



The Used Oil Sector and climate change mitigation



To evaluate the connection among the used oils and the greenhouse gas emissions we must differentiate between the mineral and the vegetable used oils.

While the mineral used oils are considered waste they don't emit any greenhouse gases, because the greenhouse gases are emitted in their combustion.

We have two choices in the final purpose of the mineral used oils:

- a) Regeneration or re-refining (always the best alternative).
- b) Use as a fuel (less favourable).

The vegetable used oils can be highly polluting, however we can turn them into biofuels, an alternative to fossil fuels. The biofuels greenhouse gas emissions are considered neutral, because a non-renewable natural resource (petroleum) is not used.

Proposal of mitigation alternatives of gas emissions with greenhouse effect in used oil sector

USED MINERAL OILS

Are those industrial oils whose lifetime has ended for the process performed.

The greenhouse gases emissions are generated by its combustion.

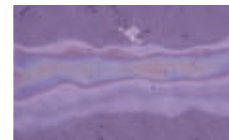
We have two choices in the final purpose of the mineral used oils:

- Regeneration or re-refining:
 - The best alternative.
 - The refining process is when the pollutants are removed and then the mineral used oils aren't considered waste.
 - This process is applicable indefinitely.
 - The refining uses less energy than is necessary for the production of new base oil from crude oil.
- Use as fuel:
 - This is the less favourable alternative.
 - You can replace fossil fuels used in the factory, but CO₂ emissions are generated.
 - Greenhouse gases emissions should be monitored to ensure the absence of pollutants that affects the human health or the environment.
 - CO₂ emission factor: 73.3 tCO₂/TJ according the IPCC Guideline.

VEGETABLE OILS

Obtained from kitchens, restaurants, hotels, etc. They have a high pollution potential.

- Transformation of vegetable used oils (waste) into biofuel:
 - Energetic independence from fossil fuels.
 - Less greenhouse gases emissions generated.
- The process has the following phases:
 - Vegetable used oils collection:
 - A good collection organization is needed to achieve a sufficient collection volume to be economically viable.
 - Awareness and population collaboration is needed to success.
 - Trans-esterification process (production of biofuel):
 - High efficient process: 100kg. of biodiesel generated from 100kg. of vegetable used oil.
 - Phases: cleaning, reaction, centrifugation, wash and dry and storage.
- Use of biodiesel:
 - You can use biodiesel in most conventional diesel vehicle engines.
 - Some vehicles require motor adjustments.



Case study: **ARGEM (Múrcia)** (Source: www.conama.es)

The Regional Sustainable Development Ministry of ARGEM (Energy Management Agency in the Murcia Region) implemented a small pilot project collecting vegetable used oils domestically. The reason for this project was the prevention of pollution which would result in the discharge of domestic vegetable used oils to the sewer. The treatment required in wastewater treatment plants is economically expensive and the process does not ensure the complete removal of the existing vegetable used oils in water.

ACTIONS IMPLEMENTED

- A total of 140,000 funnels were designed and distributed.
- Placement of 500 vegetable used oils containers to deposit the filled bottles.
- AERTA (Collection, Treatment and oils and fat Recycling Business Association) collects the bottles and applies a process of trans-esterification to obtain biodiesel.

RESULTS

During the first five months of the project more than 11,500 l of oil were collected only in the Murcia region.

At the trans-esterification plant a liter of biodiesel per liter of vegetable used oil can be obtained.