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Document Browsing Icons:

Index | Previous page | Back to previous page | Next page

Print | Zoom in | Zoom out

CONTENTS

Joint Programme Coordinator's corner

Myrsini Christou
EERA Bioenergy Coordinator

Dear EERA Bioenergy members, dear eebionews readers,

Last week the EUBCE - European Biomass Conference & Exhibition was held in Marseille 24-27 June 2024. Impressive event, numerous sessions and side-events, wide range of topics addressed: from availability of sustainable resources to conversion for energy, carriers, fuels and bio-based products and finally to sustainability impacts and policies. Here I will focus on advanced biofuels and biomethane specifically, which was a topic addressed in several sessions and side-events. I had the honor and pleasure to chair two Industry Track sessions, one on the "Progress in innovative biomethane technologies development" and the other on the "Biomethane production and market development" and participated in Tripartite Roundtable discussions on biomethane with two large delegations from India and China.

Further to that, the BIP – Biomethane Industrial Partnership organised an inspiring event on "EU Feedstock Potential for Sustainable Biomethane: Opportunities from Novel Cropping Systems and Marginal and Contaminated Lands", where I had the pleasure to present the report prepared by the BIP team on biomethane potential from the deployment of novel cropping systems across Europe.

Finally, yet importantly, I had the opportunity to present the work being done in the GreenMeUp Project for enhancing the uptake of biomethane in Europe and aligning the deployment of biomethane in several EU Member States.

More information on all events can be found in the conference website.

But why biomethane?

Because biomethane is here and now. Biomethane is already available as renewable gas injected into the Natural Gas grid. It prevents emissions across the whole value chain, with a three-fold emissions mitigation effect. Firstly, by preventing the emissions produced by the decomposition of the organic matter from being released into the atmosphere, secondly by displacing fossil fuels and thirdly by returning organic carbon back into the soil when digestate is used as soil fertilizer and enhancement. On top of all, there is the ambitious goal set by the REPowerEU of the production of 35bcm biomethane by 2030 in Europe, which triggers the fast development of this market.

Some highlights from all these meetings could be:

- Europe is the largest producer of biogas and biomethane in the world today, and it will be essential to scale up production of these renewable gases to meet renewable energy demand by 2030 and achieve climate targets in 2050.

- Considering that at present only 4.2 bcm of biomethane is produced in Europe there is still a huge gap to bridge to meet the target of 35bcm by 2030. How shall we proceed? Jens Bo Holm-Nielsen suggested that we need sustainable feedstocks and cheap carbon sources, biomethane in the European Gas Grid and biogas CO_2 for methanation, and Power to X with wind and solar scale up cases.

- To do the above, a two-fold approach should be followed: By enhancing R&I activities and by strengthening policies.

R&I is needed first to unlock the availability of residual biomass that is still largely unexploited. In the GreenMeUp project, we recorded low biomass mobilization in countries where the biomethane target lags, lack of incentives for feedstock providers to deliver their feedstock to biogas plants, low digestate use as fertilizer and soil enhancement. We estimated that the theoretical potential of agricultural residues (manure, straw, food waste) could reach 40 bcm. However, we could expect that only 40% of these quantities could be actually reached with the present biomass logistics. R&I is needed to produce new feedstock with novel cropping systems and using marginal and contaminated lands. In the exercise we have done in BIP – Task Force 3 "Assessing sustainable potential for innovative biomass sources to produce biomethane" we worked out several examples with crop rotations in the several agro-environmental zones of Europe (Atlantic, Boreal, Continental and Mediterranean). The estimated theoretical potentials allowed the production of 40bcm by 2030.

R&I is also needed to support innovations for cost-efficient conversion technologies. A variety of technologies are being tested in numerous R&I projects, like HYFUELUP (Hybrid Biomethane Production from Integrated Biomass Conversion) project presented by Gonçalo Lourinho/ CoLAB-BIOREF (Portugal) that aims to develop an advanced technology for biomethane production using gasification and methanation. Supercritical water gasification process to prepare biogas from sewage sludge demonstration plant is another research topic presented by Sebastien Quenard /CEA (France).

