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Newsletter

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Editorial

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Announcement

Lighthouses for the Integrated Biorefinery Concept for biobased Products in EU Member States

Follow-up Workshop of the EU-Symposium "Renewable Raw Materials for Industry - Contribution to Sustainable Chemistry" (17 / 18 October 2007)

Wednesday 5th November 2008, 9.00 h, in the Bavarian Representation, Rue Wiertz 77, Brussels

Since the first EU symposium on Renewable Raw Materials for Industry on 17/18 October 2007, new developments have occurred. In December 2007 the EU Commission Interservice Group on biobased products finalised the report "Accelerating the development of the market for biobased products in Europe", composed in preparation of and as input to the Lead Market Communication of the European Commission COM(2007)860 final (cf. http://ec.europa.eu/enterprise/leadmarket/leadmarket.htm & http://ec.europa.eu/enterprise/leadmarket/biobased_products.htm).

After this first symposium – which involved amongst others the European Parliament and several DGs from the European Commission – we will now present concrete current EU industry and academia involvement in innovations in the biobased products and biorefinery areas. This work contributes positively to the current energy and feedstock discussion.

Based on SusChem's (European Technology Platform for Sustainable Chemistry) visionary project on the integrated and diversified biorefinery and the Industrial Biotechnology proposals of the SusChem "Implementation Action Plan", this workshop aims at demonstrating detailed activities that are performed in several EU Member States.

The workshop will be opened by Ms. Dr. Angelika Niebler, Member of the European Parliament and Chairperson of the EP Committee on Industry, Research and Energy.

Platform
Bio-based
Business

Her speech will be followed by presentations from DG Research and DG Enterprise and Industry on their respective activities. In order to demonstrate the cooperation between the Services of the EU Commission involved on these issues, the representative of DG Research will speak on the biorefinery concept in the frame of the 7th EU Research Programme. This issue is directly linked to the report of the EU task force for the implementation plan for "Lead Markets Initiative on Biobased Products", which will be described by the representative of DG Enterprise and Industry. The concept of a certification scheme at international and EU level will be demonstrated by FNR.

By opening the reception in the evening, Ms. Emilia Müller, Minister for Economic Affairs, Infrastructure, Transport and Technology of the State of Bavaria, will illustrate the political aspect of the Bavarian Biotech Cluster.

Dietrich Witmeyer
General Secretary of ERRMA

Creative bookkeeping with CO_2 sequestration

Travel consumes fuel. If this fuel is of fossil origin it gives rise to CO_2 emissions with all kinds of undesirable effects on our global climate as a consequence. It comes as no surprise that ways have been found to compensate for such CO_2 emissions. Several "climate compensation programs" are based on the fact that growing trees sequestrate CO_2 in biomass, thereby reducing the greenhouse effect. If, for instance, all airplane travellers would compensate their contribution in kerosene consumption by sponsoring or planting trees this would solve an increasing problem. And, for that matter, why stop at airplane travel: most of the fossil petroleum is used for road travel, so why not compensate for that as well?

The above strategy sounds valid but there are some flaws in the reasoning:

- Of the 85 million barrels of mineral oil recovered each day, 70% is used for transport. This corresponds to about 3,500 million m^3 fuel a year. Since 1 m3 of gasoline used as fuel in a car produces plm. 2.3 tons of CO_2, the global transport fuel-derived CO_2 emission per year is about 8,000 million tons of CO_2. Assuming an average sequestration potential for trees of 9 tons per hectare, this implies that we would have to plant about 9 million square kilometres of new forests to compensate for fuel-derived CO_2 emissions, or almost the total land area of the USA. This quick and dirty calculation shows that this is in my opinion an unrealistic way to solve the carbon emission problem and is, at best, a way to generate moral support, or, at worst, to shift the attention away from more painful measures.

- Increasingly, cases reach the news headlines where trees are allegedly planted to compensate for (travel-related) CO_2 emissions, but where upon closer inspection these forests were already in existence before the program was started. This can, of course be solved by closer control and certification of participating CO_2 compensation programs.

- A more fundamental flaw in the reasoning is that CO_2 sequestration will only have effect if the CO_2 is fixated into biomass indefinitely. Since mineral oil is in fact CO_2 sequestrated in biomass millions of years ago, carbon fixation in biomass would close the cycle is this biomass would be taken out of the equation for, again, the coming millions of years or so. This is obviously not the case. It can be expected that carbon that was fixated in trees will within, say, one century again be released in the atmosphere, be it by burning or by microbial decomposing. Therefore in fact only a shift of the present CO_2 emission for a number of decades into the future is achieved. This would make it no less than a form of "creative bookkeeping".

