BioTheRoS

Collaborative actions to bring novel **BIO**fuels **THE**rmochemical **RO**utes into industrial **S**cale

Deliverable 7.5

Network and database for knowledge sharing

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Coordinator	Centre for Research and Technology Hellas (CERTH)
Partners	Centre for Research and Technology Hellas (CERTH) Biomass Technology Group BV (BTG) Centro de Investigación de Recursos y Consumos Energéticos (CIRCE) Wirtschaft & Infrastruktur GmbH & Co Planungs-KG (WIP) BEST - Bioenergy and Sustainable Technologies GmbH (BEST) Motor Oil Hellas (MOH)
Website	www.biotheros.eu

Changelog

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The BioTheRoS Project has received funding from the European Union's Horizon Europe research and innovation programme under Grant Agreement No. 101122212

Disclaimer

Executive Summary

This document is a brief report describing the Deliverable D7.5 Network and database for knowledge sharing, which is a public website developed within WP7. The introduction includes a general description of the BioTheRoS project, the importance of international cooperation and network development and the scope of this report.

Deliverable D7.5 is the first deliverable in the series of network and database for knowledge sharing and describes the status after the first project year (09/2024). The deliverable will be updated again 09/2025.

The network and database for knowledge sharing (Knowledge Hub) contains and lists relevant information from the research field of BioTheRoS, which includes a list of research groups and stakeholders (Research Network), as well as a list with technical reports and links to important scientific publications (Publication Database).

This deliverable describes the concept and structure, the clustered topics, the sources of information, the integration into the existing BioTheRoS website and filtering and search options. At the moment the publication database lists over 30 entries covering scientific publications, technical reports and datasets and the research network lists over 50 entries. The current list of entries can be found in the Annex. The databases are updated on an ongoing basis and customised in consultation with the partners.

Research groups which are not listed and would like to be involved in the BioTheRoS network for knowledge sharing are invited to contact andrea.sonnleitner@best-research.eu.

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List of abbreviations

AMF	Advanced Motor Fuels
ETIP	European Technology and Innovation Platform
EU	European Union
FT	Fischer Tropsch
IEA	International Energy Agency
MI	Mission Innovation
SOTA	State-of-the-Art
TEC	Thermochemical

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Introduction

The BioTheRoS project

BioTheRoS will develop best practices and concepts along the entire value chain for accelerating the scale-up of sustainable biofuels worldwide. This will be done based on advancements to the State-Of-The-Art (SOTA) on two key thermochemical (TEC) biomass conversion technologies: (1) pyrolysis and the upgrading of its intermediate products, and (2) gasification and Fischer-Tropsch (FT) synthesis. This will be achieved through international cooperation and knowledge exchange, in particular via IEA Bioenergy, in which many Mission Innovation (MI) countries take part.

International cooperation and network development

For the integration of stakeholders and experts the project has established a work package on "International cooperation and network development". Scaling up sustainable biofuels is a global challenge in terms of environmental, social, and economic sustainability, which can benefit from international collaboration and knowledge exchange. The objectives of the work package are to

- map and use synergies with European and international research groups working on relevant researchquestions for scaling-up sustainable biofuels
- exchange information with European and nternational groups and networks on topics related to sustainable biofuels value chains
- develop a network for knowledge sharing and information exchange through international collaboration

International cooperation activities including active seeking for synergies with EU and international projects, cooperation with international networks and setting up a network for knowledge sharing will ensure that the project builds on and contributes to global knowledge building for sustainable scaling of advanced biofuels value chains.

Within this work package the deliverable 7.1 on the Identification and mapping of selected EU funded and international projects with potential synergies has been published. The document can be found at https://www.biotheros.eu/en/project-outputs/public-deliverables/ and give an overview on projects and research groups dealing with similar topics to BioTheRoS.

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Scope of this report

Deliverable 7.5 is a public website which contains the network and database for knowledge sharing of the BioTheRoS project. This report is a descriptive supplement and documentation of this database. The database provides information on international projects and international research networks to the worldwide community. This deliverable covers the content of the databases on publications and research groups. Deliverable D7.5 documents the status of the network and database for knowledge sharing in the first project year (10/2023 – 09/2024). The database will be updated continuously, the written deliverable will be updated in M24 of the project duration.

The database itself is accessed on https://www.biotheros.eu/en/knowledge-hub/.

Network and database for knowledge sharing

Concept and structure

To show that the database serves as a hub for the exchange of information and knowledge, the title "Knowledge Hub" was chosen. The BioTheRoS Knowledge Hub is a database established in the course of the project and provides links to relevant publications and research groups. Scaling up sustainable biofuels is a global challenge in terms of environmental, social, and economic sustainability, which can benefit from international collaboration and knowledge exchange. This Knowledge Hub is a network for knowledge sharing and information exchange through international collaboration and contributes to global knowledge building for sustainable scaling of advanced biofuels value chains.

