

Newsletter IEA Bioenergy Task42

Number 2, August 2017

New website of IEA Bioenergy Task42

In July the new website of Task 42 was launched in the same layout as the other IEA Bioenergy websites. It can be found at the following address:

www.task42.ieabioenergy.com

IEA Bioenergy
Task 42

Biorefining in a future BioEconomy

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Welcome to the new website of IEA Bioenergy Task 42

Our goal is to contribute to the development and deployment of integrated biorefineries as part of highly efficient sustainable value chains (co-)producing food/feed ingredients, chemicals, materials, fuels, power and/or heat out of sustainably sourced biomass (wood, crops, residues, etc.) as base for a global BioEconomy.

[Click here for the old website](#)

EVENTS	NEWS	PUBLICATIONS
Webinar 'Biohubs – taking biorefining to the next level – Lessons from Canada' Webinar Fri 7th Jul, 2017	Biorefinery Engineering Master's Programme July 3, 2017 New report available: Proteins for Food, Feed and Biobased Applications: Biorefining of protein containing biomass May 9, 2017	Denmark Country Report 2017 May 16, 2017 Round Table The Netherlands (NL) May 16, 2017 Updates biorefineries in Italy May 16, 2017

Food Feed Chemicals Materials Fuels Power Heat

IEA Bioenergy, also known as the Technology Collaboration Programme (TCP) for a Programme of Research, Development and Demonstration on Bioenergy, functions within a Framework created by the International Energy Agency (IEA). Views, findings and publications of IEA Bioenergy do not necessarily represent the views or policies of the IEA Secretariat or of its individual Member countries.



Work Programme 2016 – 2018

Biorefining in the Circular Economy & BioEconomy

Biorefining, the sustainable processing of biomass into a range of marketable biobased products and bioenergy/biofuels, is an innovative and efficient approach to use available biomass resources for the synergistic co-production of power, heat and biofuels alongside food and feed ingredients, pharmaceuticals, chemicals, materials, minerals and short-cyclic CO₂.



The Circular Economy is defined as an economy that is restorative and regenerative by design, and which aims to keep products, components and materials at their highest utility and value at all times, distinguishing between technical and biological cycles [Ellen MacArthur Foundation]. The Circular Economy mainly focuses on the efficient use of finite resources and ensures that these resources are reused as long as possible. Biorefining is one of the key enabling technologies of the Circular Economy, closing loops of raw biomass materials (re-use of agro-, process- and post-consumer residues), minerals, water and carbon. Therefore, biorefining

is the optimal strategy for large-scale sustainable use of biomass in the BioEconomy. It will result in cost-competitive co-production of food/feed ingredients, biobased products and bioenergy combined with optimal socio-economic and environmental impacts (efficient use of resources, reduced GHG emissions, etc.).

Aim of IEA Bioenergy Task 42 – Biorefining in a future BioEconomy

The aim is to facilitate the commercialisation and market deployment of environmentally sound, socially acceptable, and cost-competitive biorefinery systems and technologies, and to advise policy and industrial decision makers accordingly. Task42 provides an international platform for collaboration and information exchange between industry, SMEs, GOs, NGOs, RTOs and universities concerning biorefinery research, development, demonstration and policy analysis. This includes the development of networks, dissemination of information, and provision of science-based technology analysis, as well as support and advice to policy makers, involvement of industry, and encouragement of membership by countries with a strong biorefinery infrastructure and appropriate policies. Gaps and barriers to deployment will be addressed to successfully promote sustainable biorefinery systems market implementation.

Work Programme 2016 – 2018

The priority of the Task42 activities for the 2016 – 2018 triennium all have the objective to further contribute to the market deployment of sustainable biorefineries, and are mainly based on successful developments started in former triennia.



