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Bioenergy News

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IEA Bioenergy
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Press Release – The Dawn of Greater Energy Independence

Paul Bennett
Chair of the Executive Committee

The Ukraine war has exposed Europe's critical dependence on fossil fuel imports, so EU Member States are discussing the required steps to break away from their dependence on fossil fuels. Meanwhile in its latest Assessment Report the IPCC also calls for rapid action to move away from fossil fuels to reverse the trends in climate change. Paul Bennett, Chair of the Executive Committee of IEA Bioenergy refers to the advantages of bioenergy contribution to energy security in a fossil free future.

Europe is looking for ways out of its dependence on coal, oil and especially gas and move towards climate neutrality. Energy savings and renewable energy are the key tools to achieve that. Solar and wind energy are the focus of public attention when it comes to sustainable energy independence and energy security. Little attention is paid to the global potential of bioenergy from sustainably sourced biomass – and wrongly so. Because without bioenergy, the urgent step toward fossil free greater energy security and climate neutrality will not succeed. It is the overlooked giant of the energy transition.

The three perspectives of energy security, energy independence and climate change mitigation are in the focus of bioenergy:

- We need to utilize the vast potential of energy production from sustainable biomass
- We need a heat transition for climate-neutral energy security
- We need to seize the opportunities of bioenergy to combine renewable energy production with CO2 removal from the atmosphere.

Perspective #1: Utilize the vast potential of energy production from sustainable biomass

Bioenergy is the most widely used renewable energy in the world. It accounts for about ten percent of global energy supply (for electricity, heating, cooling and transport). In Europe, bioenergy represents about 60 percent of renewable energy. There is room to expand the mobilization of biomass in a sustainable way and use it for modern and clean bioenergy applications.

Thus, bioenergy is an important and essential part of global and European energy security. It allows for more independence from fossil fuels. Bioenergy prices are much more stable than fossil fuel prices; it can be produced from local resources and absorb seasonal fluctuations of other renewables; bioenergy is compatible with current infrastructures, so it can already be used now. Most importantly, biomass can be stored, it is versatile and can deliver heat and power, supply fuels for transportation or deliver renewable gas.

Bioenergy contributes substantially to climate change mitigation when it is produced from biomass that is grown sustainably or based on waste and residues; converted to energy products efficiently and used to replace fossil fuels.

However, bioenergy is in the slipstream of solar and wind energy, which does not do justice to its global importance. Only with an expansion of sustainable bioenergy – in addition to energy savings and strong growth of other types of renewables – we will be able to meet the increasing demand for renewable energy and also achieve more (national) energy independence. Around 96% of the EU's current use of biomass for bioenergy originates from the EU itself.

It is necessary to:

- Expand deployment of existing technologies such as biomethane to replace fossil gas, or combined heat and power production from biomass.
- Commercialize new technologies such as biomass gasification or integrated biorefineries to co-produce biochemicals, biofuels and heat.
- Ensure sustainable biomass supply for renewable fuels, e.g. through the implementation of certification and other sustainability governance systems.

Take away:

For the transition to a climate neutral society, all types of renewables are important. We need to reduce energy demand and maximize the contribution of fuels, power and heat from renewable resources – including biogenic resources – to reduce greenhouse gas emissions and protect the climate. This contributes to the targets of the European Green Deal and to both global and national energy security.

Perspective #2: Heat generation through bioenergy – the overlooked giant

Heat generation (for buildings and industry processes) represents more than 50 percent of global energy consumption and is still largely dependent on fossil fuels such as oil, gas or coal. Moving away from fossil resources in heat generation is a key component in decarbonization. This fact is largely underestimated since the attention of policymakers and the public is more on electricity generation where other renewables (solar, wind) can play a leading role.

For heat generation, biomass is currently by far the most important renewable energy source. It includes heat supply from solid fuels, liquid fuels, gaseous fuels and the biogenic fraction of waste. A large proportion of biobased heat is already produced from residual materials and green waste.

Biomass can be stored cost-effectively on a larger scale (wood chip or pellet storage, biomethane storage, liquid biofuels storage) and can be used in a targeted manner. It is also capable of providing heat at a high temperature level without additional costly technology.

It is necessary to:

- Reduce energy demand for domestic heating through efficiency measures, for example better insulation
- Stimulate the transition of fossil fuels in industries to renewable heat
- Deploy district heating in urban areas to replace individual fossil stoves and boilers

Take away:

A transition away from fossil-based heating is necessary to move towards a carbon neutral and secure energy system. Bioenergy is the overlooked giant of the energy transition – particularly for renewable heat – and, due to its great decarbonization potential, a decisive key to energy security.

Perspective #3: Combining renewable energy production with CO2 extraction from the atmosphere.

To stabilize global temperatures in the coming decades, removal of CO2 from the atmosphere, so called "negative emissions", will be a necessity, not just an option. This was recently confirmed by the IPCC Sixth Assessment Report. One of the leading negative emission pathways is „BECCS", i.e., Bioenergy with Carbon Capture and Storage. CO2 generated in the process – which was initially absorbed from the atmosphere during plant growth – is not released back to the atmosphere, but captured and stored underground. This way BECCS combines renewable energy production with negative emissions.

It is necessary to:

- Intensify research to improve CO2 capture and storage processes
- Bring BECCS from pilot to full scale projects
- Improve business models and regulations regarding CO2 capture and storage,
- Invest in CO2 distribution and storage facilities

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From the Secretariat

Andrea Rossi
ExCo Secretary

ExCo89, Virtual Meeting

With the continuing challenges posed by COVID-19, the IEA Bioenergy ExCo89 meeting was held as a Virtual Meeting in three separate sessions on 16, 18 and 19 May 2022 with Paul Bennett as Chair, Dina Bacovsky and Sandra Hermle as Vice-chairs and Andrea Rossi as Secretary.

Changes to Executive Committee

A new Member for Estonia was Mr Kristo Kaasik; a new Alternate Member for European Commission was Mr Johannes Baur; a new Alternate Member for Germany was Dr Tilman Schachtsiek; a new Alternate Member for India was Mr Asheesh Joshi; for Japan, a new Member was Mr Takahisa Yano, and a new Alternate Member was Mr Junichi Yoshida; for South Africa, a new Member was Dr Karen Surridge, and a new Alternate Member was Prof Christina Trois; a new Alternate Member for Switzerland was Ms Natalie Bachmann.

ExCo89 Workshop

IEA Bioenergy held its biannual workshop on 23-24 May 2022 in conjunction with the ExCo89 meeting. The workshop on 'Bioenergy and Sustainable Development' was held in virtual form and was organised in collaboration with the Global Bioenergy Partnership (GBEP) and the Biofuture Platform.

The workshop consisted of two separate sessions:

1. The first session examined debates surrounding the contribution of bioenergy to climate change mitigation

2. The second session considered opportunities for sustainability co-benefits (beyond climate) and ways to create win-win approaches, e.g. to lift socio-economic perspectives in rural areas and improve the way landscapes are managed.

Each session consisted of keynote presentations, followed by a panel discussion. The workshop sessions had 244 and 173 participants respectively. The PowerPoint presentations and recordings can be downloaded from the IEA Bioenergy website.