Strengthening of policies and development of country-tailored policy frameworks is of outmost importance, as pointed out by Mieke Decorte / EBA (EU Biogas Association). In terms of planning, one of the measures are including specific targets in the National Energy and Climate Plans. All countries must submit their updated NECPs and the Commission has encouraged Member States to include a component on biogas and biomethane. Out of 22 NECP's published, 17 mention either a biomethane or a biogas target. In 10 NECPs there's a biomethane target, 6 had a biomethane target already announced at the national level but not yet included in the NECP. Belgium, Bulgaria, Germany, Hungary, Portugal and Romania do not have any target.

In the GreenMeUp project, we identified that the absence of well-defined roadmaps outlining planned regulatory and legislative changes, along with short-, medium-, and long-term biomethane production targets, creates uncertainty and risks hindering the country's ability to achieve EU targets. Full transposition of RED II into national legislation is still pending in most countries. Long licensing procedures, lack of certification mechanisms or national registry for biogas/biomethane, uncertainty regarding the accounting of injected biomethane are among the major barriers that need country-tailored policy measures.

It was very interesting here to see that outside EU there were also initiatives to support the biomethane market. Sam Lehr /Coalition for Renewable Natural Gas (USA) presented successful policy measures in the USA, like compliance programs for clean fuel standards, renewable gas standards, clean heat standards, clean electricity standards and tax credits. GHG Accounting Standards Carbon Accounting Guidance are in development. In India on the other hand, according to SSV Ramakumar/ Indian Oil Corporation (India), there is a highly proactive policy framework "SATAT – Sustainable Alternatives to Affordable Transportation" that applies also to biomethane. Measures are related to the feedstock supply chain, capital subsidies, mandates & infrastructure creation, and other enablers. The interesting thing with India is the strong involvement of Ministry of Fertilisers for the promotion of organic manure use.

In a nutshell:

As the European Biogas Association (EBA) states: "Biomethane can directly substitute on the rise natural of gas imports, being it flexible as readily stored and deployed using existing gas infrastructure and technologies. Production is growing and, by 2050, it can be increased at least fivefold, going up to 167 bcm for biogas and biomethane together. This potential can be delivered using sustainable feedstocks".

Myrsini

EERA Bioenergy news in brief

WEBINARS ON COLLABORATIVE EU PROJECTS GENERATION

EERA Bioenergy JP organised on March three internal webinars to promote synergies among the five Subprogrammes and boost project collaboration among EERA Bioenergy members.

These webinars gathered scientists and researchers from the organization to explore key technologies and solutions for renewable energy and for transport and therefore contribute to European climate policies and the United Nation's Sustainable Development Goals.

These were the topics discussed:

- HORIZON-CL5-2024-D3-02-03: Development of smart concepts of integrated energy-driven bio-refineries for co-production of advanced biofuels, bio-chemicals and biomaterials

This topic gave rise to two separate webinars, an initial one on 7 March that served to introduce the members and their preliminary ideas; and a second one on 25 April, in which the two potential consortia that emerged on SAF and biomethane production were discussed in more detail.

- HORIZON-CL5-2024-D3-02-10: Market Uptake Measures of Renewable Energy Systems

On 15 March, the webinar about market uptake measures was held. A couple of ideas emerged on improving social acceptability of SAF and Renewable Energy Systems.

- HORIZON-CL5-2024-D3-02-02: Development of next-generation synthetic renewable fuel technologies

The last webinar took place on 20 march and gave rise to the greatest variety of ideas involving different renewable fuel technologies.