The focus will be on international and national networking activities, standardisation and certification of biobased products, policy advice, and the role of industrial and SME stakeholders from the bioenergy and biofuel sectors in the transition to a BioEconomy. Task42 will increase co-operation with other IEA Technical Collaboration Programmes (i.e. IEA-IETS), other IEA Bioenergy Tasks, and international organisations (FAO, OECD, EC DG JRC, EU ETIP and EERA Bioenergy, etc.) The Work Programme 2016 – 2018 is divided into four main Activity Areas (AAs), viz.:

- Biorefinery Systems – Analysis and assessment of biorefining in the whole value chain (AA1)
- Product Quality – Reporting on related biobased products/bioenergy standardisation, certification and policy activities at national, European and global levels (AA2)
- Evolving BioEconomy – Analysing and advising on perspectives of biorefining in a Circular BioEconomy (AA3)
- Communication, Dissemination and Training – Knowledge exchange by stakeholder consultation, reporting and lecturing (AA4)

Expected results 2016 – 2018

In this Triennium Task 42 will deliver several results, which include among others:

- Biorefinery expert system & Biorefinery factsheets
- Biorefinery Country Reports
- Three background reports: i) Biobased Chemicals, ii) Proteins for Food/Feed and Industrial Applications & iii) Biobased Fibrous Materials
- Training Activities
- Thematic Stakeholder Workshops

New Work Programme 2019–2021 - Request for input

In the 2nd half of 2017, Task 42 will draft a first work programme for the 2019-2021 Triennium. All stakeholders, e.g. SMEs, industry, policy makers, NGOs, research institutes, universities, etc., active in the biorefinery/BioEconomy sector are invited to come-up with specific ideas for this new work programme.

Questions that we have in mind are e.g.:

- What biorefinery/BioEconomy data are you looking for?
- What kind of assessment tools are still lacking?
- What type of reports or papers provide added-value for your activities?
- Do you need any biorefinery/BioEconomy based training?
- Do you want to be involved more closely to the activities of Task42?



So please send us your ideas, input and requests before the end of September 2017 by e-mail to secretariaat.bbp@wur.nl, stating in the subject line: 'IEA Bioenergy Task42 – Input 2019-2021 Work Programme'.

21st Task42 Progress Meeting - Brisbane & Mackey, Australia



From 14-18 November 2016 Task42 organised its 21th Progress Meeting in both Brisbane and Mackey in Australia. This Progress Meeting was coupled to the Bioenergy Australia 2016 Conference in Brisbane where Task42 provided 5 lectures, and to an extensive excursion programme in Mackey with visits to [Wilmar Ethanol Distillery](#), [Queensland University of Technology Biocommodities Pilot Plant](#), [Mackay Sugar Cogen Plant at Mackay Sugar Ltd.](#) and Sugar Refinery of Sugar Australia.

Presentations given by Task42 at the Bioenergy Australia 2016 Conference:

- [Second Generation Biorefineries – Optimisation Opportunities And Implications For Australia](#), Geoff Bell, Microbiogen
- [Zambezi Biorefinery: "Pure" Glucose From 2nd Generation Feedstocks](#), Ed de Jong, Avantium Chemicals BV, The Netherlands
- [Overview on Biorefining Activities in Austria](#), Michael Mandl, TBW Research, Austria
- [Bioenergy Demonstration Projects In Canada: Lessons Learned, Key Factors For Success, Knowledge And Technology Gaps](#), Eric Soucy, Natural Resources Canada
- [Corn Stover Value Chain: From Farm to Sugar](#), Murray McLaughlin, Bioindustrial Innovation Canada

22nd Task42 Progress Meeting - Gothenburg, Sweden



On the 15th of May 2017 the Task42 NTLs met in Gothenburg, Sweden, for their 22nd Progress Meeting. All country reports and other presentations can be found on the [Task42 website](#). The meeting was combined with the workshop on "The role of industrial biorefineries in a low-carbon country". This workshop was organized by the Technology Collaboration Programmes IEA Bioenergy and IEA IETS, and hosted by Chalmers University of Technology and the Swedish Energy Agency. The results can be found [here](#).



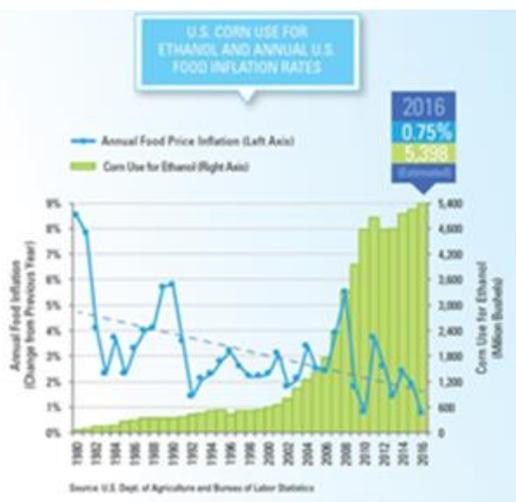
Biorefinery news from Australia

Progress continues but roadblocks and challenges remain

On March 28, 2017, the Australian Federal Government released a Productivity Commission Report that considered the "Regulation of Agriculture". The report is a significant document that is utilised by the Government as an independent source of information and recommendations and "Identify regulations that impose an unnecessary (and therefore avoidable) burden on farm business". There were a number of issues that were identified in the report that did not reflect positively on the biofuels or biorefinery industries. Some of these issues that were identified included:

