

Enhanced Oil Recovery Market Report by Technology (Thermal-Enhanced Oil Recovery, Gas-Enhanced Oil Recovery, Chemical-Enhanced Oil Recovery, and Others), Application (Onshore, Offshore), and Region 2024-2032

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Abstracts

The global enhanced oil recovery (EOR) market size reached US\$ 59.1 Billion in 2023. Looking forward, IMARC Group expects the market to reach US\$ 111.0 Billion by 2032, exhibiting a growth rate (CAGR) of 7% during 2024-2032. The escalating number of aging wells coupled with the declining oil output from existing oilfields, continual developments of novel EOR techniques, and the rising demand for enhanced oil production are some of the major factors propelling the market.

Enhanced oil recovery (EOR) refers to a set of advanced techniques employed in the oil and gas industry to extract additional hydrocarbons from reservoirs beyond what can be recovered using conventional methods. EOR strategies aim to maximize production by altering reservoir conditions and fluid behavior. Common EOR methods include thermal, chemical, and miscible gas injection. Thermal methods, such as steam injection, increase the reservoir temperature to reduce oil viscosity, enabling easier flow. Chemical methods involve injecting polymers or surfactants to modify fluid properties, aiding in oil displacement. Miscible gas injection, typically using carbon dioxide or nitrogen, enhances oil mobility and reduces resistance within the reservoir. EOR techniques are highly technical and site-specific, considering factors, such as reservoir characteristics, fluid composition, and economic feasibility.

The global market is driven by the rising demand for enhanced oil production. The escalating number of aging wells and the declining oil output from existing oilfields have generated a heightened need for enhanced oil recovery (EOR) solutions worldwide.

These solutions have exhibited a remarkable capacity to significantly amplify overall production compared to traditional oil extraction methods. EOR technologies play a pivotal role in augmenting the permeability of mature oil reservoirs, facilitating smoother hydrocarbon movement, and thereby boosting oil recovery rates. Moreover, EOR projects often require significant upfront investments in technology, equipment, and research. When there is available investment and funding, it can boost the EOR market by supporting the development and implementation of these projects. Furthermore, the development of novel EOR techniques, such as chemical, thermal, and microbial EOR, can open up new opportunities for oil recovery and stimulate market growth. Also, EOR techniques are not limited to conventional oil reservoirs. They can also be applied to unconventional reservoirs like shale oil and heavy oil deposits, expanding the potential market.

Enhanced Oil Recovery Market Trends/Drivers: Depleting Reservoirs and Maturing Oil Fields

Several conventional oil fields have been in production for decades, leading to declining production rates due to natural reservoir pressure depletion. As reservoirs age, the remaining oil becomes trapped in complex rock formations, making it challenging to recover using conventional methods. EOR techniques, particularly thermal methods, including steam injection, provide a solution by reducing oil viscosity and facilitating its movement to production wells. This driver is especially pronounced in regions where conventional oil production has plateaued, as EOR offers a viable strategy to extend the productive life of these fields and tap into previously unrecoverable reserves. The market for EOR technologies is thus propelled by the urgent need to sustain and increase oil production from mature fields.

Continual Technological Advancements and Innovations

The EOR market benefits from ongoing research and development efforts aimed at enhancing recovery rates, optimizing injection strategies, and reducing operational costs. Advancements in reservoir modeling and simulation tools enable engineers to better understand reservoir behavior and design tailored EOR strategies. Additionally, breakthroughs in nanotechnology have paved the way for improved chemical agents with greater capabilities to alter fluid behavior and displace trapped oil. Innovations in well design and completion techniques also contribute to the efficient deployment of EOR methods. As the oil industry embraces digitalization and automation, the integration of data analytics and machine learning further augments the effectiveness of EOR processes. The promise of higher yields and reduced environmental impact

through technological innovation acts as a strong driver, attracting investment and propelling the EOR market forward.

