

TECHNOLOGY COLLABORATION PROGRAMMES (TCPs)

EUWP ANNUAL BRIEFING TEMPLATE

| TCP NAME | Report Date |
|---------------|-------------|
| Bioenergy TCP | 11/02/2022 |

Main Technology Policy Messages/Recommendation

- Reaching climate neutrality globally requires an unprecedented transformation of the energy system. The IEA Roadmap 'Net Zero Emissions by 2050' recognises bioenergy as an important option, providing up to 20% of total energy supply in 2050, and playing a significant role to reach carbon neutrality of the global energy system. A growing role of biomass/biofuels would be needed in industry, transport as well as heat and power production.
- Bioenergy with carbon capture and storage (BECCS) is one of the critical options to achieve negative emissions, combining renewable energy production with CO₂ removal from the atmosphere.
- Bioenergy should not be considered in isolation, but as part of a broader bioeconomy in which materials, food and energy are co-produced.
- Sustainability governance is key. There needs to be a clear understanding of what sustainable biomass means and how much can be mobilized.
- Increased efforts for sustainable biomass mobilisation are needed. This also requires connecting a local and dispersed biomass feedstock base with centralised processing at scale.
- Transition is accelerating. Companies and sectors (energy providers, transport sectors, industries, ...) are taking concrete steps towards climate neutrality.
- Priorities of biomass use will evolve and are gradually shifting to difficult-to-electrify sectors.
- Reliable and coherent political framework conditions are of key importance to motivate investments and to scale up new technologies.
- Flexibility (short and long term) is one of the key characteristics of bioenergy in an energy system with increasing shares of variable renewables.

Achievements (recent developments in the last year only)

Events

- Between 29 November and 9 December 2021, IEA Bioenergy held its Triannual Conference. The central theme was 'The role of biomass in the transition towards a carbon neutral society'. The conference consisted of 10 online technical sessions and 4 panel sessions, and it was attended by almost 1200 people from around 90 countries. https://www.ieabioenergy.com/wp-content/uploads/2021/12/Report_IEABioenergyConference2021_final.pdf

As part of the IEA Bioenergy Webinar Series, webinars were organized on the following topics:

- Sustainable Lignin Valorisation (4 November 2021)
- Sustainable Aviation Fuel/Biojet Technologies – Commercialisation Status, Opportunities and Challenges (13 July 2021)
- Resilient Biomass Supply Chains in the post-COVID Recovery (3 June 2021)
- Residential Wood Combustion – Towards Low Emission Systems (6 May 2021)
- Flexible Bioenergy in Renewable Energy Systems (18 March 2021)
- Gasification of Biomass and Waste (24 February 2021) – under IEA Bioenergy Task 33
- Integration of Biogas Systems into the Energy System (21 January 2021)

Slides and recordings of all webinars are available at: <https://www.ieabioenergy.com/iea-publications/webinars/>

Publication highlights

- The **IEA Bioenergy Annual Report 2020** was published in April 2021. In addition to a report from the Executive Committee and a detailed progress report on each of the Tasks, it includes a special feature article 'Technical, ecological and economic assessment of biorefinery cases' prepared by Task 42 - see <https://www.ieabioenergy.com/blog/publications/new-publication-iea-bioenergy-annual-report-2020/>
- Updated **IEA Bioenergy country reports** were released in November 2021, providing a detailed overview of bioenergy implementation in IEA Bioenergy member countries and the role of bioenergy in the national energy mix. In addition to the individual country reports, a summary report was published. This report presents a comparative overview of the results for the different countries for the role of bioenergy in total energy supply (TES), in electricity use, total fuel/heat consumption, and in transport energy consumption - see <https://www.ieabioenergy.com/blog/publications/2021-country-reports/>
- In the inter-Task project 'Bioenergy for high temperature heat in industry' a policy report '**Decarbonizing industrial process heat: the role of biomass**' was published in December 2021 – see <https://itp-hightemperatureheat.ieabioenergy.com/publications/decarbonizing-industrial-process-heat-the-role-of-biomass/>
- In the inter-Task project 'The role of bioenergy in a WB2/SDG world' a report '**Biomass Supply and the Sustainable Development Goals**' was published in September 2021, containing 37 best practice case studies from around the world on how biomass supply chains could be implemented to support bioenergy production while simultaneously contributing to the UN Sustainable Development Goals – see <https://www.ieabioenergy.com/blog/publications/biomass-supply-chains-and-their-contribution-to-the-sustainable-development-goals/>
- In the inter-Task project 'Renewable gas – deployment, markets and sustainable trade' a report '**Renewable Gas - Discussion on the State of the Industry and its Future in a Decarbonized World**' was published by Task 37 in November 2021 – see <https://www.ieabioenergy.com/blog/publications/renewable-gas-discussion-on-the-state-of-the-industry-and-its-future-in-a-decarbonised-world/>
- In the Inter-Task project 'Deployment of BECCUS value chains' a first set of **Bio-CCS case studies** focused on integrating CCS in central biomass based heat and/or power production was published in May 2021 – see <https://www.ieabioenergy.com/blog/publications/deployment-of-bio-ccs-case-studies/>
- A sample of additional publications/outputs in 2021 from the Tasks include:
 - Task 33 report: **Emerging Gasification Technologies for Waste & Biomass** – see <https://www.ieabioenergy.com/blog/publications/new-publication-emerging-gasification-technologies-for-waste-biomass/>
 - Task 34 scientific paper: **Round Robin results of biomass liquefaction oils** – see <https://www.ieabioenergy.com/blog/publications/new-publication-round-robin-results-of-biomass-liquefaction-oils/>
 - Task 36 report: **Waste-to-Energy and Social Acceptance: Copenhill WtE plant in Copenhagen** – see <https://www.ieabioenergy.com/blog/publications/new-publication-waste-to-energy-and-social-acceptance-copenhill-wte-plant-in-copenhagen/>
 - Task 37 report: **Potential and utilization of manure to generate biogas in seven countries** – see <https://www.ieabioenergy.com/blog/publications/potential-and-utilization-of-manure-to-generate-biogas-in-seven-countries/>
 - Task 39 report: **Progress in the Commercialization of Biojet / Sustainable Aviation Fuels: Technologies, potential and challenges** – see <https://www.ieabioenergy.com/blog/publications/progress-in-the-commercialization-of-biojet-sustainable-aviation-fuels-technologies-potential-and-challenges/>