- Biofuel support can increase fuel costs and may not help the environment
- Biofuels may significantly increase carbon emissions
- Biofuel mandates have limited benefits for farmers
- Biofuels could lift feed prices and reduce feed availability
- Biofuel industry outcomes should be market driven

The recommendation by the Productivity Commission with respect to biofuels is as follows: "Arrangements to support the biofuel industry – including excise arrangements and ethanol mandates – deliver negligible environmental benefits and impose unnecessary costs on farmers and the community. The Australian, New South Wales and Queensland Governments should remove these arrangements by the end of 2018". A review of the identified issues found that there are strong arguments to suggest that many of them are either misleading or not necessarily true.



For example: The NRMA noted in Jan 2016, that E10 should be marginally cheaper than standard unleaded. The USDA found that GHG emissions are reduced between 40% and 108% depending upon the feedstock utilised when producing ethanol. The higher octane nature of ethanol means that it can be utilised more efficiently in high compression car engines. The ethanol itself is cleaner burning and not carcinogenic like other octane enhancers. New biofuel projects in Queensland are expected to generate at least 600 jobs in the districts they are developed [Source: RDA] and that the development of these projects is

expected to reduce the rate of families leaving the district and lower dependency on high risk single market products such as crystal sugar [Source: NQBE]. According to the RFA there is no relation between feed prices and biofuel production. When ethanol production surged in the US by a factor of over 10 times, there was no increase in food price inflation.



Biorefinery news from Denmark

Mandatory blending mandate

In autumn 2016, the Danish Parliament agreed on a mandatory blending mandate of 0.9% advanced biofuels (2G ethanol) by 2020. At the same time, the Danish Oil Industry Association announced that it was working on a volunteer blending scheme of advanced biofuels of even up to 2.5% already from 2019. These blending targets will require between 70 and 200 Ml of advanced biofuels in Denmark.

Maabjerg Energy Concept (MEC)

In October 2016, the Danish biorefinery project "[Maabjerg Energy Concept – MEC](#)", which has been under development and planning since 2011, announced that the project would not be realized. The main reason being that the Danish Parliament did not pass new legislation enabling municipal loan guarantees for local energy infrastructure projects to also include advanced biofuels production facilities. In April 2017, MEC announced that in a letter of intent, the London based investment firm Pioneer Point Partners has expressed its intent to negotiate an investment up to 160 million Euro in a 2G bioethanol plant in Denmark, provided the regulatory framework is settled. MEC is therefore now looking for commercial partners to invest and operate an ethanol plant placed adjacent to the existing biogas and power plant facilities. In the original MEC project, the ethanol plant would produce 77 Ml of ethanol based on straw.

Biorefining green biomass

The use of green biomass (grass, clover and lucerne) for biorefining has currently large interest in Denmark. Several studies document that the green (perennial) biomasses have the potential of high yields with minimal environmental impact compared to traditional crops (wheat and corn). Biorefining of the green biomass involves extraction of protein to produce a feed for monogastrics and the pulp is used for cattle feed. The options for further refining of pulp and juice are also being investigated. Currently, these studies are part of two large projects: [Organofinery](#) and [BioValue-SPIR](#). In the autumn of 2016, the two projects joined resources to do a large-scale test involving the processing of 400 tons of fresh clover grass to produce 7 tons of concentrated protein paste for animal feeding trails.

Recommendations for developing circular economy

On June 7, 2017 The Advisory Board for Circular Economics delivered 27 recommendations to the government aimed at Denmark achieving a more circular economy, where new green business models and reduced resource consumption will strengthen companies' competitiveness for the benefit of Denmark's growth. Among the recommendations related biorefining are promoting better framework conditions for establishment of biorefineries and support establishment of new value chains for agricultural feedstocks.



