

Editorial

Cradle to cradle: solution or hype?

Since its appearance in 2002 the book "Cradle to cradle" by McDonough & Braungart has become a major hit in many places in the world. Its philosophy on "remaking the way we make things" introduces a new way of thinking that focuses on product design to contribute to a more sustainable world. Not only designers, also policy makers embrace this new idea. For instance, the Venlo region in The Netherlands take the cradle-to-cradle philosophy as a guideline for regional development. This is reflected in, e.g., the creation of a cradle-to-cradle chair at the regional college that is expected to attract 2000 students by 2012, the availability of funds for companies that want to switch to cradle-to-cradle thinking and the wish to organize the 2012 agricultural/horticultural exhibition "Floriade" according to the cradle-to-cradle philosophy.

Such a regional transition into a more cradle-to-cradle society is a very laudable initiative since it increases awareness with the general public of sustainability issues and triggers companies on how to exploit this trend and come up with commercial opportunities. However, in my opinion there lies a danger in the popularity of this concept. In a way it triggers a kind of déjà vu from the late eighties/early nineties when "agrification" was the buzz word: have farmers produce new crops for industry, such that agricultural overproduction is reduced, the crop rotation schedule is expanded and industry is provided with new and interesting renewable raw materials. This led to R&D and demonstration programs that were aimed at the creation of new domesticated crops with new processing value chains and new products in the market to replace formerly petroleum-based products. And all of this in 4 years, thank you very much. However good the intentions, in hindsight it is clear that such programs were overambitious and could only lead to disappointments. It was certainly not the cure-all that it was proclaimed to be. From the resulting hangovers with policy makers we can learn a few things to prevent the cradle-to-cradle philosophy from stepping in the same pitfall.

Basically the cradle-to-cradle philosophy implies that products can be designed in such a way that after the economic life-time of a product it can be deconstructed into components that can all be re-used in new products in the "technosphere", preferably of higher added value (upcycling rather than downcycling), or can be completely degraded in the biosphere. One example, as highlighted by McDonough & Braungart, is the use of Korean rice husks as packing component for electronics that can then be

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REACH and chances for renewable

reused as material for making bricks. So far, however, there are not many examples in which this philosophy truly holds. It is still uncertain how many second-life applications can realistically be conceived for non-degradable materials. Also, if this upcycling were really to take off and the demand for first life products does not change, the technosphere will still have a tendency to grow. Degradation of materials in the biosphere can help to maintain the balance, but it is also important to get a feeling about the quantity of biodegradable materials involved. Is there a limit to how much we can handle and how will this affect the value chain? What additional logistic, transport and energy costs result from the necessary recycling activities and how can they be minimized? How do we prevent that cradle-to-cradle is used as an excuse to continue (over)consumption of goods?

Again, I support the cradle-to-cradle philosophy very much as a way of thinking and as a means to generate awareness for sustainability issues with the general public and (not in the least) with policy makers. Also I am convinced that it can inspire people and can result in many cradle-to-cradle-proof concepts and products from which certainly a good number of companies can get some commercial benefit. However, what I don't believe is that cradle-to-cradle is all the world needs now to build a fully sustainable society. In the worst case it may divert attention from other activities directed towards sustainability. In my opinion it is just one factor in many that we need to cultivate, just like dematerialization, process intensification, biobased economy, energy

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transition and all the other current buzz words. Any buzz word that gets the attention of people to think and act on sustainability is fine with me, but if cradle-to-cradle is overemphasized, becomes a hype and hopes are set too high, we can only expect disappointments that lead to negativity and loss of public and governmental support. The transition to a sustainable society is not achieved by leaning on just one hype but requires action on many different fronts.

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



Due to the REACH' regulations that came into force in June 2007, the responsibility for the safe production and use of materials in the EU has shifted towards the companies. The Platform BBB has carried out a desk-top study for Wageningen UR, The Netherlands, to investigate the consequences of REACH for the production and use of renewable resources. Herewith, a short summary of the conclusions. (The full report -51 pages- is available in Dutch.)

The major conclusion is: REACH has equal consequences for petrochemical and renewable resources and their derivatives. REACH is aimed at all products produced or imported in the EU in volumes of more than 1 ton/year by one producer. Except for about 60 well known non-toxic renewable resources (a fixed list in the REACH Annex), REACH makes no distinction between petrochemical or renewable resources in the requirements for registration.

