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In this number of the Green Indicator, I have the pleasure of summarising a new set of answers. This time to the question: *Is there a need for tax-incentives on biochemicals as well as biofuels?* We have had representatives from the industry, the venture capital community and cleantech opinion-formers in the form of Cleantech Inn Sweden. Brook Porter with Kleiner Perkins and Helena Tillborg with Cleantech Inn Sweden both argue, in different ways on the topic of leveling the playing field. The fossil feedstock used today for chemical production is in itself not carrying its societal costs, this due to the indirect, or even direct, subsidies in the form of environmental impact, global warming and military interventions. Therefore subsidiaries are required to bring the biochemicals to the same level as for fossil feedstocks.

Jan Brandin uses different argumentation for answering the question affirmatively, since the transition from a fossil to a renewable feedstock situation is desirable from a future competitive and cost perspective. This wanted transition should be driven by the governments through subsidiaries to avoid being caught by surprise and forcing bad decisions later.

We will be back after Christmas with a new set of answers for you, in this issue you will be reading about the creativity of man in the creation of alternative feedstocks and catalysis. With that all that remain is to wish you a **Merry Christmas and a Happy New Year.**

/ Christian Hultberg

Creative Feedstocks

There seems to be no end to the creativity of human beings. In the search for new, alternative ways to get feedstock for fuel production there seems to be no boundaries, not even space is off-limits. The first example of creativity is the use of roadside rights-of-way where a number of universities in the US are currently focusing their efforts. Instead of just maintaining the roadsides, which is required two to three times per year anyway, they are used for growing canola, safflower, camelina etc. The results: 150 l of oil per hectare and good chances of lowering the carbon dioxide footprint of the state-owned vehicle fleet without using additional agricultural land.

Green Indicator #9, December 2010

CatScan



Nature Inspires

Catalysts have over the last 150 years or so been manufactured in the same way. Starting from natural minerals and adding various active materials for increasing selectivity, activity and general performance of the catalysts. This is the traditional way of catalyst preparation, but there is a need for more tailored surfaces for performing advanced reactions. In the past these types of surfaces have been built up through chemical vapour deposition, requiring methods making them less practical for industrial production.



However, with the proven benefits of these types of surfaces, alternative methods of producing these are of interest. One way of creating these symmetric and highly repetitive surfaces may be to look at nature and its ability of creating these regular structures. Starting for instance with a DNA sequence, one can envision coding a starting



catalysts can be created.

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Algae have been discussed extensively in the context of renewables. A recent development has however justified it being brought up again here in brief. The US air force research laboratory will start testing the use of powder form algae. That is not only the triglyceride part of the algae will be used, but a dried version of the entire micro-organism will be used after suspension in air and combusted in a special powder combustion chamber.

So what about space? The prospect of using Jatropha as an alternative feedstock has been touched upon in earlier issues of the Green Indicator. This feedstock has now been taken one step further and seeds have been sent out into orbit at the International Space Station for activating dormant genes with microgravity exposure. The aim of the research is to produce a crop which grow to the same size, produce more oil, tolerate dry weather and ripen uniformly. Hopefully more can be reported from this development as time progress.