New reports

- "[Green biomass – Protein production through biorefining](#)", published by Danish Center for Food and Agriculture, Aarhus University. The report summarizes the current knowledge on the biotechnical as well as economic issues in relation to value creation of green biomass in Denmark.
- "[Mapping of the Danish Bioenergy Cluster](#)" (only in Danish), published by Danish Energy Industries Federation. The reports maps the Danish bioenergy industry. It covers 1200 companies, 11,500 jobs and exports for more than 1 billion EUR.
- "[The Fundamentals of BiEconomy: The Biobased Society](#)", published by United Federation of Danish Workers 3F. The booklet contains easy-to-understand illustrations and text providing a comprehensive introduction to the BioEconomy in general and explains the possibilities for Denmark (available in Danish, English and German).

Biorefinery news from the Netherlands

Small-scale biorefining Report



Wageningen University & Research Report has recently published a report on [Small-scale biorefining](#). One promising way to accelerate the market implementation of integrated biorefineries is to promote small (regional) biorefinery initiatives. Small-scale biorefineries require relatively low initial investments, and therefore are often lacking the financing problems that larger facilities face (new technologies with often complicated business cases making it difficult to get reasonable financing conditions). They are potentially able to make use of available local resources and involve stakeholders and product markets that create a common foundation for

joint development and market deployment. Furthermore, by using modular and transportable units, the refinery process potentially can be operated at several locations, increasing their operation window, and therefore their market competitiveness. Small-scale biorefinery processes seem to be specifically interesting for the efficient and sustainable valorisation for relatively wet agro-crops (grass, beets, maize, etc.), agro-residues (leaves/foilage), food processing residues and aquatic biomass (microalgae, duckweed, etc.).



The Catchbio R&D programme has delivered valuable results

CATCHBIO



Biomass catalysis was the central focus of the ten-year Dutch research programme CatchBio. The work was clustered in three domains: energy, bulk chemicals and fine chemicals/ pharmaceuticals. The focus initially included biofuels but in a later stage attention shifted to bulk chemicals in particular. The heterogeneous character of biomass provides the necessary challenges in the development of catalysts which can convert this variable input into the desired intermediary product. Many of the results can be found [here](#).

Biorefinery news from the United States

General

The United States' biobased sector and its stakeholders are growing and adapting constantly in response to new policy, market drivers and funding. Recent policy news in the US includes California's approval of Ensyn's Renewable Fuel Oil (RFO) under the Low Carbon Fuel Standard, the EPA's proposal for bio-intermediates to generate RINs and the California Air Resources Board (CARB) consideration to allow the alternative jet fuels to generate credits under the LCFS.

A number of new pilot- and demonstration-scale biorefinery projects were selected by the DOE and two commercial scale biorefineries continue operation. A \$200M Waste-to-Energy plant from Enerkem is moving forward. Fulcrum BioEnergy continues development of their Nevada based facility and plans to develop additional facilities in the near future. Red Rock Biofuels, Nevada and Emerald also continue to progress on the plants development to produce the renewable drop-ins.

The Bioenergy Technologies Office recently held its biennial Peer Review and will host its annual conference [Bioeconomy 2017](#) in July. Additionally, two upcoming bioenergy workshops will be held in June.

Recent bioenergy publications and reports include the second volume of the [Billion-Ton Report](#), the [Integrated Biorefinery Optimization Workshop Summary report](#), and the [Alternative Aviation Fuels Workshop report](#).

These workshops brought together stakeholders from government, industry, and academia to discuss challenges and opportunities currently facing IBR Optimization and the growth of alternative aviation fuels.



Policy News

The California Air Resources Board (CARB), in February 2016 granted key regulatory approvals to Ensyn Corp. for their Renewable Fuel Oil (RFO) pursuant to the Low Carbon Fuel Standard (LCFS). These approvals permit the production of gasoline and diesel via RFO co-processing in specific CA refineries using RFO produced at Ensyn's facility in Ontario from forest residues. The resulting renewable gasoline and diesel were found to have a carbon intensity of ~70% less than petroleum-based fuels.

CARB also held a public meeting in March to discuss allowing alternative jet fuels to generate credits under the LCFS as an opt-in fuel. The potential amendment would be included in the subsequent rulemaking amendment process, and is proposed to go into effect on January 1, 2019. The staff presentation from this meeting is linked [here](#).

