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Opportunities and challenges of biodiesel commercialization in India

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India is amongst the fastest developing economy of the world with 7% GDP growth rate. Fossil fuels play a major role in the energy mix of India; however, the twin challenges of depletion of fossil fuels coupled with environmental degradation have mandated research on renewable alternative fuels in India. India is a diesel driven economy as farming transportation and industrial sectors use diesel extensively resulting diesel consumption four times higher than gasoline. The most promising fuel either to supplement or substitute diesel in Indian scenario is biodiesel. Biodiesel is a clean renewable fuel for diesel engine and usually produced through the process of transesterification. The homogeneous catalyst is preferred in the transesterification; however, heterogeneous catalysts with nano-particles can provide new routes for the environmentally benign production of biodiesel. Apart from biodiesel production from liquid biomass through transesterification, hydro-processing of liquid biomass to biofuel using a catalyst is an alternate conversion technology which is raising a lot of interest in both academia and industry. The major challenges for biodiesel commercialization in India are the high production cost which could be substantially reduced by adopting new technologies such as super-critical transesterification or high shear mixing. The Government of India has approved India's National Biofuel Policy on December 24, 2009 and has proposed a target of 20% blending of both biodiesel and bioethanol by end of 12th Five-Year Plan (2017). Also financial incentives for new and second-generation biofuels will be provided apart from creating a National Biofuel Fund. Most importantly the price of biodiesel will be market determined. 11.2 million Ha of land has been identified for jatropha cultivation under National Biodiesel Mission (NBM). Food crops are not sustainable for biodiesel production in Indian context and efforts are underway for use of un-explored TBO. India is also facing difficulties with land availability for large scale production of non-edible oilseeds and initial research is also carried out to develop algal biodiesel.

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