- Task 42 report: **Sustainable Lignin Valorisation** – see <https://www.ieabioenergy.com/blog/publications/sustainable-lignin-valorization/>
- Task 43 scientific paper: **Supply chain resilience during a pandemic – Lessons from the Southeast United States wood-pellet supply chain response to COVID-19** – see <https://www.ieabioenergy.com/blog/publications/supply-chain-resilience-during-a-pandemic-lessons-from-the-southeast-united-states-wood-pellet-supply-chain-response-to-covid-19/>
- Task 44 report: **Technologies for Flexible Bioenergy** – see <https://www.ieabioenergy.com/blog/publications/technologies-for-flexible-bioenergy/>
- Task 45 scientific article: **Applying a science-based systems perspective to dispel misconceptions about climate effects of forest bioenergy** – see <https://www.ieabioenergy.com/blog/publications/applying-a-science-based-systems-perspective-to-dispel-misconceptions-about-climate-effects-of-forest-bioenergy/>

Outlook to the Future (optional)

- The Executive Committee approved the work programme for new triennium (2022-2024), comprising eleven active 3-year Tasks.
- Turkey has been invited by the ExCo to join the TCP. The necessary approval procedures are currently being completed by the relevant government entities.
- Discussions are on-going with the U.S. Grains Council regarding their possible engagement in IEA Bioenergy Task 39 (Biofuels to Decarbonize Transport) as a Limited Sponsor.

Dissemination and publications (other than ExCo meetings and workshops included below)

- Over the last year through the engagement with ETA Florence, IEA Bioenergy outreach has significantly improved as measured by social media indicators.
- With the support of ETA Florence, after launching a redesigned website along with a new brand identity and logo in May 2020, IEA Bioenergy is in the process of revamping the Task web-sites.
- A contract has been awarded to a Communications Specialist (MFM - Menschen für Medien) to further improve the dissemination of IEA Bioenergy outputs and increase the impact of our efforts.
- The IEA Bioenergy quarterly Newsletter is distributed electronically to 4,500 recipients.
- IEA Bioenergy has an ongoing programme of bi-monthly webinars (see <http://www.ieabioenergy.com/iea-publications/webinars/>), with around 300 unique participants; the most recent webinar addressed *Integration of Biogas Systems into the Energy System* – see <https://www.ieabioenergy.com/blog/publications/iea-bioenergy-webinar-integration-of-biogas-systems-into-the-energy-system/>
- 2-page summaries of recent Task reports, as well as key messages are published on the IEA Bioenergy website.
- Reports and workshop announcements are actively distributed through the IEA Bioenergy Twitter and LinkedIn accounts.
- Also see list of published reports under "Achievements" above.
- A contract has been awarded to BEST – Bioenergy and Sustainable Technologies GmbH to undertake an overhaul of the 2009 bioenergy report 'Bioenergy – a sustainable and reliable energy source: A review of status and prospects'. The review, which will be published in 2022, will place the transformation of bioenergy towards a future sustainable use at its centre. While primarily directed at policy and decision makers, it will also be an authoritative reference for a broad stakeholder audience.