The US EPA is proposing a change to the Renewable Fuel Standard (RFS) which would allow renewable fuel produced from bio-intermediates to generate RINs for existing approved pathways, supporting the growth of advanced biofuels. Under the proposed change, bio-intermediate producers would be subject to requirements similar to those for renewable fuel producers.

Biorefinery Updates

The two pioneer-scale biorefineries in operation in the US; POET and DuPont continue to work towards production of fuel at commercial volumes.

DOE recently announced up to \$12.9 million for six projects related to the manufacturing of advanced or cellulosic biofuels, bioproducts, refinery-compatible intermediates, and/or biopower.

- Pilot-Scale: Global Algae Innovations and Thermochem Recovery International, Inc.
- Demonstration-Scale: AVAPCO and LanzaTech, Inc.
- Pilot-Scale Waste-to-Energy: Rialto Bioenergy, LLC and Water Environment & Reuse Foundation

Energkem is moving forward with its plans for a \$200M MSW to ethanol facility in Minnesota. The facility plans to use much of the 400,000 tons of MSW produced by Dakota County per year and could be online as soon as 2020.

Fulcrum BioEnergy plans to develop eight waste-to-energy facilities by 2022, including its first 11 million gallon plant currently in development in McCarran, Nevada. Fulcrum's first plant is expected to come online in the second half of 2018.

Conferences

BETO held its biennial Peer Review in Denver, CO in March. Approximately 192 projects in BETO's research, development, and demonstration portfolio were presented to and



reviewed by more than 40 external subject matter experts from industry, academia, and federal agencies.

Two stakeholder engagement workshops to be held in June include the "[Workshop on Moving Beyond Drop-In Replacements: Performance Advantaged Biobased Chemicals](#)" on June 1 and the "[Biofuels and Bioproducts from Wet and Gaseous Waste Streams: Market Barriers and Opportunities \(Waste to Energy\) Workshop](#)" on June 6-7 in Denver, Colorado and Berkeley, California respectively.

BETO will also hold its annual conference "[Bioeconomy 2017: Domestic Resources for a Vibrant Future](#)" on July 12-13 in Washington, DC.

Publications

Recent bioenergy publications include the [2016 Billion-Ton Report \(BT16\), Volume 2](#) and workshop summary reports from the [Biorefinery Optimization Workshop](#) and the [Alternative Aviation Fuels Workshop](#). A full list of publications can be found [here](#).

Biorefinery news from Italy

Green Chemistry Cluster

In the last ten years Italy has invested in biobased economy and green chemistry. The figure on the next page shows the overall maps of industrial initiatives¹. On the whole Italy has constructed five Flagship Biorefineries. Most of the industrial initiatives are based in the Piedmont region (Novamont, Biochemtex, Reverdia).

The Cluster of "Green Chemistry", [SPRING](#), is a national platform which brings together the main stakeholders (more than 100) of the value chain, from farmers to associations. It is a proven, effective collaboration between the public and private sector research bodies with strong competences in the main sector of the value chain of biobased industry and all stakeholders in the local areas; a network of large, medium and small-sized companies which work together. The main sectors represented are biobased chemicals, oleochemistry, bio-lubricants, cosmetics, fibres, bioplastics. Italy shows important projects of reconversion of industrial sites affected by the crisis, into biorefineries for the production of biobased products and bio-chemicals from renewable sources, with positive impacts on employment, the environment, product profitability and integration with oil-based products, to enable greater specialisation and competitiveness.

Some of these projects, coordinated by Italian leading players in bio-based industries sector have been recognized as flagship initiatives in Europe by the BBI Joint Undertaking. [First2Run](#): Flagship demonstration of an integrated biorefinery for dry crops sustainable

¹ SOURCE: Public consultation on the adoption of a bioeconomy Strategy for Italy (presented on 20 April 2017-Rome)



exploitation towards biobased materials production. [BIOSKOH](#)'s: Innovation Stepping Stones for a novel European Second Generation BioEconomy.