Supportive Regulatory and Environmental Factors

Governments recognize the value of extending the life of existing oil fields through enhanced recovery methods, as this approach aligns with energy security and economic growth goals. Moreover, as concerns about greenhouse gas emissions and carbon footprint intensify, EOR techniques such as carbon dioxide (CO₂) injection gain prominence. CO₂, a byproduct of various industrial processes, can be captured and utilized for EOR, offering a dual benefit of enhanced oil recovery and carbon capture and storage. Financial incentives, tax breaks, and regulatory frameworks that encourage CO₂ utilization for EOR further incentivize the adoption of these methods. The convergence of energy security, environmental stewardship, and regulatory support establishes a favorable landscape for the growth of the EOR market, making it an attractive proposition for oil companies looking to align with sustainable practices.

Enhanced Oil Recovery Industry Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the global enhanced oil recovery (EOR) market report, along with forecasts at the global and regional levels from 2024-2032. Our report has categorized the market based on technology and application.

Breakup by Technology:

- Thermal-Enhanced Oil Recovery
- Gas-Enhanced Oil Recovery
- Chemical-Enhanced Oil Recovery
- Others

Thermal-enhanced recovery dominates the market

The report has provided a detailed breakup and analysis of the market based on the technology. This includes thermal-enhanced oil recovery, gas-enhanced oil recovery, chemical-enhanced oil recovery, and others. According to the report, thermal-enhanced oil recovery represented the largest segment.

The thermal-enhanced recovery methodology entails the strategic application of heat to the subsurface reservoir, a process designed to catalyze the reduction of crude oil

viscosity, streamline its flow dynamics, and ultimately facilitate its extraction. Steam injection, the vanguard of thermal-enhanced recovery, has carved its niche as an exceptionally potent strategy across a spectrum of reservoir types, encompassing heavy oil deposits, tar sands, and even conventional oil fields. By infusing reservoirs with high-pressure steam, the thermal equilibrium of the encompassing rock and oil is raised, leading to a noticeable drop in oil viscosity. This transformative effect eases the oil's movement towards production wells, thereby escalating recovery rates appreciably. The ascendancy of thermal-enhanced recovery methodologies is further underpinned by the evolution of steam generation technologies, fostering greater efficiency and adept distribution of heat throughout the reservoir matrix.

Breakup by Application:

Onshore

Offshore

Onshore holds the largest share of the market

A detailed breakup and analysis of the market based on the application has also been provided in the report. This includes onshore and offshore. According to the report, onshore accounted for the largest market share.

Onshore reservoirs possess unique attributes that favor the deployment of EOR techniques. They tend to be more accessible for the establishment of infrastructure, including injection and production wells, pipelines, and treatment facilities. This proximity enables efficient implementation and monitoring of EOR operations, contributing to enhanced control over processes and recovery outcomes. Moreover, the geological and reservoir characteristics of onshore fields often align well with various EOR methods. Thermal EOR, such as steam injection, can be readily applied to unlock heavy and viscous oils found in many onshore reservoirs. Similarly, chemical and gas based EOR techniques can be adapted to the specific conditions of onshore formations, optimizing recovery rates and resource utilization. Logistical advantages also play a pivotal role in the prominence of onshore EOR. Transportation of equipment, personnel, and resources is generally simpler and more cost-effective on land, leading to reduced operational complexities compared to offshore operations that require specialized vessels and facilities.

Breakup by Region:

North America

Europe

Asia Pacific

Middle East and Africa

Latin America

North America exhibits a clear dominance, accounting for the largest enhanced oil recovery market share

The report has also provided a comprehensive analysis of all the major regional markets, which include North America, Europe, Asia Pacific, Middle East and Africa, and Latin America. According to the report, North America accounted for the largest market share.