Collaboration and Co-operation

Other IEA network TCPs and co-ordination groups

- IEA Bioenergy and the Biofuture Platform finalised a Memorandum of Understanding (MOU) to facilitate collaboration, which was approved by the Executive Committee.
- Through the Tasks, IEA Bioenergy has existing engagement with several other TCPs - AMF, IETS, CCC, GHG, ETSAP, DHC, and Combustion.
- Together with the AMF TCP, IEA Bioenergy organized sectoral discussion on e-fuels (in connection with the Universal TCP meeting).
- IEA Bioenergy held two online meetings with the Hydrogen TCP to exchange information and discuss synergies, especially in relation to the work of Task 33 (Gasification of biogenic residue and its applications) and in the context of a Task 41 project on Renewable Gas – Hydrogen in the grid.
- The Technical Coordinator of IEA Bioenergy joined the Sectoral Group Discussion organized by the IETS TCP.
- IEA Bioenergy has an MoU with FAO.
- IEA Bioenergy is collaborating with GBEP on biomass sustainability through Tasks 45 and Task 40. IEA Bioenergy is also involved in GBEP Activity Group 7 on 'Biogas' through Task 37 and in Activity Group 8 on 'Advanced Liquid Biofuels' through Task 39.
- IEA Bioenergy and IRENA have agreed to review outputs from each other's work programmes and potentially cooperate in future joint activities.

IEA secretariat

- IEA Bioenergy, particularly through the Technical Coordinator, has provided input to a number of IEA initiatives such as:
 - Review of the IEA report on Low Carbon Fuels, the GFEI (Global Fuel Economy Initiative) report and the IEA Renewables 2021 report.
 - Input to the 'Today in the Lab - Tomorrow in Energy' initiative.
 - Participation in the GREET+ Extension project.
 - Participation in meetings of the Transport Coordination Group.
 - Participation in the Universal TCP meeting.

Membership

- There are 26 contracting parties in the Bioenergy TCP.

Management

- The last Executive Committee meeting, ExCo88, was held as a virtual meeting on 11-14 October 2021.
- The next Executive Committee meeting, ExCo89, will be held as a Virtual meeting on 16-19 May 2022. A virtual, ExCo89 workshop will be organized as well.
- A new term of the IEA Bioenergy TCP has been approved and runs to the 28th February 2025.
- A draft revised text of the IEA Bioenergy Implementing Agreement was prepared by the IEA Office of Legal Counsel and is currently being reviewed by the Executive Committee.
- The current triennium for the Tasks under the IEA Bioenergy TCP started on the 1st January 2022 and runs to the 31st December 2024.

(include additional detail if desired)

- The Executive Committee approved the appointment of Paul Bennett as Chair and Dina Bacovsky and Sandra Hermle as Vice-chairs for 2022.
- The Executive Committee elected a new Secretary, Andrea Rossi, for the new triennium (2022-2024).

- The contract of the Technical Coordinator, Luc Pelkmans, was renewed until the end of the new triennium (i.e. December 2024).
- The Core Team (Chair, Vice-chairs, Technical Coordinator, Past Chair, Head of the Communication Team and Secretary) hold a teleconference on a monthly basis to discuss general management of the TCP.
- In the interest of improving our outreach, a Communications Committee holds a teleconference once a month.
- IEA Bioenergy has engaged the services of a major Communications Specialist to improve the dissemination of outputs and impact of our efforts.

MEETINGS OR WORKSHOPS

| Latest ExCo meetings | | Future ExCo meetings | | | |
|----------------------|--------------------------|----------------------|----------------------|---------------|-----------------|
| Place | Date | Place | Date | Place | Date |
| Virtual meeting | 11-14 October 2021 | Virtual meeting | 16-19 May 2022 | Austria (tbc) | Oct/Nov 2022 |
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FUTURE ANNEX OR TASK MEETINGS – Note: [Due to Covid-19 travel restrictions Tasks currently hold online meetings on a regular basis. Physical meetings may be considered for the second half of 2022.](#)

| Annex/Task | Place | Date |
|--|----------------|------|
| Task 32 - Biomass Combustion & Co-firing | See note above | |
| Task 33 - Gasification of Biomass and Waste | See note above | |
| Task 34 - Direct Thermochemical Liquefaction | See note above | |
| Task 36 – Material and Energy valorisation of waste in a Circular Economy | See note above | |
| Task 37 – Energy from Biogas | See note above | |
| Task 39 – Commercialising Conventional and Advanced Transport Biofuels from Biomass and Other Renewable Feedstocks | See note above | |
| Task 40 – Deployment of biobased value chains | See note above | |
| Task 42 - Biorefining in a Circular economy | See note above | |
| Task 43 – Sustainable biomass supply integration for bioenergy within the broader bioeconomy | See note above | |
| Task 44 – Flexible bioenergy and system integration | See note above | |
| Task 45 – Climate and sustainability effects of bioenergy within the broader bioeconomy | See note above | |

CLOSED ANNEXES

| Name | Objectives / key deliverables | Launch/end dates | Participants | Key learnings |
|------|-------------------------------|------------------|--------------|---------------|
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ONGOING ANNEXES – See Table under "FUTURE ANNEX OR TASK MEETINGS" above. The Tasks listed started on the 1st January 2022 and run to the 31st December 2024.

| Name | Objectives / key deliverables | Launch/end dates | Participants | Key learnings so far |
|------|-------------------------------|------------------|--------------|----------------------|
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PLANNED ANNEXES

| Name | Expected Objectives / key deliverables | Launch date | Potential Participants | Main planned activities |
|------|--|-------------|------------------------|-------------------------|
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