Italy's Legislation supporting Biorefining

Measures for promoting green economy and limiting the excessive use of natural resources are included in the environmental annex in the [national stability law](#). It defines relevant milestones for the future Italian environmental strategies. The main focus is on green economy and circular economy, in particular through: Green Public Procurement (GPP) with environmental minimum criteria for new purchases by the public sector defined also by Labelling and Certifications (Emas, Ecolabel, Environmental Footprints, Made Green in Italy); incentives for the purchase of post-consumption materials, the management of specific waste fractions (including composting) and incentives to increase the share of separate collection and recycling; creation of a Natural Capital Committee, which can provide data on biomass consumption and monitor the impact of public policies on natural resources and ecosystem services conservation; the establishment of a system of Payment for Ecosystem and Environmental Services and the production of a catalogue on Environmental Harmful and beneficial Subsidies. Promoting local production, 1.1 GNm³/year Biomethane (upgraded Biogas), injection in grid or CNG for Transport is in the final approval stage at Italian Ministry level. The core of Industry 4.0 Plan provides tax credit for research and development and innovation expenditure (up to 50% of incremental expenditure), support of Venture Capital and Start-ups (30% tax deduction for investments up to 1 million Euros in start-ups and innovative SMEs, 30% tax deduction for investments up to 1 million Euros in start-ups and innovative SMEs).

Conferences

The main Italian conferences on bio-based chemistry in 2017 will be:

- Ecomondo, 21th edition, 7-10 November 2017, Rimini Expo Centre. Ecomondo is the leading Euro-Mediterranean area green and circular economy expo. An international event that brings together all sectors of the circular economy in a single platform: from material and energy recovery to sustainable development.
- Italian Forum on Industrial Biotechnology and Bioeconomy (IFIB) 7th edition, 5-6 October 2017 in Rome. IFBI is organized by Assobiotec, the Italian Association for the development of biotechnology which is part of the national Federation of Chemical Industry (Federchimica) The focus of the Forum will be: bioeconomy and circular economy, energy and biorefineries, bio-based industries, life-sciences, agro-food and marine biotechnology.



Biorefineries – current status and expected developments

Biorefining is not a fully new approach. Thousands of years ago the production of vegetable oils, beer and wine already required pre-treatment, separation and conversion steps; whereas paper production started around 100 AD. Industrial conventional biorefineries are currently still mainly found in the food and paper sectors.

Within recently constructed biorefineries, bioenergy/biofuel based facilities are more common. In these, heat, power and biofuels are the main products, and both agro and process residues are used to produce additional biobased products. In product based biorefineries, higher-value food and feed ingredients, pharmaceuticals, chemicals, fibrous materials (e.g. pulp, paper) and/or fertilisers are the main products, with low-quality agro and process residues used for the production of bioenergy and less commonly, biofuels. Product based biorefineries are mainly found in the food, feed and dairy, and pulp and paper industries at the current time.

Assessing the number of biorefinery facilities currently in operation globally is challenging. However, over 100 commercial, demo and pilot facilities have been identified in the participating countries (www.task42.ieabioenergy.com).

It is expected that within the next 10-20 years the use of biomass for non-food/feed applications will shift from an energy to a more product-based approach. However, the longer-term part of the biomass resources is still expected to be used for the production of advanced biofuels for transport (heavy duty transport aviation and shipping).

In the short-term (up to 2020) advanced biorefineries may be introduced in a variety of market sectors, mainly by means of upgrading of existing infrastructures, reducing both initial investment costs and the time-to-market. Bioenergy will play both an initiating and central role for the market deployment of these advanced biorefineries:

- Certified sustainable biocommodities that are now being developed and mobilised for energy applications in the mid/longer-term will also be available as raw materials for the biorefinery facilities ensuring sustainable biomass supply.
- Industrial bio-transportation fuel production facilities and digestion facilities can be further upgraded to integrated biorefineries co-producing fuels and added-value biobased products to optimise their overall sustainability, i.e. increase their financial market competitiveness.
- Low-quality value chain residues, i.e. residues that cannot be reused for added-value applications in an economically attractive way, like agro-residues, process residues and post-consumer residues, will be used for bioenergy production.

A portfolio of new biorefining concepts – i.e. whole crop biorefineries, lignocellulosic feedstock biorefineries, oleo-chemical biorefineries, green biorefineries, thermochemical biorefineries, micro and macro algae (marine) biorefineries and next generation hydrocarbon biorefineries – is currently being developed.



These concepts are expected to be implemented into the market in the medium-term (2020-2025). However, the current economic conditions (low oil price, credit crisis, recessions in part of the world) might cause severe delays in their market deployment.