POSITION PAPER ON 'BIOENERGY, BIOGAS AND BIOFUELS: RESEARCH AND INNOVATION GAPS IN THE EU', PRESENTED AT EUBCE 2024

In the framework of the 32nd **European Biomass Conference (EUBCE)**, which took place from 24-27 June in Marseille (France), EERA Bioenergy published a position paper on 'Bioenergy, Biogas and Biofuels: Research and Innovation Gaps in the EU'. Prepared during the first half of 2024 by the EERA Bioenergy members, its Management Board and Secretariat, this document is an update of EERA's Strategic Bioenergy Research and Innovation Agenda drafted to respond to the current momentum the energy landscape is going through from a scientific-technical perspective.

The paper highlights that advance in the development of bioenergy, biofuels and biogas technologies and processes will bring direct benefits to the European policy context. "The sustainable deployment of this sector will contribute to the extension and consolidation of the bioeconomy in all European regions, which has implications beyond energy and environmental concerns," it states, with the potential to induce significant benefits in both the primary and secondary sectors and in the demographic challenge.

Among the main reflections provided by the position paper, the following stand out:

- Bioenergy (energy, heat, fuels) will always be an integral and unavoidable part of optimised biomass valorisation strategies, either as a main product in so-called bioenergy/biofuel-based biorefineries or as a secondary product(s) in so-called bioproduct/biochemical/biomaterials-based biorefineries. "The next generation of biorefineries will have to integrate schemes via cascade-type processes to co-produce more than one biofuel/bioproduct. Biorefinery products versatility is key for economic feasibility, we need also the same versatility in the plants to process the feedstock", said Marcelo E. Domine (ITQ-CSIC), Subprogramme 3 Coordinator, during the presentation of the paper at EUBCE 2024.
- We need more bio-based carbon. Too often, the focus is on maximising carbon yield and the option of CO_2 sequestration or the use of biochar to achieve negative emissions is forgotten. More emphasis needs to be placed on this important aspect of bioenergy. When developing bioenergy and biofuel systems, it should not be forgotten that materials and energy go hand in hand. In the current effort to develop the bioenergy and biofuels sector, synergies with the creation of bio-based products from biomass should be addressed much more, from low TRL to deployment.
- To meet the future biomass demands required in the various sectors of the European circular bioeconomy (biocircularity), European non-food crops and aquatic feedstocks as well as agricultural, process and post-consumer waste must be used in a circular and sustainable way. Large quantities of sustainably sourced non-European biomass feedstocks should also be available to meet future European market demand and ensure security of supply.
- Further development of so-called biocommodities and a global biocommodities market will be the key success factor for making the right quantities of biomass feedstocks of the right quality available in the right place at acceptable costs. "Commodities are the solution, if there are too many standards, none of them will become a commodity", stated Wolter Elbersen (WUR), Subprogramme 1 Coordinator.
- The emergence of a biofuels industry often implies significant technological changes and economic effects beyond the sector itself, which can be estimated using CGE2 models; these models are also well suited to study the effects of policy interventions/support and can simulate biofuels market dynamics.
- Regarding the environmental impacts of bioenergy, access to company data will increase the credibility of LCA studies3; appropriate scaling of the product system is required to ensure that environmental assessments reflect commercial-scale conditions; furthermore, LCAs should also consider the effects of future technological changes in value chains associated with or supporting the production of advanced fuels.
- As a last conclusion, the paper also points out that public knowledge and awareness of bioenergy in Europe is low compared to other renewable energies. "Some of the main public concerns are related to scarcity of water resources and competition with existing food supply and price. Improving social acceptance and commitment will provide the basis for increasing the market share of bioenergy/biofuel production systems," it concludes.

STEERING COMMITTEE MEETING AT EUBCE 2024 (MARSEILLE)

In the framework of the 32nd European Biomass Conference & Exhibition in Marseille (France), EERA Bioenergy held its first Steering Committee meeting in 2024, on the 25th of June.

