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â€œMaking green fuels more reliableâ€?

10 October 2013 | Features | By Rahul Koul Koul

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With current annual refining capacity in India for diesel alone to be around 55 million metric tonnes (MMT), this natural fuel plays a pivotal role in meeting country's energy demand. Hence, of late biodiesel is being introduced to improve diesel quality to improve automotive and industrial exhaust emission. Infact, the Indian government had developed an ambitious National Biodiesel Mission to blend 5 percent biodiesel in diesel by 2011-2012 and 20 percent by 2017. However, one major backdraw in biodiesel production is utilization of 10 percent glycerol which comes out as a byproduct from biodiesel industry. It creates effluent quality problem including water pollution creating a darker side of green biodiesel. Thus, there is great requirement of finding possible cost effective and efficient procedures for degradation and utilization of the waste glycerol.

Working in this lesser explored area, Noida based Codon Biotech, has designed a project for development of efficient cost effective production and purification methodology for economic viability of the whole process conversion of waste glycerol into 1,3 propanediol (PDO), which is a highly value added industrial compound. The anaerobic, microaerophilic and thermohilic bacteria can convert waste glycerol to environmentally safe and value added Industrial compounds like 1,3 propanediol. But standardization of cost effective, environmentally safe utilization studies have not been much explored in India. The project first involves screening and selection of high 1,3 propanediol producing organism. After which the up scaling of the production yield would take place. The final objective of the project is to study and standardize a cost effective purification procedure so that the whole process could be made economical. At present most of the 1,3 propanediol used by industries is imported from either US or China.

The company was granted the Small and Business Industry Research Initiative (SBIRI) project in the year 2012 and the total grant is Rs 25 lakh, wherein 80 percent of the grant was given by DBT and 20 percent funding is done by the company itself. To further help the company, it was also provided with two external experts for guidance throughout the project duration.

Dr Tripti Bhatnagar, director, Codon Biotech is all praises for the DBT support. She says, "It was very important to us not that much financially but technically because it was a recognition for a start up biotech company like Codon Biotech. The company was recognized for its research and was technologically and infrastructurally found fit to carry out this project

individually. It was very important for our self esteem and also strengthened the belief that if we believed in the business relevance of an idea, the government could become a partner in the whole idea. And thus we can become employment generators rather than employment seekers in the field of biotechnology. Thus, the SBIRI project was very important for us."

Way Forward:

The demand for diesel is five times higher than the demand for petrol in India. But while the ethanol industry is mature, the biodiesel industry is still in its infancy. India's current biodiesel technology of choice is the transesterification of vegetable oil. Jatropa oil was the choice of biodiesel production but could not get a very good start as the biodiesel produced from jatropa is not cost effective. At present the biodiesel producing companies in India are limited and the utilization of biodiesel is also very limited. Less than 0.5 percent of total transportation fuel in India uses biofuels. But now companies like Reliance as well as Indian Council for Agricultural Research (ICAR) are investing in a lot of research and in turn promoting biofuel production from algal sources. Thus, the production of biodiesel is expected to register an increase in the near future and then the problem of discarding the resultant waste biproduct (glycerol) would certainly arise.

Thus, this project has two important parts, one is the environmental and ecofriendly part where in the surplus waste glycerol which would be produced would be utilized and the second is the standardization of cost effective production of 1,3 propanediol from the waste glycerol. Therefore, there is no doubt it would be useful to develop economical and cost effective methods for environmental friendly utilization of waste glycerol and help in converting biodiesel production into a more profitable venture for industries.