Progress with current Initiatives

Inter-Task Project – The Role of Bioenergy in a WB2/SDG World
This Inter-Task project, which has now been completed, included four inter-connected activities, namely:

- Activity A. Bioenergy and AFOLU in selected scenarios that meet WB2
  - A1: Roles of bioenergy technologies in energy system pathways towards a WB2 world
  - A2: Cumulative net GHG emissions and warming contribution over time associated with bioenergy systems and AFOLU measures in selected scenarios that meet WB2
- Activity B. The contribution of bioenergy systems to SDG implementation
  - B1: Bioenergy feedstock production that deliver multiple benefits
  - B2: Implementation strategies for bioenergy solutions that offer multiple benefits

All the outputs from this project are available here. The project results were disseminated during the ExCo89 e-workshop on "Bioenergy and Sustainable Development – Climate Change Mitigation and Opportunities for Sustainability Co-Benefits".

Inter-Task project – Bioenergy for high temperature heat in industry

Under this Inter-Task project, which has now been completed, five case studies were produced to illustrate good examples of integration of bioenergy in industry for the delivery of high temperature heat. Building upon the lessons learned emerging from these case studies, a policy synthesis report was prepared, providing information on market opportunities and potential as well as effective ways to address technical and non-technical barriers to implement bioenergy based process heat.

All the outputs from this project are available here. The project results were presented at a webinar on opportunities for bioenergy in industry, which was held on 22 February 2022.

Inter-Task project – Renewable Gas deployment, markets and sustainable trade

This project aimed to provide state-of-the-art overviews on prospects, opportunities and challenges for mechanisms that could help deploying biogas, biomethane and other renewable gases (RG) in IEA energy markets, and beyond; and to discuss technological and sustainability issues of RG from a deployment perspective, providing related recommendations for policymakers and identifying open research issues. The project, which has now been completed, was carried out in collaboration with IEA Hydrogen, EC DG ENER and industrial partners.

In March 2022, the synthesis reports of WP2 ("Status and perspectives of non-biogenic renewable gases") and WP3 ("Sustainable potentials for renewable gas trade") were published, along with a Summary report discussing the main findings from the project. All outputs from this project are available here.

Task 41 Project 11 - Renewable Gas - Hydrogen in the grid

The main objective of this project was to carry out a thorough study on renewable gas with a focus on the effect of hydrogen addition in the grid at increased concentrations up to 100%. It identified and discussed numerous challenges and hurdles for replacing natural gas by renewable gas (RG), with emphasis on H2 injection into existing gas grids and on new dedicated H2 grids. The project collected existing data and information on RG studies, and it extensively analyzed national strategies and roadmaps. All findings were summarized in a Synthesis Report, which was published in January 2022. The main conclusions were presented at the IEA Bioenergy Conference 2021.

Inter-Task Project – Deployment of BECCUS Value Chains

This project aimed to analyze technological, political and economic aspects related to near- to medium term deployment of systems used for capture and utilization or storage of biogenic CO2. The project outputs can be divided into two categories: case studies, which offer brief but focused analyses of conditions in a specific sector; and system studies, which analyze issues that cut across sectors.

Between 2020 and 2021, three case studies and a system study were published. In the first half

of 2022, an additional case study on the cement sector and a system study on carbon accounting were released. All outputs from this project are available here.

Inter-Task Project– Lessons Learned – Biofuels

This project included six work packages focused on studying national programmes and experiences of leading biofuels producing countries including but not limited to Brazil, Canada, Germany, Sweden and the USA. The analysis aimed to compare and contrast different producer countries' framework conditions and policy approaches as well as levels and rates of biofuel production growth that these have enabled.

Due to Covid-19 related impacts, outputs have been delayed. In the first half of 2022, the following outputs were finalized:

- WP1: "Status Quo of Biofuel Projects"
- WP2: "Meta-analysis"
- WP3: "Case Studies Technologies"
- WP4: "Case Study Supply Chains"

New Initiatives

Two new Inter-Task projects were approved by ExCo in April 2022: one on "Management of Biogenic CO2: BECCUS Inter-task Phase 2" and one on "Synergies of Green Hydrogen and Bio-Based Value Chains Deployment"

Inter-Task project – Management of Biogenic CO2: BECCUS Inter-task Phase 2

This project, which comprises eight working packages, aims to: facilitate cross-Task, cross-TCP and cross-sector learning on bio-CCUS; shed light on (bio)energy system integration of bio-CCUS; and address CO2 mitigation potential of bio-CCUS. It will allow for a more systemic consideration of how to take different BECCUS applications to deployment, thereby building upon, but going beyond, Phase 1. The main outputs of the project, which started in Q2 2022 and will end in Q4 2024, will include four reports, two workshops and one webinar. Collaboration is foreseen with various TCPs (ETSAP, GHG, IETS), in addition to the Synergies ITP.

Inter-Task project – Synergies of Green Hydrogen and Bio-Based Value Chains Deployment

The objective of this project is to identify and assess synergies in the deployment of green hydrogen and bio-based value chains that can enhance the use of both energy carriers and the energy system under different conditions. The focus will be on value chains directly linked to bioenergy, i.e., biomass as a source of hydrogen and bio-based processes consuming electrolytic hydrogen. The project comprises six working packages, with three reports, two webinars and a series of factsheets foreseen as key outputs. It started in June 2022 and it will end in November 2024. Collaboration is foreseen with the Hydrogen TCP and the ETSAP TCP, in addition to the BECCUS Phase 2 ITP.

Communication Strategy

The Communications Team has continued with regular online meetings to oversee communications' activities and review progress with ETA Florence. Three IEA Bioenergy webinars have been presented since ExCo89 and these can be viewed along with all previous webinars at https://www.ieabioenergy.com/iea-publications/webinars/. Work on updating the Tasks' websites with the new IEA Bioenergy brand is continuing and is expected to be completed in the third quarter of 2022. The social media statistics showed increased numbers of followers on both Twitter and LinkedIn. Regarding the website, even though the number of users has grown, there appears to be a stagnation, indicating the need for continuing efforts.

The collaboration with the Communications Specialist MFM is progressing well. Three initial actions have been identified, namely: "Media Awareness"; "Stakeholder Talks"; and "Build Communication Competence". Under these actions, MFM is currently implementing a series of activities, with the supervision of the Communications Team. In particular, a new slogan ("Accelerating to Net Zero") was identified and uploaded onto the website. Furthermore, a press release was prepared and launched in May, generating a lot of interest and feedback.

Collaboration with other International Organizations

Collaboration with the IEA, other IEA TCPs and International Organisations has continued, in spite of the challenges posed by the COVID-19 pandemic. Exchanges were ongoing with the Hydrogen TCP, the ETSAP TCP and the AMF TCP in relation to the new Inter-Task project on "Synergies of Green Hydrogen and Bio-Based Value Chains Deployment"; and with the ETSAP TCP, the GHG TCP and the IETS TCP regarding the other new Inter-Task project ("Management of Biogenic CO2: BECCUS Inter-task Phase 2"). The IEA Bioenergy TCP continues to work closely with the Global Bioenergy Partnership (GBEP) and the Biofuture Platform, which collaborated on the organization of the ExCo89 e-workshop on "Bioenergy and Sustainable Development – Climate Change Mitigation and Opportunities for Sustainability Co-Benefits". Furthermore, synergies are being explored with the Biofuture Platform in relation to possible events to be organized within the Global Clean Energy Action Forum (i.e., CEM13 + MI7), which will take place from 21 to 23 September in Pittsburgh, United States.

