



IEA Bioenergy  
Technology Collaboration Programme

# Task 40 – Deployment of biobased value chains

## Newsletter

June 2023 | Triennium 2022-2024

### Copenhagen Task 40 meeting



Welcome back to the **second year** of the triennium.

The photo shows some of the members of Task 40 in Copenhagen. After more than 2 years we finally had a physical meeting in September 2022. During the stay we also visited HOFOR's new unit 4, BIO4 at Amagerværket, one of the largest wood-fired CHP units in the world. Read more about this in the corresponding section.

You'll also find out how the Task's two new internal projects have developed. The final results of an inter-task project from the last triennium are also presented. Furthermore, the successful inter-task project BECCUS will be continued, again under the leadership of Task 40. We will bring you up to date. Last but not least, there is a brand-new inter-task

project on Green Hydrogen, led by Task 44. Task 40 is coordinating Work Package 1 on the status quo of the synergy value chains and organised a workshop in Berlin in March 2023.

See the back pages to find out about the plans for 2023 and the publications published up to June 2023.

We hope you enjoy reading this newsletter.

#### *Here in this issue:*

- **Task 40 meetings**
- **New intern and intertask projects**
- **What's going on in 2023**
- **Publications**

## NEWS

A few months ago, we welcomed Karin Pettersson as a new member and national team leader for Sweden. Karin has been a senior researcher and project manager at RISE Research Institutes of Sweden since 2016. She works on energy systems analysis, mainly in the field of bioeconomy, with a focus on economic and environmental assessments. Since 2021, Karin has been the Area Coordinator for BECCS/CCU at RISE. We look forward to a good cooperation.

## TASK 40 MEETINGS

The first physical meeting of Task 40 in the triennium 2022-2024 (and indeed since November 2019) was held in Copenhagen on 7+8 September 2022. It was greatly hosted by our Danish NTL Christian Bang from Ea Energy Analyses. Several Task 40 members joined the working meetings virtually and we had a successful and long-awaited hybrid Task meeting.



Lunchtime activities at Ea Energy Analyses

Particularly important in the group was and is the **exchange on topics of the political situation in the individual countries**. There were fruitful debates in Copenhagen on the topics of **planning plants for PtX, BECCUS, bio-based value chains** or furthermore on expert opinions and discussions on **forests** and their role for **energy and materials** provision. In the virtual meetings of Task 40 during the last two years, this space for exchange could rarely be given due to meeting in distance. Therefore, it was a **special pleasure**. Other aspects of the meeting were the **development** of topics for the **new projects** and the coordination of **internal participants** for the work packages of the new ITP projects.



Site visit at HOFOR - Amagerværket, Task 32 + Task 40

Many thanks also to **Morten Tony Hansen, Task lead from Task 32** who arranged a guided tour for both Tasks at **HOFOR's new unit 4, BIO4 at Amagerværket**, one of the largest wood-fired CHP units in the world.

Between December 2022 and May 2023 Task 40 had several online meetings and will continue in this rhythm. **Our next physical meeting** will be hold in the Netherlands in September 2023, hosted by the University Utrecht and RWE.

## INTERNAL PROJECT: CIRCULAR BIOECONOMY SYNERGIES PROJECT 1.0

Fabian Schipfer, Uwe Fritsche, Chenlin Li, Pralhad Burli, Michael Wild, Christiane Hennig

## BIOECONOMY SYNERGIES 2.0 (BIOSYN) BIOBASED VALUE CHAINS FOR RESOURCE EFFICIENCY AND SYSTEM RELIABILITY

Fabian Schipfer, Bettina Muster, Judith Buchmaier, Pralhad Burli, Sebastian Sierna-Luiza, and as project advisory board Daniela Thrän and Christiane Hennig

The IEA Bioenergy Task 40 is bringing together international expertise on biobased value chains. Value chains, or supply chains, include various segments, from cultivation, harvesting, fresh biomass supply, pre-treatment and densification, commodity trade, transformation, storage, distribution and deployment. Planning of supply chains traditionally focuses on the techno-economic viability of each segment and its entirety. Excellent planning and impact assessment are transdisciplinary endeavours relying on knowledge from natural, social and technical sciences and expertise from practitioners. The Bioeconomy

Synergies 1.0 project highlighted the broad scope of related studies, the need for a more systematic approach to address risks and uncertainties, and how to design for safety, reliability, robustness or resilience.

a sister's project on system modelling. Results will be disseminated in a final webinar in 2024.