A very important non-technical barrier for the market deployment of product-based biorefineries is the availability of sufficient sustainable biomass resources. Product-based biorefineries can accelerate their market deployment by using of both the certification expertise and logistical infrastructures that are currently being developed and set-up for the use of sustainable biobased commodities for energy purposes.

Towards 2050, the portfolio of product based biorefinery concepts could expand further. Lignocellulosic feedstock, herbaceous (green), oleo-chemical and marine (microalgae and seaweeds) biorefineries may enter the market. However, expansion will require further technology development as product-based biorefinery facilities are generally less technically mature than bioenergy/biofuel alternatives. In addition, current policy support is more favourable towards bioenergy and biofuels than the production of biobased products. As such, facilitating the market development of product-based biorefineries is likely to require more widespread policy frameworks to support biobased products.

However, since such materials are generally higher-value products than bioenergy and biofuels, expanding markets for biobased products will be a key factor in product-driven refinery expansion.

Initiatives to support industry development include: a Biorefineries Roadmap in Germany in 2012, a Strategic Biomass Vision 2030 in the Netherlands, and ongoing funding for innovative biorefinery projects from the US Department of Energy (DOE). Deployment in Europe should be boosted by the Bio-Based Industries Joint Undertaking, a partnership between the European Union and the private sector to invest USD 4.1 billion in innovative technologies and biorefineries to produce biobased products from biomass wastes and residues. In addition, the European Commission's Circular Economy package includes biomass and biobased products as a priority sector and outlines the promotion of support to innovation in the BioEconomy.

Bioenergy markets will play a central role in facilitating the growth of product based biorefineries through the development of sustainability certification processes and biomass fuel and feedstock supply chains. In addition, biofuel and biogas plants offer potential for upgraded and integrated biorefineries co-producing fuels and added-value biobased products, with such facilities benefiting from diversified product streams and increased market competitiveness. Furthermore, even in the context of wider deployment of product based biorefineries, lower-value biomass feedstock, such as agricultural and post-consumer residues that are less suitable for economic biobased product manufacture are likely to remain destined for bioenergy markets.



List of publications Task42 in 2016 – 2018 triennium

Please see the Task42 website for links to these [publications](#)

Bell, G. & E. de Jong, 2016. IEA Bioenergy Task42 – Biorefining in a Future BioEconomy. Webinar and Participation Group Meeting, Bioenergy Australia, 25 May 2016.

Bell, G. & E. de Jong, 2016. What is Australia's biofuel future? Ecogeneration, 28 October 2016.

Bell, G., 2016. Second Generation Bio-Refineries – Implications for Australia. Presentation at Irish Stakeholder Meeting combined with Task42 Progress Meeting, Dublin, Ireland, 19 April 2016.

Bos, H., E. Annevelink & R. van Ree, 2017. The Role of Biomass, Bioenergy and Biorefining in a Circular Economy. Presentation at IEA Bioenergy Task34 Workshop, Paris, 10 January 2017.

Jorgensen, H., 2016. Biorefinery RD&D in Denmark. Presentation at Irish Stakeholder Meeting combined with Task42 Progress Meeting, Dublin, Ireland, 19 April 2016.

Jungmeier, G. et al., 2016. Implementing Strategies of Biorefineries in the BioEconomy. Presentation at EUBC&E-2016, Amsterdam, the Netherlands, 6-9 June 2016.

Jungmeier G. et al., The Approach of Life-Cycle Sustainability Assessment of Biorefineries. Paper linked to EUBC&E-2016, 2016.

Mandl, M. & R. van Ree, 2017. Biorefineries in a Future BioEconomy – Activities and Current Results of IEA Bioenergy Task42. Presentation at 4th Central European Biomass Conference, Graz, Austria, 18-20 January 2017.

Mandl, M.G., 2016. Green Biorefining: Grass for Generating Products and Bioenergy. Presentation at Irish Stakeholder Meeting combined with Task42 Progress Meeting, Dublin, Ireland, 19 April 2016.

Mulder, W., 2016. Protein-driven Biorefining: Sustainable Biomass Use for Food and Non-food. Presentation at EUBC&E-2016, Amsterdam, the Netherlands, 6 June 2016.

Ree, R. van, 2017. Biorefinery Approach in the EU and Beyond. Presentation at Workshop on EU-AU R&I Partnership on Food and Nutrition Security and Sustainable Agriculture (FNSSA), Brussels, 23 January 2017.