New Implementing Agreement

Following an extensive consultation process among the members of IEA Bioenergy, at the ExCo89 meeting in May 2022, ExCo voted to approve the newImplementing Agreement (IA) of the IEA Bioenergy TCP. The new IA was then definitively approved via written procedure in July 2022. Compared to the previous version of the IA, an effort was made to align the new text with the way IEA Bioenergy is structured and operates. Some of the main changes include: agreement on three-year Programmes of Work; explicit reference to the role of "Technical Coordinator"; two year-terms for Chairs and Vice-Chairs, pending confirmation at the end of the first year; clearer description of the relationship between Operating Agent (OA) and Task Leader (TL); introduction of the concept of "Fund Manager", applying to any Secretary, OA and TL managing common funds at TCP level or Task level; and determination by ExCo of the currency of the Common Fund ahead of each triennium.

Further information:

IEA bioenergy.com

Task Focus:

Renewables gases: deployment, markets, trade and role of the gas grid

Jan Liebetrau (Task 37) & Uwe Fritsche (Task 40)

Decarbonization is about much more than electricity which only accounts for about 20% of the global final energy demand: Which technologies will be employed to decarbonize the hard-to-abate sectors such as long-range heavy-duty transport, high-temperature industrial heat, fertiliser and chemical production, and international aviation and shipping? Here, renewable gases (RG) can be key components, as the (IEA "net zero" scenario shows). There is agreement that among RG, biomethane and hydrogen H2 will be most relevant.

Biogas and biomethane

Biomethane is the largest contributor to low-carbon gas supply in the IEA World Energy Outlook scenarios. As biomethane is nearly pure methane, it can be used without any change in natural gas transmission and distribution infrastructure, or end-user appliances.

Regarding feedstocks, almost all countries which support anaerobic digestion (AD) incentivise the use of agricultural residues such as manure, and biogenic waste materials. The use of energy crops is costly and discussed controversially, with sustainability and land use being the main issues. Intercropping avoids some of the issues and might represent an alternative to conventional energy crops.

Biomethane provision based on AD is a proven technology and applied worldwide with a variety of substrates used and technologies for gas production, upgrading and utilization. For upgrading there is an increasing market share of membrane separation.

With cost reduction achieved by wind and photovoltaics, the gap to electricity costs from biogas is getting bigger. Consequently biogas-based electricity is only economic with higher feed-in tariffs than for wind and solar. Currently, biogas use is dominated by combined heat and power (CHP) units. Since upgrading and grid injection is costly for smaller-scale sites, CHP will remain the technology of choice for those aiming at high heat utilization and flexible electricity provision to balance market demand and to stabilize the grid. Biomethane as transport fuel is rather attractive due to the lack of alternatives for the fuel distributors.

The basis of comparison for renewable energy carriers in the future needs to consider the necessary reduction of CO_2 emissions, and therefore, the long-term transition to a decarbonized economy requires CO2 pricing. Up to 2050, competition of technologies for producing gaseous energy carriers will be driven by overall demand, production costs (including CO2 price) and the availability of technical alternatives. Any support scheme should also consider the availability of necessary infrastructure and technology options for gas utilization.

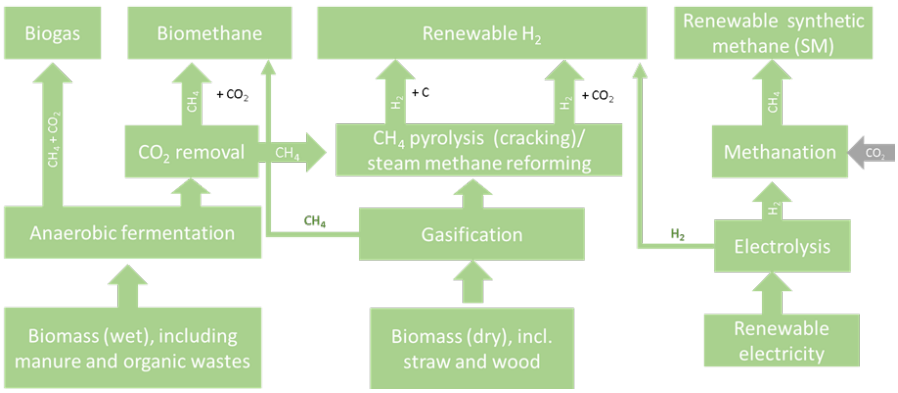
Due to the current lack of a comprehensive and cross-sectoral CO2 pricing, support for developing renewable gas needs to balance the shortfall between the revenues for the product and the financial effort for the production. With an obligatory development target for renewable fraction of the market, set e.g., by a quota, a defined market share for renewables can force a development. Yet, a proper timing of the shift from protected technology development phase to competition is crucial to avoid "lock in" effects. In the long-term, any support mechanism shall be replaced by a competitive market scheme.

Incentives to develop the sector need to reflect the availability and sustainability of substrates for biomethane production, the specific costs to access the substrates and for gas provision. Since the investment has usually long amortisation periods, the duration of temporal guarantee of the incentive is very important. Interaction and compatibility with other RG such as H2 is needed, and respective synergies will be evaluated in a new IEA Bioenergy Intertask project that just started.

Biogas upgrading to biomethane is also a valid source of CO2 for bioenergy with carbon capture and sequestration (BECCS) which achieves negative CO2 balances, and for bioenergy with carbon capture and utilization (BECCU) which delivers CO2-neutral products.

What is needed for a successful implementation of biomethane:

- Create roadmaps for renewable gas development, including for availability of substrates (such us wet organic, woody or electricity), development costs, defined time specific targets as a portion of energy use and infrastructure required and/or already available.
- Introduce quotas which place an obligation on fuel providers; this is a very effective tool to remove the necessity of renewable gas competing on price with fossil gas.
- Provide incentives which reflect the actual costs of investment and long-term operation of the renewable gas industry to ensure bankability for the developer and ensure a price effective market environment for the user of renewable gas.
- Eradicate as much as plausible, unnecessary barriers and inhibitory regulations on both a technical and regulatory level.
- Seek compatibility with other technologies through a cascading approach; this could include for example carbon capture from industry combined with hydrogen from electricity to produce methane, methanol or ammonia in electro-fuel systems.
- CO2 emissions must have a realistic monetary value associated with them; a realistic carbon tax would stimulate development and drive the transformation of green gas whilst providing for competition between renewable technologies in specific sectors, which should consequently lead to the phase out of specific incentives.



In case of increasing cross border trade the national incentive systems have to be scrutinized and if needed harmonised in order to avoid "over-incentivation" by summation of incentive schemes.

Non-biogenic renewable gases

Non-biogenic renewable gas (NBRG), encompassing hydrogen (H2) produced by electrolysis powered by renewable electricity and potential subsequent methanation with capture of CO2, are potential routes to decarbonize energy and chemical feedstock use, especially in hard-to-abate sectors. A growing number of countries developed national H2 strategies to position H2 in their decarbonization plans, some include non-biogenic renewable methane (RM). Most strategies focused on green H2 expect that its first deployment will be in industries that already consume fossil-derived H2 such as oil refining, and fertilizer and chemicals production; a focus on aviation, shipping, and long-range heavy duty trucks; a focus on the co-benefits of H2 use including reduced GHG emissions, improved air quality, reduced reliance on fossil fuel imports.

