

GREEN POWER
Feeds Your Engine



2nd VegOil

Demonstration of 2nd Generation Vegetable Oil Fuels in Advanced Engines

**Workpackage 3
Fuel development**

**Deliverable N° 3.3
Survey on additives**

Publishable summary

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1 Summary

At the usage of rape seed oil as fuel produced by extracting the seed, the elements phosphorus, calcium and magnesium get particular relevance. If natural rape seed oil should be used as bio fuel, the content of the unfavourable elements phosphorus, calcium and magnesium has to be reduced.

On the one hand the reduction is necessary to observe DIN V 51605 according to tax legislation, on the other hand the element contents should be lowered as far as possible to enable a failure free engine process. In their research work VWP found out that the minerals content of rapeseed oil as a fuel should be lower than 0.5 ppm for each element (P/Ca/Mg).

Phosphorus, calcium and magnesium contents in rape seed oil support the the oxidation stability of the oil but are also made responsible for the plugging of engine fuel filters and particulate filters. The elements may reduce the burning temperature of the oil and can cause sediment residues in combustion chamber. The alkali and earth alkali element content in unrefined vegetable oil can be kept low by processing only mature rape seed and by appropriate process handling when processing the oil seed.

Target of this deliverable is a survey on possible additives, having a positive influence on reducing P/Ca/Mg. Covered below is an explanation of known additives and their purification effect as well as characteristics of additives. Based on this survey, experiments on developing advanced vegetable oil quality with low element contents of P/Ca/Mg are realisable.

In the survey of additives, the additives bleaching clay, synthetic silica, kieselguhr, cellulose and perlite, were found which are having a positive influence on reducing P/Ca/Mg. These additives are used in industry to purify oils and to reduce unfavourable substances in the oil. Especially to purify oil out of elements phosphorus, magnesium and calcium the additives are useable.

To achieve a minimum content of P/Ca/Mg all these possible additives have to be practically examined on their impact on vegetable oil and possible different combinations for purifying oil out of substances. Based on the survey of possible additives purifying experiments to remove P/Ca/Mg out of vegetable oil are possible and will be carried out in following tasks.