EERA European Energy Research Alliance BIOENERGY

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EERA BIOENERGY NEWSLETTER

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SPRING/SUMMER 2020

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Joint Programme Coordinator's corner

Andrea Monti
EERA Bioenergy Coordinator

Dear EERA Bioenergy members, dear eebionews readers,

Despite the pandemic has dramatically affected our daily routine, lifestyle, and way of working, the EERA Bioenergy JP has maintained a fervent and intense activity, and it prepared the basis for a coming semester rich of important dates. We went on with our usual webinars aimed at building up core teams and consortia for writing proposals. The broad and active participation of the webinars confirmed your strong interest in promoting internal discussion and boosting project proposals. I'm increasingly convinced that EERA JPs and EERA Bioenergy is not an exception, should above all focus attention on open calls and soon published calls, and write high-quality proposals by benefiting from valuable and diversified skills in the EERA Bioenergy JP, rather than to debate on political trajectories, future roadmaps and work programmes which falls more within the competence of other decision-makers. This successful way of working, therefore, should be maintained and strengthened.

Some days ago we held our regular half-yearly meeting in online mode. Participation was wide and without any technical problems thanks to the excellent organization and assistance from our secretariat (BIOPLAT). My general feeling at the meeting is very positive. In addition to the brilliant presentation by Dr. Maria Georgiadou (EC - DG Research and Innovation) and the valuable contributions of all the respectable speakers, I would like to underline with great pleasure the election of the new SP1 coordinator, Dr. Wolter Elbersen, to whom all my thanks and best wishes for the new position and for the development of the stimulating program that he has expertly presented to us. I'd like to take this opportunity also for a due thanks to the previous SP1 coordinator, Dr. Jean Tayeb, for the commitment and constant and profitable contribution provided to the planning and implementation of the SP1. A special mention and a heartfelt thanks to Dr. Myrsini Christou, who brilliantly presented a rich, illuminated, and inspirational program for the EERA bioenergy. I believe it is a source of pride and great satisfaction for all of us that Myrsini and Wolter went voluntarily for the coordination of the SP1. Finally, allow me to welcome once again the four new members: BESTMER, BOUN, CIRCE Foundation, and WIP Renewable Energies (in alphabetical order). My warm welcome goes to them in the hope that they can find the expected benefits in EERA JP Bioenergy.

The next half-year sees important appointments on the agenda

The activities of our JP have also grown on other fronts and objectives. As JP coordinator, I'm a member of the EERA Policy Group that I believe is doing an important and valuable work of information and support for the activities of our JP. I hope you got to read the weekly update of the EERA Policy Group that BIOPLAT sends you every week. At the same time, representing EERA Bioenergy I attended the steering committee meetings of ETIP Bioenergy, with which we are continuing a solid cooperation activity in the framework of the Implementation Working Group 8 (IWG8) - Bioenergy and Renewable Fuels, of which we are also a member of the core team. For example, I would like to remember the positive collaboration between EERA Bioenergy and ETIP for the preparation of the bioenergy challenges and priorities document for the Clean Energy Transition Partnership (CETP). About CETP, I would like to emphasize that EERA has secured a central role in the writing of the SRIA of the CETP, and the contribution of JPCs will be essential and a unique opportunity to set the CETP R&I agenda according to research priorities identified in the EERA JPs. The SRIA of the CETP is expected to be written from July to the end of September. It was agreed that the EERA's White Paper, representing EERA's views on the transition to Climate Neutrality, will be a key guiding document for writing the SRIA of the CETP. The Bioenergy theme is included in five out of seven pillars of the CETP; as such, it is of utmost importance that EERA bioenergy has its own representatives (co-authors) in all the five pillars (clusters). Thanks to the openness and kind cooperation of Wolter Elbersen, Myrsini Christou, Jaap Kiel, Francisco Girio, Julien Blondeau, Rita Bouman, and Ana Luisa Fernando, whom I thank once again, the EERA Bioenergy is now well represented all the five clusters. This is a great achievement for our JP.

The next half-year sees important appointments on the agenda (e.g. 14th SET-Plan Conference on 23-24 Nov. 2020, in Berlin), the results of which will likely greatly influence the direction and development of the bioenergy sector in the coming years. We will be there! But our capacity for 'teamwork' will be decisive to make the EERA Bioenergy voice heard and to strengthen our priorities.

Yours sincerely,

Andrea.

EERA Bioenergy news in brief

Due to the COVID-19 situation, EERA Bioenergy JP had to adapt to working from remote. The EUBCE 2020 planned for last April, in which EERA BIOENERGY JP and many of its members were going to be represented, was canceled.

During this period, EERA Bioenergy Secretariat and Management Board have been working on different activities to keep the JP dynamic.

INCORPORATION OF FOUR NEW MEMBERS

From the beginning of the year, four new entities have presented their candidacy to be incorporated as members of the JP. The Ege University Biomass Energy Systems and Technology Application and Research Center (BESTMER) and the Bogazici University (BOUN), both from Turkey, applied for the Full membership. On the other hand, CIRCE Foundation (Spain) and WIP Renewable Energies (Germany) applied to become Associate members. After an online votation process, all entities were accepted as new EERA Bioenergy members.

WEBINARS ON COLLABORATIVE PROJECT GENERATION

Two internal webinars, restricted to EERA Bioenergy members, were organized at the beginning of May to work on collaborative project generation. All EERA Bioenergy members were invited to join the discussions for the topics LC-SC3-RES-25-2020: International cooperation with Japan for Research and Innovation on advanced biofuels and alternative renewable fuels and LC-SC3-RES-3-2020: International Cooperation with the USA and/or China on alternative renewable fuels from sunlight for energy, transport, and chemical storage.

Screenshots from the RES-25 webinar (left), coordinated by the JPC Andrea Monti, and the RES-3 webinar (right), coordinated by SP3C Francisco Gírio.

SP5 ONLINE 2020 SPRING WORKSHOP

EERA Bioenergy SP5 on Sustainability, Techno-economic analysis, and Public acceptance organized the workshop "Challenges in Bioenergy: The effect of the Green Deal for academics and companies" on the 3rd of June.

The workshop consisted of several presentations about opportunities and potential barriers expected from the European Green Deal. The goal was to reflect on how bioenergy companies and researchers can and will respond to the European Green Deal goals.

The recording of the workshop is available in the following Link

LAST SC MEETING AND ONE NEW APPOINTMENT: SUBPROGRAMME 1 COORDINATOR

The EERA Bioenergy Steering Committee meeting that took place online through GoToMeeting on the 5th of June, addressed relevant issues related to the Joint Programme structure and actions.

The four news members had the opportunity to present themselves and their entities to the rest of SC participants: BESTMER (Asiye Gül Bayrakci), BOUN (Berat Haznedaroglu), CIRCE (Paola Mazzucchelli and Clara Jarauta) and WIP (Dominik Rutz).

The new SP1 Coordinator was elected. After the presentation of each candidate (Myrsini Christou – CRES, and Wolter Elbersen - WUR), Wolter Elbersen (on the right) became the new SP1 coordinator by a majority of votes, replacing Jean Tayeb (INRA).

Besides, Maria Georgiadou from the European Commission, special guest in this session, informed the SC about the last news on renewable fuels and bioenergy R&I.

#	Time	Item	Responsible
0	13:30	Opening by JPC • Presentation and adoption of the Agenda	JPC
1	13:40	New EERA Bioenergy members. Introduction • BESTMER Ege University Biomass Energy Systems and Technology Application and Research Center (Full member) • Bogazici University BOUN (Full member) • CIRCE Foundation (Associate member) • WIP Renewable Energies (Associate member)	Representatives of BESTMER, BOUN, CIRCE and WIP
2	14:10	Election of SP1 Coordinator • Presentation of candidates: - Myrsini Christou (CRES) - Wolter Elbersen (WUR)	JPC, candidates and all
3	14:30	Discussion and online voting	Full members
4	14:40	Activities in Subprogrammes • Update and planning for 2nd semester 2020 (SP5, SP2, SP3 and SP4)	JPC and SPCs
	15:10	Break. Coffee/tea	
5	15:20	Update on EU Policy • R&I policy update	Maria Georgiadou EC, DG RTD
6	15:40	Report on EERA Bioenergy activities	Margarita de Gregorio (EERA Bioenergy Secretariat)
7	15:45	Updates from EERA Policy Group and SUPEERA EU-project	Mónica de Juan Valentina Lisi (EERA aisbl Secretariat)
8	16:00	Financial issues • Fees payments status • Accounting information	Alexandre Météreau (EERA Bioenergy Treasurer)
9	16:15	Discussion and online voting	Full members
10	16:20-16:30	AOB & Closing	JPC

Bioenergy highlights

URBAN BIOREFINERY: BOOSTING CIRCULAR ECONOMY IN CITIES THROUGH NEW MODELS OF MUNICIPAL SOLID WASTE MANAGEMENT

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Due to the rapid growth of the population, municipal solid waste (MSW) has contributed significantly to the total amount of waste generated by our society. Today in Europe, each habitant generates, on average, 0.5 tonnes of MSW per year, increasing at an annual rate of 10%. Around 40-50% of it corresponds to organic waste (OFMSW). This organic fraction mainly contains carbohydrates, proteins, and lipids, which are all useful raw materials that can be converted into valuable products. Its valorization contributes to the transition from a linear to a renewable circular economy, to achieve the European Waste Framework directive and Green Deal objectives. Digestion and composting have contributed to the reduction of the biodegradable fraction of MSW sent to landfill. Nevertheless, a new generation of bio-based products can help to improve waste treatment environmental and socio-economical sustainability.

The aim of URBIOFIN project is to demonstrate the techno-economic and environmental viability of the conversion at a semi-industrial scale (10 ton/day) of OFMSW into chemical building blocks, biopolymers, and additives. This project is coordinated by IMECAL S.L and the consortium includes a total of 16 partners representing Industry, Research Organisations, and Academia. By using the biorefinery concept applied to MSW (Urban Biorefinery), URBIOFIN will exploit the OFMSW as feedstock to produce different valuable, marketable products with applications in agriculture, cosmetics and energy among others. URBIOFIN will offer a new feasible and more sustainable scenario alternative to the current treatment of the OFMSW.

