

# **BIODIESEL IN PAKISTAN**

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## PAKISTAN ENERGY SCENARIO A FACT SHEET (2005-2006)

	<b>Oil</b>	<b>Gas</b>	<b>LPG</b>	<b>Coal</b>	<b>Electricity</b>
Production Capacity	65577 BOPD	3836 MMCFD	1495 MTD	4.06 MMT	19,439 MW
Remaining Reserves	324.47 MMB	32.58 TCF	-----	185 BT	-----
Refining Capacity	12.88 MMTY	-----	-----	-----	-----
Import	14.6 MMTY	-----	24779 MT	1.54 MMT	-----

## PAKISTAN ENERGY SCENARIO A FACT SHEET (2005-2006)

Diesel & FO Consumption	10 MMTY
Petrol Consumption	1.65 MMTY
Total Import Value of Oil	US\$ 6.60 Billion

It is evident that Pakistan needs to increase energy security by producing more energy in-house. A possibility through the development of Alternate Energy Sources.

## PAKISTAN ENERGY SCENARIO

Options available:

Nuclear  
Hydrogen  
Wind  
Solar

Bio-fuels / Bio-energy

- i. Biogas
- ii. Ethanol
- iii. Methanol
- iv. Biodiesel

## PAKISTAN ENERGY SCENARIO

- The bio-energy alternative is exciting because it provides us with easily available fuel that can fit into today's gasoline and diesel engines with minimal or no changes to existing systems.

- Biofuel is also a form of solar energy harvested from the land, as plants use photosynthesis to convert solar energy into chemical energy stored in the form of oils etc., and wherever land and water are abundant biofuel is cheap and sustainable.

- Of the bio-energy alternatives, one exciting trend is Biodiesel  
- a diesel-like substitute from plant and animal fats.

## PAKISTAN ENERGY SCENARIO

-Realizing the necessity of developing alternate sources of energy the Government of Pakistan established an Alternate Energy Development Board. The AEDB, headed by a dynamic Chairman and an agile Secretary, has been actively exploring the utilization of alternate energy sources in Pakistan.

- Recently AEDB was instrumental in establishing a few petrol pumps to supply a blend of petrol and ethanol (technically known as E10). We wish to see more petrol stations dispensing E10.

- Indigenously produced 165,000 tons of anhydrous ethanol will be enough for this purpose and can save lot of foreign exchange as well as part of environmental degradation.

## BIODIESEL IN PAKISTAN

- AEDB is also involved in the development of Biodiesel. They have sponsored a Project to provide electricity to a remote village by running diesel generator using Biodiesel as energy source.

- For this a **close loop policy** is being observed, where the producer of alternate energy source will be the user as well.

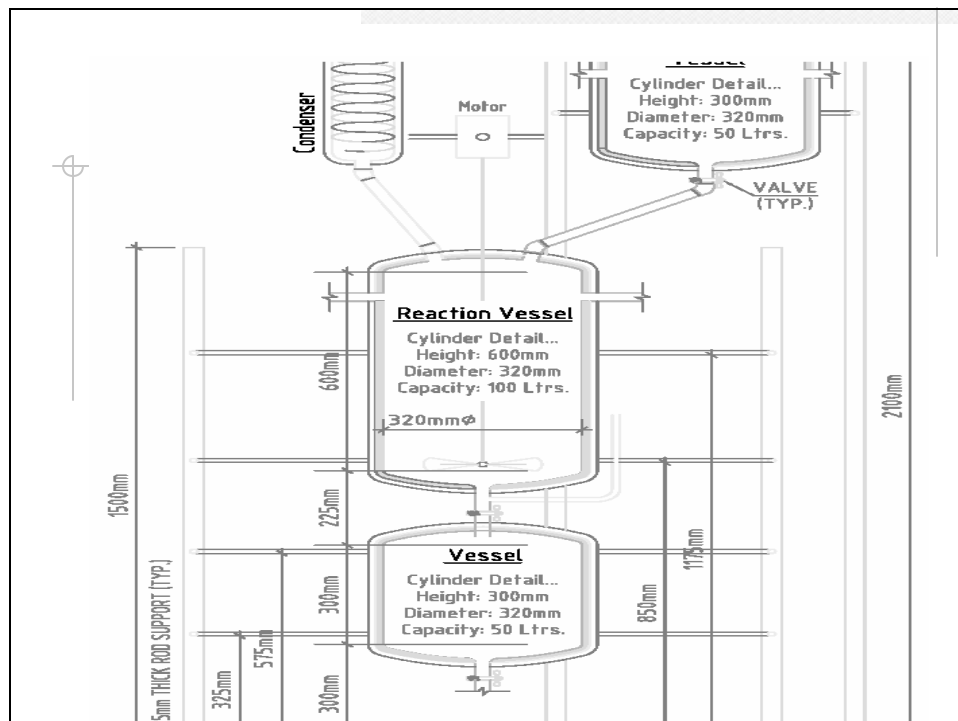
- The villagers will grow the required seeds for the vegetable oil and produce Biodiesel through trans-esterification and run the installed generator set to generate electricity for their village.