The database includes searching and collating relevant information, publications, reports, and papers from various sources, including international and European networks, research projects, and databases. The objective is to create a comprehensive database that comprises knowledge from international projects and research networks, with a focus on highlighting European industry. This database will be accessible through a dedicated subpage on the BioTheRoS project website, featuring clustered topics and a search function with filters for easy navigation. This integration enhances the project's accessibility and facilitates information dissemination to stakeholder.

As can be seen in Figure 1, this Knowledge Hub contains two subpages with databases, namely:

- Publication Database
- Research Network

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Figure 1: Concept of Knowledge Hub

The Publication Database contains and lists relevant information, including technical reports, presentations and links to important scientific publications. The Research Network is a list of global research groups, including universities and research facilities as well as organizations dealing with the topics of biofuels from gasification and pyrolysis.

Description of the clustered topics

Both databases are clustered in the following topics: Biobased value chains, Biofuels, Gasification, Pyrolysis, and Others. This makes it easier for users to search for specific topics and to find respective publications and/or research groups.

- Pyrolysis: This topic includes research that deals with thermochemical conversion by means of pyrolysis, as well as the preparation of raw materials and the processing of products like pyrolysis-oil.
- Gasification: This topic includes research that deals with thermochemical conversion by means of gasification, as well as the preparation of raw materials and further process steps like Fischer-Tropsch Synthesis and the processing of products, such as synthesis gas.
- Biofuels: This topic is broader and deals with the production and deployment of biofuels in general. It includes biofuels from the thermochemical process steps, biofuels from other processes or the use of biofuels. Maritime and aviation biofuels are also included in this topic.
- Biobased value chains: This topic deals with the entire value chain or parts of the value chain, from biomass as feedstock to sustainability issues.
- Other: This topic contains all other entries that cannot be directly assigned to one of the other topics, but are of relevance for the research field and the BioTheRoS project, such as carbon capture.

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Sources of information and data

The network for knowledge sharing is created through gathering information from existing projects. A platform for this collected information is established on the BioTheRoS website . The sources of information and data were identified during working on WP7 (see D7.1 Identification and mapping of selected EU funded and international projects with potential synergies) and from input from the project partners and the linked international networks like IEA Bioenergy, ETIP Bioenergy and IEA AMF.

The entries for the Publication Database and the Research Network are updated continuously, according to new releases or to the announcement of new research groups dealing with pyrolysis, gasification or related topics.

There is the possibility for the international research community to ask for additions in the respective databases of the BioTheRoS Knowledge Hub (per Email to andrea.sonnleitner@best-research.eu).

Presentation and integration on the project website

The Knowledge Hub is integrated as a section on the BioTheRoS website and leads to a subpage, where the individual databases can be accessed, see **Figure 2**, **Figure 3**, and **Figure 4**.