The above leads in my opinion to the conclusion that CO_2 emission compensation by planting trees has a high PR-value and is a nice option to get people involved, but is not the solution for our problems.

It is certainly no alternative for activities that will truly reduce global fossil CO_2 emissions such as the stimulation of alternative energy sources and the use of biomass for energy and material applications. Let's not forget to focus on that!

Prof.dr. Hans Derksen
President Platform Bio-based Business

Beyond oil: Opportunities for the European economy

Europoint is organising a large international congress in the congress centre of the Amsterdam RAI on 21 and 22 January 2009, to explore the consequences of rising oil prices in many sectors of our society. The title of the congress is *The Permanent Oil Crisis*, Challenges & Opportunities. The purpose of this congress is not only to explore together with a number of experts whether the high oil prices will remain high, but also to draw a conclusion regarding where opportunities exist for the Dutch and European business world and how to use those opportunities to focus on the resulting economic changes that can lead to interesting innovations.

Everyone is conscious of the fact that oil reserves are finite. Especially in connection with the current attention to CO_2 emission and climate change. However, considering the size of the known global reserves of fossil fuels, we will not have to worry about it "being depleted" during the first coming decennia. That is not the problem here. The problem is particularly the fact that the easy and thus cheap, recoverable reserves ('low-hanging fruit') is already almost exhausted and the reserves that are difficult to recover cannot be recovered quickly and economically enough. This may result in a lot of oil, but not enough to keep up with increasing demand. We expect that within 5 to 10 years the speed of production will no longer keep up with demand (witness includes recent comments made by the oil companies Shell, Total and the International Energy Agency). Such as recently (4 June) indicated in the television programme "Netwerk" (Network) by Willem Middelkoop, journalist and author of the book De permanente oliecrisis (the permanent oil crisis), and Wim de Ridder, economist and futurologist, this will have a huge effect on oil prices. We are not talking about oil price increases of a few dollars per barrel, but about an oil price increase of many hundreds of dollars per barrel, which would have a tremendous impact on the economy and society as a whole.

The congress being organised by Europoint in collaboration with a large number of organisations and experts will explore the most realistic future scenarios and the associated alternative energy and raw material sources for "our society that is addicted to oil", as described by Willem Middelkoop. Because oil is not only a raw material for diesel and petrol for the transportation industry, but is also used in numerous other products, it is inevitable that that many other economic and social industries that are important for the Netherlands will face the ever increasing oil prices. Think about agriculture and chemistry, and also about recreation and urban planning. During the congress, experts will respond to the question on how companies and organisations in each of these industries can prepare themselves for the coming oil shortage. Since the congress mainly focuses on policy makers, organisations and companies that are involved in social areas, the organisers expect that the conclusions will lead to tangible actions that will somewhat decrease our dependency on oil and help prevent adverse effects on our economic growth.

For more information please contact
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Lighthouses for the

ERRMA

www.errma.com

Wednesday 5th November 2008, 9.00 h
in the Bavarian Representation
Rue Wiertz 77, Brussels

Programme

8:00-9:00 h

Registration and coffee

9:00-9:10 h

Chair: Dirk Carrez, EuropaBio (Belgium); Coordinator of the SusChem Steering Committee Industrial Biotechnology: Welcome and introduction

9:10-9:40 h

The 7th EU Research Framework Programme; "Knowledge Based Bio-Economy": **Ms. Dr. Angelika Niebler**, Chairperson of the Committee on Industry, Research and Energy of the European Parliament

9:40-10:10 h

The Biorefinery Concept in the Context of the 7th EU Research Framework Programme: **Dr. Alfredo Aguilar Romanillos**, EU Commission, DG Research, Directorate Biotechnology, Food and Agriculture; Head of Unit Biotechnology

Chair: Dietrich Wittmeyer, ERRMA (Germany)

10:10-10:40 h

Implementation Plan for Lead Markets Initiative on Bio-based Products: **Dr. Tomas Jonsson**, EU Commission, DG Enterprise and Industry, Unit Competitiveness in the Pharmaceuticals Industry and Biotechnology; Coordinator for the "Interservice Task Force on Bio-Based Products Lead Markets"

Integrated Biorefinery Concept for bio-based products in EU Member States

Follow-up Workshop of the EU-Symposium "Renewable Raw Materials for Industry - Contribution to Sustainable Chemistry" (17 / 18 October 2007)