Ree, R. van & B. Kostova, 2017. Prospects of Biorefineries. Input on behalf of Task42 to Bioenergy Roadmap IEA, February 2017.

Ree, R. van, 2016. The Role of Biorefining in the BioEconomy. Presentation at Irish Stakeholder Meeting combined with Task42 Progress Meeting, Dublin, Ireland, 19 April 2016.

Ree, R. van, 2016. Integration of Advanced Biofuels in the Circular Economy. Presentation at 7th Stakeholder Plenary Meeting, European Biofuels Technology Platform, Brussels, Belgium, 21 June 2016.

Ree, R. van, 2016. Biorefinery Market Developments. Feature article IEA Mid-term Renewable Energy Market Report, 2016.

List of upcoming Task42 events

- 27 September 2017, Brussels, Belgium, Workshop "The Role of Bioenergy in the Circular Economy (CE) (incl. the BioEconomy)". This is joint workshop of members of IEA Bioenergy, FAO, OECD, EERA Bioenergy, ETIP Bioenergy, IRENA, JRC, and DOE to inform each other on running and planned activities in the field mentioned, to analyse cooperation opportunities to be able to use available (financial) resources as efficient as possible and to come-up with results that will have a broad support, to define one/more joint activities to be performed in the coming year(s), and to organise a joint dissemination event to communicate our views/results to a wider public (side event international conference).
- 23-25 October 2017, Vienna, Austria, 23rd Progress Meeting IEA Bioenergy Task42. This is a closed meeting for the Task42 National Representatives (NTLs) only; however, it will be coupled to an open Austrian stakeholders meeting. If you would like to supply your national contact point with information before the meeting, please contact him or her by email (see list below).
- Q1/Q2 2018, Montreal, Canada, 24th Progress Meeting IEA Bioenergy Task42.
- October 2018, San Francisco, U.S., 25th Progress Meeting IEA Bioenergy Task42, coupled to ExCo82 (week of 15 October) and the open IEA Bioenergy End-of-Triennium Conference.



National Contact Points IEA Bioenergy Task42

Country	Name	Organisation	Phone no.	e-mail
Australia	Geoff Bell	Microbiogen Pty Ltd	+61-2 94183182	geoff.bell@microbiogen.com
Austria	Michael Mandl	tbw Research GesmbH	+43-69914445211	m.mandl@tbwresearch.org
Canada	Eric Soucy	CanmetENERGY, Natural Resources Canada	+1-4506524299	eric.soucy@canada.ca
	Murray McLaughlin	Bioindustrial Innovation Canada	+1-5195505525	murraym@BInCanada.ca
Denmark	Henning Jørgensen	University of Copenhagen	+45-35331989	hej@plen.ku.dk
	Solange I. Mussatto	DTU Biosustain	+45-93511891	smussatto@biosustain.dtu.dk
Germany	Heinz Stichnothe	Thünen-Institut für Agricultural Technology	+49-5315964163	heinz.stichnothe@ti.bund.de
Ireland	Bart Bonsall	Technology Centre for Biorefining and Bioenergy	+353-862413081	bart.bonsall@ccbb.ie
Italy	Isabella de Bari	ENEA C.R. TRISAIA	+39-0835974618	isabella.debari@enea.it
	Vincenzo Motola	ENEA C.R. ISPRA	+39-0332788226	vincenzo.motola@enea.it
Netherlands	René van Ree (coordinator)	Wageningen Food and Biobased Research	+31-317480710	rene.vanree@wur.nl
	Bert Annevelink	Wageningen Food and Biobased Research	+31-317488700	bert.annevelink@wur.nl
	Ed de Jong	Avantium B.V.	+31-634347096	ed.dejong@avantium.com
	Kees Kwant (operating agent)	Netherlands Enterprise Agency, Ministry of Economic Affairs	+31-886022458	kees.kwant@rvo.nl
United States of America	Borislava Kostova	U.S. Department of Energy	+1-2025864068	borka.kostova@ee.doe.gov

Secretariat IEA Bioenergy Task42

Wageningen Research, the Netherlands

e-mail: secretariaat.bbp@wur.nl

Phone no.: +31 317 481 165

Website: www.task42.ieabioenergy.com



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www.ieabioenergy.com



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