Myrsini Christou, Joint Programme Coordinator, opened the meeting by welcoming the attendees and requesting feedback from them regarding the position paper document on 'Bioenergy, Biogas and Biofuels: Research and innovation gaps in the EU' which had been presented earlier that morning during a workshop at EUBCE. This led to a debate in which Maria Georgiadou - DG RTD comments were also included, since she attended the position paper presentation but not the meeting.

All participants agree about the importance of creating synergies and disseminating the position paper to facilitate research identification in those areas where it is missing, such as technological improvement implementation. To increase the reach of the publication, Margarita de Gregorio, EERA Bioenergy Secretariat, proposed to publish a press release with a compilation of the key messages and ideas.

Besides, the Management Board expressed their wish to keep working on this paper for the next 6 to 8 months, maintaining the document alive and updating it yearly, to include members' inputs and make it useful for the EU.

After addressing the position paper issue, the different Subprograms Coordinators took the floor to review the goals achieved since January and present the activities planned for the 2nd semester of 2024. One of the most relevant announcements was made by Berend Vreugdenhil (TNO) when he pointed out that there is a vacancy at SP4 Stationary Bioenergy and invited potential applicants to apply.

Another idea that met with broad consensus among the participants was to recommend that European R&D projects should have a long-term approach, i.e. 9 to 15 years in duration. In the opinion of the EERA Bioenergy members, 4 years are not enough to analyse the whole value chain, from feedstock, logistics, procurement, etc. However, it was suggested that interim evaluations of the projects should be carried out every 3 to 4 years.

On this occasion, instead of making a presentation during the meeting, the update on the Communication and Dissemination activities carried out by the EERA Technical Secretariat (BIOPLAT) in the first semester and the plans for the rest of the year would be distributed after the meeting.

Margarita de Gregorio thanked all the participants for their valuable participation in this meeting and hoped they would all participate as well in all the planned activities for this semester. The next Steering Committee was set to be in November.

Bioenergy highlights

SCENARIOS AS STRATEGIC DECISION SUPPORT TOOLS FOR THE SYSTEMIC INTEGRATION OF BIOMASS

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The future utilization of biomass hinges upon a nexus of factors, encompassing existing technologies, infrastructure capabilities, and the abundance and limits of available biomass resources. In tandem, evolving trends, drivers, and aspirations in energy and material applications, alongside climate imperatives, shape this trajectory. The complexity of this challenge requires systemic evaluations and forward-looking perspectives to underpin decision-making processes. The Working Group Biomass in the Energy System at DBFZ, led by Dr. Nora Szarka, engages in forward-looking systems analyses, fostering strategic decision-making for biomass integration into the bioeconomy. One pivotal approach involves trend analysis and scenario development. The Working Group develops and interpret bioenergy and bioeconomy scenarios through a modular framework, operating at both national and regional scales. The applied methods anticipate potential trajectories based on diverse drivers using participative approaches, building consistency, dissecting the trends and assembling comprehensive scenarios. As results, consistent pathways for biomass integration into the evolving bioeconomy landscape are built. In the following, two examples of the scenario work of the Working Group Biomass in the Energy System are presented.

1. Database for German energy scenarios

The goal was the development of a database of German energy and climate scenario studies for the visualisation of various energy scenarios, their assumptions and results. This allows an overall view of numerous study results, their understanding and effective comparison.

METHOD

Identification and analysis of scenario studies

Literature search, single studies and meta-analysis
Official publications e.g. via RSS-Feeds and websites of authors

Quantitative assessment of scenario studies

Data in the form of tables, graphics or within the text.