10:40-11:10 h

The Concept of International Sustainability; Certification Activities of FNR for Biofuels and the Impact on Biobased Products:
Dr. Andreas Schütte, FNR

11:10-11:30 h

Coffee break

Chair: Christophe Rupp- Dahlem, Association Chimie Vegetale (France)

11:30-12:00 h

French Initiatives to Develop Biobased Products/Chemicals (Biohub): **Dr. Christophe Rupp-Dahlem**, Roquette Freres

12:00-12:30 h

The Biorefinery Project in Italy – State-Of-The-Art of the Local Cooperation between Novamont, Regional Governments, Agriculture, Industry and Applied Research:
Catia Bastioli, CEO, Novamont

12:30 – 14:00 h

Buffet Lunch

Chair: David Williams, NNFCC (United Kingdom)

14:00-14:30 h

Towards a Competitive UK Bioeconomy; the Integrated Biorefining Technologies Initiative:
Dr. Tom Jenkins, Bioscience for Business Knowledge Transfer Network

14:30-15:00 h

The Concept of Applied Biocatalysis in Austria:
Prof. Dr. Herfried Griengl, Research Centre Applied Biocatalysis Graz

15:00-15:30 h

Coffee Break

Chair: Andreas Schütte, FNR (Germany)

15:30-16:00 h

The Biorefinery Concept for Chemical Value Added Chains:
Dr. Stephan Freyer, BASF SE

16:00-17:00 h

The Bavarian Cluster IBP ("Industrial Processes with Biogenic Building Blocks and Performance Proteins")

- Short Overview of Organization and Goals of the Cluster IBP:
  Prof. Dr. Haralabos Zorbas, Bio^{M} WB GmbH
- Second Generation Biorefineries: Challenges and Perspectives:
  Dr. Andre Koltermann, Süd-Chemie AG
- Manufacture of Bulk Chemicals from Renewable Raw Materials:
  Dr. Günter Wich, Wacker Chemie AG

17:00-18:00 h

Round Table Discussion; Results and Conclusions for the Future; Moderation:
Henning Banthien, Executive Board Member of IFOK (Institute for Organisational Communication, Berlin)

Suggested persons:
David Williams (NNFCC), **Dr. Andreas Schütte** (FNR), **Prof. Hans Derksen** (BBB), **Dr. Jean-Luc Wertz** (Valbiom), **Jean-Christophe Pouet** (ADEME), **Camille Burel** (EuropaBio), **Dietrich Wittmeyer** (ERRMA)

18:00 h

End of the Workshop: Summary: **Henning Banthien**

From 18:30-21:30 h

Reception in the Bavarian Representation:
Speech of **Ms. Emilia Müller**, State Minister of Economic Affairs, Infrastructure, Transport and Technology of the Free State of Bavaria, Munich:
The Political Aspect of the Innovation Landscape in Bavaria: The Biotech Cluster

Bioenergy - EU Policy

In January this year the European Commission presented a *Renewable Energy Roadmap* in which it proposes that the EU should set a legally binding target of 20 % of renewable energy and a minimum target of 10 % of transport biofuels by 2020 in overall EU energy consumption. The European Council endorsed these objectives as central elements of an integrated energy and climate policy. As agricultural and forest based biomass is the main source (65 %) of renewable energy in the EU, an (over)heated debate has started on the sustainability of increased biomass production for energy. Concerns have been expressed, among other things, as regards impacts on the agricultural environment, deforestation and loss biodiversity rich environments as well as impacts on food and feed prices. The impact assessment made by the Commission concludes that the above objectives can be achieved without causing unmanageable tensions between food and non-food markets. The Commission is currently working on a legislative proposal which will give a legal form to the above targets and which will include a sustainability mechanism ensuring that biofuels consumed in the EU will be produced sustainably.

BIOFUELS – IMPACTS ON AGRICULTURAL MARKETS

As the demand for transport biofuels is in the short and medium term important for the development of agricultural markets, the DG for Agriculture and Rural Development of the EU Commission has conducted an analysis of the impacts of the 10 % target on land use and on the prices of agricultural commodities [1]. The work has been carried out with the partial equilibrium model currently in use in DG AGRI for regular analyses of the commodity markets and land use as well as with the forecasts on the demand of biodiesel and bioethanol until 2020, the latter being based on energy projections of the Commission's Directorate General for Transport and Energy (PRIMES model). The results of this analysis are summarized below.

