

## Medienmitteilung

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### TA-SWISS Study on the potential for biofuels in Switzerland

## Green driving? Putting Second Generation Biofuels to the Test

**An interdisciplinary team headed by Empa researcher Rainer Zah has been studying the sustainability of second generation biofuels and has calculated how much fuel might be saved in Switzerland through the use of these new products. The investigation, which was carried out for TA-SWISS, the Swiss Centre for Technology Assessment, concludes that between 10 and 40 per cent of current fuel requirements could be sustainably supplied by second generation biofuels, taking vehicle efficiency and electromobility factors into account.**

Tomorrow's environmentally friendly vehicles for individual mobility need drive technologies which cause as little pollution as possible. However, the enthusiasm for so-called first generation biofuels, which were initially regarded as having great future potential, has practically evaporated. Despite being sustainably grown, only a small part of the complete plant is used for the production of these supposedly environmentally friendly fuels – for example its oil, sugar or starch content. This means that the raw materials are used inefficiently, so that these biofuels are significantly less environmentally friendly than originally expected, as an Empa study showed in 2007. In addition, these plants compete with food crops for resources and also pose a threat in terms of biodiversity.

### **Second generation biofuels – a beacon of hope**

Since then, processes have been developed which allow practically all kinds of biomass to be converted into fuel, including green waste, straw, manure (in both liquid and solid forms) as well as plant material with a high percentage of cellulose and scrap wood. However, most of these methods are expensive and technically demanding. In order for second generation biofuels to become commercially viable, assistance in the form of state subsidies and promotion programs must be provided. These only make sense, however, when applied to encourage the production of those biofuels which are proven beyond doubt to be sustainable and environmentally friendly. To throw light on this aspect of the new fuels, life cycle analyses over the entire production and chain of value-adding processes are required – that is, covering the manufacture, usage and disposal of any waste products. For this reason Empa's environmental experts, under the leadership of Rainer Zah, have been examining second generation biofuels in detail. The investigation is being carried out on behalf of TA-SWISS, the Swiss Centre for Technology Assessment. In addition, the project scientists have estimated as to what extent biofuels might be able to replace fossil fuels in Switzerland.

### **Tomorrow's «green» fuel is derived from waste materials**

The main conclusion of the study, being presented in Bern on June 29<sup>th</sup>, is that the most environmentally friendly biofuels are primarily those which are manufactured using waste products and left-over materials such as green waste, saw-mill waste and waste wood. When crops are grown in developing countries specifically for the production of biofuels, then the disadvantages dominate the equation, because they compete with crops for food production and thus increase the pressure on the natural ecosystem. And since in Switzerland only a limited amount of waste material is available, even in the best case biofuels would only be able to provide about eight per cent of the fuel requirements due to individual mobility.

Does this mean giving up the support of biofuels development through public funding? “No”, says Rainer Zah. “That would be a short sighted reaction. Event though the proportion of locally produced biofuel is modest, it is still equivalent to the annual energy consumption of more than a million single-family houses.” The more important question is how to diversify the energy supply for the mobility sector, or in other words how to ensure that the most appropriate drive technology is used for various travel needs – long distance journeys, urban mobility, freight transport and so on. In parallel, the priority is to increase vehicle efficiency but also to extend the electromobility network. With respect to the question of reducing consumption, Empa researchers have set an ambitious target. “Vehicles with internal combustion engines should have an average maximum consumption of 4 liters per 100 kilometers by 2030.”

### **On the whole, mobility has an enormous potential for saving energy**

Zah explains what this means in concrete terms for the year 2030, assuming the most optimistic scenario. “If the available biofuels are use to power long distance traffic, then we would save not just eight per cent fossil fuels but, thanks to more energy efficient vehicles, as much as fifteen per cent. And if simultaneously in our cities primarily electric vehicles were to be used whose batteries were charged using alternative energy technologies such as a solar power, then another 25 per cent fossil fuel “replacement potential” would be possible. That means in total it would be possible to replace about 40 per cent of today's fossil fuel consumption.”

And what recommendations for political decision makers does this all lead to? Again, Zah: “The question is not whether electromobility, improved vehicle efficiency or support for sustainable biofuel development should be allocated the highest priority. Far more important is that we have to find ways to ensure that all three approaches make significant progress and then apply them where they bring the most benefit.”

Rainer Zah headed a study on the future perspectives of biofuels undertaken by Empa on behalf of TA-SWISS. He was supported by an interdisciplinary team including ecologists from the University of Zurich and specialists on material flows and resource management from the Wuppertal Institute.

R. Zah, C. Binder, S. Bringezu, J. Reinhard, A. Schmid, H. Schuetz. Future Perspectives of 2<sup>nd</sup> Generation Biofuels, Edited by TA-SWISS – the Swiss Centre for Technology Assessment, published by Hochschulverlag AG der ETH Zürich, 2010. ISBN 978-3-7281-3334-2. Also available as an eBook, [www.vdf.ethz.ch](http://www.vdf.ethz.ch)

For a summary of the study available to download from the TA-SWISS website, see [http://www.ta-swiss.ch/a/biot\\_fuel/Kurzfassung\\_Biotreibstoffe\\_zweite\\_Generation\\_d\\_f\\_e.pdf](http://www.ta-swiss.ch/a/biot_fuel/Kurzfassung_Biotreibstoffe_zweite_Generation_d_f_e.pdf)

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