economic activity. However, there is wide ranging uncertainty within the industry as multiple forces are at play – be it global consensus on climate change and sustainability, growing consumer awareness, volatility in international trade relations and supply chain disruptions. The global pandemic has added further layers of complexity to it.
- This has necessitated enhanced cooperation and collaboration to address emerging challenges in technology landscape in E&P industry.
- In such times of turbulence, the locus of innovation needs to shift to the network in order to reduce risk exposure and time to market by leveraging the capabilities of other network partners.
- This extended resource-based approach has a definite advantage, encompassing linkages with complementary partners including suppliers, intermediaries, complementor and competitor enterprise, universities and even government organisations. Such collective pooling of network resources offers significant potential for knowledge sharing and co-creation to the benefit of E&P industry.

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Thank you