For the Ministry of Agriculture it was checked whether REACH opens new avenues for commercial activities concerning renewable resources. The conclusion is: no, renewables in itself are not favoured by REACH. Companies will have to develop chances themselves, starting with the evaluation of their present portfolio of products and the required actions for REACH administration. Important milestones in REACH are:

- From December 1, 2008 onward, it will become clear which products in general will not be registered in REACH as the present producers choose not to take action for registering. The market might be looking for less toxic alternatives.
- Starting in 2011, REACH will require to minimize the application of toxic compounds. In the course of 2009-2010 guidelines for limited application are expected. Priority will be given to reducing the use of toxic compounds on the basis of volume of use,



application and risks. If non- or less toxic alternatives are available that are technically and economically feasible, their toxic counterparts might even be forbidden.

In order to benefit from the changing playing-field, companies might take the following steps:

Step 1. Check your own portfolio of products and the required actions for REACH registration. Please note: check the exact timelines and actions to be taken. These depend on type of product, volume, known or suspected toxicity etc.

that it can inspire people and can renewable resources
is aimed at all products produced or imported in makes no disti for the

“Lead Market for Bio-based Products”

Step 2. Check with customers what products they might lack in the future due to non-registration and investigate whether renewable alternatives could provide them with similar functionalities.

As REACH will not provide any comprehensive data on what products might not be registered and hence will be taken off the market, governments could take action in order to stimulate the development of non- or less toxic renewable alternatives. For instance, the following policies could be introduced:

1. Develop a scheme to help companies gain insight in the future caps of products due to non-registration. A list containing functional products that might disappear from the market can inspire universities, institutes and companies to focus their R&D.
2. Develop a scheme for companies to increase their knowledge about renewable alternatives of present petrochemical products that might be taken off the market.
3. Provide means for companies, universities and knowledge institutes to register new developed renewable alternatives in REACH in a cheap and/or fast way in order to minimize time-to-market of newly developed alternatives.

As for now, it seems that companies focus mainly on the burden of REACH. With the above statements, it becomes clear that REACH might also give chances to new commercial activities concerning renewable resources.

Dr. Barbara de Klerk,
Platform Bio-based Business
http://ec.europa.eu/enterprise/reach/index_en.htm

¹⁾ REACH: **R**egistration, **E**valuation, **A**uthorization and **R**estriction of **C**hemical Substances.

In December 2006 The Competitiveness Council agreed to launch an initiative as a new policy approach aiming at supporting the development of markets with high economic and social value, in which European companies could develop a globally leading role, by addressing systemic failures in policy and lack of policy coordination and legislative coherence which might hamper this potential.

In May 2007 the Competitiveness Council invited the Commission to propose further steps for the creation of lead markets and other measures to enhance market demand for eco-efficient bio-based products, in order to exploit the positive environmental impact of bio-based products.

This report, prepared by the Lead Market Task Force on Bio-Based products consisting of DG Environment, Enterprise and Industry, Agriculture, Research, Market and Competition, was finalised and published in December 2007.

This report provides:

- a broad analysis of the existing and emerging markets for bio-based products,
- recommendations concerning policy coordination aimed at developing a coherent set of demand side measures driving the development of bio-based product markets, with a particular

focus on standardisation, labelling, public procurement, regulatory initiatives and communication,

- elements of validation by external stakeholders,
- roadmap of proposed actions and deliverables.

The Green-Tech Newsletters 2007 published the contribution of ERRMA within the framework of the European Platform for Sustainable Chemistry (SusChem). In March 2008 ERRMA finalised the “Contribution to develop an EU political framework on “Lead Markets for Bio-Based products as a follow up of the “Lead Market” Task Force.

This paper will be discussed with various experts and representatives from the European Commission in Paris on 28th May 2008. The main results are being summarized in the following article.

Dietrich Wittmeyer,
General Secretary of ERRMA



ERRMA position of 10th March 2008

ERRMA was asked to prepare concrete proposals for the report of the Task force on bio-based products "Accelerating the Development of the Market for Bio-based Products in Europe" published in December 2007.

Taking into account the advice of the EU-RRM group we concentrated on most promising markets for bio-based products and described the market barriers and opportunities to tackle them

From the total range of bio-based products, enumerated in the Interservice task force report we propose to start step-by-step on the basis of a sectorial approach.

As first step, biodegradable and compostable packaging materials, bio-based lubricants and bio-based "platform" chemicals are seen to form the first promising areas within bio-based products.