An analysis conducted for regional case examples in the North Sea, Texas, and Brazil illustrates how local factors such as renewable electricity resource, electricity grid GHG intensity, potential CO2 source type, and other factors affect NBRG economic feasibility (measured by levelized cost of gas), environmental sustainability (measured by GHG intensity of gas), and the cost of abating CO2 emissions using NBRG. The use of excess electricity to power electrolysis is cost-ineffective due to low electrolyser capacity factors caused by the infrequent availability of excess electricity. On the other hand, the economic and environmental feasibility of using grid electricity to maintain high electrolyser capacity factor show strong dependences on regional factors including the price of grid electricity and its GHG intensity.

In the North Sea, H2 produced from grid electricity has the lowest carbon abatement cost in 2030, but by 2050 is overtaken by H2 produced by dedicated offshore wind. In Texas, which possesses abundant wind and solar resources with high combined capacity factor, H2 produced from dedicated renewables achieves lower abatement costs in 2050. Similar trends are seen in Brazil, with H2 produced from dedicated biomass electricity. In all cases, methanation of H2 using captured CO2 to renewable methane (RM) signifi¬cant¬ly increases abatement costs, but this must be balanced against the benefits of being able to use existing natural gas infrastructure and appliances. For methanation using CO2 sourced from direct air carbon capture (DACC), high capital and operating costs lead to high CO2 prices and, thus, to high abatement costs. The lowest abatement costs for RM are seen for CO2 captured from biomethane and bioethanol plants, which combine CO2 of renewable origin with relatively low CO2 capture price due to high CO2 concentration in off-gases.

Finally, the analysis shows that the lower ends of carbon abatement cost ranges are similar to carbon tax proposals in several of countries, indicating the feasibility of NBRG in national decarbonization strategies.

Trade

Large-scale international trade is needed for RG to become an important component of decarbonization. International RG trade can be either physical through gas pipelines (or as liquefied gases in ships), or virtual through the exchange of "carbon credits" in the form of certificates.

This needs to be certified based on a standard from an authorised body and subsequently registered in a manner which allows tracking of masses and characteristics from production to consumption to avoid multiple trades or sales of one item. A register tracks the quantity of energy and the characteristics of the RG. Registers are established currently on a national level and in the EU, the European Renewable Gas Registry (http://www.ergar.org) has an ambition to harmonize initiatives on a national level to enable trade across borders.

Several countries indicate their ambition to export H2 in the 2030 timeframe and after, while others assume H2 imports. IRENA recently projected that up to 1/3 of green H2 will be traded internationally by 2050, a share slightly higher than the current share of natural gas traded globally.

For trade of green H2 and its derivatives, regulatory hurdles remain, especially the definition of "greenness" and respective GHG emission thresholds, but ongoing work in the EU and internationally aims to address these issues.

Hydrogen in the grid?

In parallel to the general RG discussion, the specific role of H2 in gas grids needs consideration, as it implies compatibility issues with the current gas infrastructure.

Nearly all country H2 strategies and roadmaps address the role of existing gas infrastructure for future H2 transmission and distribution and see H2 clusters as an important step towards H2 use, both in industry, and in regional H2 networks.

Direct H2 injection in gas grids (HIGG) could provide a steppingstone for developing a H2 infrastructure with adding up to 20 vol% of H2 to the gas grid (about 7 % by energy content). For higher H2 shares and without compromising downstream distribution and end-uses, the gas transmission system could be used for H2 transport only and H2 could be separated from transported natural gas before it is distributed to end-users. H2 separation would add $2 - $4 per kg of H2 in the longer-term. A potential alternative to that is to convert H2 into renewable synthetic methane (RM) to make H2 fully compatible with existing natural gas infrastructure and end-use technologies. Methanation of H2 costs about 50% less than the longer-term additional cost of H2 separation and could help balancing the electricity system and longer-term storage of renewable electricity.

Converting existing natural gas transmission pipelines to H2 ("repurposing") is possible in many cases. Cost of doing so would add approx. 0.05 $/kg H2, while cost for new dedicated H2 pipelines are twice as high. Costs to convert the gas distribution to be fully H2-compatible are about 20 % of repurposing transmission pipelines, and approx. 1/3 of new dedicated H2 pipelines, but strongly depend on the geographical distribution of end-users, and the topography of the area served.

Yet, barriers hinder H2 injection into gas grids: legal complexity or absence of permitting rules, divergent regulation on H2 levels, contracts and billing arrangements based on calorific value or Wobbe Index, and safety requirements for H2 and end-user equipment. The color and origin of H2 and respective GHG emission thresholds and the additionality requirements for green H2 are, together with H2 safety issues, the most relevant topics which need to be addressed.

Open questions remain on H2 versus direct electricity use in the (non-industrial) heat and road transport sectors, and what the longer-term perspective of H2 vs. renewable synthetic methane is, considering economic benefits for electricity system services and the economic value of existing gas infrastructure.

For more details on renewable gases see:

https://www.ieabioenergy.com/blog/task/renewable-gas-%e2%80%90-deployment-markets-and-sustainable-trade/

https://www.ieabioenergy.com/blog/publications/renewable-gases-hydrogen-in-the-grid/

Notice board

Task 32 - Biomass Combustion

Substituting fossil fuels with bioenergy for process heat in industry

Task 32 has in close collaboration with other IEA Bioenergy tasks highlighted options for bioenergy conversion for process heat in industry through case stories and has furthermore contributed to describing general options and barriers in a policy report. The reports have been published at the project website and the results have been presented at numerous occasions, not least at the virtual IEA Bioenergy (End-of-Triennium) conference in December 2021.

Strategies to improve air quality

At the End-of-Triennium conference, Task 32 hosted the session "Biomass and renewable heat" on the 7th of December. Apart from biomass for high temperature heat generation in industry, the topics of the session was strategies to reduce the impact on air quality from wood combustion – a topic that Task 32 plans to continue working on during the coming years. The session can be seen and presentations downloaded here.

Study of the nitrogen cycle in biomass combustion plants

During the end of 2021, Task 32 has started an additional project to shed light on the nitrogen cycle in biomass combustion plants based on research carried out by BEST in Austria. The project is led by the representatives from Austria and the Netherlands and aims at quantifying reactive nitrogen flows along the whole biomass combustion cycle. The result will be published and presented during the 2022-2024 triennium.

Task 33 - Gasification of Biogenic Residue and its Applications

Task33 published two reports during the last months. The first report is about how gasification can transform existing industries to become more biobased or even be regarded as a biorefinery and can be found online. Included in this report are 4 separate case studies that worked out in detail the integration of gasification technology on specific feedstocks in the existing industries. It shows how industry can utilize their own waste streams or use externally sourced waste streams to become more sustainable. Depending on the feedstock, an industry could not only become more sustainable but also more circular.

The second report is the overview on gasification. In this report the focus is on R&D activities and for the first time does not only contain input from countries participating in the task but also from a few selected other countries. The report is available online.