URBIOFIN
urban biorefinery

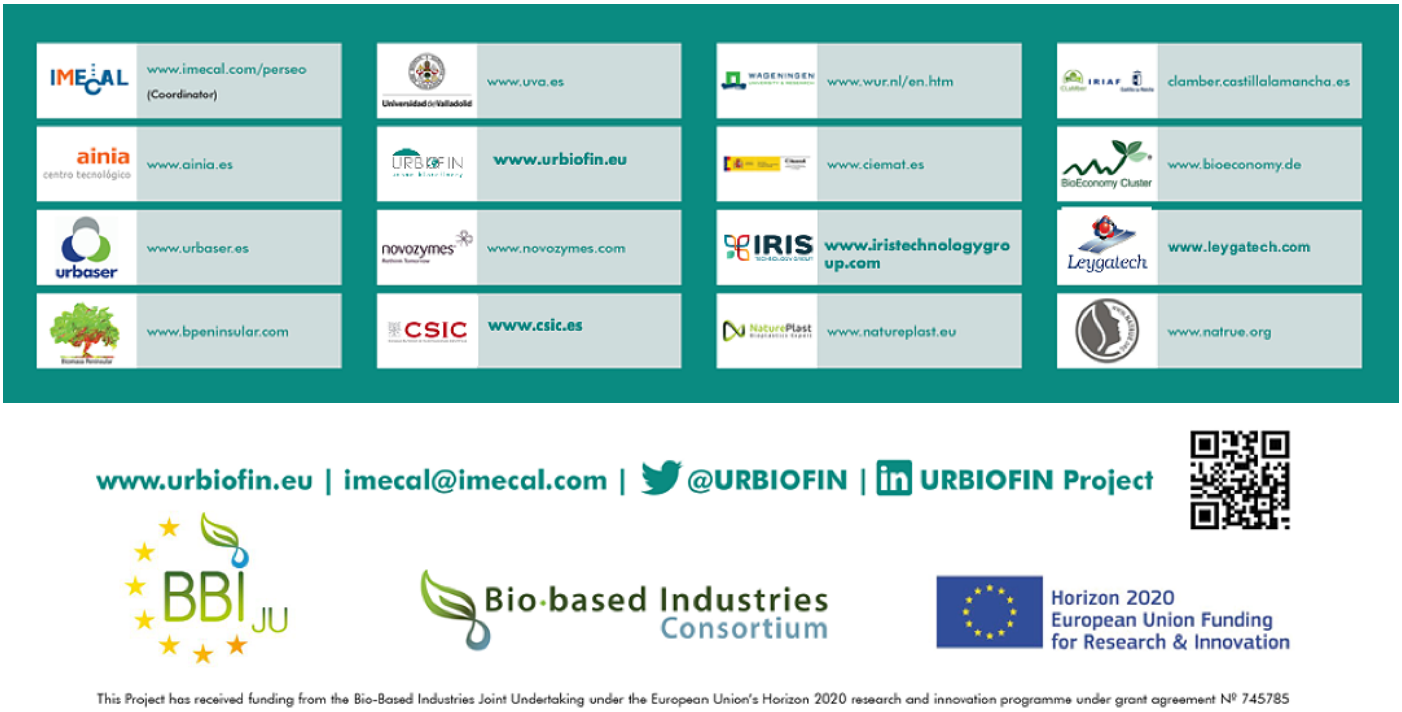

Figure 1: Partners participating in the URBIOFIN project.

OFMSW is a complex stream with variable composition. This is an important handicap for the use of OFMSW as feedstock. URBIOFIN was designed based on this variability to make an exhaustive analysis of OFMSW of different European countries, taking into account potential geographical and stational variations and different waste collection systems and pre-treatments. Essential biological processes, such as bioethanol fermentation and anaerobic digestion were selected because they are capable of dealing with complex and heterogeneous substrates. The main role of IMECAL S.L. and CIEMAT in the project is the conversion of OFMSW into bioethanol as a building block for the production of bioethylene. The pre-treatment and enzymatic hydrolysis processes of the OFMSW feedstocks for bioethanol production have already been optimized in cooperation of CIEMAT, NOVOZYMES and IMECAL, reaching high saccharification yields when using OFMSW substrates sorted at source.

The produced bioethanol will be subsequently converted into bio-ethylene at the semi-industrial scale in the new demonstration module implemented in the PERSEO biorefinery plant (IMECAL S.L., Spain). This module has been designed by CSIC (Spain) and the resulting bio-ethylene will be then used in agricultural applications such as fruit ripening.

In addition to URBIOFIN project, IMECAL and CIEMAT are in close collaboration in Waste2Bio and Ways2UP! projects (funded by the European Commission as well), aiming at developing a technological platform for the production of bioproducts and bioenergy based on the patented PERSEO Bioethanol® process. This technology is fully compatible with existing MSW treatment plants and will set the pillars for a highly integrated MSW Urban biorefinery.

Figure 2: IMECAL facilities related to the PERSEO Bioethanol® plant where conversion of biowaste to bioethanol and bioethylene takes place at the demonstration-scale.

CIRCULAR ECONOMY AND VALUE CHAIN THINKING - THE FUTURE OF WASTE-TO-ENERGY

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Through the Norwegian knowledge-building projects **WtE 2030** (Waste-to-Energy 2030, 2018-20) and **GrateCFD** (Enabling optimum Grate fired woody biomass and waste to energy plant operation through Computational Fluid Dynamics, 2017-20) huge efforts are made towards respectively keeping this sector competitive and performant and modeling of large-scale combustion systems using Computational Fluid Dynamics (CFD). Both projects are now in their final year and have produced a large number of results that contribute to the future of WtE, a future that will be increasingly influenced by circular economy and value chain thinking.

WtE 2030 has focused on developing cost-effective solutions for increased process performance through a more stable and predictable process for existing installations. The approach has included dynamic modeling, process data analysis, and new sensor concepts. Increased process stability will have a direct consequence on process performance, enabling increased energy efficiency, decreased emissions and consumables use, and increased plant capacity and availability. Other important aspects of the project are: Municipal Solid Waste (MSW) properties in a circular economy, heat storage, and fly ash valorization.

GrateCFD has focused on the development of CFD aided design tools and operational guidelines for optimum grate fired BtE and WtE plant operation through deriving fundamental knowledge about woody biomass and MSW and their degradation behavior and burnout in a hot environment. The overall aim is to develop CFD toolboxes that are able to simulate a wide range of combustion units, contributing to their improved energetic, environmental and climate performance through improved design and operational optimization.

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Waste-to-Energy – heat and power from Municipal Solid Waste incineration – is an integral part of the Norwegian (and European) energy system as it produces about half of district heating. This sector is tightly regulated and is facing more and more stringent legislation, especially concerning environmental as well as energy performance. The clear message from the EC commission to the WtE sector at the 2016 CEWEP Congress (Confederation of European WtE Plants) was to extract more energy from less waste, especially by harnessing existing WtE capacities in the EU.

The WtE sector is the center of a complex web of interests (the public, politics, energy, economy, environment) in the development of circular economy, and both WtE 2030 and GrateCFD aim at preserving and improving the sector competitiveness.

Together, the two projects and their partners are working towards the WtE circular economy future, a future which is influenced by many factors, including political, legislative, societal, technological, economic and environmental. The results from WtE 2030 is a significant contribution to understanding the dynamics and process behavior of WtE plants; while the results from GrateCFD is a significant contribution to the technological and environmental aspects connected to the core processes taking place in a WtE plant combustion chamber.

A significant further effort is needed to make today's WtE plants, the heart of the WtE value chain - that takes care of what is left after recycling/sorting, capable of meeting this challenging circular economy future. This requires a considerable and multifaceted effort, through the whole WtE value chain, and must go hand-in-hand with the development of other WtE circular economy elements, where society, behavior and legislation influence WtE both upstream and downstream in the value chain.

Recycling and sorting and alternative waste treatment technologies will heavily influence the WtE plant input and operation, while increased focus is expected on alternative ash treatment technologies, enabling value creation and safe disposal. All in all, a multitude of products can result from municipal and commercial and industrial (C&I) wastes through the full width of circular economy based value chains thereof, including heat, power, biofuels and material recovery.

When it comes to fighting global warming, CCUS should also be considered, enabling carbon-negative WtE plant operation and the option of utilizing the captured CO_2.

Circular economy and value chain thinking is set to become an integral part of Waste-to-Energy, however, a lot of efforts, including research and development, have to be carried out to arrive at this sustainable future.

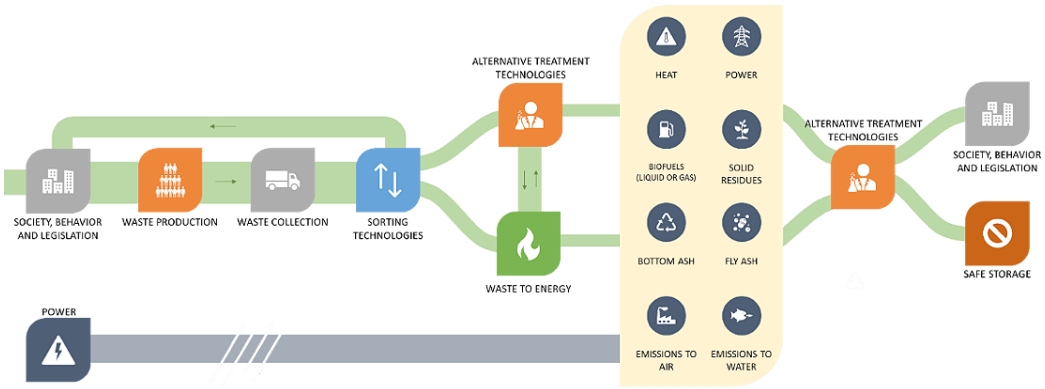

Figure 1: WtE scheme (Source: Per Carlsson, SINTEF Energy Research).

More information about the projects and results, can be found on the project homepages: Link / Link

ONLINE SEARCHABLE CATALOGUE OF BIOECONOMY SOLUTIONS

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Project aim

POWER4BIO aims at empowering regional stakeholders in Europe to boost the transition towards bioeconomy by providing them with the necessary tools, instruments and guidance to develop and implement sustainable regional bioeconomy strategies. All project developments are being validated by 10 participant regions, to make the results easy to be replicated in other European regions.

Catalogue of bio-based solutions

One of the tools that has been developed is an online accessible and searchable database containing to date 30 factsheets on bio-based resource-efficient biorefineries for bioenergy production, as well as for biomaterials, biochemicals, and food & feed. The catalogue intends to be used by regional stakeholders – e.g. policy makers, industry (associations), consultants and other interested parties – to get an overview of available promising options to convert a wide range of biomass feedstock into an array of bio-based products. The solutions shall inspire regions to replicate them in their local context.

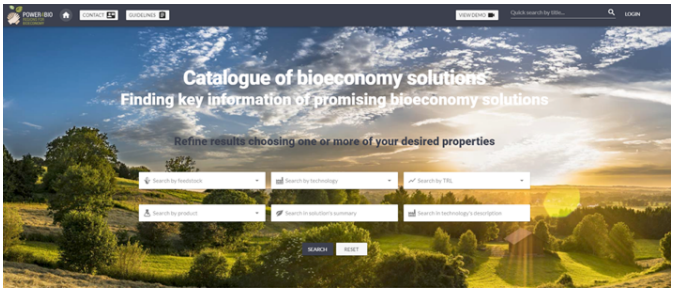

Figure 1: Screenshot of the online catalogue interface.

The content topics in the factsheets have been jointly established through all POWER4BIO partners by involving regional stakeholders. The factsheets contain a short description and several characteristics of the solution, as well as information regarding suitability of biomass feedstock for production of the target product, benefits of the solution related to the value chain and specific constraints for implementation.

The online accessible database, developed by POWER4BI partner DRAXIS, is available via simple interface at the website. The user may apply different searching criteria to facilitate finding solutions of interest: feedstock, technology, TRL, products, as well as via words in the Summary and Technology Description. Once a solution is selected for viewing, the user may navigate to other solutions with similar content via keywords. Details of solutions of interest can be exported to PDF and printed if wished. Guidelines on how to use and search the catalogue are available on the catalogue website.

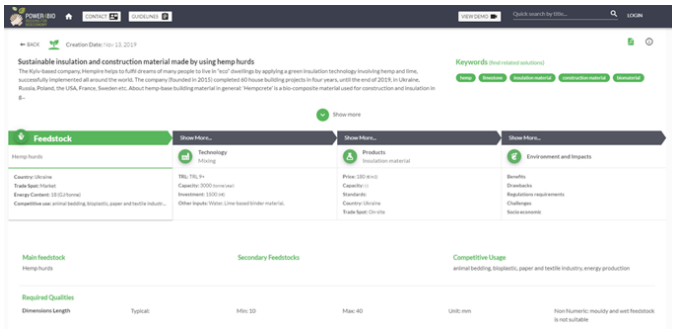

Figure 2: Screenshot of the view page of a solution factsheet.

