



Production and use of bioenergy in Rūjiena region

Eco-Intelligence in Action
2008 - 2010

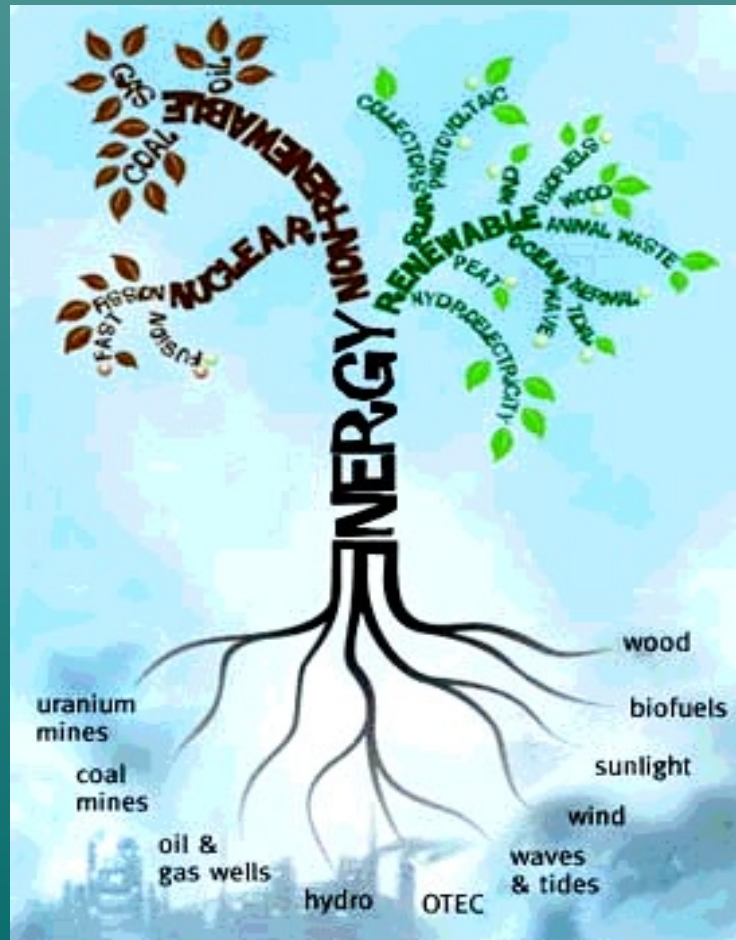
Project conference in Lappeenranta May 15-21 2010

Karīna Dreimane
Alīna Deksne
Rūjiena Secondary School
Latvia

Kinds of energy resources:

Non-renewable:

- ◆ coal
- ◆ gas
- ◆ oil



Renewable:

- ◆ wind
- ◆ hydro
- ◆ sunlight
- ◆ biofuels
- ◆ thermal heat
- ◆ waves
- ◆ tides
- ◆ wood

1. Extraction of biogas (methane) from waste
2. Extraction of biofuel from rape-seeds
3. Production of biofuel from wood chips

1. Extraction of biogas (methane) from waste



WASTE



METHANE GAS
 CH_4

ZAAO is a waste management organization and is operating in the North Vidzeme Region



This organization has created a landfill Daibe. It is a treatment and disposal site of solid waste in the North Vidzeme Region.

A special equipment in the landfill collects the biogas (methane) which originates from the decomposing waste.



There is a gas collection system in the landfill Daibe the pipes of which stretch for almost 3 km, as well as a pumping station and a gas regulation station.

The gas is burnt and used in production of electricity.



In September 2009 a group of students involved in the Comenius project visited the landfill Daibe and got acquainted with the biogas production.



2. Extraction of biofuel from rape-seeds



RAPE-SEED PLANT



BIODIESEL

Biodiesel is a fuel, produced as a result of a chemical reaction between vegetable butters or adiposes and alcohols in presence of a catalyst.

As raw material for biodiesel are used rapeseed, sunflower, soybean, coconut palm, worked vegetable butter or any adipose.

“Delta Rīga” Ltd. produces biodiesel from rapeseed.



Rape-seed plant cultivation



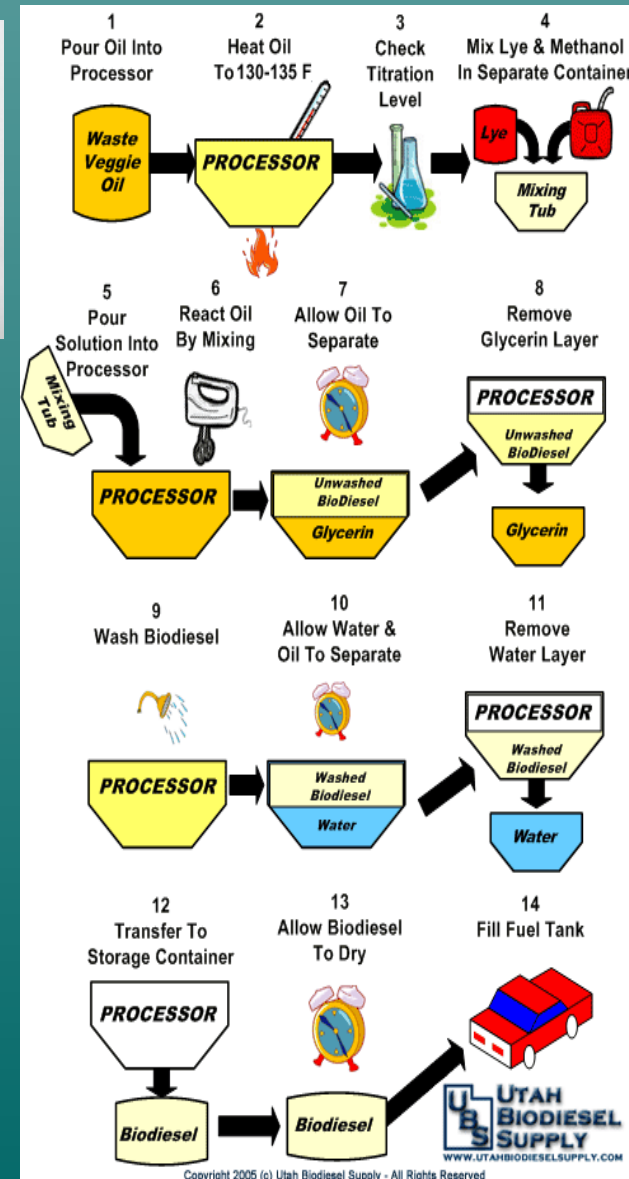
Biodiesel is made by chemically altering an organic oil through the use of a catalyst and alcohol.

