

Task 34

Direct Thermochemical Liquefaction of Biomass

3rd Task 34 Meeting Triennium 2022-24
November 2nd, 2023
at NREL in Golden (Colorado)/ U.S.A. (hybrid)
09:00-18:00 (MDT)

Recognition of Meeting Participants

Alex Böhm	(AB)	Task Assistant
Axel Funke	(AF)	Task Lead/ NTL Germany (Minutes)
Bert van de Beld	(BvB)	NTL The Netherlands
Birger Kerckow	(BK)	Country Representative Germany (online until 11:30h)
Daniele Castello	(DC)	Alternate NTL Denmark
Francois Collard	(FC)	NTL New Zealand
Lasse Rosendahl	(LR)	NTL Denmark
Mike Thorson	(MT)	NTL U.S.
Murlidhar Gupta	(MG)	Alternate NTL Canada

Strategic Discussion Task 34 Development

The current Task 34 objective and scope have been intensively discussed. While it was consensus that they still apply by principle the way they have been formulated three years ago, it was also clear that certain aspects should be emphasized and/or added. The revised versions are documented below.

Additionally, it was discussed that reference to DTL bio-oils being a biobased commodity as well as the fact that DTL technology supports circular carbon economy/ management is appropriate and could be included in the final version.

One in-depth discussion evolved around how to deal with biochar production. It was concluded that it can and will be considered as a byproduct from DTL, but not for cases where biochar is the target product. This decision was based on the low connection of biochar to bioenergy (biochar fuel applications are currently not anticipated in net zero roadmaps such as e.g. the IEA NZE scenario), but also on the risk to dilute technology considerations of Task 34 scope since technology for biochar production is different and its implementation faces other challenges than DTL.

AF will approach AUS, CHI and NOR country representatives whether (and how) they want to get involved in setting up the proposal since all of these countries expressed potential interest to joint Task 34.

Objective

The objective of Task 34 is to advance the international implementation of bioenergy technology through objective information analysis and dissemination in the areas of direct thermochemical liquefaction of sustainable biomass and bio-based waste for transportation fuel (e.g. SAF and marine fuels), flexible bioenergy applications (e.g. heat, power), and the production of biocarbon based chemicals/ materials.

Scope

Task 34 continues to follow the expanded scope to include activities on pyrolytic, hydrothermal and solvothermal liquefaction without or with catalysts, as well as feedstock pre-treatment, potential DTL oil post-processing, and various end use applications. In order to meet the task objectives, Task 34 continues to actively involve industry and decision-makers and exploit interactions with other Tasks and Intertask Projects.

Task Lead

AF explained that starting from 2028, a new task lead will be required. There is the possibility to have a co-task lead to ease transition. Anyone who is interested in taking over the task lead is welcome to do so and should approach AF (and/ or their country representative).

All participants approve that AF potentially remains task lead even though Task 34 was lead two consecutive triennia by him.

Collaborations

AF will approach IEA Bioenergy Task 39 and 45 to discuss opportunities for collaboration. BvB will continue to maintain contact with Task 44.

It was discussed whether it could make sense to approach stakeholders in the field of slow pyrolysis, e.g. the European Biochar Industry and/ or International Biochar Initiative. It was noted that Task 34 should be careful not to divert from a focus on DTL bio-oil and also that it might be yet a bit early to approach biochar related initiatives.

Work Packages for Upcoming Triennium

Following list of potential work packages for the upcoming triennium was identified (potential WP leads indicated in brackets):

- (DTL) pathways to (ASTM) SAF approval (and marine fuels) (BvB, MT, DC)
- Compare specs of different fuels/ fuel requirements (FC, DC)
- Use of byproducts (gas, char, minerals) (MG - char, DC – gas, LR – minerals)
- The use of non-woody material in FP; pre-treatment of biomass (BvB, AF)
- Update commercialization report (FC)
- Mobile/ small scale units (potentially align with update of commercialization report?) (MG)
- Report on catalytic pyrolysis developments (FC)
- Aqueous phase/ water management in HTL (and upgrading) (LR)
- The role of DTL technology and DTL based commodities in a future energy system (BvB)
- Status of challenges and applications of AI in DTL technologies (MG)
- Technical Notes
 - Use of quench media (MG, AF)
 - Gas metering/ measurements (FC)

- Stability of FPBO
- Fouling issues in continuous HTL operation (MT, DC)
- Hybrid pyrolysis/ gasification (MG)
- Partial deoxygenation (MG)

After feedback from missing participants, short work package descriptions should be set up by the indicated WP leads until end of January 2024.

Webinar(s)/ increasing visibility

It was consensus among the participants that Task 34 should realize a webinar.

Given the topics identified in the previous task meeting in India, it was clear that they will not be realized early 2024. WP 1.1 is not in a shape that would justify an efficient webinar and AF pointed out that the topic of 'FP of non-woody biomass' should be covered in a work package first before being disseminated in a webinar to increase efficiency.

Instead it was agreed that a webinar featuring the almost finalized WP 1.2 report 'Production of chemicals and materials from DTL' will be very efficient and at the same time of broad interest. It seems reasonable to have two separate webinars targeting the different audiences from HTL and FP as follows:

- HTL (organized by MT)
 - Storm about AD
 - Patrick Biller
 - ...
- FP – AF
 - BTG
 - One of the NTL's EU project with relevant activities
 - Circa Group (FC)
 - Prof Heeres
 - Representative from ISU

The role of DTL in a climate neutral society was also discussed based on the Task 34 focus presented by AF during ExCo 92. The basic concept will be featured for the Task 34 focus in the upcoming IEA Bioenergy newsletter (prepared by AF). MT, LR and DC will provide input regarding the role of HTL for this IEA Bioenergy newsletter so that it can be covered, too.

AF asked all participants to consider presentation of Task 34 related work if they are participating in conferences, e.g. by proposing a poster.

Definition Stable/ Hydrotreated FPBO

AF presented the summary of the discussion from last task meeting in India, structured as potential Technical Note and including additional input from relevant literature in this field by D. Elliott and A. Oasmaa.

A discussion evolved around the feasibility to publish such a Technical Note around two major lines of argumentation. On the one hand it was argued that presenting different definitions will confuse the audience even further since so many different definitions co-exist. On the other hand it was argued that such an overview will provide guidance, especially when suppliers request specific

characteristics. It was consensus that Task 34 will not be able to recommend a set of definitions, and that this might even not be desirable.

Since no one agreed to finalize the Technical Note it was decided to archive the summary in the sharepoint and revive it if need be.

Update Work Packages

This item of the agenda was skipped due to time constraints and will be instead covered in the next online meeting.

PyNe 54

The article list was updated after a short discussion on possible contributions

Other Business

Upcoming Task Meetings

The Netherlands were confirmed as host for the next meeting in person, BvB will provide suggestions for possible dates in November 2024 (avoid Thanksgiving – last week November).

Demoplant database update and extension

AF explained that he is in the process of updating the demoplant database to align with the commercialization report from 2023. After this update there is the urgent need to revise the remaining database entries and also to add potentially new units. Furthermore, HTL demoplants are not listed in this database, yet. Some HTL units are available in the demoplant database from Task 39; MT, DC, and LR will check these entries to see whether they contain all relevant information and, in case not, provide additionally needed parameters. The ultimate aim is to integrate HTL units also in Task 34 demoplant database to align with the task's scope.

IEA Task 34 Budget

AF presented the financial progress report as supplied for ExCo 92 and explained in detail the overspent of management budget in 2023. There were no objections to proceed even though 15-20% overspent is anticipated in 2023. AF will make sure that budget will be met in 2024.