Database development

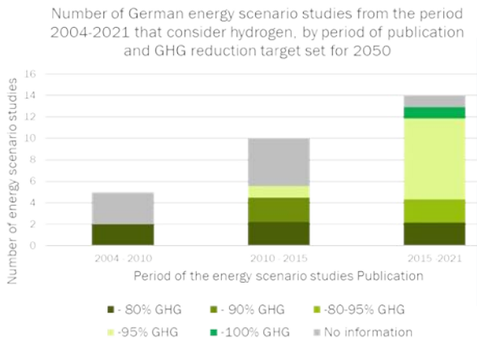
Example parameters:

- Biomass potential
- Energy production
- Primary energy consumption
- Final energy consumption
- Energy import/export
- Gross domestic product
- Population

RESULTS

Scenario Tool database
94 Energy studies - 536 Single-scenarios - 23.198 Data points

An example of the scenario tool database: hydrogen within energy scenarios



Early studies:
More hydrogen integrated in scenarios for GHG reduction

Increasing reduction of hydrogen in the studies correlates with higher GHG reduction ambitious

2. European policy portfolio scenarios for the material use of biomass

Goal of this study was the development of policy portfolio scenarios for four biomass material use sectors –chemicals, construction, plastics and textile– until 2050, in the framework of the SUSTRACK project[1]. The scenarios should entail policy goals that are essential for the transformation to a circular biobased economy. The resulted scenarios will be implemented in a system dynamics model (Green Economy Model) and will be used for the identification of policy priorities.

METHOD

Criteria used to select scenario parameters:

- Broaden material use of biogenic materials, residues and wastes
- Expand circularity instead of linearity
- Scale down amount of waste and disposal
- Cut down GHG emissions
- Lower biodiversity and land use impacts

Set up scenario scope and selection of case study sectors

Setting policy framework and selection of policy goals that support the transformation of sectors from a linear to a circular bio-based model.
Case study sectors: chemicals, construction, plastics and textiles

Selection of focus countries

Criteria for country selection:
- Importance and impact of the sector (i.e. contribution of sectors to the national economy)
- Total size of the economy
- GHG emissions at EU level

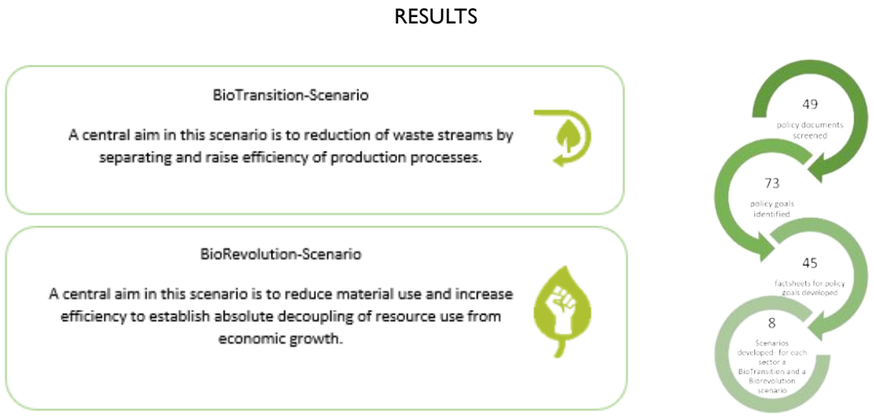
Screening criteria and data collection

Criteria for the screening of policy documents: aligned to the circular economy strategy and the circular economy action plan of the EU

Scenario formulation: Overarching and sector specific

Scenario formulation, based on
- Consultation of experts
- international INSPIRE conference

[1] SUSTRACK - Supporting the identification of policy priorities and recommendations for designing a sustainable track towards circular bio-based systems (HORIZON-CL6-2022-CIRCBIO-01).



THE BIOVINESHOOT PROJECT: PROGRESS TOWARDS A TECHNOLOGICAL SOLUTION FOR UNDERUSED AGRICULTURAL RESIDUES

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In the current scenario of increasing consumption of fossil fuels worldwide and severe consequences occurring in the climate, the production of biofuels and bioproducts from biomass resources appears as a key pillar in the transition from a fossil-based economy towards a bio-based economy. Among the different types of biomasses, lignocellulosic biomass has great potential.