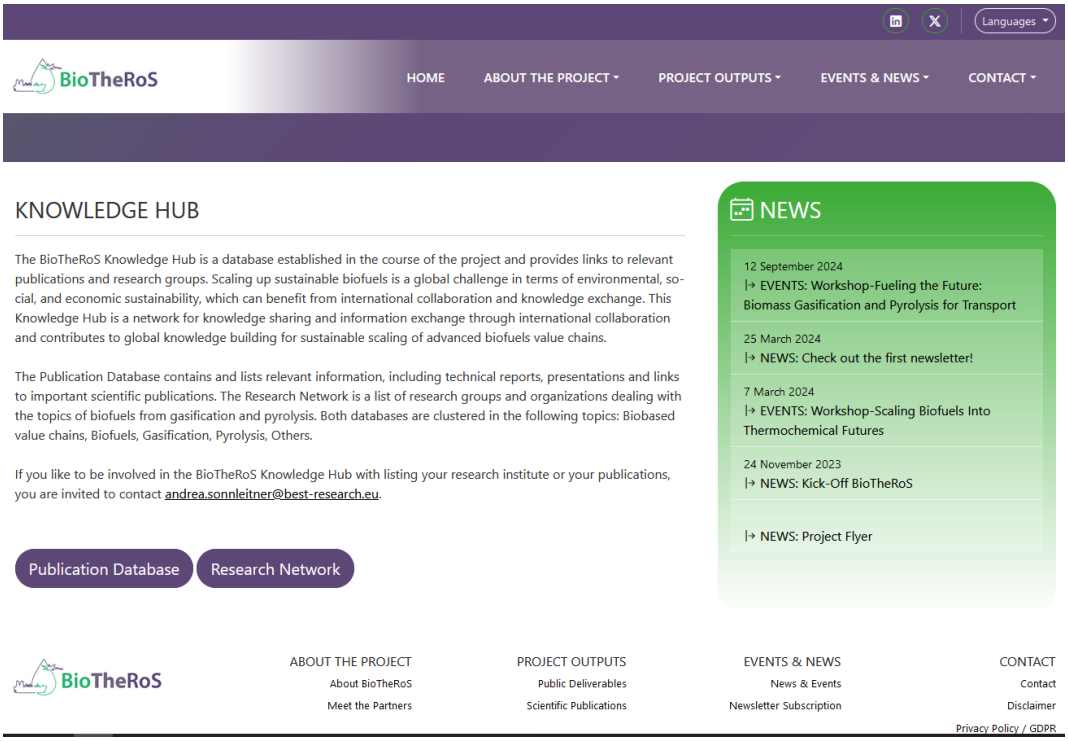

Figure 2: Screenshot Knowledge Hub Subpage

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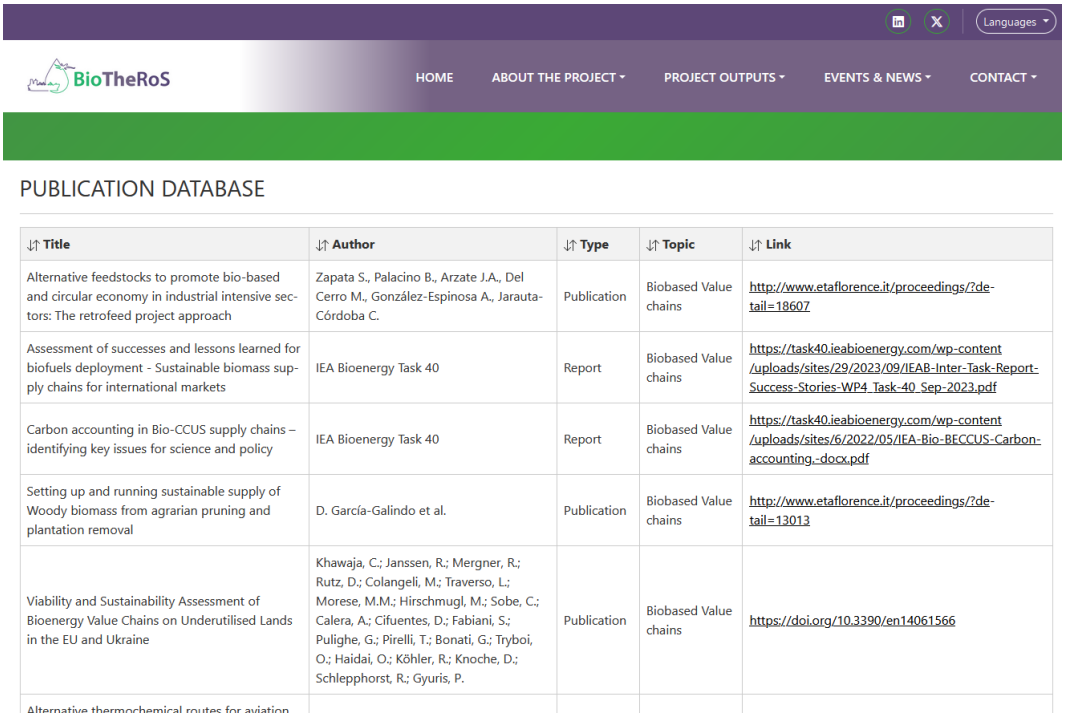


