



Biorefinery.nl

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Knowledge dissemination

Analysing the contribution of the Dutch Network on Biorefinery on information dissemination, knowledge transfer, and education

Initial survey

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Summary

At the beginning of 2006, Wageningen University and Research Centre (WUR) and the Energy research Centre of the Netherlands (ECN), two prominent players in the field of biomass research, started the Dutch Network on Biorefinery (Biorefinery.nl). Biorefinery.nl has the ambition to support the implementation of the Dutch policy concerning sustainable use of biomass. Both on the short (2010), medium (2020) and long term (2040) a considerable contribution is expected of biomass to fulfil the sustainability goals in the field of energy, products and chemicals. SenterNovem, a Dutch government agency of the Ministry of Economic affairs, supports this Biorefinery.nl initiative.

In February 2006, ECN and WUR informed parties on the Biorefinery.nl initiative and asked them whether or not they are willing to participate in the Dutch Network on Biorefinery, receiving 'up-to-date' information about biorefinery activities in the Netherlands and other countries, about promising combinations of products and fuels, and about expected production costs. Participation would enable them to establish their own company and marketing strategy concerning biorefinery concepts. Enclosed to an informative brochure, sent to approximately 900 people, was an initial survey, intended to analyse the knowledge of and opinion on biorefinery concepts.

Based on the response on this initial survey it can be concluded that several parties are interested in biorefinery and even have considered some kind of biorefinery concept. These initiatives also show that there is a broad variety in concepts to be considered biorefinery, varying from food and feed related pre-refining of biomass feedstock to end-refining of biomass (intermediates) in existing conventional (fossil fuel based) refineries. Most of these concepts, however, come under the definition provided by the Biorefinery.nl initiative.

In the 1st workshop on the possibilities of biorefinery concepts for the industry, ECN and WUR – the founders of the Biorefinery.nl initiative – will provide a forum for a technical review of state-of-the-art research leading to the development of biorefinery technologies. This workshop will, furthermore, enable different industries to come together and address common as well as conflicting technical and market issues with regards to biorefinery opportunities for the agro & food industry, the chemical industry and the energy sector. The comments and suggestions provided by the respondents of this survey will be brought along during the workshop.

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1. Introduction

At the beginning of 2006, Wageningen University and Research Centre (WUR) and the Energy research Centre of the Netherlands (ECN), two prominent players in the field of biomass research, started the Dutch Network on Biorefinery (Biorefinery.nl). Biorefinery.nl has the ambition to support the implementation of the Dutch policy concerning sustainable use of biomass. Both on the short (2010), medium (2020) and long term (2040) a considerable contribution is expected of biomass to fulfil the sustainability goals in the field of energy, products and chemicals. SenterNovem, a Dutch government agency of the Ministry of Economic affairs, supports this Biorefinery.nl initiative.

A close cooperation of different participants with a broad variety of disciplines within Biorefinery.nl will enable research, development, demonstration and implementation of innovative biorefinery concepts. This whole route will certainly require a considerable effort of all parties involved (research institutes, government and industry). However, the final result will be a solid knowledge and market position of both the Netherlands and Europe on the field of sustainable biomass chains.

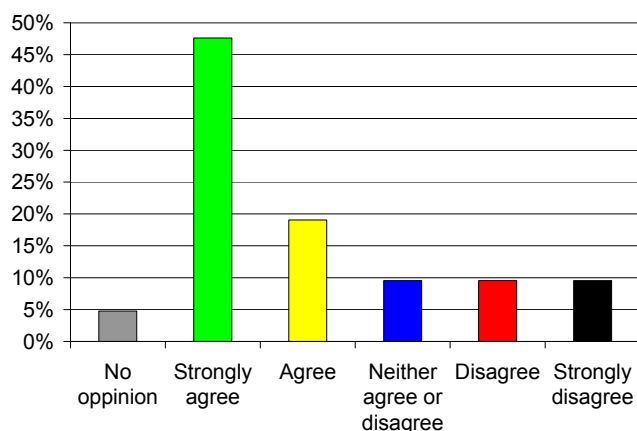
In February 2006, ECN and WUR informed parties on the Biorefinery.nl initiative and asked them whether or not they are willing to participate in the Dutch Network on Biorefinery, receiving 'up-to-date' information about biorefinery activities in the Netherlands and other countries, about promising combinations of products and fuels, and about expected production costs. Participation would enable them to establish their own company and marketing strategy concerning biorefinery concepts.

Enclosed to an informative brochure, send to approximately 900 people, was an initial survey, intended to analyse the knowledge of and opinion on biorefinery concepts. The results of this survey are discussed in this report.

2. Initial survey

The initial survey contained seven questions on biorefinery and was intended to analyse the existing knowledge of and opinion on biorefinery concepts, as well as to find out whether or not the recipient of the survey was interested to participate in a network on biorefinery. The response on the questions is presented graphically for each question in the following paragraphs. Additional comments provided on specific questions are included as well.