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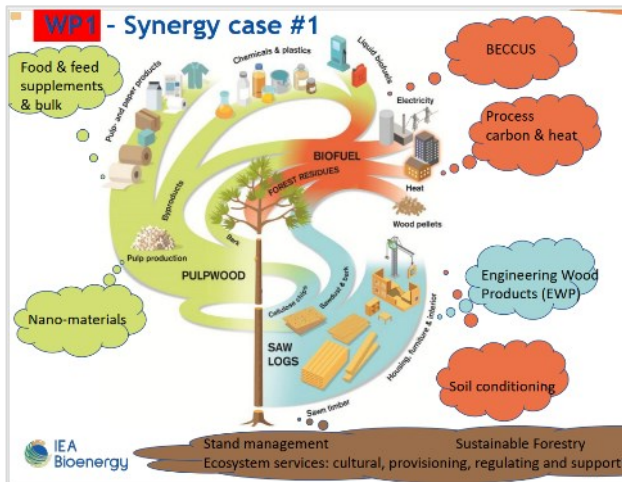


Figure from [Progress & Prospect Report 2019-2021](#)

The BioSyn project aims to design adequate value chains. A novel planning framework that opts for both resource efficiency and system reliability throughout the value chain must be introduced and tested.

In the first step, different types of risks and uncertainties are collected. Natural, societal, infrastructure and technological uncertainties are considered. We describe key value chain aspects based on selected European and U.S. case studies, including uncertainty manifestation, potential adverse and beneficial consequences, anticipation methods, and possible measures.

The methodological framework should enable a better understanding of actions that trade-off resilience with efficiency and such that provide synergies.

Results include research and policy recommendations for value chains that enshrine sustainable development against growing uncertainties. It can be expected that the recommendations boost the relevance of (1) the coupling between regional and international trade networks, (2) the diversification of feedstock and product portfolios, (3) the coupling between the bioeconomy, more synthetic, electrified parts of the economy, (4) flexible bioenergy, and green hydrogen technologies that exhibit low full-load hours.

The Project BioSyn started in May 2023. The following steps include selecting case studies for the bioenergy and Bioeconomy value chain networks. Cross-fertilization of findings happens via

## INTERNAL PROJECT: REGIONAL TRANSITIONS IN EXISTING BIOENERGY MARKETS 1.0 + 2.0

Ric Hoefnagels, Damon Hartley, Chenlin Li, Fabian Schipfer, Michael Wild, Christiane Hennig, Pralhad Burli, Christopher Schmid, Alexandra Pfeiffer, Uwe R. Fritsche

Bioenergy is an essential component of the transition towards a climate-neutral energy sector by 2050 to meet global climate targets. However, rather than a single homogenous sector, bioenergy is a complex and diverse network of regional, national and international value chains part of the larger bioeconomy. To better understand how bioenergy could develop in the context of the energy transition and development of the circular (bio)economy, experts from IEA Bioenergy Task 40 have explored possible strategies to develop sustainable biobased value chains in a regional dynamic market context. This was the core of the Regional Transitions (RT) project 1.0 which is currently being finalized. The focus was on feedstock supply chains and an overall synthesis paper which will be available in July 2023 from the Task 40 website.

In parallel, discussions within Task 40 began on a follow-up project ("RT 2.0") which will be decided upon in the September 2023 Task meeting in Utrecht.

Publications see [Task 40 library](#).

