



Indian Hotels has adopted a new eco-friendly process, which converts its waste cooking oil into biodiesel and also produces soap as a by-product.

## THE CONTEXT



The Taj MG Road, Bengaluru generate around 300 litres of waste cooking oil at their restaurants each month. This was either discharged into the drain or given away to a local recycler at a cost, which was neither environmentally friendly nor cost-effective. Hence, the company decided to look for an innovative solution to dispose waste cooking oil in a safe and

## THE INNOVATION



The hotel collaborated with the Mahatma Gandhi Institute of Rural Energy Development (MGIRED) to convert waste cooking oil into biodiesel through a chemical process called transesterification. Under this, the waste oil is first filtered with a cotton cloth to remove any solid particulates or food particles, after which it is heated up to 110 degree Celcius to remove any moisture content. The oil is then blended with methanol (200 ml per litre) and sodium hydroxide (4.5 grams per litre), and the mixture is heated for 90 minutes at 65 degrees Celcius.

Once the mixture cools and settles, it forms two layers. The upper one is classified as biodiesel while the lower one is glycerin or glycerol. After removing the glycerin, the biodiesel is washed with tap water to remove any sodium hydroxide residue. It is then heated to 110 degrees Celsius to remove moisture. After blending it with 20% diesel, the biodiesel is then fit for use in diesel-powered vehicles and power generators.

The process has a typical yield of 70%, that is 100 litres of waste cooking oil generates about 70 litres of biodiesel. In addition, 5,000 soap bars of 20 grams each are produced from the glycerol. The biodiesel was analysed by the District Biofuel Information and Demonstration Centre at the Gandhi Krishi Vigyan Kendra (GKVK), University of Agricultural Sciences, Bengaluru, and found to have the desired specifications. The soap, which is being used by the community, has also been found to be satisfactory.

## KEY CHALLENGE



**TO IMPLEMENT THE PROJECT IN A SUSTAINABLE MANNER IN A RUNNING HOTEL, MANAGE THE LOGISTICS FOR WASTE OIL TRANSPORTATION AND DISTRIBUTE SOAP TO THE COMMUNITY**

The hotel group has successfully run this circular economy project for over a year now, which should inspire other hotel chains to follow suit.



## THE IMPACT



The hotel was spending Rs 6,000 a month on giving away the waste cooking oil to a local vendor. The new process, which comes at zero cost, has eliminated this. Moreover, by delivering green fuel and soap for the community, it has not only helped reduce emissions but also provided economic benefits to the hotel and social benefits to the local community.