Lignocellulosic biomass comprises a wide range of materials from different sources (e.g. agricultural waste and forestry, energy crops, agro-industrial waste and the fraction organic waste from urban solid waste), which constitute a wide source of renewable raw materials susceptible to revaluation through appropriate transformation processes. An example is the vine shoot (VS) biomass, the waste originating from the operations of vine pruning, which represents an abundant and cheap source of residual lignocellulosic biomass that currently has limited use as fuel in power generation industries and, mainly, in-home applications.

The project BioVineShoot is a coordinated project funded by the Spanish Ministry of Science, Innovation and Universities that has as general objective the achievement of a comprehensive fractionation of VS into their main components, and their subsequent valorisation into bioenergy and bioproducts through chemical and biochemical conversion processes integrated into a biorefinery strategy. The Energy, Environmental and Technology Research Centre (Madrid, Spain), (CIEMAT, of its acronym in Spanish), the Spanish National Research Council (CSIC; Madrid, Spain), and the University of Jaen, (Jaen, Spain), constitute the project consortium.

The main activity of CIEMAT in BIOVINESHOOT is "Biochemical conversion of the cellulosic fraction of vine shoot biomass into ethanol and bioproducts" (BIOBISEV subproject). It focuses on the study of an integral fractionation technology of VS biomass through **extrusion technology**, in combination with **ionic liquids**, aimed at generating different streams containing main biomass components, i.e., cellulose, hemicellulose and lignin. In the cellulose enriched pretreated materials by twin-screw extrusion, it considers the optimization of the **enzymatic hydrolysis** step to achieve the maximum sugar production yield and concentration from pretreated VS biomass. An important goal is the optimization of the enzymatic dosage by studying process strategies to increase the effectiveness of the hydrolysis under moderate or even low enzyme dosages. Finally, sugar-containing hydrolysates as fermentation media to obtain targeted **high-added value bioproducts, i.e, ethanol, lactic acid and caproic acid** are used. Different fermentation strategies are carried out for each compound employing selected microorganisms (yeast and bacteria) along the different project stages.

The BIOVISEB contributes to bioeconomy deployment through an improvement of the current chemicals production systems and the enlargement of the scientific, technical and economic development around the wine sector. The results obtained provides valuable information to design valorisation plants in other geographical areas with great concentration of biomass residues from agroindustry, so contributing to enlarge the bioeconomy growth in those zones. Moreover, this novel approach may also have an important social impact linked to the possibility of boosting employment creation in rural areas with high density of residual biomass, as is the case of wine crop regions.

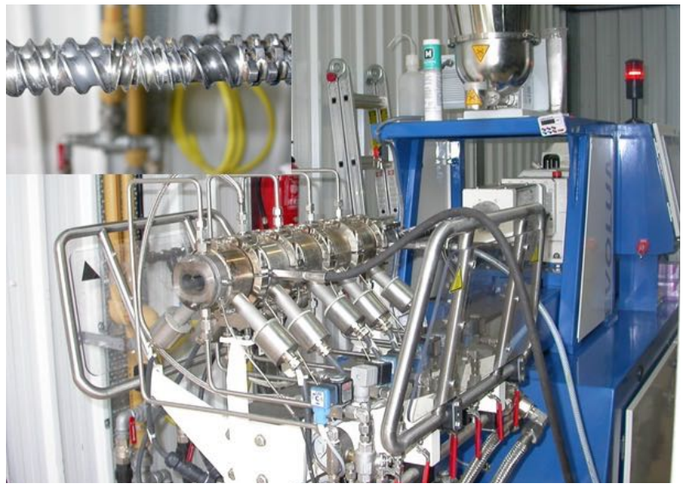

Figure 1. Twin-screw extrusion equipment at CIEMAT facilities and detail of screw configuration inside the barrels.