BioTheRoS

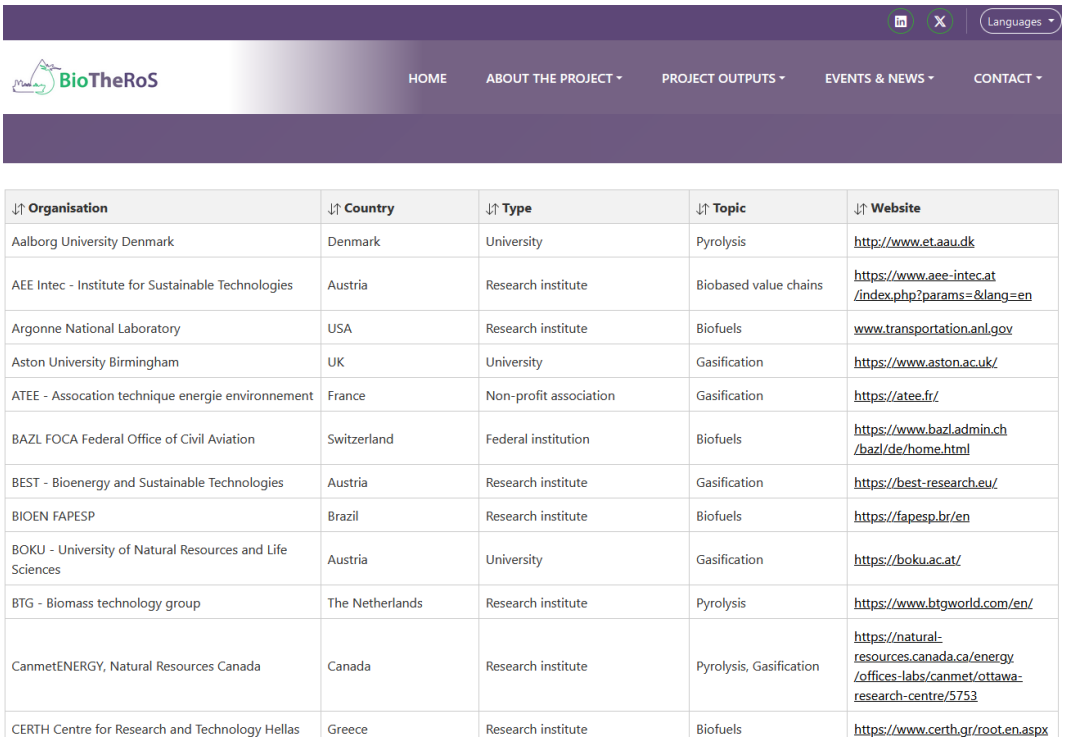
Languages

HOME | ABOUT THE PROJECT | PROJECT OUTPUTS | EVENTS & NEWS | CONTACT

PUBLICATION DATABASE

Title	Author	Type	Topic	Link
Alternative feedstocks to promote bio-based and circular economy in industrial intensive sectors: The retrofeed project approach	Zapata S., Palacino B., Arzate J.A., Del Cerro M., González-Espinosa A., Jarauta-Córdoba C.	Publication	Biobased Value chains	http://www.etaflorence.it/proceedings/?detail=18607
Assessment of successes and lessons learned for biofuels deployment - Sustainable biomass supply chains for international markets	IEA Bioenergy Task 40	Report	Biobased Value chains	https://task40.ieabioenergy.com/wp-content/uploads/sites/29/2023/09/IEAB-Inter-Task-Report-Success-Stories-WP4_Task-40_Sep-2023.pdf
Carbon accounting in Bio-CCUS supply chains – identifying key issues for science and policy	IEA Bioenergy Task 40	Report	Biobased Value chains	https://task40.ieabioenergy.com/wp-content/uploads/sites/6/2022/05/IEA-Bio-BECCUS-Carbon-accounting.-docx.pdf
Setting up and running sustainable supply of Woody biomass from agrarian pruning and plantation removal	D. García-Galindo et al.	Publication	Biobased Value chains	http://www.etaflorence.it/proceedings/?detail=13013
Viability and Sustainability Assessment of Bioenergy Value Chains on Underutilised Lands in the EU and Ukraine	Khawaja, C.; Janssen, R.; Mergner, R.; Rutz, D.; Colangeli, M.; Traverso, L.; Morese, M.M.; Hirschmugl, M.; Sobe, C.; Calera, A.; Cifuentes, D.; Fabiani, S.; Pulighe, G.; Pirelli, T.; Bonati, G.; Tryboi, O.; Haidai, O.; Köhler, R.; Knoche, D.; Schlepphorst, R.; Gyuris, P.	Publication	Biobased Value chains	https://doi.org/10.3390/en14061566
Alternative thermochemical routes for aviation				

