

> ASPECTS WHICH CONDITION THE ENHANCED OIL RECOVERY PROJECT DEVELOPMENT



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The oil fields exploitation is inevitably linked to the implementation of secondary recovery or enhanced recovery projects at an early or mature stage given the characteristics and conditions of the hydrocarbon reservoirs. However the development of enhanced oil recovery projects, within the different NOCs and IOCs, from a strategic planning point of view is subject to several variables such as:

1. Long-term Vision,
2. Production Increase or Recovery Factor,
3. Organizational Culture,
4. Oil Price Susceptibility,
5. Technical Risks and Uncertainties,
6. Criteria Focused on Cost Reduction,
7. Competitive Alternatives (different technologies).

1. LONG TERM VISION

The corporate vision of an operator regarding the exploitation of hydrocarbon reserves must be very clear and aligned with the need to implement enhanced oil recovery projects in the medium or long term. Ultimately, this will provide the necessary impetus for planning and, finally, its execution.

2. PRODUCTION INCREASE OR RECOVERY FACTOR

The Operators generally point to practical IOR options as an alternative for accelerated production recovery, noting that it can generally destroy the value of the asset and the possibility of significantly increasing oil production and the recovery factor.



3. ORGANIZATIONAL CULTURE

An operator's EOR culture or philosophy should be born out of the corporate Vision. All the internal departments must be committed to the enhanced oil recovery strategy as the route that will ensure success and significant impact on production levels.

4. OIL PRICES SUSCEPTIBILITY

The implementation of EOR projects, given the level of disbursements (capital intensive), is highly sensitive to the price of an oil barrel. Therefore, economic evaluations and sensitivities analysis are critical to determine the appropriate timing for execution.



5. TECHNICAL RISKS AND UNCERTAINTIES

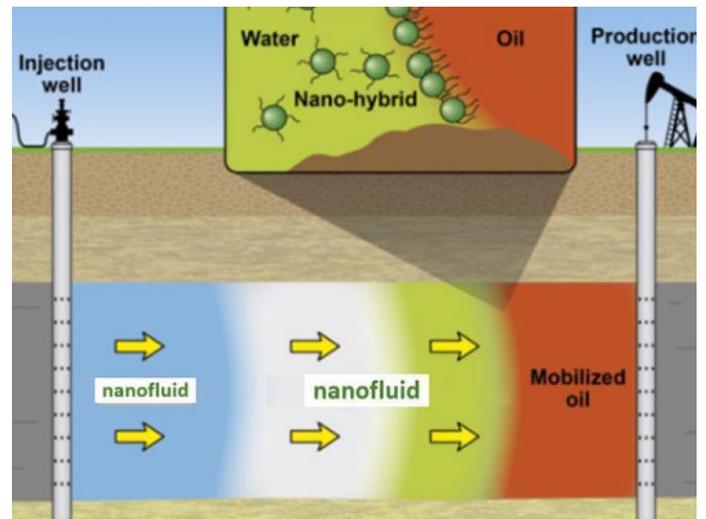
The enhanced oil recovery project implementation and their different technologies entails associated risks of different natures, such as: Technology Maturity Level, Geological Uncertainty, Resource Availability, among other factors.

6. CRITERIA FOCUSED ON COST REDUCTION

It obeys the corporate policies and guidelines of each operator, where cost reduction is prioritized over the optimal exploitation strategies of each Field, this fact that might end up condemning the execution of enhanced oil recovery projects

7. COMPETITIVE ALTERNATIVES

Currently, there are several emerging technologies for Enhanced Oil Recovery, some of them very promising, such as nanotechnologies and/or hybrid EOR processes, which present a lot of uncertainties and a low degree of maturity. However, at this point the Technology Screening process is crucial in order to select the alternative with the highest probability of success.



In some cases, it is difficult to weigh these 7 determining factors related to the execution of enhanced oil recovery projects, because the NOC's and IOC's make their decisions giving different weights to each of the mentioned variables. In spite of this, Nakasawa Mining and Energy has the necessary experience, resources and state-of-the-art technology to support decision making and assertive planning of enhanced recovery projects, which translates into an increased probability of success.