As the second step and based on the acknowledged self commitment for biodegradable and compostable packaging flanked by EU Norms, certification schemes and pragmatic labelling, we described the existing market barriers as well as opportunities and proposals by emphasizing especially the coherence of different EU regulations, ERRMA is preparing a similar concept for biodegradable and environmentally compatible lubricants.

Additionally, as described in the BREW¹⁾ report on white biotechnology, bio-based intermediates, as building blocks and platform chemicals will play an increasing role in the future EU markets.

We proposed in details:

1) An integrated EU policy framework for organic waste, fertilizers and packaging taking especially into account the biodegradable polymers.

Referring to the proposed policy measures as described in the Interservice Task Force report on a bio-based products lead market, ERRMA's first choice is a voluntary agreement in form of a self commitment of industry in combination with European standards, certification schemes and an EU pragmatic labelling approach.

2) A consistent information system and guidance for Life-Cycle-Assessments (LCAs) and other environmental and eco-efficiency aspects.

¹⁾ Medium and long-term opportunities and risks of the biotechnological production of bulk chemicals from renewable resources - The BREW project, European Commission's GROWTH Programme (DG Research). Final report 420 p., September 2006 (www.chem.uu.nl/brew/).



www.errma.com

develop an EU political paper on “Lead Markets of Bio-based Products”



Because of the information availability needs showing the economic and environmental advantages of these products and the necessity to have harmonised EU market information available, a communication strategy is required to ensure and increase further market demands. Therefore, information on current markets and prices as well as on future developments and realistic perspectives for RRM and bio-based products thereof has already started in Germany and France, however, it is essential that this is also being performed in all other European countries. Support from the EU-Commission to run such an enlarged market survey for all Member States has been asked and the coming topics of the different calls for proposals within the 7th EU-Research Framework Programme. A topic within the last call for proposal was open.

3) A European wide definition of “Bio-Based

Products” is needed to enhance the market transparency.

The content of RRM is not by itself a parameter directly related to environmental sustainability on a general basis. The assessment of the sustainability of these products has to be carefully analysed on a case-by-case basis. ERRMA is ready to communicate “biobased to a certain extent x%” which has to be verified according to international accepted methods, certification and standards. In this respect, in the USA an ASTM standard has already been developed to quantify the renewable carbon content of a product. European Bioplastics is working on a corresponding certification scheme for biobased plastics. ERRMA is ready to support the development of such a scheme.

4) EU market introduction programmes / demonstration projects form another urgent need.

The European Commission’s Communication on Lead Markets including also biobased products, (see EU press release from 7 January 2008,) is seen as a new policy and a vehicle that could acknowledge possible demonstration projects/market introduction programmes on EU level. The EU-Competitiveness and Innovation Programme (CIP) and the 7th Framework Programme for Research could possibly support such demonstration projects/market introduction programmes as flanking measures.

Conclusions

1. Harmonisation and coherence of different legislation is necessary to ensure the success of flanking measures for EU lead markets for biobased products.
2. EU wide support of self commitments flanked by standards, certification schemes and labels is also of the utmost importance; information and awareness arising of these instruments should be supported by the EU Commission.
3. National incentives to support the market introduction by demonstration/ market introduction programmes as already in force in some Member States shall be accepted EU-wide and initiated by EU Commission useful and balanced criteria for such incentives have to be developed in a dialogue between EU Commission, the Member States and the concerned industries.
4. Coherent information and communication programmes comprising of an EU wide market survey and an EU wide market introduction programme based on a pan European coherent strategy and an increase of research funding to meet bottlenecks and a EU awareness campaign is necessary.

Sixth edition of European Motor BioFuels Forum a great success

the event lived up to all expectations, attracting 273 participants from 32 countries

The sixth edition of the European Motor BioFuels Forum that took place in De Doelen in Rotterdam was a great success. The two-day event also included the IEA Bioenergy Task 39 Programme. This programme had been set up by the International Energy Agency and ran parallel with the Forum. Both programmes turned out to be very successful. Over the two days 273 delegates from 32 countries gathered at De Doelen to discuss all aspects of biofuels. The Minister of Housing, Spatial Planning and the Environment of the Netherlands, Mrs. Jacqueline M. Cramer, delivered the opening speech of this Forum. In her speech she focused on the role of biofuels in the Dutch and European climate policy and on sustainable production of biofuels. Besides the speakers' programmes over the two days there also was an indoor trade show and a Bio-car-expo. At the Bio-Car Expo, car manufacturers Saab, Volvo, Ford and Mercedes demonstrated their bio ethanol car models.