Figure 3: Screenshot Publication Database



BioTheRoS

Languages

HOME | ABOUT THE PROJECT | PROJECT OUTPUTS | EVENTS & NEWS | CONTACT

Organisation	Country	Type	Topic	Website
Aalborg University Denmark	Denmark	University	Pyrolysis	http://www.et.aau.dk
AEE Intec - Institute for Sustainable Technologies	Austria	Research institute	Biobased value chains	https://www.aee-intec.at/index.php?params=&lang=en
Argonne National Laboratory	USA	Research institute	Biofuels	www.transportation.anl.gov
Aston University Birmingham	UK	University	Gasification	https://www.aston.ac.uk/
ATEE - Assocation technique energie environnement	France	Non-profit association	Gasification	https://atee.fr/
BAZL FOCA Federal Office of Civil Aviation	Switzerland	Federal institution	Biofuels	https://www.bazl.admin.ch/bazl/de/home.html
BEST - Bioenergy and Sustainable Technologies	Austria	Research institute	Gasification	https://best-research.eu/
BIOEN FAPESP	Brazil	Research institute	Biofuels	https://fapesp.br/en
BOKU - University of Natural Resources and Life Sciences	Austria	University	Gasification	https://boku.ac.at/
BTG - Biomass technology group	The Netherlands	Research institute	Pyrolysis	https://www.btgworld.com/en/
CanmetENERGY, Natural Resources Canada	Canada	Research institute	Pyrolysis, Gasification	https://natural-resources.canada.ca/energy/offices-labs/canmet/ottawa-research-centre/5753
CERTH Centre for Research and Technology Hellas	Greece	Research institute	Biofuels	https://www.certh.gr/root.en.aspx

Figure 4: Screenshot Research Network

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Filtering and search options

At present, the filter option is limited to the alphabetical order of the lists according to the different column names. Active filtering by selection is not yet possible.

It is planned to establish filter methods in the databases. In addition to the active selection of filters and topics. Additionally, there will also be a search function.

These points will be implemented jointly by BEST and WIP and will take place soon.

Content of databases and listed information

The publication database currently includes over 30 entries covering scientific publications, technical reports and datasets. At the moment, the publication database mainly contains publications from preliminary projects of the BIoTheros project partners and important reports from the related international networks (IEA Bioenergy, ETIP Bioenergy).

The research network currently includes over 50 entries covering stakeholders from universities, research institutes, non-profit associations, federal institutions, consultants, energy providers, technology providers and refineries. As of today, the research groups include the BioTheRoS partners and the respective members of the IEA Bioenergy Tasks 33, 34, 39, 40 and IEA AMF networks.

The current status of the database is listed in the Annex. The databases are updated on an ongoing basis and customised in consultation with the partners.

Outlook and further development of the BioTheRoS Knowledge Hub

The BioTheRoS Knowledge Hub will be continuously updated. Discussions on the contents and contributions to the knowledge database with the BioTheRoS project team and the leaders of the international networks like IEA Bioenergy, IEA AMF and ETIP Bioenergy are planned to improve the Knowledge Hub and add new research information.

After the second project year of BioTheRoS (09/25) a renewed display of the current status is planned, which will be described in Deliverable 7.6.

If you want to be involved in the BioTheRoS Knowledge Hub with listing your research institute or your publications, you are invited to contact andrea.sonnleitner@best-research.eu.

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Annex

Table 1. Publication Database (30/09/2024)

Title	Author	Type	Topic	Link
Alternative feedstocks to promote bio-based and circular economy in industrial intensive sectors: The retrofeed project approach	Zapata S., Palacino B., Arzate J.A., Del Cerro M., González-Espinosa A., Jarauta-Córdoba C.	Publication	Biobased Value chains	http://www.etaflorence.it/proceedings/?detail=18607
Assessment of successes and lessons learned for biofuels deployment - Sustainable biomass supply chains for international markets	IEA Bioenergy Task 40	Report	Biobased Value chains	https://task40.ieabioenergy.com/wp-content/uploads/sites/29/2023/09/IEAB-Inter-Task-Report-Success-Stories-WP4_Task-40_Sep-2023.pdf
Carbon accounting in Bio-CCUS supply chains – identifying key issues for science and policy	IEA Bioenergy Task 40	Report	Biobased Value chains	https://task40.ieabioenergy.com/wp-content/uploads/sites/6/2022/05/IEA-Bio-BECCUS-Carbon-accounting.-docx.pdf
Setting up and running sustainable supply of Woody biomass from agrarian pruning and plantation removal	D. García-Galindo et al.	Publication	Biobased Value chains	http://www.etaflorence.it/proceedings/?detail=13013
Viability and Sustainability Assessment of Bioenergy Value Chains on Underutilised Lands in the EU and Ukraine	Khawaja, C.; Janssen, R.; Mergner, R.; Rutz, D.; Colangeli, M.; Traverso, L.; Morese, M.M.; Hirschmugl, M.; Sobe, C.; Calera, A.; Cifuentes, D.; Fabiani, S.; Pulighe, G.; Pirelli, T.; Bonati, G.; Tryboi, O.; Haidai, O.; Köhler, R.; Knoche, D.; Schlepphorst, R.; Gyuris, P.	Publication	Biobased Value chains	https://doi.org/10.3390/en14061566
Alternative thermochemical routes for aviation biofuels via alcohols synthesis: Process modeling, techno-economic assessment and comparison	K. Atsonios, M.-A. Kougioumtzis, K.D. Panopoulos, E. Kakaras	Publication	Biofuels	https://doi.org/10.1016/j.apenergy.2014.10.056
Bioenergy Retrofitting in Europe's Industry - Biofit Results	Reumerman, P., Rutz, D., Janssen, R., Bacovsky, D., Hauschild, S.,	Publication	Biofuels	http://www.etaflorence.it/proceedings/?detail=19247