Feedstocks for biofuels in the EU

The impacts of the new 10% minimum target in 2020 should be seen in relation to the existing legislation, which sets the target at 5.75% in 2010. According to the Commission's analysis the current biofuel Directive would fail to produce an incorporation of 5.75% in 2010, but by 2020 a share of 6.9% in all road transport fuels could be expected under a "no policy change" scenario. The proposed new legislation would therefore increase biofuel demand by 3.1 percentage points. In addition to this it would lead to a more

Framework and Implications for Agricultural Markets Part II

evenly spread consumption pattern across the EU Member States compared to the impact of the present biofuel directive.

The main feedstocks currently used for biofuels in the EU are cereals and sugar beet for ethanol, and rapeseed with some soy and limited amounts of sunflower seed for biodiesel. These are expected to continue to be important raw materials, but with the second generation technologies gradually coming to the market, the share of food crops as biofuel feedstocks will diminish. The assumption in the Commission's impact assessment is that industrial scale use of 2nd generation technologies would start from about 2015 and that in 2020 30 % of total domestic consumption would consist of second generation fuels. There are many uncertainties related to this estimate, and the outlook on this issue crucially depends on the future costs of production.

The share of imports in the EU consumption of biofuels will also influence future market developments in Europe - and globally, as the EU is one of the main players on the global agricultural commodity markets, in particular for wheat. In its biofuel supply the EU is currently more or less self sufficient, and the world leader, for biodiesel while it imports significant quantities of fuel ethanol in particular from Brazil but also from a number of developing countries such as Pakistan and South Africa. However, the EU has significant potential to increase ethanol production based on domestic feedstocks (cereals and in the future straw and other cellulosic materials) while its possibilities for increasing rapeseed production for biodiesel are more limited. With the 10 % biofuels target it is therefore expected that in 2020 the EU would import about 10 mio tonnes of rapeseed, sun flower seed, soybean and palm oil (in seed equivalent) for biodiesel production. For bioethanol the share of import would be much lower.

According to the Commission's analysis imports would serve around 20% of the total biofuel production in 2020. About half of them would be first generation feedstock, mainly oilseeds and vegetable oils for biodiesel. The rest would be ethanol and wood based materials for ethanol production.

The development of second generation technologies and the share of imports on the EU biofuel market are interdependent so that the more 2nd generation there will be available, the less imports will be needed. This is due to the fact that there is considerable potential in the EU to increase supply of feedstocks for BTL and cellulosic ethanol. If the share of 2nd generation stays much below the estimated 30 %, the share of imports will be higher than 20 %.

Market impacts

The impact of the 10 % target on agricultural markets is estimated to be relatively modest because of the relatively long period up to 2020, which allows the agricultural markets to adapt, the gradual replacement of food crops with 2nd generation feedstocks and with part of biofuel needs being covered with imports. EU domestic use of cereals will significantly increase while exports of cereals from the EU to third countries will decrease. The long run impact of biofuels on cereal prices is estimated to be in the range of 3% to 6% as compared to 2006 prices.

Impacts on the oilseed markets are more significant as a much larger share of the annual harvest or rapeseed, the main biodiesel feedstock, is used for biofuel production. Currently this share of the annual EU harvests is about two thirds. Because of substitution effects market impacts affect all main oil crops. Price impacts are estimated to be significant for sun flower seed, for which the price increase could be 15% because of the small global production potential. The developing production of rapeseed in Russia and Ukraine would, on the other hand, keep rapeseed prices at moderate levels; these prices are estimated to increase between 8% and 10%. Soybean oil prices would see a significant increase due to the development of biodiesel industries in other parts of the world, in particular in Brazil and the US.

The prices of by-products of biofuel production are an important factor in the overall impact on agricultural markets. These are economically best used as animal feed and second best as burning them in the biofuel production process. They would see a significant relative fall in prices. A significant side effect of the 10 % biofuel target is therefore that cattle production will benefit from the availability of cheap dried distiller grain (DDG), the by-product of bioethanol production from cereals. DDG is protein and fibre rich and has high energy content, and could substitute some of the silage maize currently used as cattle feed. Pork and poultry production would equally benefit from cheaper protein feeds partly from bioethanol by-products but more importantly from the biodiesel production. This will partly offset the increasing feed costs caused by the price impact on cereals. Livestock production itself could produce biogas using parts of the waste.

Impacts on land use

The increasing demand for first and second generation biofuels could affect land use in the EU in various ways. Biofuel demand adds another outlet to the food and feed production of agriculture. The development of relative prices between these market outlets is a main determining factor for the land use decisions of farmers between individual crops but also between agricultural production and other uses, also contributing to a slow down of land abandonment.

