

# Petroleum Engineering

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## Design of a car kit using *Jatropha Curcas* oil as fuel in compression ignition engines

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World's conventional energy resources are coming to an end. *Jatropha curcas* is an alternative source of renewable energy which could contribute towards sustainable development of the society. It has properties near to that of diesel which makes it a good candidate for green kerosene but the prolonged use on existing compression ignition engines may cause wear and tear due to the oil's higher viscosity. This research is aimed towards development of an engine modification kit which could run on pure plant oil from *Jatropha* by utilizing heat from radiator water. Complete thermal analysis of heat exchanger was done and its dimensions were calculated. *Jatropha curcas* oil was heated upto 90°C. The results showed that at this temperature viscosity dropped down to an optimum level post the heat exchanger, making it a more mobile fuel and suitable to be used in an unmodified compression ignition engine.

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## Challenges and prospects of oil production with EOR techniques in India

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Production of enhanced oil has been badly affected due to current fall of oil price resulting into serious crisis for some of the EOR projects as these are no longer economically viability. This in turn is putting challenge to the oil industry to recover oil from more complicated areas. After primary and secondary methods two thirds of the original oil in place (OOIP) in a reservoir is not produced and still pending for recovery by efficient enhanced oil recovery (EOR) methods. Exploration Geoscientists are looking for new discoveries in the deeper and erstwhile inaccessible basins for petroleum resources. Enhanced oil and gas recovery (EOGR) methods have a large scope to take the opportunity to solve the problems. EOR is used when primary and secondary recovery cannot recover the rest of the trapped oil after these processes. Chemical slugs are injected to mobilize the trapped crude oil within the pore throats of the reservoir rocks. Enhanced oil recovery is conducted by applying some extrinsic energy on the reservoir pool. This energy can be generated by injecting chemical from outside. Several other methods including application of heat or newer innovative methods such as nano-materials as additive in the injection fluid to improve the sweep and displacement efficiencies are being tried. Therefore novel techniques such as microbes and nano-robots combined with chemical and thermal methods can improve the recovery significantly and may prove to be effective in Indian as well as other older fields under the current crude oil price scenario.

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