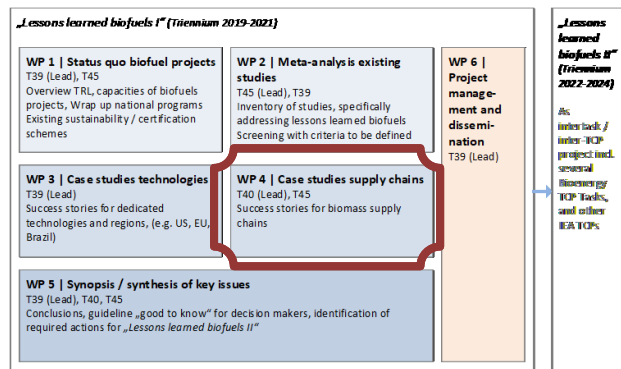
Contact: Ric Hoefnagels, r.hoefnagels[at]juu.nl

## INTER-TASK PROJECT: ASSESS SUCCESSES AND LESSONS LEARNED FOR BIOFUELS DEPLOYMENT- FINAL RESULTS

Pralhad Burli, Christiane Hennig, Ric Hoefnagels, Michael Wild, Quang Nguyen (former Task 40 member) and Stefan Majer (Task 45)

This inter-task project assessed successes and lessons learned for conventional/advanced biofuels deployment and sought to analyze international progress and experiences to identify which approaches are proving to be most effective so they

can be expeditiously and more broadly deployed to get transport decarbonization back on track with SDS goals. Of the 6 work packages (see figure), Task 40 led Work Package 4: "*Sustainable biomass supply chains for international markets*", which summary report was already completed in July 2022 and will be soon published as part of the synthesis report of the whole project.



Overview of the ITP work packages and lead Task 40 of WP4

The lessons learnt in supply chains, sustainability certification, standards and developments of markets of biodiesel, methanol, wood chips and wood pellets are highly relevant for new biomass markets including bio-based chemicals and advanced biofuels. Cost-effective, reliable and sustainable feedstock supply chains are crucial to a successful development of advanced biofuels. Advanced biofuels will develop in an increasingly internationalized market with respect to tradeable feedstocks as well as international end-use markets such as shipping and aviation. The main goal of WP4 report is to describe and analyze well-functioning infrastructure and stakeholder engagement of all actors in the supply chain.

The report presents case studies for feedstock supply chains that have been evaluated from multiple viewpoints as these are vital for successful development of advanced biofuels. The report highlights lessons from biorefineries and pulp mills using consistent feedstock (Brazil), European experiences in development of bio-based supply chains for torrefied woody biomass, pioneer biorefineries in the US (traditional feedstock pre-processing for herbaceous feedstocks) and conceptual depots producing conversion-ready feedstock and co-products.

More information at [project page](#) and coming soon a scoping report.

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## INTER-TASK PROJECT: MANAGEMENT OF BIOGENIC CO<sub>2</sub>: BECCUS INTER-TASK PHASE 2

Christiane Hennig, Christian Bang, Ric Hoefnagels, Karin Pettersson, Chenlin Li, Amey Shigrekar, Hanno Frijns

This inter-task project is led by Task 40 with participation from 6 other IEA Bioenergy Tasks: Task 32, Task 33, Task 34, Task 36, Task 44 and Task 45. It runs from June 2022 until December 2024 and is a follow-up project to the inter-task project Deployment of BECCUS Value Chains (BECCUS 1.0) which has been carried out in the years 2019 to 2021.

This inter-task project has three core objectives: 1) to facilitate cross-Task, cross TCP and cross-sector learning on implementing bio-CCUS, 2) to shed some light on the effects of the integration of bio-CCUS within the overall (bio)energy system and 3) to address the differences between BECCS and BECCU and explore the question of when it is best to store or utilize CO<sub>2</sub>. This will allow for a systemic consideration of how to take different BECCUS applications to deployment.

The planned project outputs are system studies, case studies and a synthesis study, where the case studies are brief but focused factsheets of certain technologies/conditions in a specific sector and the system studies analyze issues that relate to the (bio)energy system and cut across sectors and TCPs.

More information and publications via: <https://www.ieabioenergy.com/blog/task/deployment-of-beccus-value-chains/>, in [Task 40 library](#) or on the last page of this newsletter.