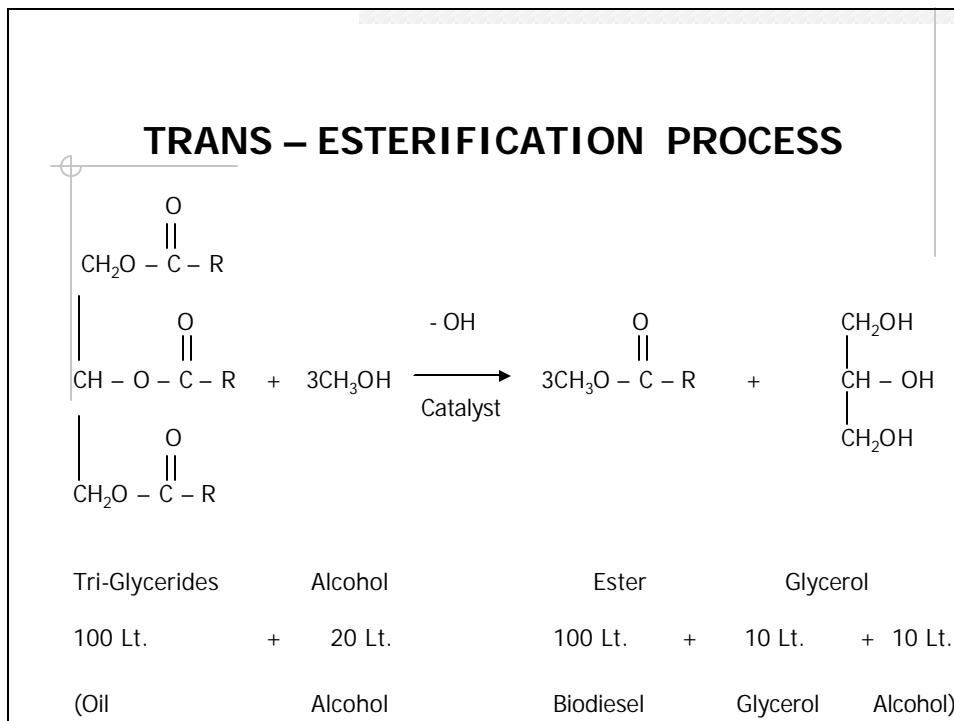
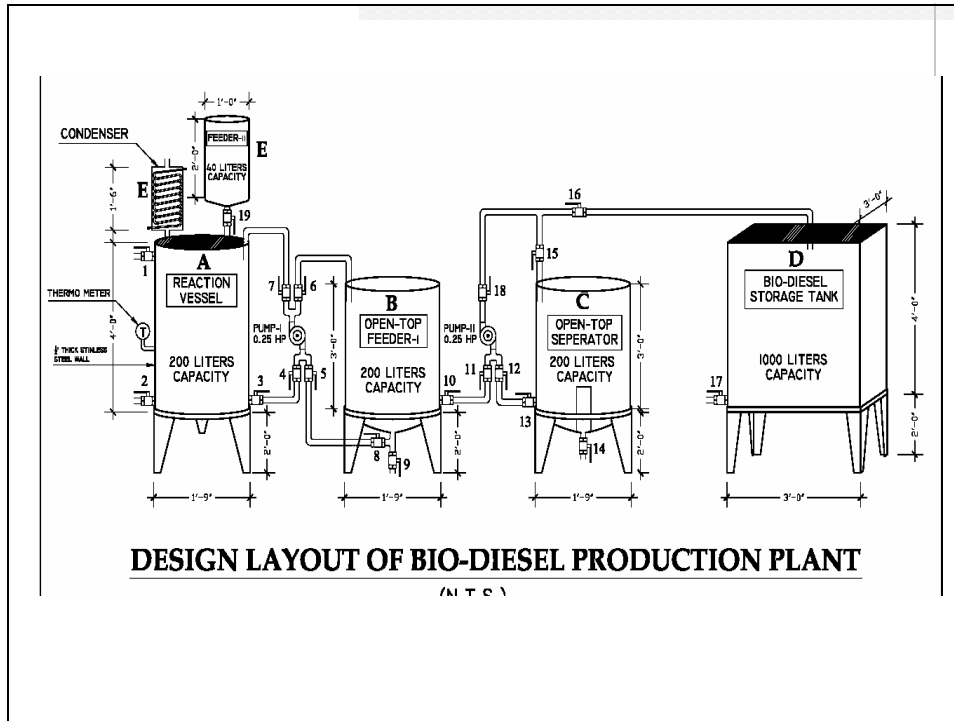
## BIODIESEL IN PAKISTAN

-The technology of trans-esterification has already been developed and tested locally at Sir Syed University of Engineering & Technology, Karachi.