Other project deliverables

Several other deliverables of the POWER4BIO project include:

- Description of technologically mature solutions, suitable to be deployed at small-scale in rural areas, for inspiration.
- Description of business models of a selection of bio-based technology solutions, to support regions to identify the most adequate bio-based solutions for their situation.
- Description of suitable existing (regional) policies, and recommendations, to support bioeconomy business models.
- Five Central and Eastern European regions have set up Regional Bioeconomy Hubs (RBHs) where key regional stakeholders are collaborating to develop a bioeconomy strategy for their region.
- Five Western and Southern European regions are reviewing their already existing regional bioeconomy strategies.
- Guidelines to establish RBHs and to develop new regional strategies and to update existing strategies.
- Ten open cross-visits will be organized, one by each of the POWER4BIO regions.
- Training and education programmes for regional stakeholders will be provided.

More info on these deliverables can be found at Link; publicly available deliverables can be downloaded at Link.

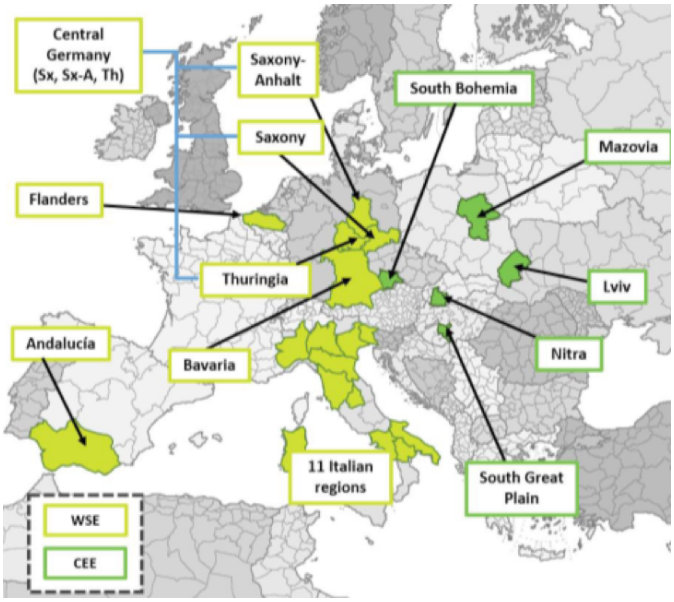

Figure 3: The 10 regions participating in POWER4BIO.

About POWER4BIO

This project is running from October 2018 to March 2021 and has received 2.9 M€ funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 818351. Wageningen Research (WR) has received funding from the Dutch ministry of agriculture nature and food quality through TKI-TU as well, under BO-49-001-006.

Consortium

- Fundacíon CIRCE Centro de Investigacíon de Recursos y Consumos Energéticos (CIRCE, Spain)
- Deutsches Biomasseforschungszentrum gemeinnützige GmbH (DBFZ, Germany)
- Stichting Wageningen Research (WR, Netherlands)
- META Group SRL (META, Italy)
- National Agricultural Research and Innovation Center (AKI, Hungary)
- EPC Project Corporation Climate. Sustainability. Communications. gGmbH (EPC, Germany)
- DRAXIS Environmental S.A. (DRAXIS, Greece)
- Bay Zoltán Nonprofit Ltd. for Applied Research (BZN, Hungary)
- Ukrainian National Forestry University (UNFU, Ukraine)
- Consejería de Agricultura, Ganadería, Pesca y Desarrollo Sostenible (CAGPDS, Spain)
- Mazovia Energy Agency (MAE, Poland)
- University of South Bohemia (USB, Czech)
- Chemie Cluster Bayern GmbH (CCB, Germany)
- Sustainable Processes and Resources for Innovation and National Growth (SPRING, Italy)
- Vlaams Gewest (Government of Flanders, EWI, Belgium)
- Slovak University of Agriculture in Nitra (SUA, Slovakia)
- European Chemical Regions Network asbl (ECRN, Belgium)

EUROPEAN COMMISSION

CROP DIVERSIFICATION TO MEET THE BIOGAS DONE RIGHT (BDR): A CASE STUDY FOR THE PO VALLEY REGION, ITALY

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BDR concept aims at producing biomethane following the idea of closing the CO_2-cycle. Compared to the traditional biogas production system the difference relies on the integration of multiple cropping where the main crop serves for food/feed while the secondary crop is specifically grown for energy production without affecting food/feed production and blended with animal manure and other by-products. Further differences are: i) full recycling of the digestate as fertilizer; ii) adoption of minimum or no-tillage practices; iii) precision agriculture and other beneficial environmental outcomes.

The present case study was focused on the agronomical and economical evaluation of the shift from a traditional double maize-based biogas production to a full BDR system with hemp, fiber sorghum and sunn hemp so to identify potential alternatives to the current BDR system. The data were collected from several experiments conducted at the agricultural experimental farm of Bologna University, Italy and from literature reviews.

Figure 1: Left to right: hemp, fiber sorghum and sunn hemp cultivated as dedicated bioenergy crops in the 2018 growing season at the experimental farm of Bologna.

Hemp and fiber sorghum are usually grown as main crop in the Po valley (Zatta et al., 2012; Zegada-Lizarazu and Monti, 2011), whereas sunn hemp demonstrated its suitability as double crop after a winter cereal yielding up to 7 Mg ha^{-1} (Parenti et al., 2018). These three annual warm season lignocellulosic crops showed great potential to be integrated into existing food/feed-based cropping systems as feedstock for biogas production and to be competitive with maize. Indeed, maize is characterized by very high production and environmental costs (irrigations, fertilizations, and pesticides), whereas the dedicated energy crops meet the BDR concepts thanks to their lower input requirements (Zegada-Lizarazu and Monti, 2012).

Main findings

Even though maize has the highest energy output per unit of biomass (310 kW Mg^{-1})(calculated from Zhang et al., 2020), fibre sorghum resulted as the crop with the lowest production cost on energy yield with 0.08 €/kWh followed by maize, sunn hemp and hemp with 0.13, 0.16 and 0.18 €/kWh, respectively. The current energy price is 0.04 €/kWh, increased up to 23 €/kWh due to government payments, that result essential to keep the system profitability.

Another interesting scenario is mixing hemp, fiber sorghum and sunn hemp as a blend to replace maize. The choice of the right blend ratio can feed the plant at maize-like profitability level maximizing the BDR concepts of crop diversification.

Conclusion

From the economic perspective, fiber sorghum is the best candidate for replacing maize in BDR systems in the Po valley. Its resistance to drought and low fertilization requirement allows it to provide similar yield compared to maize but at cheaper production costs. Otherwise, hemp, fiber sorghum and sunn hemp blend can provide additional ecosystem services in terms of biodiversity.

The shift from conventional to BDR systems can improve the sustainability of the biogas value chain without competing with food crops and, besides, can increase the profitability of energy production. Otherwise, the crop diversification will lead to several environmental benefits and these actions should be supported by the government payment to fasten the transition towards modern agricultural business encompassing the multifunctional role of first sector.

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Further information

European Biogas Association.
Italian Biogas Association.

INTEGRATED BIOREFINERY CONCEPT FOR BIOECONOMY DRIVEN DEVELOPMENT

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EERA Bioenergy member Boğaziçi University did the groundbreaking for Project INDEPENDENT (Integrated Biorefinery Concept for Bioeconomy Driven Development) co-funded by EU and Turkish Ministry of Industry and Technology under Competitive Sectors Programme.

A growing interest in designing biorefineries using algae species to produce several bio-commodity products also includes means of exploring their favorable greenhouse gas, water and land-use sustainability metrics. In this respect, key inputs include utilizing recycled nitrogen and phosphorus resources, tapping into existing CO_2 emissions, and uncompromised water supplies. In addition, options to exploit residual biomass for additional bioenergy and biofertilizer applications for soil amendments are also considered auspicious for a more competent biorefinery platform.

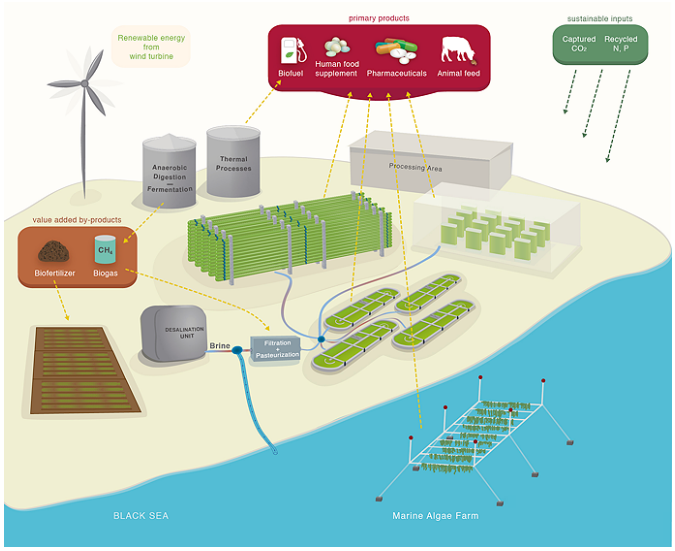

Figure 1 Carbon-negative biorefinery concept designed by Boğaziçi University.

Project INDEPENDENT is designed to build on all of these well thought contemplations to construct an integrated algal biorefinery that produces a portfolio of products that can be adjusted to meet market demands as a gateway into large scale production. Project site is carefully selected on Boğaziçi University's Saritepe Campus, located on the coast of Black Sea with readily access to seawater. Emboldening on the interdisciplinary nature of the team, a non-destructive breakwater system will be designed to generate a coastal site suitable for macroalgae cultivation at open sea. Microalgae cultivation will be supported by recycled nutrients and waste CO_2. Novel marine macro- and microalgae species will be pursued for pharmaceutical, human food and animal feed applications in addition to traditional biofuel functions. Digested algal biomass will be made available to organic farming activities on campus. A wind turbine operated year-round will supply renewable energy to all operations on site allowing carbon-negative production, a first for EU. In addition to a full scale environmental life cycle assessment (e-LCA), a social life cycle assessment (s-LCA) will be conducted to assess the social and sociological aspects of algal biorefinery and its products, their actual and potential positive as well as negative impacts on the communities involved.

AGROinLOG ASSESSED THE VIABILITY OF INTEGRATED BIOMASS LOGISTICS CENTRES (IBLCS) IN DIFFERENT SECTORS IN EUROPE

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Many European agro-industries are characterized by the fact that capital goods and facilities cannot be used year-round due to the seasonal availability of their primary feedstocks. AGROinLOG project was born in 2016 aiming to improve the competitiveness of these agro-industries through their transformation into Integrated Biomass Logistics Centres (IBLC).

The Integrated Biomass Logistics Centre (IBLC) concept establishes a connection between the seasonal overcapacity at agro-industries and the regional availability of biomass residues as resources (biocommodities), increasing the utilization of the facilities of these agro-industries. Alternative non-food feedstocks (e.g., crop residues or non-food crops) could fill the idle periods of, for example, the pre-treatment equipment (e.g., dryer, mill etc.) or of the storage capacity at the facility.