The new triennium started with a larger group then before. Task 33 is now composed of 12 countries and includes, Canada, the US, the UK, Sweden, Netherlands, Belgium, France, Austria, Germany, Italy, India and China. With the new group of countries we aim to develop new interesting information focussing on all the different applications for gasification. We've defined subtasks working on the CHP / co-firing, on SNG, on biofuels, on biochemicals and on hydrogen. All produced starting with gasification. What is interesting that in many of these pathways there is an options to realize negative carbon emissions. Either as CO2 or as bio-char. To emphasize this unique selling point for gasification a dedicated group will work on this to create more attention to this.

On the 30th of June, a webinar was organized on one of the latest reports by Task 33 on how to use gasification to turn existing industries into bio-refineries.

Task 34 - Direct Thermochemical Liquefaction

Co-processing of fast pyrolysis bio-oils have taken the next step towards commercialization with the commercial demonstration project 'Pyrocell' featured in the latest success story provided by Task 34. Preem refinery in Sweden is taking up production of a whole, dedicated fast pyrolysis unit to co-process fast pyrolysis bio-oil directly into their fluid catalytic cracker unit. This significantly increases the share of renewable carbon in the existing range of refinery products, primarily the gasoline range. Moreover, a report that reviews 'Electrochemical transformations of fast pyrolysis bio-oils and related bio-oil compounds' summarizing fundamentals and recent developments in this dynamic field was published. Both publications can be found at https://task34.ieabioenergy.com/task-34-reports/.

Task 34 has re-started meeting physically and the first workshop was held at VTT in Finland, providing an excellent overview of Finish activities related to direct thermochemical liquefaction. In Q4/ 2022 we are looking forward to visit the newest Task 34 member country India, hosted by HP Green R&D Centre in Bengaluru.

2021 marked an anniversary for publication of the PyNe newsletter published by Task 34 – the 50th PyNe in the 25th year of its publication was celebrated with an additional issue that focused on the rich history of PyNe and Task 34. Many of the persons shaping this history have prepared contributions to shape this jubilee PyNe (https://task34.ieabioenergy.com/wp-content/uploads/sites/3/2021/12/PyNe50_V2.pdf).

Task 36 - Material and Energy Valorisation of Waste in a Circular Economy

A new triennium has begun, and the period has been characterized by finalisation of work from the previous period and planning for the new triennium. Task 36 participated in the IEA/ IETS workshop around circular bioeconomy and biomass oriented industrial symbiosis on February 16th.

A new case study around a MSW sorting facility in Norway has been published. It points out some of the development that are seen, where automated sorting is applied on residual waste (after source separation). The plant primarily sorts out plastic and paper and are co-located with a WtE facility that receives the residual waste. The facility helps increasing the material recycling of plastics and paper, and at the same time decreases the cost for direct fossil emissions from the WtE plant.

A summary report of the work from the task performed during the previous triennium "Material and energy valorisation of waste in a circular economy" has also been published. The report highlights some of the challenges in the transformation towards a circular society, and shows how a sound waste management can contribute to a more circular material use as well as generating energy that can be utilised. It points out that although there is still a lot of technical challenges, there are also significant work to be done in the area of social acceptance and policy.

Task 37 - Energy from Biogas

Task 37 released the report "Perspectives on biomethane as a transport fuel within a circular economy, energy, and environmental system". The report addresses aspects of the technology, market situation and sustainability aspects of biomethane. Exemplars of successful implementation of biomethane based transport solutions with a high technological readiness

level for all elements of the chain from production to vehicles are presented and recommendations for policy makers round out the study. Concluding the transport biomethane sits well in the broad circular economy, energy, and environmental system providing services across a range of sectors including reduction in fugitive methane emissions from slurries, treatment of residues, provision of biofertiliser, provision of food grade CO2 and a fuel readily available for long distance heavy haulage.

In May 2022 a Task meeting in Italy was hosted by the Consorzio Italiano Biogas CIB. During a a site visit of Pieve Ecoenergia S.c.a. Task 37 members could discuss with CIB experts and the plant operator the specifications of the Biogas Done Right concept and the further development named "Farming for Future". The integration of biogas operation in a modern agriculture were to be seen. Besides the utilization of agricultural residues in the biomethane application, this includes strip till technique, double cropping, precision farming, digestate injector for emission reduction and animal husbandry combining high automatization, animal welfare and manure management aiming for emission reduction and high gas yields.

Task 39 - Biofuels to Decarbonize Transport

Task 39 is managed by Tomas Ekbom, SVEBIO (Sweden) and Glaucia Mendes Souza, University of São Paulo (Brazil) which are new task leaders. We would like to express our thanks to the former task leaders Jim McMillan, NREL (USA) and Jack Saddler, UBC (Canada). The task group has been added recently with Estonia as new participating country making the group 14 strong. In addition, US Grains Council has been accepted as Limited Sponsor by IEA Bioenergy ExCo and participates with an expert.

The task has organized two business meetings since the new triennium started January 2022 and participated in several webinars. The next physical business meeting will be for 12-13th of September 2022 in Sweden, where a study visit is planned for the Pyrocell plant, north of Stockholm. The plant shows pyrolysis of sawdust to bioliquids, which are transported to an oil refinery for HVO production.

The task is scheduled for several presentations of projects and reports at the international conference on advanced biofuels to be held in September in Stockholm.

Implementation Agendas: Compare-and-Contrast Transport Biofuels Policies (2019-2021 Update)

The Implementation Agendas project is a collective effort between the Task 39's country representatives. It summarises each country's biofuels policies, assesses the market penetration of biofuels and, more importantly, compares-and-contrasts the relative success of the various policies including both technology push and market-pull policies (Figure 1), used to promote transport biofuels development and

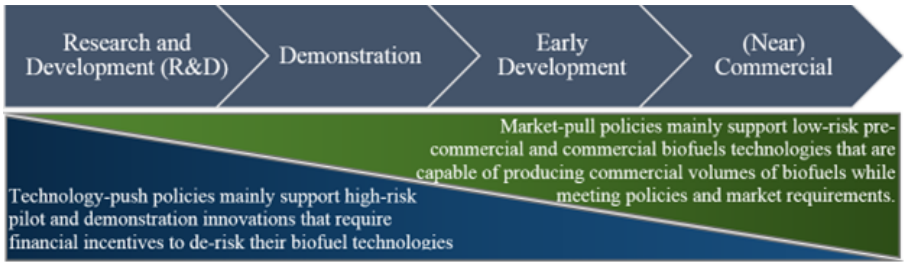


Figure 1. Task 39 has been monitoring the effectiveness of technology-push and market-pull policies to encourage the production and use of transport biofuels in member countries since 2007

use. The information reported and discussed in the report are based on the data collected via a questionnaire completed by each Task 39 country representative.