	Saastamoinen, H., Karampinis, E., Davidis, B.			
Biofuels in Emerging Markets; Potential for sustainable production and consumption	IEA Bioenergy Task 39	Report	Biofuels	https://task39.ieabioenergy.com/wp-content/uploads/sites/37/2023/03/Biofuels-in-Emerging-Markets.pdf
Current Status of Advanced Biofuels Demonstrations in Europe	ETIP Bioenergy Working Group 2 – Conversion Processes and ETIP-B-SABS2 project team	Report	Biofuels	https://www.etipbioenergy.eu/images/ETIP-B-SABS2_WG2_Current_Status_of_Adv_Biofuels_Demonstrations_in_Europe_Mar2020_final.pdf
Database on facilities for the production of advanced liquid and gaseous biofuels for transport	IEA Bioenergy Task 39	Dataset	Biofuels	https://demoplants.best-research.eu/
Integration of hydroprocessing modeling of bio-liquids into flowsheeting design tools for biofuels production	K. Atsonios, K. D. Panopoulos, N. Nikolopoulos, A. A. Lappas. E. Kakaras	Publication	Biofuels	https://doi.org/10.1016/j.fuproc.2017.11.009
Production Facilities	ETIP Bioenergy	Dataset	Biofuels	https://www.etipbioenergy.eu/databases/production-facilities
Progress in Commercialization of Biojet /Sustainable Aviation Fuels (SAF): Technologies and policies	IEA Bioenergy Task 39	Report	Biofuels	https://task39.ieabioenergy.com/wp-content/uploads/sites/37/2024/05/IEA-Bioenergy-Task-39-SAF-report.pdf
Update on drop-in biofuel and co- processing commercialization	IEA Bioenergy Task 39	Report	Biofuels	https://task39.ieabioenergy.com/wp-content/uploads/sites/37/2024/07/IEA-Bioenergy-Task-39-drop-in-biofuels-and-co-processing-report-June-2024.pdf
Database Gasification of Biomass and Waste	IEA Bioenergy Task 33	Dataset	Gasification	https://task33.ieabioenergy.com/database/

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Emerging Gasification Technologies for Waste & Biomass	IEA Bioenergy Task 33	Report	Gasification	https://task33.ieabioenergy.com/wp-content/uploads/sites/33/2022/07/Emerging-Gasification-Technologies_final-1.pdf
Fischer-Tropsch products from biomass-derived syngas and renewable hydrogen	Gruber, H., Groß, P., Rauch, R. et al.	Publication	Gasification	https://doi.org/10.1007/s00440-002-0236-0
Gasification applications in existing infrastructures for production of sustainable value-added products	IEA Bioenergy Task 33	Report	Gasification	https://task33.ieabioenergy.com/wp-content/uploads/sites/33/2022/07/Gasification_integration_final.pdf
Gasification of Liquids derived from Direct Thermochemical Liquefaction	IEA Bioenergy Task 34	Report	Gasification	https://task34.ieabioenergy.com/wp-content/uploads/sites/3/2023/12/DTL-Oil-Gasification.pdf
Influence of bed material coatings on the water-gas-shift reaction and steam reforming of toluene as tar model compound of biomass gasification	M. Kuba, F. Havlik, F. Kirnbauer, and H. Hofbauer	Publication	Gasification	https://doi.org/10.1016/j.biombioe.2015.11.029
Power to Fuels: Dynamic Modeling of a Slurry Bubble Column Reactor in Lab-Scale for Fischer Tropsch Synthesis under Variable Load of Synthesis Gas	Seyednejadian, S., Rauch, R., Bensaid, S., Hofbauer, H., Weber, G., Saracco, G.	Publication	Gasification	https://doi.org/10.3390/app8040514
Status report on thermal gasification of biomass and waste 2021	IEA Bioenergy Task 33	Report	Gasification	https://task33.ieabioenergy.com/wp-content/uploads/sites/33/2022/07/Status-Report2021_final.pdf
Twinning for Promoting Excellence, Ability and Knowledge to Develop Advanced Waste Gasification Solutions	Tamosiunas, A., Skvorcinskiene, R., Striūgas, N., Urbonas, R., Mergner, R., Ball, I., Janssen, R., Rutz, D., Pazeraite, A., Genys, D., Fendt, S., Bastek, S., Seemann, M.	Publication	Gasification	http://www.etaflorence.it/proceedings/?detail=18303
Efficient diagnosis of grate-fired biomass boilers by a simplified CFD-based approach	Rezeau, L.I. Díez, J. Royo and M. Díaz-Ramírez	Publication	Other	https://doi.org/10.1016/j.fuproc.2017.11.024