Production of biodiesel:



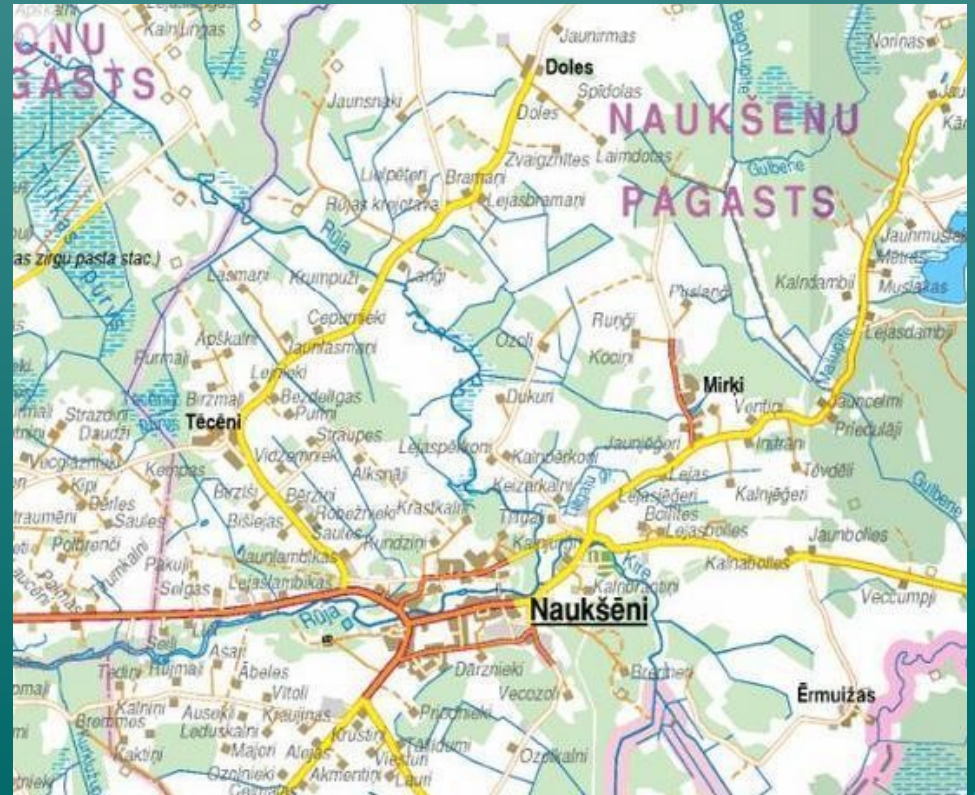
- the organic oil is heated
- a mixture of catalyst and alcohol is added to the oil
- the oil, catalyst and alcohol mixture is mixed and then allowed to settle
- the chemical reaction between the oil, alcohol, and the catalyst breaks down the oil into several layers
- two of the layers - glycerin and soap are drained off
- the biodiesel is washed, dried and finally filtered.

And biodiesel is ready to be used.



Just 8 km from Rūjiena in Naukšēni there is a company "Delta Rīga" Ltd. which produces biodiesel.

This manufacturing process does not pollute the air, soil and water – the process is environmentally friendly and clean.



Advantages of biodiesel

- Biodiesel is non-toxic and harmless to health, when in contact with skin.
- The use of biodiesel is not dangerous to the environment
- It can be used in place of petroleum diesel fuel for vehicles. Such vehicles produce significantly fewer emissions.
- It can be used also as heating oil for buildings

✓ "Delta Rīga" Ltd. after manufacturing biodiesel, produces such side products as forage and ecologically clean heating fuel.

✓ The company supplies the local area with heating fuel and electricity.

✓ The company exports about 90% of the biofuel, mostly to Lithuania.

✓ "Delta Rīga" Ltd. also produces
glycerin
rape-seed cakes



rape-seed cakes

3. Production of biofuel from wood chips



WOOD



WOOD CHIPS

Wood chips are a valuable side-product of woodworking. It is produced by crushing wood waste



Wood chips are used:

- for heating
- for manufacturing of chipboard
- for production of briquettes
- in biomass energy production facilities
- in agriculture, horticulture, etc.



Wood chips are used in the heating system of Rūjiena town. The chips are obtained from the local woodworking enterprise “Helda” Ltd.



Thanks for attention!