The fifth and most recent update of the report (2019-2021) describes ongoing developments in the biofuels sector and highlights successful policies (such as the Low Carbon Fuels Standard, (LCFS)) that have been used by member countries to facilitate the production and use of low-carbon-intensive biofuels (Figure 2). A summary of the report highlights includes:

- Additional country chapters for India, Norway and Ireland, the countries that joined Task 39 in the 2019- 2021 triennium
- Historical GHG emissions inventory data and the contribution that the transport sector made to the national GHG emission inventory of each member country
- Historical biofuel developments and the related GHG emissions policies in each member country
- Existing and emerging sustainability certification schemes for transport biofuels and feedstocks
- Compliance costs of biofuel policies (e.g. $/tCO2, $/GJ)
- Historical biofuels and feedstocks imports and exports
- Co-processing trials/demonstrations at oil refineries

The full report can be downloaded here, Task 39 website

Task 40 - Deployment of Biobased Value Chains

The year started with the final work in the projects and the publication of the results of the 2019-2021

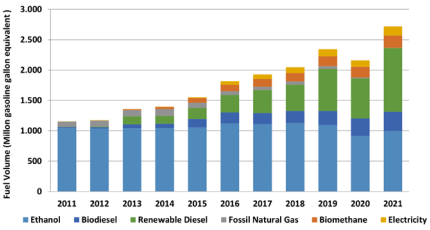


Figure 2. California LCFS has been driving the growth of all low-carbon transport fuels including drop-in/advanced biofuels (CARB, 2022). Task 39 has been collecting biofuels production and use from member countries to evaluate the effectiveness of policies in creating a stable environment for the increased production and use of biofuels

triennium. The Task 40 work was focused on **two internal projects (Regional Transitions, Circular Bioeconomy Synergies), four intertask projects** in cooperation with other IEA Bioenergy tasks (Renewable Gas, Bioenergy for High Temperature Heat in Industry, Deployment of BECCUS value chains, Lessons learned biofuels) **and one special project** (Renewable Gas – Hydrogen in the grid). In total, **two scientific articles** were published in specialist journals, one results report and seven **further contributions** from the results of the work packages processed were completed. Additionally, **four more contributions to case studies, one summary report** and **one work package report** are about to be finalised. Further information on https://task40.ieabioenergy.com/ and in the Publication section of this newsletter. With the start of the new triennium, we unfortunately also had to say goodbye to our long-time colleague and Swedish NTL and member Olle Olsson. He was Task 40's Co-Task Lead since 2019, led the BECCUS intertaks project and represented Task 40 in the intertask project Bioenergy for High Temperature Heat in Industry . Many thanks Olle for your great work. It has been a real pleasure working with you in Task 40 over the last few years, thank you for your leadership and for being a wonderful colleague.

Since January, Task 40 has **met four times virtually**. After the summer break, a **physical meeting** is finally planned. We are all looking forward to it very much. In addition to the meeting, a joint **workshop with Task 32** on experiences with large scale wood chip combustion plants and CCU/CCS will also take place there.

Two other news are the **relaunch of the Task 40 website** in a fresh and new design and the **recently published Task 40 Newsletter** with detailed information about the upcoming projects in the next three years. Be inspired, click here for all insights and information: https://task40.ieabioenergy.com/.

Task 42 - Biorefining in a Circular Economy

At the moment of supplying the information for this newsletter the Task 42 Global Biorefinery Status report 2022 was almost ready for publication.

The Global Biorefinery Status Report aims to give an overview of recent biorefinery developments. The overall goal of the report is to provide a scientifically sound source that will help to accelerate further development

and the worldwide market implementation of biorefineries in the circular economy, for example by identifying trends and new developments.

First of all, it is based on a summary of data and information that is reported by the representatives of partnering countries in the Task 42 Biorefinery Country Reports (https://task42.ieabioenergy.com/document-category/country-reports/). This information was extended with important biorefinery initiatives in other countries outside Task 42. So, the status report gives a description of the current situation of biorefinery in a representative selection of countries: how many biorefineries exist, which types, which feedstocks, which technology, what products, etc.

Another important part is an analysis of the deployment status of biorefineries in the different areas of the world based on information in the Biorefinery Plant Portal (https://task42.ieabioenergy.com/databases/). Moreover, the report presents both, major technical and non-technical deployment barriers and applied/potential solutions to tackle these barriers. Furthermore, success stories and case studies were identified, and a list of best practices will be set-up to learn from for further biorefinery market deployment.

As soon as the report is officially published in July it can be downloaded from the Task 42 website in the section publications (https://task42.ieabioenergy.com/publications/).

Task 43 - Biomass Supply in Sustainable and Circular Economies

Task 43 work collectively to address barriers to sustainably sourced biomass supply chains by:

- (WP1) analyzing and quantifying current opportunities
- (WP2) improving supply chain efficiencies
- (WP3) biohubs for high value, integrated biomass supply in sustainable and circular economies

All three Work Packages involve documenting strategies for adapting biomass supply to support thriving bioeconomies and contribute to multiple SDGs through improved land, forest and materials management providing renewable resources to sustainable and circular economies. The following technical reports have been delivered by the Task 43 team in 2022:

- The Role of Biomass Supply Chains for Bioenergy in the Post-COVID-19 Economy
- Innovative bio-based pile cover for biomass chip storage
- To be or not to be a biobased commodity: Assessing requirements and candidates for lignocellulosic based commodities
- Integrated biomass residue management in Sandalwood Plantations

The Environmental Sustainability Studies of Biohub Archetypes presentation has also been made available on the website.

The Task 43 have been working with Energies to produce a Special Issue Sustainable Biomass Supply Integration for Bioenergy within the Broader Bioeconomy. The deadline for submission of manuscripts is 30 August 2022. Additional information on submitting a manuscript is available here: http://www.mdpi.com/user/manuscripts/upload/

Task 44 - Flexible Bioenergy and System Integration

The key results from the triennium 2019-2021 were presented in the session 'Bioenergy's contribution to low-carbon energy systems' in IEA Bioenergy Conference in December 2021 and are also summarized in the scientific publication 'Status of and expectations for flexible bioenergy to support resource efficiency and to accelerate the energy transition'.

Task 44 started the triennium 2022-2024 with a kick-off meeting in March 2022. In a new constellation, the Task brings together experts with diverse backgrounds and a good geographical coverage representing Australia, Austria, the European Commission, Finland, Germany, Sweden, Switzerland, the Netherlands and US. During the past three years, Task 44 delivered a wide range of information around **status and definition** of flexible bioenergy as well as **key actions** required for the successful implementation of flexible bioenergy systems. These findings serve as a good basis for the upcoming work. In the new triennium, Task 44 will **focus on monitoring technical progress** of flexible bioenergy technologies, concretizing flexible bioenergy by providing Best Practice examples (https://task44.ieabioenergy.com/best-practices/) and identifying **policy landscape**. Furthermore, Task 44 will approach towards **energy system modelling community** to promote integration of flexible bioenergy solutions in energy system models, which helps in quantification of value of flexibility.

Task 44 also focuses on interlinkages between flexibility, hydrogen, and bioenergy carbon capture and storage/utilization (CCS/U). Task 44 leads a new Inter-Task project on 'Synergies of green hydrogen and bio-based value chains deployment', which had a kick-off meeting in the beginning of June 2022. The meeting gathered together over 20 experts from the field, representing 10 IEA Bioenergy Tasks.