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Energy and the Environment	Itskos G; Nikolopoulos N.; Kourkoumpas D.-S.; Koutsianos A.; Violidakis I.; Drosatos P.; Grammelis P.	Book	Other	https://doi.org/10.1016/B978-0-444-62733-9.00006-X
Introducing an Artificial Neural Network Energy Minimization Multi-Scale drag scheme for fluidized particles	A. Nikolopoulos, C. Samlis, M. Zeneli, N. Nikolopoulos, S. Karellas, P. Grammelis	Publication	Other	https://doi.org/10.1016/j.ces.2020.116013
Commercial status of direct thermochemical liquefaction technologies	IEA Bioenergy Task 34	Report	Pyrolysis	https://task34.ieabioenergy.com/wp-content/uploads/sites/3/2024/02/WP3.3-DTL-Final.pdf
Ignition and combustion characteristics of hydrotreated pyrolysis oil in a combustion research unit	Jinlin Han, Yu Wang, L.M.T.Somers, Bert van de Beld	Publication	Pyrolysis	https://doi.org/10.1016/j.fuel.2022.123419
Life Cycle Analysis of Energy Production from Food Waste through Anaerobic Digestion, Pyrolysis and Integrated Energy System	S. Adebayo Opatokun, A. Lopez-Sabiron et al.	Publication	Pyrolysis	https://doi.org/10.3390/su9101804
MUSIC White Paper Fast Pyrolysis Bio-oil	P. Reumerman, J. Vos, T. Lammens	Report	Pyrolysis	https://www.music-h2020.eu/publications-reports/MUSIC_D6-1_WhitePaperPart2FastPyrolysisBio-Oil_FV.pdf
Production of Chemicals and Materials from Direct Thermochemical Liquefaction; Potential applications, status, outlook and challenges	IEA Bioenergy Task 34	Report	Pyrolysis	https://task34.ieabioenergy.com/wp-content/uploads/sites/3/2024/02/DTL_Production_Chemicals_and_Materials_final.pdf
Pyrolysis Demoplant Database	IEA Bioenergy Task 34	Dataset	Pyrolysis	https://demoplants21.best-research.eu/projects/displaymap/twhWVt
Pyrolysis Energy Conversion Systems	Grammelis, Panagiotis; Margaritis, Nikolaos; Kourkoumpas, Dimitrios	Publication	Pyrolysis	https://doi.org/10.1016/B978-0-12-809597-3.00445-4

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Table 2. Research Network (30/09/2024)

Organisation	Country	Type	Topics	Website
Aalborg University Denmark	Denmark	University	Pyrolysis	http://www.et.aau.dk
AEE Intec - Institute for Sustainable Technologies	Austria	Research institute	Biobased value chains	https://www.aee-intec.at/index.php?params=&lang=en
Argonne National Laboratory	USA	Research institute	Biofuels	www.transportation.anl.gov
Aston University Birmingham	UK	University	Gasification	https://www.aston.ac.uk/
ATEE - Assocation technique energie environnement	France	Non-profit association	Gasification	https://atee.fr/
BAZL FOCA Federal Office of Civil Aviation	Switzerland	Federal institution	Biofuels	https://www.bazl.admin.ch/bazl/de/home.html
BEST - Bioenergy and Sustainable Technologies	Austria	Research institute	Gasification	https://best-research.eu/
BIOEN FAPESP	Brazil	Research institute	Biofuels	https://fapesp.br/en
BOKU - University of Natural Resources and Life Sciences	Austria	University	Gasification	https://boku.ac.at/
BTG - Biomass technology group	The Netherlands	Research institute	Pyrolysis	https://www.btgworld.com/en/
CanmetENERGY, Natural Resources Canada	Canada	Research institute	Pyrolysis, Gasification	https://natural-resources.canada.ca/energy/offices-labs/canmet/ottawa-research-centre/5753
CERTH Centre for Research and Technology Hellas	Greece	Research institute	Biofuels	https://www.certh.gr/root.en.aspx
China Automotive Technology and Research Center (CATARC)	China	Research institute	Biofuels	https://europe.catarctc.com/en
CIRCE Centro Tecnologico	Spain	Research institute	Biofuels	https://www.fcirce.es/en/
CNU Chungnum National University	South Korea	University	Biofuels	https://international.jnu.ac.kr/IndexMain.aspx
CR Enea Trisaia	Italy	Research institute	Gasification	https://www.trisaia.enea.it/
Danish Technological Institute	Denmark	Research institute	Biofuels	https://www.dti.dk/