Contact: Christiane Hennig, [christiane.hennig\[at\]dbfz.de](mailto:christiane.hennig[at]dbfz.de) and Christian Bang, [cb\[at\]eaea.dk](mailto:cb[at]eaea.dk)

## INTER-TASK PROJECT: SYNERGIES OF GREEN HYDROGEN AND BIO-BASED VALUE CHAINS DEPLOYMENT

Christiane Hennig, Fabian Schipfer, Nora Lange, Uwe Fritsche, Christian Bang, Pralhad Burli, Mark Bouwmeester

The objective of the Synergies inter-task 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

project aims at providing a synthesized view on promising value chains, major drivers and barriers for the deployment, and measures to overcome the barriers based on micro level case studies as well as macro level systemic approach.

The project is led by Task 44 and is participated by 10 Tasks, namely Tasks 32, 33, 34, 36, 37, 39, 40, 42, 44 and 45. The project was started in June 2022 and runs until November 2024 and constitutes of 6 dedicated work packages. Task 40 is coordinating work package 1 on the status quo of synergy value chains where the core outputs are the organization of an expert workshop on the deployment perspective of green hydrogen from biomass and green hydrogen use in bio-based processes and a scoping report. Furthermore Task 40 contributes to another 3 work packages within this ITP.

More information and publications via:

<https://www.ieabioenergy.com/blog/task/synergies-of-green-hydrogen-and-bio-based-value-chains-deployment/>, [Task 40 library](#) or on the last page of this newsletter.

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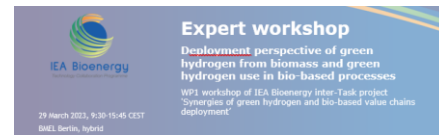
## EXPERT WORKSHOP: DEPLOYMENT PERSPECTIVE OF GREEN HYDROGEN FROM BIOMASS AND GREEN HYDROGEN USE IN BIO-BASED PROCESSES

As part of the work package 1 of the ITP Synergies of green hydrogen and bio-based value chains deployment an expert workshop has been **organized and led Task 40 in collaboration with other IEA Bioenergy Tasks 32, 33, 34, 36, 37, 39, 42, 44, and 45**. The event took place as a hybrid event at the Federal Ministry of Food and Agriculture in Berlin on March 29, 2023.

The goal of this workshop was to discuss the status and the deployment perspective of concepts and case studies on 1) green hydrogen from biomass and 2) green hydrogen use in bio-based processes. The outcome will serve as input for developing an overview and an assessment of promising concepts for deployment within the Inter-Task project.

For this purpose, different stakeholders from industry and academia as well as related TCPs and IEA representatives had been views and academic views - namely from Torrgas, Hytron/NEA Group, Oulu University, IEA Hydrogen TCP, IEA AMF TCP, IEA Bioenergy TCP, IEA Paris and the German

Federal Ministry of Food and Agriculture. Overall 29 participants joined in Berlin and virtually.



Location: Berlin (hybrid)

Date: 29/03/23

Organized by IEA Bioenergy TCP the workshop is coordinated by IEA Bioenergy Task 40 in collaboration with IEA Bioenergy Tasks 32, 33, 34, 36, 37, 39, 42, 44, and 45) within the scope of "Inter-Task project on Synergies of green hydrogen and bio-based value chains deployment".

Participation will be by invitation only. Invited other organizations/TCPs: IEA Hydrogen TCP, IEA AMF (Task 64) and IEA Headquarters

Background & goal of the workshop

- Framing and describing possible value chains combining hydrogen production and deployment of hydrogen and bio-based processes for different bio-based end-products, including technologies at different development stages with different Tasks and stakeholders.
- Overview on the status and deployment perspective of concepts on 1) green hydrogen from biomass and 2) green hydrogen use in bio-based processes.
- Discussion and definition of an assessment framework for evaluating the deployment of 1) green hydrogen from biomass and 2) green hydrogen use in bio-based processes.
  - Case study selection for in-depth presentation and analysis
    - Definition of boundaries, timeframe etc. (framing of the project)
    - Indicators for technical, economic, environmental, system and "102-link" criteria
- Set of specific case studies and concepts for further assessment within the Inter-Task project on Synergies of green hydrogen and bio-based value chains deployment.