Task 45 - Climate and Sustainability

Effects of Bioenergy within the broader Bioeconomy

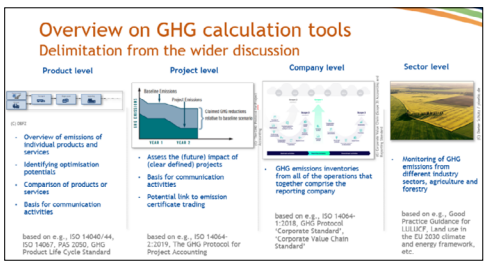
On March 31st 2022, IEA Bioenergy Task 45 organised a webinar to present aspects related to the quantification of the climate effects of bioenergy systems. As Task 45 aims to build a body of knowledge to equip the community of practice to undertake well-informed studies on the sustainability of bioenergy, the main objective of the workshop was to present recent scientific findings on the methods to quantify climate effects of bioenergy. The webinar, which was moderated by Floor van der Hilst (Utrecht University, co-chair IEA Bioenergy Task 45) focussed on Life Cycle Assessment (LCA) and addressed the methodological choices, the characteristics of various GHG calculation tools, and the implications thereof for the quantification of climate change effects.

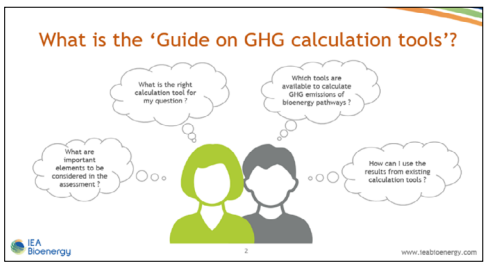
During the first contribution, Miguel Brandão (KTH) presented several aspects and examples of methodological choices that have a significant influence on the overall LCA results of bioenergy systems. The presentation aimed to raise awareness on aspects such as system boundaries, substitution effects as well as temporal effects in LCA.

Otávio Cavalett (NTU) presented an IEA Bioenergy study which analysed a number of relevant GHG calculators for biofuels, aiming to analyse their underlying assumptions, methodologies and background data. The study provided an important contribution to a better understanding and interpretation of results calculated with the respective tools.

Finally, Stefan Majer (DBFZ) gave an overview of existing tools to quantify the climate effects of bioenergy systems. This will be the core of a forthcoming report of IEA Bioenergy Task 45 that aims to provide support and orientation for stakeholders who are interested to understand the climate impacts of a specific bioenergy pathway.

The webinar has been recorded and is available at: https://www.youtube.com/watch?v=4RDJ9IbRq4A





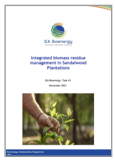
Publications

To be or not to be a biobased commodity

This report, carried out by Wageningen Food & Biobased Research, and financially supported by IEA Bioenergy Task 43 looks into requirements and candidates for lignocellulosic biomass-based commodities.

Read more

Integrated biomass residue management in Sandalwood Plantations in Australia



To support emerging local and regional biomass markets and to improve the sustainable management of the tropical sandalwood plantation resource, this study – which was carried out in the frame of IEA Bioenergy Task 43 (Biomass supply) – explores the potential availability and market feasibility of integrated biomass supply for bioproducts.

Read more

Carbon accounting in Bio-CCUS supply chains – Identifying key issues for science and policy

This report – developed by IEA Bioenergy Task 45 (Sustainability) and Task 40 (Deployment) – reviews key issues to focus on and discusses different options for how these could be addressed from a scientific as well as from a policy perspective.

Read more

Case study about a MSW sorting facility in Norway – IVAR

The purpose of this report is to showcase examples from which countries can get inspiration and support in implementing solutions in the waste/resource management and Waste-to-Energy sector that would facilitate their transition towards circularity.

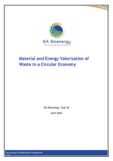
Read more

Impact of the COVID-19 Pandemic on the Canadian Wood Pellet Industry

To determine the effect of the COVID-19 pandemic on the Canadian wood pellet industry, economic and market data were analyzed, in parallel with a survey of Canadian manufacturers on their experiences during the first three waves of the pandemic, covering the period from March 2020 to September 2021.

Read more

Material and Energy Valorisation of Waste in a Circular Economy



This report discusses some of the drivers for a more circular approach to waste management in the context of energy recovery. It considers the role of emerging technology pathways – not only thermochemical pathways, but those based on biological and other novel technologies.

Read more

Land use for bioenergy: synergies and trade-offs between Sustainable Development Goals

Using the United Nations Sustainable Development Goals (SDGs) framework, this paper identified the main synergies and trade-offs associated with land use for dedicated energy crop production and identified the context-specific conditions which affect those synergies and trade-offs.

Read more

Renewable gas - Deployment, markets and sustainable trade

The reports provide state-of-the-art overviews on prospects, opportunities and challenges for deploying biogas, biomethane and other renewable gases in energy markets. It discusses technological and sustainability issues of renewable gases from a deployment perspective, derives recommendations for policymakers, and identifies open research issues.

Read more

The Role of Biomass Supply Chains for Bioenergy in the Post-COVID-19 Economy

The aim of research was to provide evidence-based advice, supported by expert opinion, that would aid policy framing related to biomass supply chains in a recovery programme and beyond. This exercise was conducted to identify the best forward-looking policy actions and strategies by which to advance societal goals.

Read more

Implementation of Transport Biofuels Policies

The increasing global production and use of biofuels plus the growing numbers of national and regional policies that support the development of biofuels markets. This recent update describes ongoing developments in the biofuels sector and the successful policies used by member countries to facilitate the production and use of low-carbon-intensive biofuels.

Read more

IEA Bioenergy Annual Report 2021

The IEA Bioenergy Annual Report 2021 includes a special feature article 'Sustainability of Biomass for the Biobased Economy' prepared by Task 45. The Annual Report also includes a report from the Executive Committee and a detailed progress report on each Task. Also included is key information such as Task participation, Contracting Parties, budget tables and substantial contact information plus lists of reports and papers produced by the Technology Collaboration Programme.

Read more

How can biomass supply for bioenergy deliver multiple benefits and contribute to sustainable development goals?

A virtual workshop was organized by IEA Bioenergy and GBEP on June 15th and 16th, 2021. The objectives of the workshop were to: explore the importance of the SDGs for biomass supply chains; share best practice case studies; explore and propose preliminary recommendations.

Read more

A perspective on the state of the biogas industry from selected member countries of IEA Bioenergy Task 37

Each country report summary includes information on the number of biogas plants in operation, biogas production data, how the biogas is utilised, the number of biogas upgrading plants, the number of vehicles using biomethane as fuel, the number of biomethane filling stations, details of financial support schemes in each country and some information on national biogas projects and production facilities.

Read more

Innovative bio-based pile cover for biomass chip storage

This study aimed to investigate the performance of an innovative bio-based wood chip pile cover compared to conventional treatments (plastic-covered and uncovered) in eastern Finnish conditions. The innovative pile covering method was developed to protect biofuel piles from rain and meltwaters, without the use of plastic.

Read more

Status report on thermal gasification of biomass and waste

This report, produced by IEA Bioenergy Task 33, provides an overview of research activities on gasification of biomass and waste in Austria, France, Germany, India, Italy, the Netherlands, Spain, Sweden, UK and the USA. Gasification as a thermochemical conversion offers great potential to further improve aspects related to feedstock variation, process parameters, products and by-products. The technology could be stand-alone or integrated into other processes for the production of value-added products.

Read more

Success story: Biobased gasoline from sawdust via pyrolysis oil and refinery upgrading

The pyrolysis plant is situated at the Setra Kastet sawmill and has just been commissioned; production started in September 2021. The facility is designed to produce about 25 000 ton of biobased pyrolysis oil per year and the target is that all this pyrolysis oil will be upgraded to renewable fuel at Preem's refinery in Lysekil, Sweden.