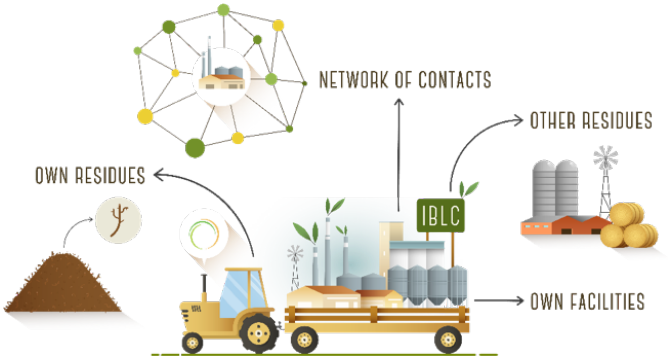

Figure 1: IBLC concept.

Thus, an IBLC is defined as a business strategy for agro-industries to take advantage of available capacities (in terms of facilities, equipment, waste, non-used local resources and staff) as a resource for the processing of biomass as a renewable feedstock for bioenergy and/or biorefinery markets.

There are three important drivers to develop an IBLC in an agroindustry: (1) diversification of inputs by using extra feedstock types (not only food or feed but also non-food biomass residues); (2) the optimization of available and new capacities (3) thirdly the diversification of outputs by obtaining extra revenues.

AGROinLOG tested the IBLC concept in three real experimental plants. In Spain at a fodder industry, in Greece at an olive oil industry, and in Sweden inside a grain-milling industry. The work carried out in these agro-industries included not only the design and optimisation of a new logistics chain and production line, but also the assessment of the technical, financial, and environmental feasibility of the new activity. This included the evaluation and validation of the quality of the new products obtained: energy pellets, thermoplastic reinforced with natural fibers, bioboards, adsorbents for hydrocarbons spills, activated carbon for electronic applications, bedding for bunnies, phenols extraction, biooil and biochar pellets.

Figure 2: Biooil (left) and OTP pellets (right).

Furthermore, the project analysed the opportunities of replicating the IBLC business model in 6 different sectors: olive oil, feed and fodder, vegetable oil, wine, grain and sugar sectors. These sectors were selected considering their potential for implementation of future IBLCs. Moreover, generic IBLC strategies were developed based on the analysis of different regional case studies in these sectors.

The outcomes of the project include best practice guidelines for implementing IBLCs; business models & roadmaps for IBLCs deployment in Europe; insights into the real operational conditions of three IBLCs in the grain, olive oil and animal feed sector; opportunities for the production of biomass & biocommodities; key factors for logistics integration in these IBLCs and results from the assessment of the environmental, economic, and social impacts of IBLC strategies.

Figure 3: AGROinLOG consortium meets in Sweden.

Thus, AGROinLOG project is now coming to an end having shed light over the viability of Integrated Biomass Logistics Centres (IBLCs). It is demonstrated that European agro-industries could be able to develop a new business line with lower investment based on the integrated approach which could contribute to stabilizing their annual activity (avoiding idle periods) and maintaining or creating new jobs. AGROinLOG contributes this way to address the problem of biomass supply including waste, improve circularity and resource efficiency while avoiding the competence with food and contributing to rural development.

For more information:
- Visit the project website here Link
- Watch the final project video here Link and the videos about the demo sites in Spain, Greece and Sweden.

LignoCOST NETWORK - ESTABLISHMENT OF A PAN-EUROPEAN NETWORK ON THE SUSTAINABLE VALORISATION OF LIGNIN

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Lignin is removed during pulping and is released in the production of cellulosic ethanol. Currently, the base case for lignin is to use it simply as an internal energy source. However, the industry is more and more convinced that economic valorisation of this aromatic side stream is absolutely essential to make the processing of lignocellulosic feedstocks market competitive. In addition to those processes that consider lignin a side stream, much attention is nowadays given to the development of biorefineries, in which, next to cellulose, lignin actually is one of the main, high-value intermediate product streams to be further processed into a portfolio of bio-based products, materials and secondary energy carriers.

To unlock the potential of lignin, an interdisciplinary and cross-sectoral approach is needed by grouping relevant expertises within one pan-European network to tackle and overcome the challenges faced in industrial lignin valorisation. This fulfills our aim to stimulate the industrial application of lignin.

In October 2018, LignoCOST brought together partners with complementary expertises, active over the whole lignin value chain from production to applications. With 260 participants from 36 European countries, 4 Near Neighbour Countries and 4 International Partner Countries a strong network has been created. LignoCOST has a duration of 4 years.

LignoCOST is organised in 5 working groups:

- WG1 WikiLignin, tool for lignin information. The purpose of WG1 is to develop a database comprising lignin sources, availability, properties and repository of state-of-the-art analytical methodologies and turnkey methods for industry.
- WG2 Production and catalytic conversion technologies. The focus of WG 2 is on bio- and chemo-catalytic conversion technologies including technology readiness level (TRL) assessment of lignocellulosic raw material.
- WG3 Industrial application requirements versus lignin properties. The focus of WG3 is on industrial application requirements (market demand) versus lignin properties (supply). Bringing these two topics together will result in viable industrial opportunities for lignin application.
- WG4 Development of value chains for lignin valorisation. The focus of WG4 is to create industrial viable opportunities for lignin valorisation by identifying industrial value chains from supplier to end-user.
- WG5 Technical and full sustainability aspects, LCA, market deployment, potential and implementation. Life cycle analysis is an important tool for evaluating the opportunities for the implementation of lignin in industrial processes. WG5 will evaluate the LCA's for the most promising opportunities.

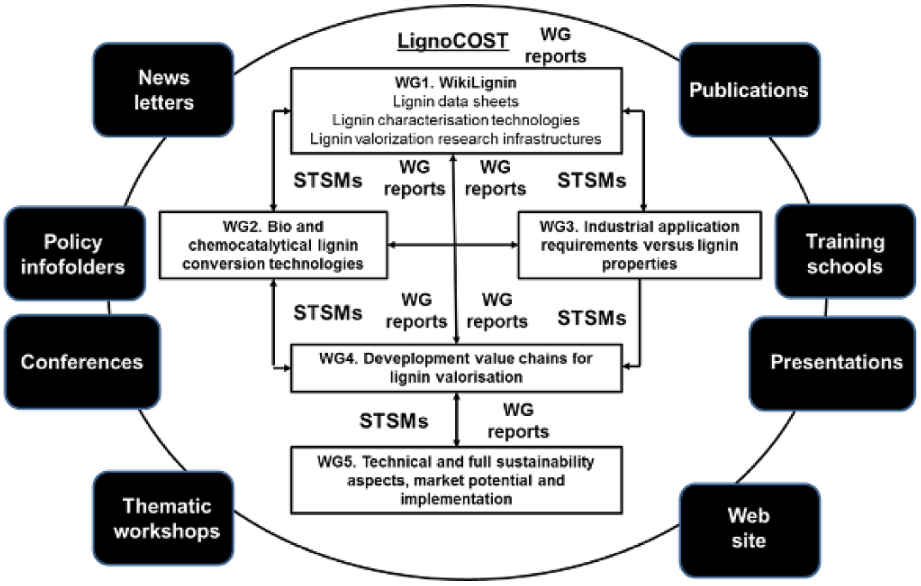

Figure 1: LignoCOST is organised in 5 working groups.

LignoCOST facilitates networking activities such as meetings, training schools, short term scientific missions and workshops. More information can be found at Link; email to lignocost@wur.nl.

Figure 2: LignoCOST consortium.

COST Action LignoCOST (CA17128) kindly acknowledge the support by COST (European Cooperation in Science and Technology).

FROM NEUTRAL TO NEGATIVE CO_2 EMISSIONS

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Climate change and global waste management are two high priority societal challenges for which governments all over the world are setting goals under the concepts of circular economy and low-carbon economy. These actions can even be carried out in synergy when combining Carbon Capture and Storage (CCS) with energy from waste to become a negative CO_2 technology. For municipalities having ambitious targets like the City of Oslo (Norway) aiming at 95 % greenhouse gas reduction by 2030, Waste-to-Energy (WtE) plants are very good candidates. In Oslo, WtE represents roughly 25 % of the total CO_2 emissions. CCS technologies have progressed considerably in the last two decades offering many capture solutions, often classified under post-combustion, pre-combustion, and oxy-fuel combustion capture methods. The post-combustion capture route is an end-of-pipe solution and is the most plausible from a retrofit perspective, as almost no modification of the plant is expected, apart from possible energetic integration. Several pilot projects in The Netherlands, Norway, and Japan have proven the feasibility of CCS application to WtE plants based on this approach. The other capture routes require to adapt the plants and are more relevant for greenfield projects, something which is very interesting for one of the few hard industrial segments with large growth potential as most of the waste is still being landfilled around the world.

The CAPEWASTE project studies a capture technology based on oxy-fuel combustion where oxygen is used instead of air in the waste incineration process. The flue gas of such a process is only composed of CO_2 and water vapour, allowing CO_2 to be cheaply and easily separated by condensing water. The R&D partner SINTEF Energy Research studies experimentally how to efficiently burn Municipal Solid Waste (MSW) in an oxy-fuel atmosphere and subsequently how to scale up the technology by use of numerical combustion simulations. The project owner REG (formerly EGE) City of Oslo provides one of its WtE plants as a model for the study such that the feasibility and pertinence of the oxy-fuel capture technology can be assessed realistically.

The specific characteristics of the waste as fuel and WtE plant configuration as an energy provider require that all capture technologies be assessed carefully to minimize the technological risks. This is the aim of the project NEWEST-CCUS which gathers research institutions from UK, Norway, Germany, and the Netherlands and attracted more than a dozen operators and suppliers. The Full-scale CCS Project in Norway which will demonstrate CCS all the way from capture to storage and will prepare a geological sink for European CO_2 emissions is a further drive for developing a panel of technologies through the common European research effort NEWEST-CCUS. One particularity of municipal solid waste in Europe is that roughly 50 % of its carbon originates from biogenic sources, therefore storing permanently more than 50 % of the emissions from a WtE plant would result in removing CO_2 from the atmosphere.

About CAPEWASTE:

The Norwegian project CAPEWASTE consortium comprises the research performing partners: REG/EGE-City of Oslo (owner), SINTEF Energy Research (leader), Linde AS, and with an observer role: the Norwegian Environmental Agency. The project is co-funded by the industrial partners and support from the CLIMIT program of the Research Council of Norway under grant #281869.

About NEWEST-CCUS:

The project NEWEST-CCUS consortium comprises 7 research performing partners from the UK (University of Edinburgh – coordinator; University of Sheffield; Scottish CCS, Carbon Clean Solutions), Norway (SINTEF Energy Research), Germany (University of Stuttgart), The Netherlands (TNO), and more than 15 industrial and interest organization partners with advisor role. Co-funded by the ERA-NET Accelerating CCS Technologies initiative under project #299683. The governments of each participating country contribute funding.

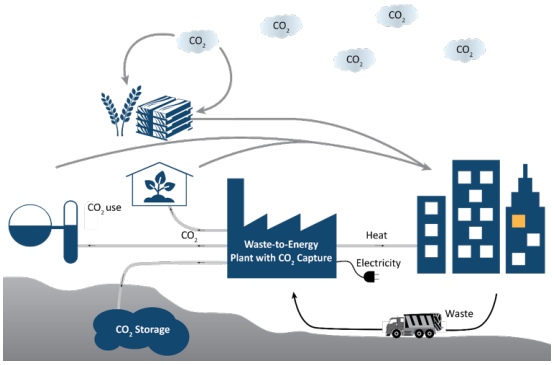

Figure 1: CO_2 cycle in Waste-to-Energy with CCS and CCUS (Source: SINTEF).