AGENDA (CEST)

9:30

Welcome & Intro to the workshop

Welcome from the German Federal Ministry of Food and Agriculture, [Hannes Köllger](#),

Presentation of the background and goal of the workshop, [Christiane Hennig](#), DBFZ, IEA

Bioenergy TCP, Task 40

Presentation of the TCPs, IEA headquarters

- Luc Pelkmans, IEA Bioenergy TCP

- Sotirios Iacovos, IEA AMF TCP

- Alberto Herguido, IEA Hydrogen TCP

- Iñaki Herrero, IEA Paris

Industry Session

Technology Collaboration Programme

The outcome of this expert workshop will support developing an assessment framework for case studies and defining set of specific case studies and concepts for further assessment jointly with WP2 and WP3.

More information and publications via <https://www.ieabioenergy.com/blog/ieaevent/expert-workshop-deployment-perspective-of-green-hydrogen-from-biomass-and-green-hydrogen-use-in-bio-based-processes/>, [Task 40 library](#) or on the last page of this newsletter.

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christiane.hennig[at]dbfz.de and Nora Lange,  
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## WHAT'S GOING ON DURING THE REST OF 2023

We are very much looking forward to our next physical/hybrid meeting in the Netherlands in September 2023.

Task 40 is on the organizing committee preparing the ExCo92 workshop on the topic of "Contribution of modern bioenergy solutions - in synergy with other renewables - to reach carbon neutrality in the energy system". This event is planned to take place in Lyon on October 19, 2023. Furthermore we are contributing to the webinar on the inter-task project "Assess successes and lessons learned for biofuel deployment" summarizing and discussing the project results. As well as to the technology

expert workshop “Biomass combustion and BECCUS” within the scope of the inter-task project Management of biogenic CO<sub>2</sub>. Both events are scheduled for September 2023.

## PUBLICATIONS 2022-2023

### Reports

#### Bioeconomy Synergies Project

**Progress & Prospect Report 2019-2021**, June 2022, [download](#)

Fabian Schipfer, Pralhad Burli, Christiane Hennig, Uwe Fritsche, Chenlin Li, Michael Wild

#### **Contribution of IEA Bioenergy Task 40 to the IEA Bioenergy inter-task project "Assess successes and lessons learned for biofuels deployment"**

Burli, P.; Hennig, C.; Hoefnagels, R.; Wild, M.; Majer, S.; Nguyen, Q. (2022): *“Sustainable biomass supply chains for international markets”*

This publication will be available soon as part of the inter-task project publication of the synthesis report.

#### **Contribution of IEA Bioenergy Task 40 to the IEA Bioenergy inter-task project Deployment of BECCUS value chains**

**Topical report of sequestering CO<sub>2</sub> from ethanol production**, January 2023, [download](#)

#### **“Deployment of BECCUS value chains in the United States”**

Tasmin Hossain, Pralhad Burli, Juliana Pin, Daniela Jonesa, Damon Hartley, Richard Hess

**Synthesis report**, November 2022, [download](#)

#### **“From concept to commercialization”**

Olle Olsson, Michaël Becidan, Christian Bang, Nabil Abdalla, Silvana Bürck, Horst Fehrenbach, Zoe M. Harris, Daniela Thrän, Otavio Cavalett, Francesco Cherubini, Christiane Hennig

**ISBN 979-12-80907-22-6**

This report and case study are part of a series of studies carried out under the Deployment of BECCS/U Value Chains project with the aim to highlight sector-specific characteristics. More case studies and reports available [here](#).

### Journal publications

Paul Bennett, Jan Liebetrau, Uwe Fritsche (2023) Biomass & bioenergy IEA bioenergy: Update 72, Biomass and Bioenergy, Volume 168, 2023, 106584, ISSN0961-9534, <https://doi.org/10.1016/j.biombioe.2022.106584>. (<https://www.sciencedirect.com/science/article/pii/S096195342200246X>)

For more info, upcoming events or contact please visit our homepage:

<https://task40.ieabioenergy.com>