North America collectively possesses a wealth of diverse oil reservoirs spanning conventional fields, heavy oil deposits, and shale formations. This diverse resource base provides a fertile ground for the application of various EOR techniques tailored to specific reservoir characteristics. North America's technological leadership in EOR methods, notably thermal methods, including steam and in-situ combustion, further solidifies its pre-eminence. Pioneering research and innovation in reservoir simulation, chemical agents, and well design have given rise to sophisticated EOR strategies, propelling recovery rates and shaping the market landscape. Moreover, the presence of well-developed transportation networks, refineries, and distribution systems facilitates the integration of EOR processes into existing operations, thereby reducing implementation barriers. Moreover, North America's favorable regulatory environment, driven by a mix of innovation incentives and energy security imperatives, augments its EOR endeavors.

Competitive Landscape:

EOR companies are heavily investing in research and development to innovate and improve existing EOR techniques. They focus on developing new chemical agents, optimizing injection strategies, and refining reservoir simulation and modeling technologies. R&D efforts aim to increase the efficiency, effectiveness, and applicability of EOR methods to various reservoir types. Furthermore, major companies are working to develop and implement advanced technologies such as data analytics, artificial intelligence, and machine learning to enhance reservoir characterization, optimize injection rates, and predict production behavior. These technologies help operators make informed decisions and adapt EOR strategies in real-time, improving overall recovery rates. EOR companies often conduct pilot projects and field trials to test the

feasibility and effectiveness of new EOR techniques in actual reservoir conditions. These projects provide valuable data and insights that guide further development and scaling up of successful methods.

The report has provided a comprehensive analysis of the competitive landscape in the market. Detailed profiles of all major companies have also been provided. Some of the key players in the market include:

Basf Se
Halliburton Corporation
Royal Dutch Shell Plc
Schlumberger Ltd.
Chevron Phillips Chemical Corporation
Fmc Technologies Inc.
National Aluminium Company Limited (NALCO)
Praxair Inc.
Secure Energy Services Inc.
Xytel Corporation
Equinor ASA
BP Plc
China Petroleum & Chemical Corporation (Sinopec)
Oil and Natural Gas Corporation Ltd. (ONGC)
ExxonMobil Corporation
ConocoPhillips
Petroleo Brasileiro (Petrobras) S.A.
PJSC Lukoil Oil Company

Recent Developments:

In February 2023, Basf Se launched high-pressure regenerative CO₂ capture technology HiPACT. The technology efficiently captures CO₂ from hydrogen production process gas using natural gas as feedstock, reducing capture costs by releasing CO₂ off gas above atmospheric pressure. It boasts high-temperature durability and absorption performance. The recovered CO₂ enhances gas recovery in depleted fields via CCUS, promoting effective Carbon Capture and Storage (CCS).

In February 2023, China Petroleum & Chemical Corporation (Sinopec) launched the world's largest green hydrogen-coal chemical project. The Project utilized the rich solar and wind energy resources to produce green hydrogen directly, projecting to reach an annual production capacity of 30,000 tons of green hydrogen and 240,000 tons of green oxygen, which will be used for the carbon reduction initiatives of the adjacent ZTHC Energy intensive coal processing pilot project.

In June 2023, Halliburton Corporation announced an agreement on leading well construction automation solutions. By combining Nabors' drilling process automation and digital solutions with Halliburton's sub-surface expertise, this agreement aims to achieve well construction efficiencies through consistent and repeatable outcomes.

Key Questions Answered in This Report

1. What was the size of the global Enhanced Oil Recovery (EOR) market in 2023?
2. What is the expected growth rate of the global Enhanced Oil Recovery (EOR) market during 2024-2032?
3. What are the key factors driving the global Enhanced Oil Recovery (EOR) market?
4. What has been the impact of COVID-19 on the global Enhanced Oil Recovery (EOR) market?
5. What is the breakup of the global Enhanced Oil Recovery (EOR) market based on the technology?
6. What is the breakup of the global Enhanced Oil Recovery (EOR) market based on the application?
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