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DBFZ (Deutsches Biomasse Forschungszentrum)	Germany	Research institute	Biofuels, Biobased value chains	https://www.dbfz.de/en/
Ea Energy Analyses	Denmark	Consultant	Biobased value chains	https://www.ea-energianalyse.dk/da/
ECAM Brussels Engineering School	Belgium	University	Gasification	https://www.ecam.be/
Environment and Climate Change Canada	Canada	Federal institution	Biofuels	https://www.canada.ca/en/environment-climate-change.html
EPE Energy Research Office	Brazil	Federal institution	Biofuels	https://www.epe.gov.br/en
FNR (Fachagentur Nachwachsende Rohstoffe)	Germany	Research institute	Biofuels, Biobased value chains	https://www.fnr.de/
Hasselt University	Belgium	University	Biofuels	https://www.uhasselt.be/en
HP Green R&D Centre	India	Research institute	Pyrolysis	https://www.hindustanpetroleum.com/
Idaho National Laboratory	USA	Research institute	Biobased value chains	https://inl.gov/
Indian Oil Corporation Ltd.	India	Energy provider	Gasification	https://iocl.com/pages/r-and-d-centre
International Institute for Sustainability Analysis and Strategy (IINAS)	Germany	Research institute	Biobased value chains	https://iinas.org/
Karlsruhe Institute of Technology	Germany	Research institute	Gasification, Pyrolysis	www.kit.edu
KIER Korea Institute of Energy Research	Korea	Research institute	Biofuels	https://www.kier.re.kr/eng/
LEC (Large Engines Competence Center)	Austria	Research institute	Biofuels	https://www.lec.at/
Lulea University of Technology	Sweden	University	Gasification	https://www.ltu.se/en
Motor Oil Hellas	Greece	Refinery	Other	https://www.moh.gr/en/
NEDO New Energy and Industrial Technology Development	Japan	Research institute	Biofuels	https://www.nedo.go.jp/english/
NREL National Renewable Energy Laboratory	USA	Research institute	Gasification	https://www.nrel.gov/
Pacific Northwest National Laboratory (PNNL)	USA	Research institute	Pyrolysis	www.pnnl.gov

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QIBEBT Qingdao Institute of Bioenergy and Bioprocess Technology	China	Research institute	Pyrolysis	http://english.qibebt.cas.cn/
Renetech	Ireland	Technology provider	Biofuels	https://www.renetech.net/
RISE Research Institute of Sweden	Sweden	Research institute	Biobased value chains	https://www.ri.se/en
RVO Netherland Enterprise Agency	The Netherlands	Federal institution	Gasification, Biofuels	https://english.rvo.nl/
RWE Generation NL BV	Netherlands	Energy provider	Biobased value chains	https://www.rwe.com/en/
Scion	New Zealand	Research institute	Pyrolysis, Biofuels	www.scionresearch.com
Svebio	Sweden	Association	Biofuels	https://www.svebio.se/
Technical University of Denmark (DTU)	Denmark	University	Biofuels	https://www.dtu.dk/english/
Technical University Vienna	Austria	University	Biobased value chains	https://www.tuwien.at/etit/esea
TNO (former ECN)	The Netherlands	Technology provider	Gasification	https://www.tno.nl/en/
Tsinghua University	China	University	Gasification, Biofuels	https://www.tsinghua.edu.cn/en/
U.S. Department of Energy	USA	Federal institution	Biofuels, Biobased value chains	https://www.energy.gov/
UBC (University of British Columbia)	Canada	University	Biofuels	https://www.ubc.ca/
UCPH (University of Copenhagen)	Denmark	University	Biofuels	https://www.ku.dk/english/
Utrecht University	Netherlands	University	Biobased value chains	https://www.uu.nl/en
VTT Technical Research Centre of Finland Ltd	Finland	Research institute	Pyrolysis, Biofuels	www.vtt.fi
Wild&Partner	Austria	Consultant	Biobased value chains	https://www.wild.or.at/
WinGD	Switzerland	Energy provider	Biofuels	https://www.wingd.com/en/
WIP Renewable Energies	Germany	Consultant	Biofuels	https://www.wip-munich.de/

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