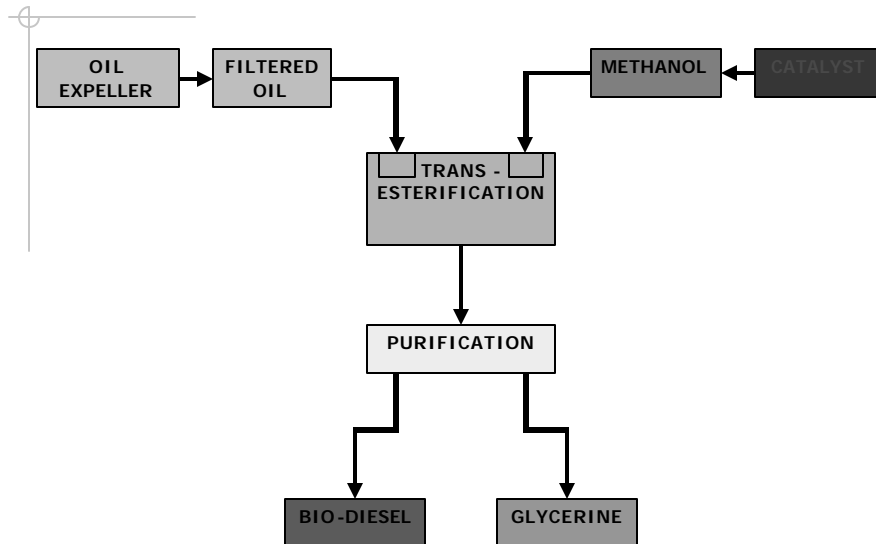
- The capacity of locally developed unit for the production of Biodiesel is 100 liters per batch in two hours.

- On full scale it can produce up to 400 liters of Biodiesel per day using which a 200 KW generator can run for 8 hours on B100 (100% Biodiesel).





## FLOW CHART FOR BIODIESEL



## FUEL PROPERTIES

	Fuel weight Lbs/gal	Heat of combustion BTU/gal	Cetane number	Viscosity centistokes
Petroleum Diesel	7.05	140,000	48	3.0
100% Biodiesel (B100)	7.30	130,000	55	5.7
B20 mix (20/80)	7.10	138,000	50	3.3
Raw vegetable oil	7.50	130,000	35 to 45	40 to 50

## BIODIESEL IN PAKISTAN

- Since we are an agriculture-based economy, production of Biodiesel in Pakistan will strengthen our agricultural sector and empower the farmers.

- **Money, as we all know, does not grow on trees, but a possible energy solution clearly does.**

- Jatropha & Pongamia are two such examples of plants that could be grown to yield biofuel.


## BIODIESEL IN PAKISTAN

- Plantation of these plants is likely to create at least one job for every acre of planted trees; the total impact on agricultural employment alone could be huge.







- Moreover, these plants have the ability to grow on marginal, waste or arid land.

- Pakistan has large areas of such poor quality land (more than 80 million acres), ideal for the cultivation of energy crops, so growing Jatropha & Pongamia would not divert land away from growing vital food crops.

Wasteland



**Jatropha Bio-Diesel**



Jatropha and Pongamia Fruits and Seeds

## **BIODIESEL IN PAKISTAN**

- To produce biodiesel, besides vegetable oil, alcohol (ethanol or methanol) is also required. It only constitutes about 10% of the volume of biodiesel.
- Ethanol is abundantly available – courtesy sugar industry. Methanol can easily be produced from natural gas.

**So... in a nutshell**

**TECHNOLOGY IS AVAILABLE**

**LAND IS AVAILABLE**

**OTHER NECESSARY RAW MATERIALS**

**ARE INDIGENOUS**

**THE ONLY THING WE NEED**

**IS**

**THE WILL TO DO IT!!!!**

## **CO-INVESTMENT OPPORTUNITY**

### Taking the Initiative

TMT VENTURES is launching a **US\$100m**

Private Equity Fund with **Alternate Energy**

as one of the focus sectors.

## **THANK YOU**

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