THE PULP&FUEL PROJECT

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The production of paper is a two-step process, from wood to cellulosic fibres to paper. Cellulosic fibres are produced by the pulp industry via a chemical pulping process. Paper is produced from cellulosic fibres and inorganic additives. The pulp & paper industry mobilises large amounts of biomass (mainly wood) as well as recycled paper. As such, the pulp & paper bio-refineries play an important role in the circular economy.

The objective of the project Pulp&Fuel is to show how biofuels can be produced from residues found on a standard pulp mill: mainly bark and black liquor. The project studies different gasification technologies adapted to each resource, including fixed bed and entrained flow gasification, applied to bark and paper recycling waste to produce syngas (H_2, CO). Black liquor is gasified by supercritical water gasification to produce H_2. The project further studies gas cleaning and fuel synthesis with technologies adapted to the scale and the constraints of a pulp mill.

Bark is a high ash fuel and is difficult to inject as a powder into any gasifier. The project compares two different gasification technologies: fixed bed and entrained flow gasifiers. Both technologies need adaptations to allow them to process bark. The entrained flow gasifier, working with pulverized feedstocks, needs an adapted injection device. This patented injection device can also process feeds with limited amounts of plastics.

The fixed bed gasifier, on the other hand, is operated with pelletized fuels. Fuel injection is less of a problem. Fixed bed gasifiers are generally associated with a poor syngas quality and often require a separate reforming reactor downstream of the gasifier. The innovative design of the fixed bed gasifier used in this project allows gasification and reforming in one single reactor. This concept, therefore, means significantly reduced investment costs for the gasification plant. To make the concept commercially viable, the entire process needs to be made continuous with a continuous ash discharge.

Supercritical water gasification is also notoriously difficult due to precipitation issues of salts and limited carbon conversion. The Pulp&Fuel project studies the conversion of black liquor in sub- and supercritical conditions to propose a pathway that allows maximum conversion while allowing better salt management.

Fischer-Tropsch fuel synthesis is well known and adapted to large-scale plants. The specificity of the Pulp&Fuel concept is that a carbon monoxide rich stream is available from the dry gasifiers and a hydrogen-rich stream comes from the supercritical water gasifier. This configuration can be exploited in a staged fuel synthesis unit increasing yields while remaining suitable to small-scale units.

Both pulping and fuel synthesis processes are energy-intensive but also produce heat. Process and energy integration tools are used to ensure optimal use of resources to minimise losses. A standard gasification-fuel synthesis unit produces energy and material streams that can be employed elsewhere on the pulping plant, important synergies can be found between the two units. The pulp plant can reduce the amount of biomass needed in its combustion units while the efficiency of the biomass gasification can be boosted.

PULP&FUEL
pulp and paper industry waste to fuel

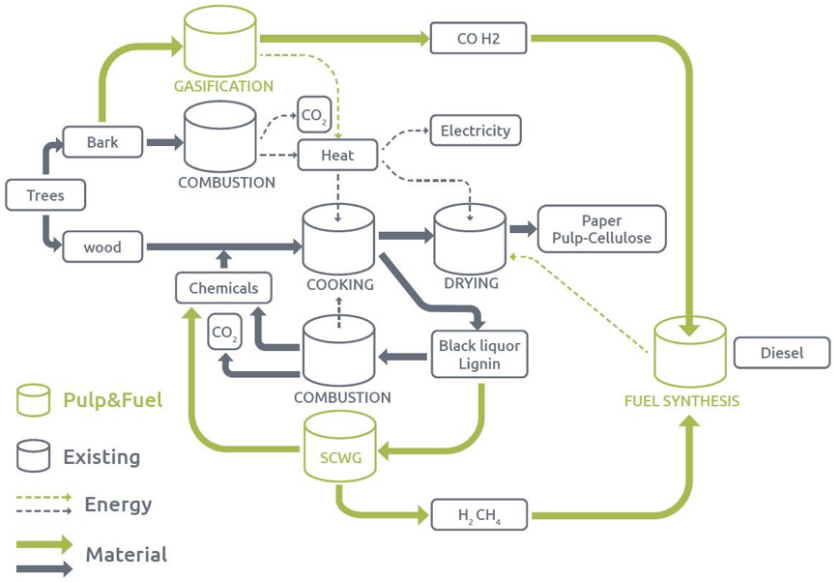

Figure 1: Processes studied in the Pulp&Fuel project.

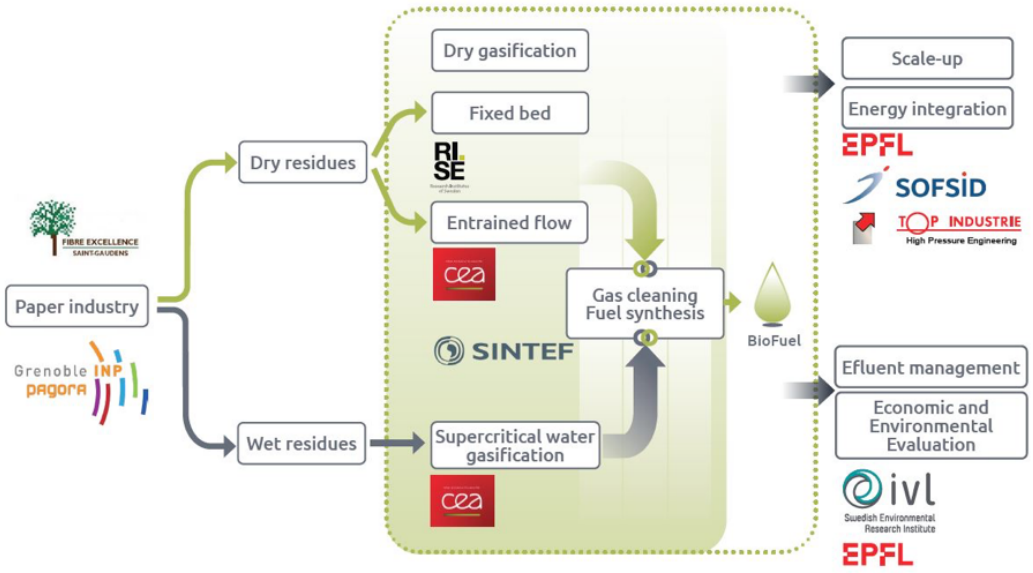

Figure 2: Tasks distribution within the partners.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 818011.

A NEW PARTNER FOR R&I ACTIVITIES ON BIOREFINERIES IN PORTUGAL

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BIOREF
Laboratório Colaborativo para as Biorrefinarias

LNEG, an EERA-Bioenergy member is heading a new entity called Associação BIOREF-Collaborative Laboratory (CoLAB) for Research & Innovation on Biorefineries.

BIOREF is a non-profit private association currently constituted by 20 associates: eight Universities and Polytechnics, and eleven companies (large companies and SMEs) all of them keen to look for new biomass-based advanced processes and technologies for investing into marketable products. LNEG acts as the President of the Administration Board of CoLAB BIOREF.

CoLAB BIOREF core R&I activities target the development of a variety of technological activities, considered essential for promoting the deployment of advanced biorefineries in Portugal and for supporting its CoLAB founding private members and any other European public or private entity that contracts the CoLAB as a high-tech service provider. The visual presentation of the integration of scientific, technological and innovation potential with main feedstocks and end-products being in the scope of BIOREF is given in Figure 1.

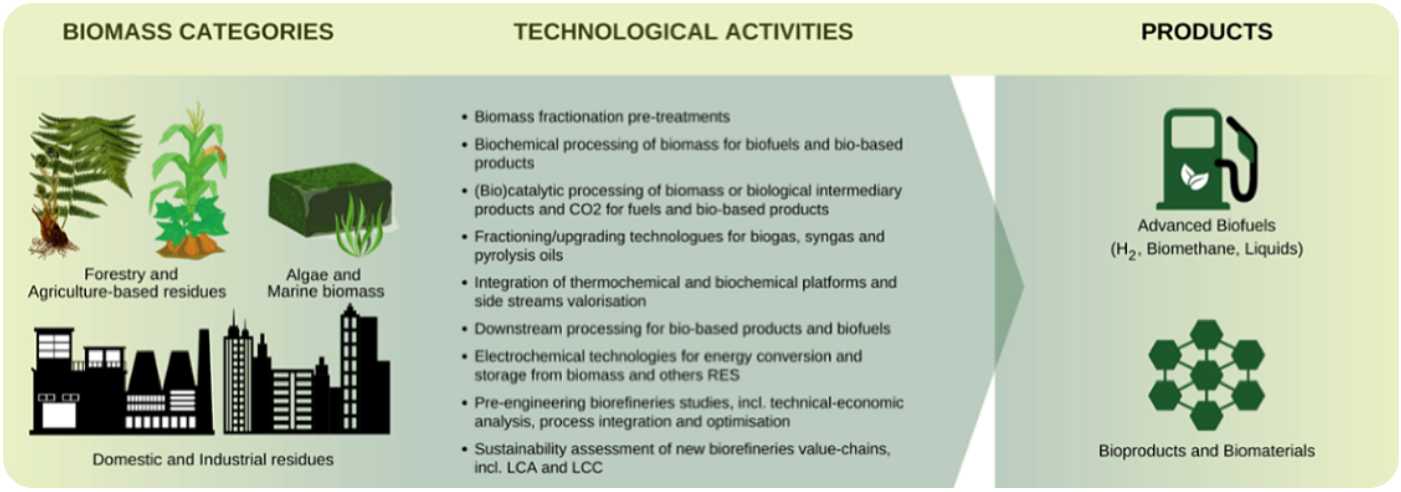

Figure 1: The integration of technological activities, biomass and products being in the interest of BIOREF CoLAB.

Development of new cost-effective technologies to produce biofuels and bio-based products and improvement in biomass conversion efficiency are cornerstone for the next 10 years of research. Innovation in this complex area requires strong links between R&D Centers and Private companies deeply interested in investing on these challenging, yet essential advanced technologies.

Five strategic R&I axes for innovation activities were defined and included in the Colab´s Agenda:

Strategic Axis #1: Sustainable Renewable Gases
Strategic Axis #2: Biomass Thermochemical Conversion
Strategic Axis #3: Bio-based Biorefineries
Strategic Axis #4: Advanced Liquid Biofuels
Strategic Axis #5: Purification and Downstream Processing of Bioproducts

The BIOREF CoLAB intends to be one of the driving forces to change the paradigm of economic development through a national strategy for biomass as a renewable resource. For this, BIOREF aims to:

1. Promote Bioeconomy and Bioenergy creating highly qualified national human resources taking advantage of biomass as a national and abundant resource.
2. Use the previous and well established national and international associations, networks (EERA, BBI JU, ESEIA, ETIP Bioenergy, ART Fuels Forum, IEA, CYTED, EABA, AEBIOM, ePure) and links with financial institutions (FCT, H2020, P2020, ANI, FAI) to promote internationalization and to facilitate high-quality innovation transfer of knowledge to national industrial tissue to achieve the development of biorefineries in Portugal.
3. Promote a "market-driven" Research & Innovation Agenda related to the use of advanced technologies characterized by more sustainable and the low(est) carbon footprint by the use of different types of biomasses, especially residues as feedstocks for new processes and products.
4. Focus on applied research and development (TRL 4-7) actions leading to the implementation of energy- and bio-based product-oriented biorefineries
5. Use of Key Performance Indicators (KPIs) focused on three pillars of sustainability (economic, social, and environmental) to monitor the accomplishment of BIOREF Vision.