2.1 We are familiar with the term biorefinery

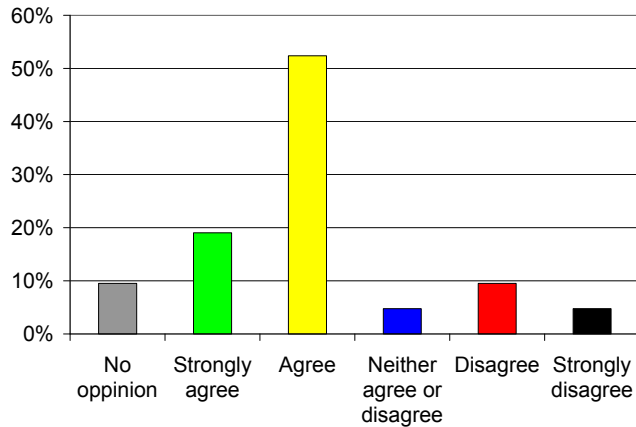


Even without explaining the term biorefinery in detail already 67% respondents was already familiar with some kind of (definition of) biorefinery

2.2 The definition of biorefining by Biorefinery.nl matches our ideas on biorefining

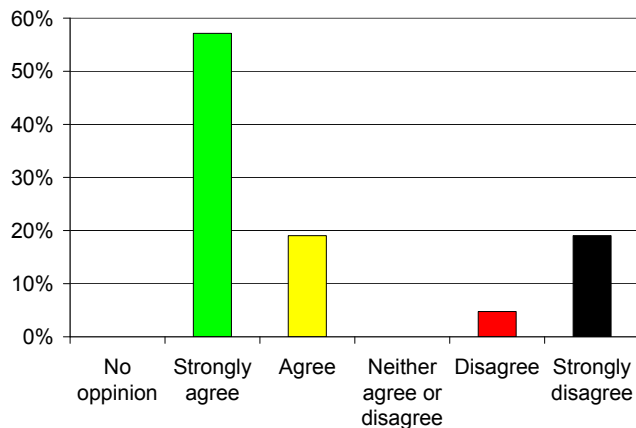
The definition read that a biorefinery is a facility that integrates biomass conversion processes and equipment to co-produce fuels, power, and chemicals from divers biomass sources. The biorefinery concept is analogous to today's petroleum refineries, which produce multiple fuels and products from petroleum. Industrial biorefineries have been identified as the most promising routes to the creation of a bio-based economy. Partial biorefineries already exist in some agricultural and forest products facilities. These systems can be improved through better utilization of residues and optimization of total added value creation. Applying the lessons learned from existing facilities to comparable situations can enhance new biorefineries.

By producing multiple products, a biorefinery can take advantage of the natural complexity and differences in biomass components/intermediates and therefore maximize the value derived from the biomass. A biorefinery might, *e.g.*, produce one or several low-volume, but high-value, chemical products and a low-value, but high-volume, platform chemical and/or liquid transportation fuel; while generating power and heat for its own use, and likely enough for sale of electricity. High-value products enhance profitability, high-volume chemicals and/or transportation fuels help to meet European energy needs and CO₂ emission reduction goals; whereas the power and/or heat both reduce overall production costs and greenhouse gas emissions. Biorefineries can play a major role in the transition to a more sustainable Dutch economy. Realization of high-efficient biorefining processes at places where biomass can be gathered, grown and/or imported and where the 'green' products can be sold to a cluster of chemical and material industries, is believed to be a key to meet the longer term policy goals.



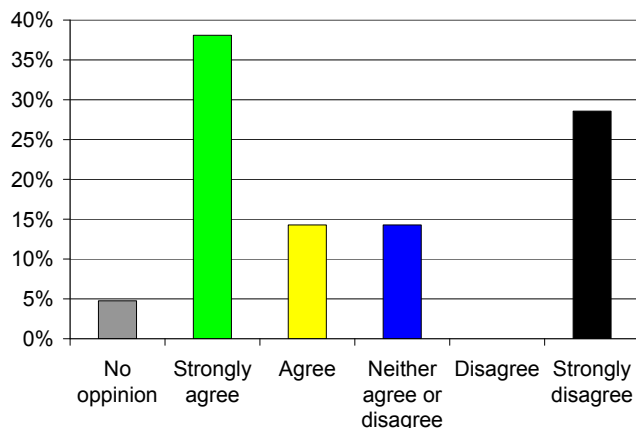
The majority of the respondents, i.e. 67%, agree on de definition provided, although some specific comments are made, for example that the definition should a statement including the economy-of-scale, the “necessity” of large-scale biorefineries and as a result the biomass feedstock and pre-transport-conversion technologies to be considered. Other comments relate to specific high-value products providing more revenues than any other energetic use of biomass, hence suggest that the focus should be more on these high-value products in stead of low-value bulk products.