However, the overall impact of the 10 % target and the proposed new legislation on land use for biofuel production is estimated to be relatively modest. Only

about 5 to 7 mio hectares would be additionally used, depending on the share of contribution of second generation fuels. About 15% of EU arable land is estimated to be used for biofuels in 2020. The total land use for first and second generation biofuel production would be 17.5 mio ha. The Commission's conclusion is therefore that the additional land use requirements would not excessively influence the land resources of the EU-27. Moreover, the more even distribution of production capacities over the EU assure that a concentration of biofuel feedstock production in only a few regions could be avoided.

An important source for adding production potential will be the currently obligatory set aside, which is used as a supply control instrument requiring farmers to idle land in order to restrict production. This supply control instrument affects currently about 3.9 mio ha in the EU-27.

In conclusion, the 10% scenario does not overly stretch the land availability nor does it lead to a significant increase of intensity of production because of the limited pressure on markets. The long term until 2020 and the expected availability of 2nd generation technologies would leave enough possibilities for European farmers to adapt to this new market outlet. Farm employment could be expected to decline less than under a scenario without biofuels and additional jobs will be created in the downstream activities and processing of biofuels.

BIOFUELS

The targets for renewable energy are seen as good news for European agriculture: they promise new outlets and a positive development of demand and prices at a time when farmers are increasingly faced with international competition. Furthermore, expanded uses of agricultural biomass can create value-added production and support economic fabrics of rural areas.

Bioenergy production represents one of the major main stream opportunities for agriculture over the medium to long term in the EU. The 10% incorporation rate realised over this long period until 2020 together with newly available technologies assures a sustainable path in providing the EU with renewable transport fuels without disrupting domestic and world markets.

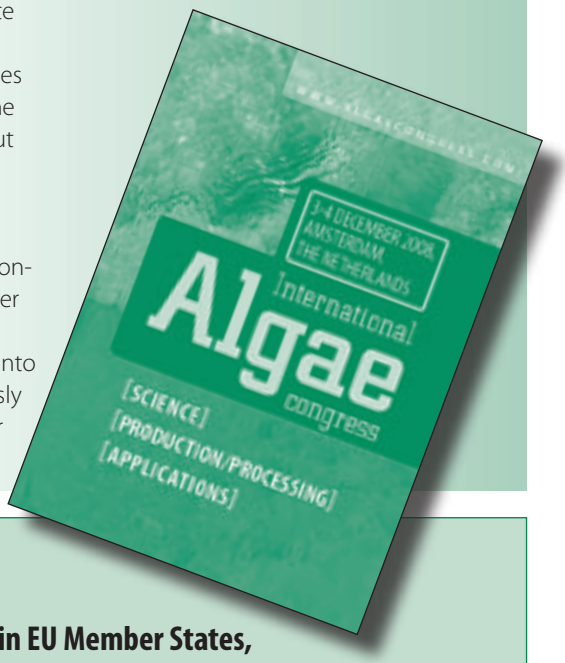
The Common Agricultural Policy includes some specific support measures for the production of energy and other non-food crops. In the development of a longer term vision of the CAP, the best possible integration of energy and climate policy into the policy instruments will be continuously assessed, while eyes will be kept open for the balance between the food, feed and non-food markets.

The policy documents referred to above are available on http://ec.europa.eu/energy/energy_policy/index_en.htm

Ms. Hilkka Summa
European Commission,
Directorate General for Agriculture and Rural Development

REFERENCES

[1] Prospects of agricultural markets and income in the European Union 2006-2013. European Commission, DG Agriculture and Rural Development, January 2007.



Calendar of events

Lighthouses for the Integrated Biorefinery Concept for biobased products in EU Member States, Wednesday 5th November 2008, Bavarian Representation, Brussels. For more information please contact: Mr. Dietrich Wittmeyer, General Secretary of ERRMA, **E**: wittmeyer@vci.de , **I**: www.errma.com , Prof. Dr. Haralabos Zorbas, Managing Director BioM WB GmbH, Spokesman of the Cluster IBP **E**: zorbas@bio-m.org

International Algae Congress, 3 & 4 December 2008, Amsterdam, The Netherlands For more information please contact: Ms. Tessa de Boer, **E**: tdeboer@agriprojects.nl, **I**: www.algeacongress.com

International congress: 'The Permanent Oil Crisis, Challenges & Opportunities', 21 & 22 January 2009, Amsterdam RAI, The Netherlands For more information please contact: Ms. Ilona Leuvenkamp, **E**: ileuvenkamp@europoint.eu, **I**: www.permanentoilcrisis.com

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