To conclude, BIOREF is your right private partner for R&I development under Direct Research Services Provider and for Horizon Europe proposals for developing Low-Carbon solutions through energy- and bio-based biorefineries. Contact us! Link; joana-bernardo@bioref-colab.pt

BIOFIT - BIOENERGY RETROFITS FOR EUROPE´S INDUSTRY

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Nowadays, fossil fuel scarcity, environmental concerns and energy security have caused a great interest in the development of renewable energy systems. The increase of renewable energy production will not only reduce Green House Gas (GHG) emissions but also improve energy security, stimulate innovation, create new jobs and contribute to economic development.

Bioenergy retrofitting is one of the fast ways to increase the contribution of renewable energy in Europe by making the energy production of existing industries more sustainable. Retrofitting, which means replacing a part of a factory or installation with state-of-the-art equipment, can be a good alternative to replace fossil fuels or to upgrade renewable technology. Compared to building entirely new plants, retrofitting often means lower capital expenditure (CAPEX), shorter lead times, faster implementation, less production time losses and lower risks.

The BIOFIT project, supported by the European Union's Horizon 2020 programme, aims to facilitate the introduction of bioenergy retrofitting in five European industry sectors: first-generation (1G) biofuels, pulp and paper, fossil refineries, fossil firing power and Combined Heat and Power (CHP) plants.

The main activities in the BIOFIT project include the following: (1) development of specific case studies for bioenergy retrofitting for each of the industrial sectors considered,(2) obtaining an accurate and complete overview of options for bioenergy retrofitting in these industries, (3) engaging and supporting stakeholders and market actors, (4) assessment of framework conditions and (5) advice to policymakers at a national and regional level. One of the important outcomes of this project will be therefore the description of possible conversion options for the industries considered, as well as the conditions under which these retrofits can be made.

The BIOFIT consortium consists of fourteen partners from eight European countries: Sweden, The Netherlands, Germany, Spain, Finland, Austria, Bosnia-Herzegovina and Greece. The consortium includes both industrial and research partners. In this project, the Biofuels Unit at CIEMAT leads the bioethanol case study. Here, two retrofitting scenarios will be investigated together with the company Biocarburantes de Castilla y Leon (BCyL), aiming at integrating the production of advanced biofuels into the existing cereal-based 1G ethanol production facility in Babilafuente, Spain. The first mid-term length scenario (Figure 1) will aim to produce 11,000 m3/year of advanced bioethanol using some of the feedstocks listed in the Renewable Energy Directive, and others industrial waste streams under evaluation by the Spanish authorities to be included in that list. The second scenario (Figure 2) involves retrofitting of the existing 1G process to produce 19,000 m3/year of advanced ethanol from the unutilised components of the current feedstocks, thereby creating an integrated facility that produces both first-generation and advanced ethanol. The second case requires several modifications which will have a considerably longer duration and greater capital investment and expenditure than the retrofit of the first case.

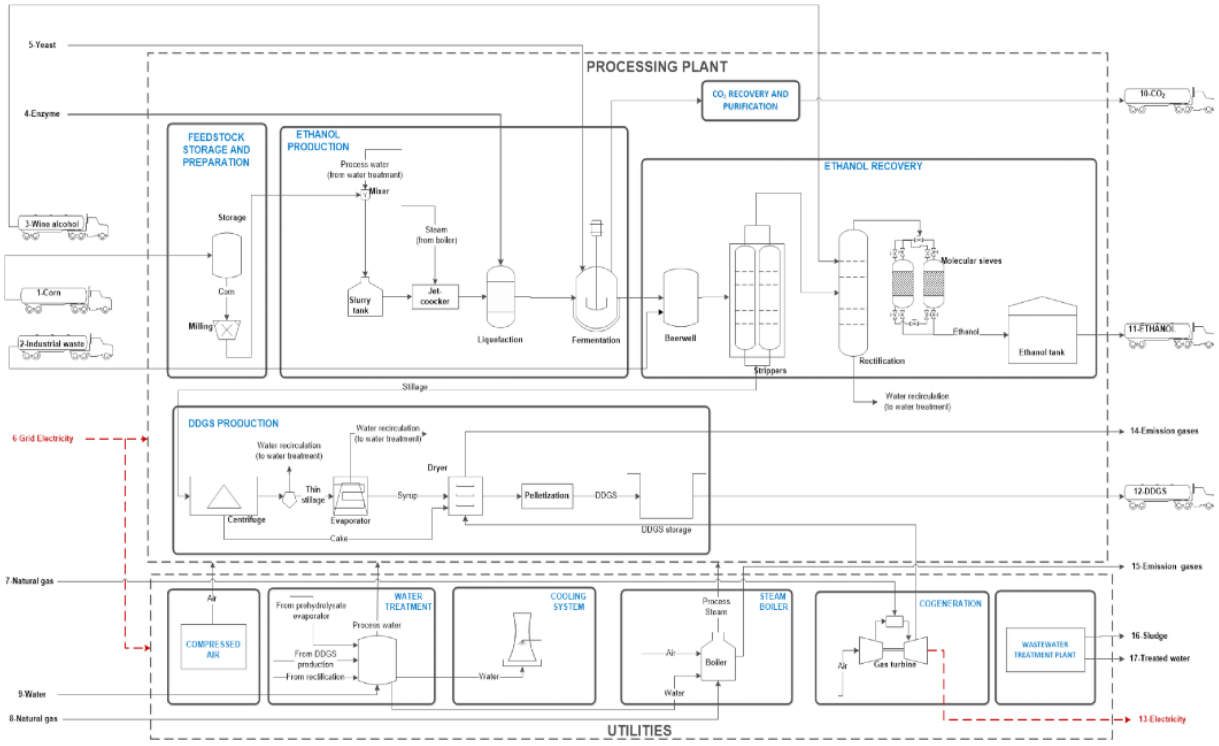

Figure 1: Descriptive flow sheet of the retrofit of Biocarburantes de Castilla y León facility (Scenario 1).

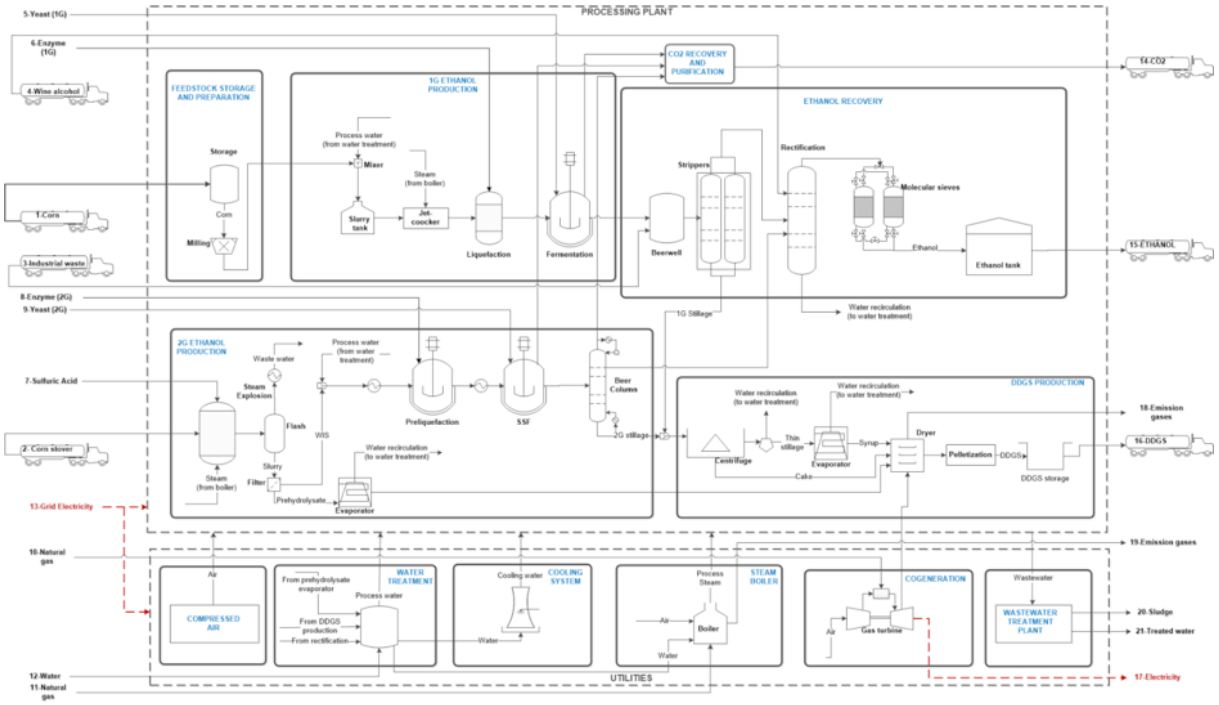

Figure 2: Descriptive flow sheet of the retrofit of Biocarburantes de Castilla y León facility (Scenario 2).

3RD DOCTORAL COLLOQUIUM BIOENERGY

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The 3rd Doctoral Colloquium BIOENERGY will take place on 17./18 9.2020 as a virtual event.

The European Union is committed to achieving climate neutrality by 2050, with the European Green Deal as instrument for steering progress towards climate protection and a more sustainable economy. To meet these targets, transformative action is needed by all sectors. Thanks to its versatility, bioenergy supports greenhouse gas emissions abatement, fosters the integration of renewable energy in a smart way, and extends the value chains of the bioeconomy.

Although the bioenergy research on European level is already very advanced, the diverse and high-level research on this topic is currently lacking networking and visibility. For this reason, it is highly important to bring together future researchers, industry leaders and policy makers early on to share knowledge, discuss research gaps and challenges. Simultaneously networking between scientific institutions that are already intensely involved in bioenergy research, needs to be extended.

Addressing that demand, the Doctoral Colloquium BIOENERGY was initiated in 2018. Since then, it not only serves as a platform for junior scientists to gain further qualification, but also provides them an opportunity for networking and scientific exchange. Doctoral researchers from both universities and other research institutions present and discuss their latest results and advancements.

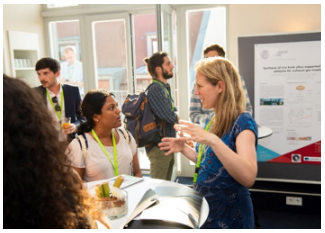

Figure 1: Networking sessions. 3rd Doctoral Colloquium BIOENERGY.

The Doctoral Colloquium BIOENERGY covers every part of the biomass conversion chain, from the feedstock to different conversion pathways and their technological implementation, up to the resulting products and services. Furthermore, the necessary system analyses and measures for system integration are addressed.

Figure 2: Ceremony. 3rd Doctoral Colloquium BIOENERGY.

The 3rd Doctoral Colloquium BIOENERGY is organized by the DBFZ - Deutsches Biomasseforschungszentrum gGmbH under the cientific direction of Professor Dr.-Ing. Daniela Thrän (DBFZ, UFZ - Helmholtz Centre for Environmental Research, University of Leipzig) and supported by the Scientific Advisory Board comprises more than 40 renowned bioenergy scientists from Germany, Austria, Switzerland and Norway.

For registration and further information, please visit our website at ⊕ Link.

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New members

FULL MEMBERS

BOUN - Boğaziçi University

Boğaziçi University (BOUN) is the highest-ranking, non-profit, public university of Turkey, founded in 1863. With more than 150 years of research and teaching tradition, its administrative and academic quality is recognized and approved by the European University Association (EUA).