Read more

Perspectives on biomethane as transport fuel within a circular economy, energy, and environmental system

This report, produced by IEA Bioenergy Task 37 (biogas), provides exemplars of very good biomethane based transport solutions from Sweden, the UK, Norway and the US. Transport biomethane sits well in the broad circular economy, energy, and environmental system. In essence biomethane can be considered as one of the products or services of a broad biogas system.

Read more

Deployment of bio-CCS in the cement sector: an overview of technology options and policy tools

This report reviews the prospects for implementation of CCS in the cement sector. Particular attention is given to the opportunities of combining this with the use of biogenic fuels for process heat, so-called BECCS or bio-CCS. Bio-CCS could prove to be a vital tool to make cement production with net-zero CO2 emissions possible and could potentially also enable "negative emissions", also referred to as carbon dioxide removal (CDR).

Read more

Strategies for the mobilization and deployment of local low-value, heterogeneous biomass resources for a circular bioeconomy

This paper builds upon the work of the IEA Bioenergy Task 40 experts, who transfer and extend their knowledge on current bioenergy carrier provision structures to the local, low-value feedstock base of the circular bioeconomy . It aims to cluster mobilization measures into three assessment levels: the legislative framework, technological innovation and market creation.

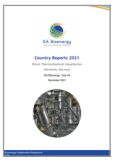
Read more

Bioenergy for climate change mitigation: Scale and sustainability

The article summarizes the state of knowledge concerning potential co-benefits and adverse side effects of bioenergy systems and discusses limitations of modelling studies used to analyse consequences of bioenergy expansion.

Read more

Overview of Thermochemical Liquefaction activities in Denmark and Norway



This report provides an overview of research activities, demonstration activities and commercial applications of Direct Thermochemical Liquefaction of biomass in Denmark and Norway.

Read more

Status of and expectations for flexible bioenergy to support resource efficiency and to accelerate the energy transition

The paper explores the current status of, and stakeholder expectations for, bioenergy flexibility, drawing on recent questionnaire data gathered in the IEA Bioenergy TCP to provide a technological and deployment status review for eleven countries.

Read more

International assessment of bioenergy stakeholders research requirements of GIS based biomass analytics

This study aimed to determine what category of GIS-based research biomass/bioenergy stakeholders consider the most valuable. A voluntary questionnaire was distributed to bioenergy stakeholders from a variety of countries to discern perceived usefulness ratings for various analytics.

Read more

Renewable Gases – Hydrogen in the Grid

This report provides a synthesis of an IEA Bioenergy project on renewable gases (RG) and the effect of hydrogen in gas grids. The activity was funded by the European Commission, Germany, and Sweden, with contributions from the Netherlands. The project collected existing data, performance indicators, information on RG studies & projects and analysed national strategies.

Read more

Decarbonizing industrial process heat: the role of biomass

This report highlights the opportunities for bioenergy technologies to deliver heat in industry and compares it with alternatives for decarbonisation such as CCS, electrification and hydrogen. The report provides specific policy recommendations to accelerate its adoption.

Read more

Combustion of wood chips and grain residues for process heat supply in the largest bakery in Switzerland

In order to substitute fossil fuels, a biomass combustion plant was realized to provide process heat for the bakery by thermal oil. Since the treatment of the raw materials for the bakery causes residues in the up-stream milling process, the vision to use milling residues as energy for the bakery arose.

Read more

Gasification applications in existing infrastructures for the production of sustainable value-added products

The aim of this report, prepared by IEA Bioenergy Task 33 (gasification of biomass and waste), is to suggest gasification-based process routes to be implemented either into existing industries, either in new process chains with a focus on biorefinery systems. Gasification technology can be applied in different, already existing industrial and agricultural infrastructures

Read more

Decentralized micro-biodigester systems for rural areas in South Africa

This report presents the results of a study contextualised within two interrelated, but distinct, rural bioenergy projects. These two projects encompassed repairs to 26 existing household digesters and design and implementation of new integrated biogas provision and sanitation systems at five Early Childhood Development Centres (ECDCs).

Read more

IEA Bioenergy Events

Executive Committee

ExCo90 will be held in Vienna (Austria) on 17-20 October 2022

Task Events

Biomass Combustion and BECCUS – workshops and site visits
Task 32, in collaboration with Task 40, is organising open workshops and sites visits to facilitate the exchange of technical experiences with biomass combustion and with CO_2 capture from flue gas to supply negative greenhouse gas emissions. More information will be posted on the Task 32 website in due time.

Task 37 will hold a meeting in Q4 2022 in coordination with the Nordic Biogas Conference

Webinars

A webinar on "Material and Energy Valorization of Waste in a Circular Economy" will be held in September 2022.

Exact date and title will be announced in due course.

Other Events

ACHEMA
22-26 August 2022
Frankfurt am Main (DE)
https://www.achema.de/en/

World Bioeconomy Forum – Annual Conference
07 -09 September 2022
Ruka (FI) & Online
https://wcbef.com/

Svebio Fuel Market Day
08 September 2022
Stockholm (SE) & Online
https://www.svebio.se/om-oss/konferens-er-och-event/fuel-market-day/

8th Advanced Biofuels Conference (ABC 2022)
13-15 September 2022
Stockholm (SE)
http://advancedbiofuelsconference.org/

RWM & Letsrecycle Live Event
14-15 September 2022
Birmingham (UK)
https://www.rwmexhibition.com

13th Clean Energy Ministerial
21-23 September 2022
Pittsburgh (US)
https://www.cleanenergyministerial.org/

9th GBEP Bioenergy Week
26-29 September 2022
Asunción (PY)
http://www.globalbioenergy.org/events1/gbep-events-2022/working-group-on-capacity-building-meetings-and-activities-2022/it/

Biomass Power On
28-29 September 2022
Hamburg (DE)
https://fortesmedia.com/biomass-power-on-2022.4.en.2.1.20.html

Nordic Biogas Conference
03-06 October 2022
Linkoping (SE)
https://nordicbiogasconference.com/

8th International Poplar Symposium (IPS VIII)
04-06 October 2022
Online
https://ips2022.ilfe.org/

XV International Bioenergy Congress
05-06 October 2022
Valladolid (ES)
https://www.congresobioenergia.org/

Progress in Biomethane-Mobility
11-13 October 2022
Schwäbisch Hall (DE)
https://ibbk-biogas.com/schedule/progress-in-biomethane-mobility/

Argus Biofuels Europe Conference
11-13 October 2022
London (UK) & Online
https://www.argusmedia.com/en/conferences-events-listing/biofuels

Biogas Power On + Future of Biofuels
12-13 October 2022
Copenhagen (DK)
https://fortesmedia.com/biogas-power-on-2022.4.en.2.1.18.html

European Biogas Conference 2022
25-26 October 2022
Brussels (BE)
https://www.europeanbiogas.eu/european-biogas-conference-2022/

Nordic Wood Biorefinery Conference 2022
25-27 October 2022
Helsinki (FI)
https://www.vttresearch.com/en/news-and-ideas/nordic-wood-biorefinery-conference-2022-registration-open

See the full calendar of events:
https://www.ieabioenergy.com/iea-bioenergy-task-events/full-calendar/

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