This 6th edition of this internationally significant event on motor biofuels was held under patronage of three Dutch ministries: the Ministry of Agriculture, Nature and Food Quality, the Ministry of Housing, Spatial Planning and the Environment and the Ministry of Transport, Public Works and Water Management. This event was organized for the sixth time by Europoint Conferences & Exhibitions from the Netherlands, in cooperation with Rotterdam Climate Initiative.

Mrs. Jacqueline M. Cramer, the Dutch Minister of Housing, Spatial Planning and the Environment of the Netherlands delivered the key-note speech of the Forum on 9 January. In her speech she drew attention to three issues: the role of biofuels in the Dutch climate policy, the role of biofuels in the EU policy on climate change and thirdly how to ensure sustainable production of biofuels. She concluded that the Dutch government is taking its responsibility in the biofuels market share, nationally and internationally. "I wish to emphasise that the minimum target of ten per cent in 2020 has my full support," she said. Over the two days a further 75 speakers representing a wide range of international institutions and sectors of activity took the floor to express their views on various topics. Both the Motor BioFuels Forum and the IEA programme were well received by the audience, in particular the sessions on sustainability and second generation biofuels got much interest.

The unique Bio-Car Expo demonstrated the bio ethanol (E85) car models in the world, which are actually available on the consumer market these days. These models demonstrated by Ford, Saab, Volvo and Mercedes received much attention from the participants. Also the Scania buses which drove the delegates on the first night to the Port of Rotterdam where they boarded the dinner cruise were biofuel driven buses.

The organisers are satisfied when looking back at this successful event during which the entire European biofuels industry exchanged know-how and experiences. The previous BioFuels Forums all took place in different European countries. The next, 7th edition of the European Motor BioFuels Forum has been scheduled to take place in France in 2009 (www.biofuels2009.eu).



Mrs. Jacqueline M. Cramer, Dutch Minister of Housing, Spatial Planning and the Environment.

Bioenergy - EU Policy Framework and Implications for Agricultural Markets

Part I

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.

1 - EU POLICY FOR RENEWABLE ENERGY

Renewable energy has been on the agenda of the European Commission since the late 90's, although it has become a high profile policy only since the last couple of years. The main reasons for renewable energy gaining in importance in EU policy are the problems encountered in security of supply of conventional fossil fuels and increasing consciousness about climate change. The main EU-level legal instruments currently in force for promoting the use of renewable energy sources are the Directive on green electricity [1], the Directive on the promotion of transport biofuels [2] and the Directive on energy taxation.

Last year (2007) the Commission presented to the Council and the European Parliament the so called "Climate and Energy Package", which included a wide range of policy proposals on energy and climate protection with the horizon of 2020. The proposals concerning renewable energy were included in the *Renewable Energy Roadmap* and in the *Biofuels Progress Report*, both supported by impact assessments analysing the economic, environmental and social implications of the proposed policy.

The energy package was adopted together with a *Communication on policy options for limiting the global climate change to 2° Celsius*, emphasising the integration and interdependence of climate and energy policies.

The core proposals concerning renewable energy are the setting of legally binding targets for a 20 % share of renewable energy and a minimum target of 10 % of transport biofuels by the year 2020. These were accompanied by a 20 % target for energy saving and a 20 % target for the reduction of greenhouse gas emissions by 2020. The European Council endorsed these proposals and encouraged the Commission to present proposals for making these targets into legal obligations. The two main and equally important objectives of the renewable energy policy are reduction of greenhouse gas emissions from the use of fossil fuels and the improvement of security of supply through the diversification of energy sources.

The Commission presented on the 23 January 2008 a legislative proposal on renewable energy. This new directive will cover all three main sectors of energy use: electricity, heating and cooling and

transport. It will give a legal form for the target of 20 % of renewable energy sources and for the minimum target of 10 % of transport biofuels. The overall renewable energy target will be differentiated between the Member States according to their resources and current situation in the renewable energy sector, whereas the target for transport biofuels is proposed to become a legally binding minimum target for all Member States. As renewable energy use influences greenhouse gas emissions, proposals for the revision of the EU emission trading system and for "effort sharing" for the target of reducing emissions by 20 % by 2020 were presented at the same time, as parts of an "energy and climate package". Apart from the overall renewable energy target and the biofuels target the energy mix and energy policy measures of the Member States will not be regulated on EU level. Public support by the Member States to renewable energy forms, as well as for other energy forms, is governed by general competition law and Community rules on state aids.