The main tenets of BOUN's vision are increasing its competitiveness in academic research and being among the best research universities in the world. Around 1500 projects have been sponsored at the University by various funding resources such as EU Framework programs, European Molecular Biology Organization, American Philosophical Society, NIH, NSF and various multinational corporations, such as IBM, Siemens, Intel, SRC, Microsoft, SAP Germany. The success rate in the number and the estimated value of the awarded contracts has gradually increased since 2003, from the beginning of Turkey's association with FP6. The University is also a partner in the EURAXESS network and a mobility center in the university, established to support foreign researchers in Turkey and to encourage Turkish researchers in the participation of the mobility programs of the EU, works in accordance with more than 200 other mobility centers currently established in the other member and associate countries of the EU.

BOUN hosts 115 research laboratories and 22 R&D centers. Relevant to EERA Bioenergy subprogrammes, several research groups at BOUN are involved with sustainable production of algal biomass such as İstanbul Microalgae Biotechnologies Research and Development Center (IMBIYOTAB), a unique test-bed established around 2.500 m2 area as the main hub for algal biotechnology products for food, energy, pharma and environmental sectors. IMBIYOTAB is currently being upgraded and converted into an integrated biorefinery with a capacity of more than 2400 tons of algal biomass per year. Researchers from Institute of Environmental Sciences (IES) are involved with biomass to biofuels and solid waste to energy routes, whereas Dept. of Chemistry and Chem. Engr. are specialized in thermochemical platforms and primary thermochemical conversion systems respectively. Meanwhile, BOUN also has civil engineering faculty members working on stationary bioenergy fields.

Lastly, there is a strong group in BOUN Economics Department specializing in environmental sustainability and eLCA/sLCA/TEA assessments of biomass resources.

More information on Boğaziçi University can be found through their main website at: Link or from EERA Bioenergy representative Asst. Prof. Dr. Berat Haznedaroglu at berat.haznedaroglu@boun.edu.tr.

ASSOCIATE MEMBERS

CIRCE - Centre of Research for Energy Resources and Consumption

CIRCE Foundation was established in 1993 as an independent Research Centre to create and develop solutions and scientific/technical knowledge and to transfer them to the business sector in the field of energy. CIRCE's mission is to drive forward improvements in energy efficiency and to spread the use of renewable energy by means of the development of R&D activities and formative actions, thereby contributing to sustainable development.

Over 180 professionals with a broad variety of profiles compose the team of people working at CIRCE. Since 1993, CIRCE has conducted more than 2.500 R&D&I project at national and international level and has trained more than 1.850 professionals from 47 countries within the postgraduate courses CIRCE promotes. CIRCE maintains a national leadership position in the field of energy, being the second national research centre getting more projects in competitive calls during the period 2014-2019 in Spain.

The main research topics in CIRCE are energy efficiency, renewable energies (including solar, wind and biomass), smart mobility, natural resources, biomass, electrical substations, smart-grids and storage, industry 4.0, circular economy and sustainability.

As proof of its experience in international projects, CIRCE is involved in 23 FP7 projects, being the coordinator of 6 of them and 68 H2020, being coordinator of 21. Regarding European relevant associations and platforms, CIRCE is a founding member and currently in the board of SPIRE PPP, co-chair of the WG2 of the ETIP SNET, as well as member the Bio-bases Industries JU (BBI), EUREC, EARTO, the DHC+ Platform and the European Bioeconomy Network (EuBioNet).

Technologies for Bioeconomy Group

The group addresses the main thermochemical activities within CIRCE while is in charge of **demonstrating the feasibility of different technologies to valorise biomass** and other raw materials coming from residues. Among these technologies, CIRCE has extensive experience in biomass combustion, gasification, pyrolysis, and others, both in simulation and experimental facilities. This experience is combined with a strong working line in **energy-intensive industrial processes**, assessing energy and resource efficiency by means of simulation and computer vision techniques.

The Technologies for Bioeconomy Group counts with a vast experience in market analysis and **resources availability** to be transformed, not only into biofuels but also into other commodities. In this line, CIRCE offers the following capacities:

- Supply chain and quality impact of resources.
- Evaluating the most promising markets for biomass resources.
- Determining the potential of different biomass resources in Europe at a regional, province or county scale through geographical information systems.
- Assessing the most promising areas of production from the theoretical data to understand the real availability of resources.
- Studying the contractibility, risks, and opportunities of the procurement of certain biomass resources.

Moreover, the Group conducts activities leading to empower EU regions for maximising the mobilisation and use of endogenous biomass feedstock and implementing methodologies to address rural development challenges. Thus, CIRCE guides and supports policymakers and other regional stakeholders to make the most suitable decisions in the transition to a bioeconomy era.

circe
RESEARCH CENTRE
FOR ENERGY RESOURCES
AND CONSUMPTION

WIP Renewable Energies

WIP is a renewable energy consultancy with a long history of managing research and innovation projects and organizing leading conferences and events in the sector. With more than 30 years of experience and a multinational team of over 20 people, we have already successfully implemented more than 350 European and international projects in the field of Renewable Energy.

Our mission is to contribute to this goal by facilitating research, innovation and market integration of renewable energy systems through collaborative efforts across all sectors of society.

Our services

Research, Consultancy, Communication and Exploitation Services

Research & Consultancy

We have a long track record of carrying out *high-quality studies* in all areas where our company is active. The type of work ranges from *economic assessments and market research to policy analysis and Life Cycle Assessments*.

Comms, dissemination and exploitation

We have a team of experts who develop *communication campaigns*, Stakeholder workshops as well as *strategies for the exploitation of R&I project results*, targeting either the general public or selected target groups.

Event Organisation

WIP's expertise with event organization includes the *conception, pre-financing, preparation, organisation and management* of high-level and large-scale inter-national conferences, workshops, seminars and exhibitions in the field of RES.

Thematic areas at WIP

Renewable Energy Technologies

- Solar energy
- Bioenergy & bioeconomy
- Wind energy
- Hydropower
- Other Renewable Energy Technologies

Energy System Integration

- Energy storage and grid integration
- Energy efficiency
- Smart cities and networks
- Sector coupling

Market Uptake

- Social Innovation
- Policy development
- Sustainability analysis
- Training and capacity building
- Communication and ExploitationCIRCE Foundation was established in 1993 as an independent

Research Centre to create and develop solutions and scientific/technical knowledge and to transfer them to the business sector in the field of energy. CIRCE's mission is to drive forward improvements in energy efficiency and to spread the use of renewable energy by means of the development of R&D activities and formative actions, thereby contributing to a sustainable development.

A selection of WIP's bioenergy reference projects

Today, bioenergy is the EU's largest renewable energy source, and it is expected to remain a key component of the energy mix in 2030 and beyond, thus making an important contribution to the renewable energy target of the European Union. Representing an innovative solution for the heat, electricity and transport sector, sustainably managed biomass is thus a main driver of the development of a European bioeconomy. For this reason, WIP is engaged in projects enhancing the development of bioenergy solutions and the uptake of a circular and sustainable bioeconomy in Europe.

DiBiCoo - Digital Global Biogas Cooperation.

MUSIC - Market Uptake Support for Intermediate Bioenergy Carriers.

BE-Rural - Bio-based strategies and roadmaps for enhanced rural and regional development in the EU.

BIOPLAT-EU - Promoting sustainable use of underutilized lands for bioenergy production through a web-based Platform for Europe.

BABET-REAL5 - New Technology and Strategy for a Large and Sustainable Deployment of Second Generation Biofuel in Rural Areas.

BIOFIT - Bioenergy Retrofits for Europe's Industry.

WIP RENEWABLE ENERGIES

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Germany
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Useful information

1. IEA Bioenergy Task 37 updated list of biogas upgrading plants

IEA Bioenergy Task 37 (biogas) collected a list of 606 facilities greening the gas grid in their member countries. Growth in industry is extensive with significant scale in Germany, UK, Sweden and France.

The database of biogas upgrading facilities is available here:
Link

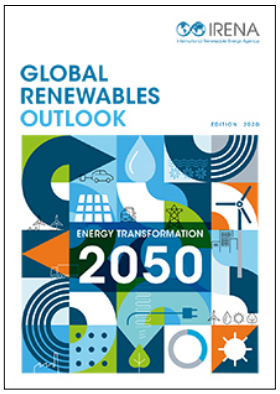
2. EU Circular Economy Action Plan

The European Commission has adopted a new Circular Economy Action Plan - one of the main blocks of the European Green Deal, Europe's new agenda for sustainable growth.

The new Action Plan announces initiatives along the entire life cycle of products, targeting for example their design, promoting circular economy processes, fostering sustainable consumption, and aiming to ensure that the resources used are kept in the EU economy for as long as possible. It introduces legislative and non-legislative measures targeting areas where action at the EU level brings real added value.

The EU Circular Economy Action Plan is available here:
Link

Publications



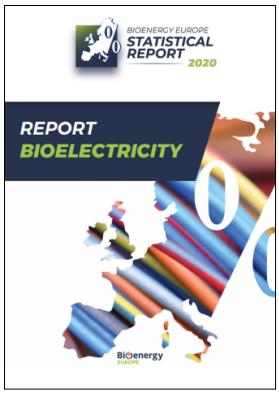
Global renewables outlook: Energy Transformation 2050

International Renewable Energy Agency (IRENA)

TThe Global Renewables Outlook shows the path to create a sustainable future energy system. This flagship report highlights climate-safe investment options until 2050, the policy framework needed for the transition and the challenges faced by different regions. As the world seeks durable economic solutions, accelerated uptake of renewables promises to drive sustainable development, boost well-being and create tens of millions of new jobs.

This comprehensive analysis from IRENA outlines the investments and technologies needed to decarbonise the energy system in line with the Paris Agreement. It also explores deeper decarbonisation options for the hardest sectors, aiming to eventually cut carbon dioxide (CO_2) emissions to zero.

PDF



Bioenergy Europe: Statistical Report 2019

Bioenergy Europe

The European Biomass Association (Bioenergy Europe) has published the following chapters of its statistical report 2020. In addition, each report is accompanied by a policy brief.

Bioenergy Europe: Statistical Report 2020 - Bioelectricity

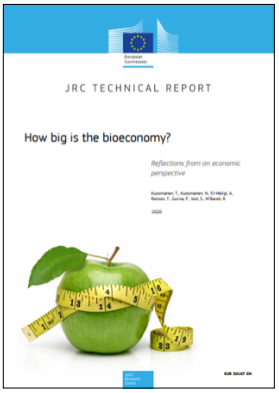
This report provides readers with accurate and up-to-date information on the current state of play of bioelectricity, the availability and dynamics of supply, and much more!

PDF

Bioenergy Europe: Statistical Report 2020 – Biogas

The report provides readers with accurate, up-to-date data on the current state of play of biogas consumption and production and much more!

PDF

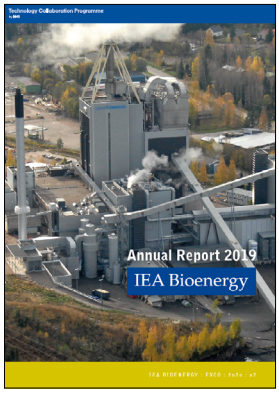


How big is the bioeconomy?

JRC Technical Report, European Commission

The critical role of the Circular Bioeconomy in the sustainable transition has been widely recognized, to the point that many countries worldwide have elaborated their bioeconomy strategies and others are in the process of framing their own. The purpose of the report is to advance more objective and rigorous measurement and analysis of the bioeconomy according to the broad definition of the European Commission in 2018. The focus is mainly on the economic indicators, aiming at the inclusion of bio-based services derived from the symmetric input-output tables from the system of national accounts available from Eurostat and additional expert information.

