

## Technology Offer

# Enzymatic technology for biodiesel production from vegetable oils

## Summary

*A Romanian research institute has developed a technology for obtaining diesel engine fuel from sunflower oil, by using the transesterification reaction with methanol in enzymatic catalysis. The Romanian research institute is looking for commercial agreement with technical assistance (engineering and technical assistance) with an industrial partner, to develop, homologate and introduce the new technology into production.*

<b>Creation Date</b>	19 May 2015
<b>Last Update</b>	04 November 2015
<b>Expiration Date</b>	03 November 2016
<b>Reference</b>	TORO20150519001

## Details

### Description

Within this technology, a Diesel-type fuel is obtained from sunflower oil, by using the transesterification reaction with methanol in enzymatic catalysis, with *Candida antarctica* lipase B in immobilized form as biocatalysts. The reaction mixture submitted to the transesterification reaction is prepared by mixing the sunflower oil with tert-butanol and methanol and introduced then over the packed-bed immobilized enzyme. The reaction mixture is thermostated at a temperature of 38-40 °C. The reaction mixture flow rate is adjusted so as to ensure a total stationary time of 4 hours. The separation of crude biodiesel from the crude glycerol resulted as by-product result is achieved by decantation. The biodiesel is then submitted to a distillation process, for removing both the tert-butanol used as reaction medium and the exceeding methanol and, finally, to obtain the purified biodiesel. The Romanian research institute is looking for commercial agreement with technical assistance to develop, homologate and introduce the technology into production.

In the commercial agreement with technical assistance, the partner will scale-up the technology at pilot level by using technical assistance and qualified personnel according by the research institute. For this technology was applied for patent applied in Romanian but is not yet granted.

### Advantages and Innovations

Main advantages of the offer:

- Increases the installation productivity by significantly reducing the production cycle time and the process steps required for the purification of the finished product.
- Significant reduction of energy consumption due to lower reaction temperatures.
- Simplified technological scheme, due to the reduction of purification stages for crude biodiesel compared to conventional procedures.
- An alternative more environmentally friendly as compared to the conventional process

because it does not require wastewater treatment.

- Is obtained 98% purified biodiesel

## Stage of Development

Under development/lab tested

## IPR Status

Patent(s) applied for but not yet granted

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## Keywords

### Technology

04005003      Liquid biofuels

### Market

06007001      Other energy production  
09001003      Leasing of railcars, buses, cars, etc.

### NACE

M.72.1.9      Other research and experimental development on natural sciences and engineering

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## Network Contact

### Issuing Partner

NATIONAL INSTITUTE OF RESEARCH AND DEVELOPMENT FOR OPTOELECTRONICS

### Contact Person

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**Open for EOI :**    **Yes**

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## Dissemination

### Send to Sector Group

Intelligent Energy

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## Client

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### Type and Size of Organisation Behind the Profile

R&D Institution

### Year Established

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### Already Engaged in Trans-National Cooperation

Yes

### Languages Spoken

Romanian  
English

### Client Country

Romania

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## Partner Sought

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### Type and Role of Partner Sought

- Type of partner sought: industry
- Specific area of activity of the partner: Renewable energy / Biofuels production
- Task to be performed by the partner sought: In the commercial agreement with technical assistance, the partner will scale-up the technology, using appropriate equipments and qualified personnel. The Romanian research institute will support its partner with effective start-up and technical consultancy.

### Type and Size of Partner Sought

R&D Institution

### Type of Partnership Considered

Commercial agreement with technical assistance