The Commission justifies the need for a separate target for transport biofuels by the fact that progress in the substitution of fossil fuels by renewable energy sources has so far been clearly slower than in the electricity sector. The current EU Directive on biofuels sets for 2010 a target of 5.75 %, but this target is only indicative for the Member States. The analysis of the Member States policies and of the evolution of the EU biofuels market shows that with the current policies the share of biofuels is highly likely to stay far below this target. Stronger measures are therefore needed if progress is to be made in the substitution of fossil fuels by biofuels in the transport sector. In the electricity sector, where the EU Directive sets stronger obligations for the Member States, progress has been faster, and the level which is likely to be reached by 2010 (19 %) is not far short of the target level of 21 %.

2 - SUSTAINABILITY OF BIOFUELS

Alternative uses of what the land produces have been at the center of attention since the European Commission presented its Energy Package with its ambitious targets for expanding renewable energy sources. Biomass is the main source (65 %) of renewable energy in the EU, which means that agriculture and forestry are the main contributors to a more secure and sustainable energy and climate policy. By 2020 the share of biomass in the overall variety of renewable energy sources is expected to diminish as the share of other renewable energy sources, in particular wind energy, is expected to grow compared to the situation today. Nevertheless, achieving the 20 % target means that the total amount of biomass consumed for energy purposes will have to increase considerably.

As renewable energy is promoted in order to achieve a more sustainable energy future for Europe, it is important to ensure the increased production and use of biomass for energy will not have undesirable environmental, social or economic consequences. Questions are being asked about its impacts on the agricultural environment, deforestation and biodiversity, as well as about impacts on prices of food and feed and availability of bio-based raw materials for other non-energy uses. The Nuremberg Declaration [4], which the German Presidency addressed to Council in March this year, strongly supports the ambitious targets for renewable energy while calling for realising the full potential of renewable

resources – including the expansion of their industrial utilisation.

With the current technologies agricultural biomass plays a major role in the production of liquid transport biofuels, while forest biomass and various waste streams are the main renewable energy sources in the production of electricity and heat. As regards agriculture in the EU and globally, it is in particular the production and use of crops for transport biofuels which has been at the centre of attention in the sustainability debate of renewable energy. In the EU policy debate it has also received special attention and in the Renewable Energy Roadmap the Commission committed itself to including in the forthcoming legislation on biofuels a mechanism for ensuring the sustainability of biofuels used in the EU.

The proposal for the new renewable energy Directive does therefore include criteria on biofuel sustainability, which aim at discouraging the use of those systems for biofuel production which may have undesirable environmental consequences. The criteria exclude conversion of land with high biodiversity value or high carbon stock for the cultivation of biofuel feedstocks, they discourage production pathways which do not guarantee an acceptable level of savings in greenhouse gas emissions, calculated on life-cycle basis, and they encourage the use of 2nd generation technologies. The design of the “sustainability system” is constrained by the requirement of WTO-compatibility: it has to avoid any discrimination between domestic production and imports and it must not act as a non-tariff barrier for trade. Furthermore, it should not favour one biofuel crop rather than another, it should be simple and enforceable, and avoid additional

administrative burden for farmers, traders or fuel suppliers.

Although it has to be acknowledged that globally the large scale deployment of biofuels does involve risks as regards loss of biodiversity and carbon sequestration potential in particular in tropical countries, in the EU the production of crops for energy – as well as for any other use – is already governed by strict environmental legislation. In the EU domestic production the use of a part of certain crops for energy will not add to or change the need for environmental controls. It would be difficult to justify different environmental requirements for energy crops from those that are already in place for cultivation of the same crops for food and feed. This is another aspect that had to be taken into account in the design of the “sustainability system”.

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

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- [2] Council Directive 2003/30/EC on promotion of the use of biofuels and other renewable fuels for transport.
- [3] Council Directive 2003/96/EC on restructuring the Community framework for the taxation of energy products and electricity.
- [4] Council of the European Union OR.de 7379/07 AGRI 80. Conference: “Fuelling the Future – Renewable Resources Show the Way Forward for Rural Areas, Nuremberg, 5-6 March 2007”. Presidency conclusions 14.3.

Calendar of events

First Dutch Algae Congress “Truth & Untruth about Algae”
27 May 2008, de Meerpaal, Dronten, The Netherlands. (Dutch spoken congress)

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