PDF



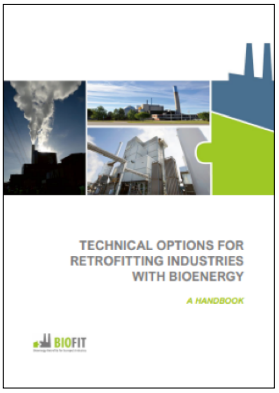
IEA Bioenergy Annual report 2019

IEA Bioenergy

The IEA Bioenergy Annual Report 2019 includes a special feature article 'Gasification – a versatile technology' prepared by Task 33.

The Annual Report also includes a report from the Executive Committee and a detailed progress report on each of the Tasks. 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.

PDF



Handbook: Technical options for retrofitting industries with bioenergy

BIOFIT project

The BIOFIT project, supported by the Horizon 2020 programme of the European Union, supports bioenergy retrofitting in Europe's first-generation biofuels industry, pulp and paper industry, fossil refineries, fossil power plants, and in combined heat and power (CHP) industries. The selection of these industries is due to the specifications of the call text in the Horizon 2020 programme, under which BIOFIT was submitted in the call for proposals.

To present the technical opportunities of retrofitting, this handbook on "Technical options for retrofitting industries with bioenergy" was written by the BIOFIT consortium members. The handbook paints a broad picture of technical solutions for the targeted industries, which are very different, but which may face similar challenges. The objective is to provide this information to stakeholders and decision-makers in the relevant industries who might have little technical background knowledge. The handbook should facilitate the technical understanding of bioenergy opportunities for their industries. It is presented in simple language and includes many easy-to-understand graphs and illustrations.

PDF

Trends on use of solid recovered fuels

IEA Bioenergy Task 36

This IEA Bioenergy Task 36 report analyses the trends on the use of solid recovered fuels (SRF) in a selection of countries in Europe, Asia and Africa. Solid Recovered Fuels (SRFs) are a subset of the large family of Refuse Derived Fuels (RDFs), consisting of processed fuels that meet specific quality requirements defined in a standard. The report looks at the current role of SRF (production and final end uses) in the waste-to-energy value chains, with the main drivers and barriers. It also looks into future perspectives of the use of SRF for energy recovery, within circular economy developments.

PDF

Save the date! International bioenergy events

JULY 2020

6-9 July 2020
28th European Biomass Conference & Exhibition (e-EUBCE 2020)
Virtual conference
link

8-10 July 2020
Advanced Bioeconomy Leadership Conference (ABLC 2020)
Washington DC, USA
link

AUGUST 2020

16-18 August 2020
9th Asia-Pacific Biomass Energy Exhibition
Guangzhou, China
link

SEPTEMBER 2020

9-10 September 2020
Biomass Trade Summit Europe 2020
Amsterdam, The Netherlands
link

15-17 September 2020
Advanced Biofuels Conference 2020
Stockholm, Sweden
link

17-18 September 2020
15th International Conference on Biofuels and Bioenergy
Virtual conference
link

21-22 September 2020
15th Global Summit and Expo on Biomass and Bioenergy
Virtual Conference
link

22-23 September 2020
Biogas Power ON
Copenhagen, Denmark
link

22-23 September 2020
Future of Biofuels 2020
Copenhagen, Denmark
link

22-30 September 2020
20th Congress for Wood Energy
Virtual conference
link

29-30 September 2020
Biomass for Energy 2020
Kiev, Ukraine
link

OCTOBER 2020

6-7 October 2020
Oleofuels 2020
Marseille, France
link

12-13 October 2020
16th World Bioenergy Congress and Expo
Virtual and physical event in Zurich, Switzerland
link

15 October 2020
100% RHC EVENT 2020 / The RHC ETIP Annual Conference Online
Virtual conference
link

NOVEMBER 2020

17-19 November 2020
European Bioenergy Future (EBF) 2020
Brussels, Belgium
link

EERA Bioenergy in Europe

Table 1: Full and Associate members of the EERA Bioenergy Joint Programme.

Aalborg University
Department of Energy Technology (Denmark)

web

AICIA
Asociación de Investigación y Cooperación Industrial de Andalucía (Spain)

web

BERA
Belgian Energy Research Aliance (Belgium)

web

BESTMER
Ege Üniversitesi Biyokütle Enerji Sistemleri ve Teknolojileri Merkezi Ege (Turkey)

web

BOUN
Boğaziçi University (Turkey)

web

CAMPUS IBERUS
Campus de Excelencia Internacional del Valle del Ebro (Spain)

web Campus / web Universidad

CEA
French Alternative Energies and Atomic Energy Commission (France)

web

CENER
National Renewable Energy Centre – Biomass Deparment (Spain)

web

CIEMAT
Centro de Investigaciones Energéticas, Medioambientales y Tecnológicas (Spain)

web

CIRCE
Centro de Investigación de Recursos y Consumos Energéticos (Spain)

web

CNR
Istituto Motori del Consiglio Nazionale delle Ricerche (Italy)

web

CNRS
Centre National de la Recherche Scientifique (France)

web

CRES
Center for Renewable Energy Sources and Saving (Greece)

web

CSIC
Agencia Estatal Consejo Superior de Investigaciones Científicas (Spain)

web

DFBZ
Deutsches Biomasseforschungszentrum gemeinnützige GmbH (German Biomass Research Center gGmbH)

web

DTU
Technical University of Denmark

web

ECN
Energy Research Centre of the Netherlands (The Netherlands)

web

ENEA
Italian National Agency for New Technologies, Energy and Sustainable Economic Development (Italy)

web

FCiências.ID
Associação para a Investigação Desenvolvimento de Ciências (Portugal)

web

IEN
The Institute of Power Engineering (Poland)

web

IFK Stuttgart
Institute of Combustion and Power Plant Technology (Germany)
web

IMDEA
Instituto Madrileño de Estudios Avanzados (Spain)
web

KIT
The Research University in the Helmholtz Association (Germany)
web KIT / web BIOLIQ

LNEG
Laboratório Nacional de Energia e Geologia (Portugal)
web

NIC
National Institute of Chemistry (Slovenia)
web

NTNU
Norwegian University of Science and Technology (Norway)
web

NTUA
The National Technical University of Athens (Greece)
web / web

PSI
Paul Scherrer Institut (Switzerland)
web

RE-CORD
Renewable Energy Consortium for Research and Demonstration (Italy)
web

SINTEF
(Norway)
web

TÜBITAK
Scientific and Technological Research Council of Turkey (Turkey)
web

UKERC
UK Energy Research Centre
web
ASTON UNIVERSITY
web
SUPERGEN Bioenergy Hub
web
(United Kingdom)

UNIBO
Universitá di Bologna (Italy)
web

UNICT
Università degli studi di Catania (Italy)
web

UNIMORE
University of Modena and Reggio Emilia (Italy)
web

UNIPD
Università degli Studi di Padova (Italy)
web

UNITO
Università di Torino (Italy)
web

UNL
Universidade NOVA de Lisboa, Faculdade de Ciências e Tecnologia (Portugal)
web

UPV/EHU
University of Basque Country (Euskal Herriko Unibertsitatea) (Spain)
web

UWM
University of Warmia and Mazury in Olsztyn (Poland)
web

VŠB
Technical University of Ostrava (Czech Republic)
web

VTT
Technical Research Centre of Finland Ltd (Finland)
web

WIP
WIP Renewable Energies (Germany)
web

WUR
Wageningen University & Research (The Netherlands)
web

EERA Bioenergy in Europe

EERA Bioenergy is open to new complementary RTD organisations.
Please contact the Joint Programme Secretariat for further details at secretaria@bioplat.org

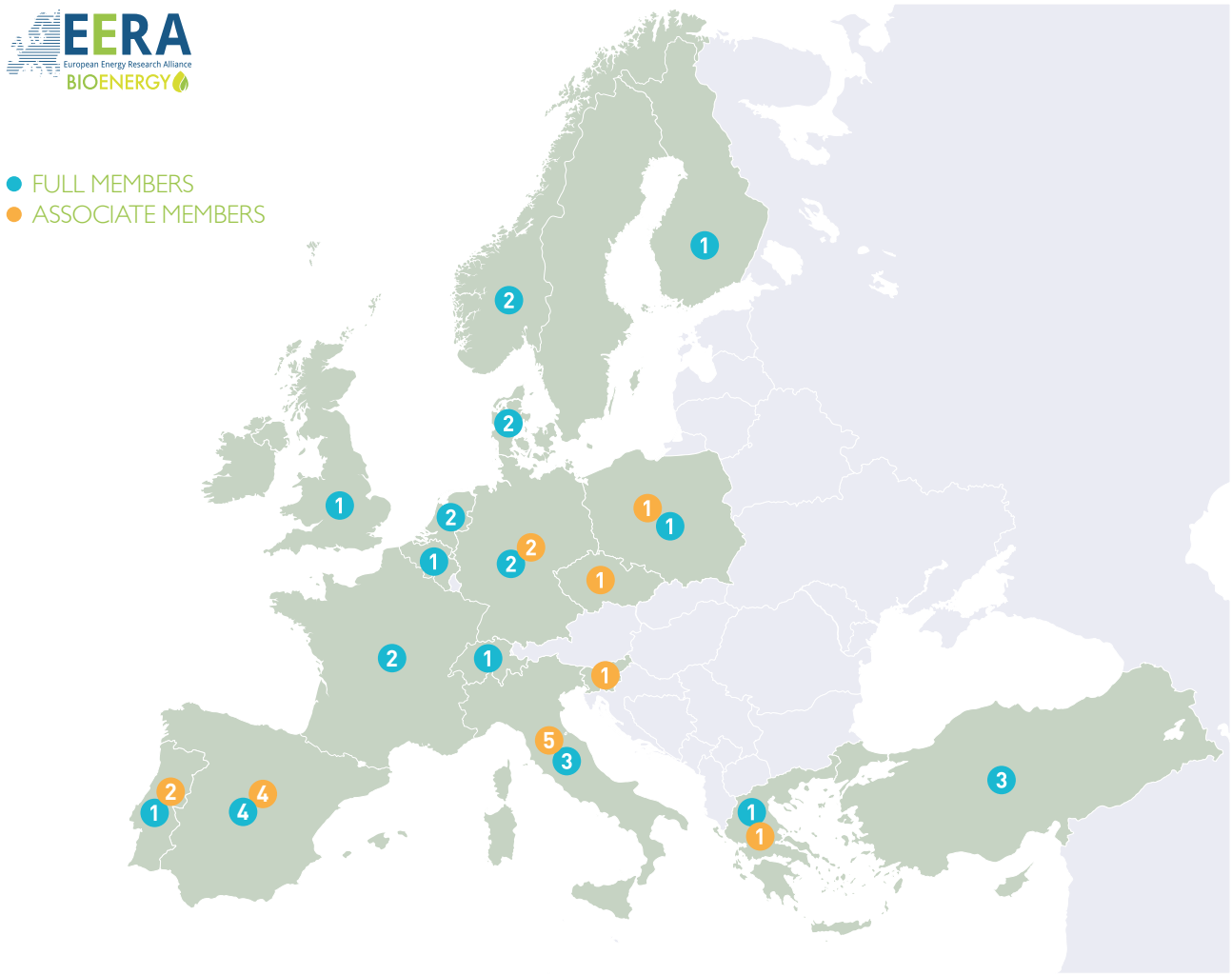


Figure 1: The EERA Bioenergy Joint Programme consists of 44 members (27 Full members and 17 Associate members) from a total of 18 countries. Link

www.eera-bioenergy.eu

Contacts

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