2.3 Our company has a possible interest in biorefining



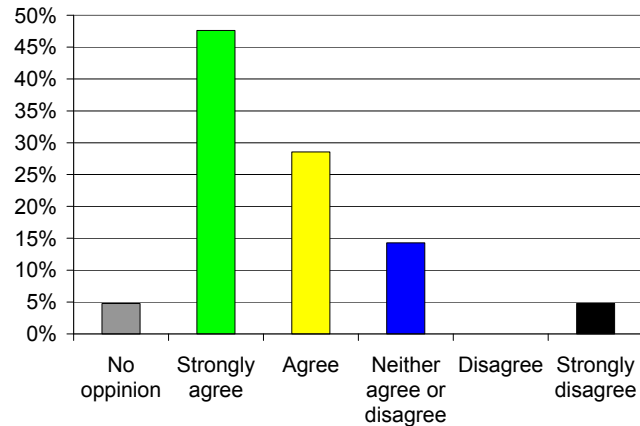
Most of the respondents have a direct interest in biorefining, although it is stated that biorefinery should not only be in the interest of Western European companies, but for small scale farmers in the tropics (in pro poor chain development of products related to biorefinery) as well.

2.4 We have already considered some kind of biorefinery concept



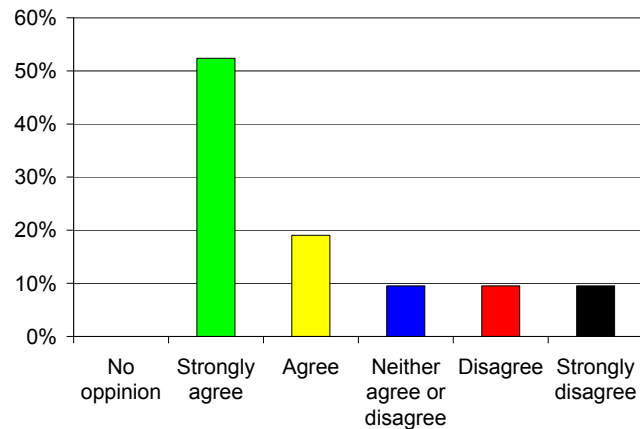
There are already several respondents mentioning to have considered some kind of biorefinery concept, although from the description of these concepts it is clear that there's a broad variety of concepts that are considered as biorefinery. Concepts considered include application of pyrolysis oil in existing (fossil fuel based) refineries, small-scale farmers cooperatives for biodiesel production, co-production of furfural & syngas based liquid transportation fuels and co-production of lactic acid / amino acids & use of residual grass fibres for fibre products or energetic use (biogas).

2.5 We are convinced of the necessity in the future of biomass refineries (in general)



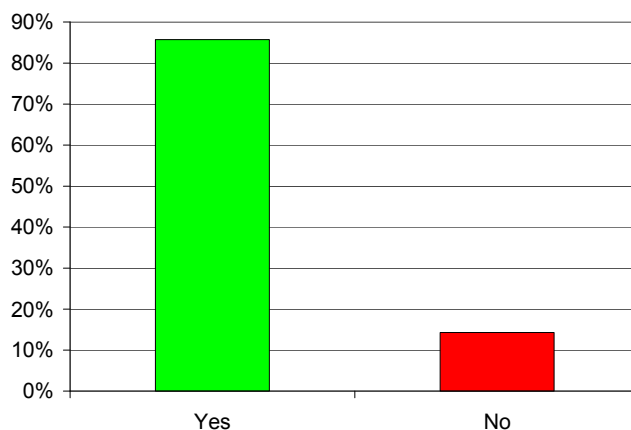
As might be expected from the response on the previous questions of the survey, the vast majority of the respondents is of the opinion that in the future biomass refineries, in general, will be necessary for both economic and ecological application of biomass feedstock in the different industries.

2.6 We are interested in participating in the Biorefinery.nl initiative



There is a significant interest among the respondent in participating in the Biorefinery.nl initiative, although of course depending on the actual expectations and targets set by the network. The gathering and dissemination of information on and developments of biorefinery concepts is considered to be extremely valuable. It is however stated by some that in order to actual participate, the focus should not only be on a more sustainable Dutch economy, but also on a more global area, e.g. biorefinery in the tropics, or exporting biodiesel to EU to help the EU to fulfil its Kyoto obligations. Furthermore, in order to participate an agreement regarding the intellectual property rights needs to be established.

2.7 We would like to receive more information on biorefining / the Biorefinery.nl initiative



In general most respondents would like to receive more information on biorefining and/or the Biorefinery.nl initiative.

2.8 Conclusions

Based on the response on this initial survey it can be concluded that several parties are interested in biorefinery and even have considered some kind of biorefinery concept. These initiatives also show that there is a broad variety in concepts to be considered biorefinery, varying from food and feed related pre-refining of biomass feedstock to end-refining of biomass (intermediates) in existing conventional (fossil fuel based) refineries. Most of these concepts, however, come under the definition provided by the Biorefinery.nl initiative.

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