CONCEPTS, TOOLS AND APPLICATIONS FOR COMMUNITY-DRIVEN BIOECONOMY DEVELOPMENT IN EUROPEAN RURAL AREAS – THE SCALE-UP PROJECT

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SCALE UP
community-driven
bioeconomy development

The transition to a sustainable bioeconomy in rural Europe faces challenges such as slow uptake of small-scale technological developments, unresolved questions around equitable benefit distribution, and ecological impacts of increased biomass production. The EU-funded SCALE-UP project aims to address these issues by adapting, implementing, and evaluating tools that help regional stakeholders overcome apparent bottlenecks in fully exploiting the bioeconomy potential in their regions.

Background

Despite numerous EU-funded projects and initiatives supporting the uptake of bioeconomy at the regional level, rural actors still lack the capacity to collaborate and develop novel, sustainable bio-based products and services. Regional stakeholders often struggle to fully exploit the existing bioeconomy potential due to a lack of technical expertise, competitive networks, and knowledge of potential markets. The absence of a comprehensive framework linking bio-based solutions to rural development goals hinders the realization of social, environmental, and economic benefits in these areas.

The Project

SCALE-UP is an EU Horizon Europe-funded project that aims to assist regional multi-actor partnerships in identifying and scaling up innovative and sustainable bio-based value chains that utilize local resources. The project will adapt, implement, and assess tools to help regional actors overcome barriers to fully exploiting their region's bioeconomy potentials.

The project aims to promote innovative, sustainable, and inclusive bio-based solutions that align with policies like the European Green Deal and EU Bioeconomy Strategy while considering the capacities of regional ecosystems. By applying a multi-actor approach, SCALE-UP will help regional stakeholders overcome the apparent bottlenecks in fully exploiting their bioeconomy potential, ultimately contributing to a more sustainable and thriving bioeconomy in rural Europe.

The project focuses on six carefully selected regions across Europe: Northern Sweden, Mazovia (Poland), French Atlantic Arc, Upper Austria, Strumica (North Macedonia), and Andalusia (Spain). These regions were chosen as case studies due to their diverse range of viable "valorisation options" (bio-based solutions based on regional biomass streams) in the agricultural and forestry sectors, which can be replicated in the corresponding countries and macro-regions.

The SCALE-UP project is coordinated by Ecologic Institute, Germany, and features a consortium of eight partners: Technological Corporation of Andalusia (Spain), WIP Renewable Energies (Germany), Association of Chambers of Agriculture of the Atlantic Arc (France), UNIMOS Foundation (Poland), International Centre for Sustainable Development of Energy, Water and Environment Systems (North Macedonia), Biomass Technology Group (the Netherlands), Food Cluster – Business Upper Austria (Austria), and BioFuel Region (Sweden).

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Participants of the SCALE-UP kick-off meeting in Sevilla, Spain, September 2022.

SCALE-UP project has received funding from the European Union´s Horizon 2020 research and innovation programme under grant agreement No 101060264.

ON THE PERFORMANCE OF MODERN WOOD STOVES – RESULTS FROM THE KNOWLEDGE BUILDING PROJECT SUSWOODSTOVES

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The overall objective of the Norwegian knowledge building project SusWoodStoves is sustainable wood stoves through stove, building integration and value chain optimisation.

To increase the sustainability of wood stoves, emission reduction and increased energetic performance are key factors.

Results from SusWoodStoves show that the modern wood stoves of today outperform the staged air combustion wood stoves introduced in the 1990s, as further continuous improvements have been carried out and new and improved designs have been introduced. Hence, in national emission inventories this should be considered, so the mean emission factors used for the overall modern wood stove category reflect the continuous improvements over the last decades. The measurements carried out in SusWoodStoves made it possible to provide such emission factors for the modern wood stove category, for a wide range of emission compounds. The results show that most emissions of unburnt have been much reduced the last decades. However, for black carbon and for emissions due to minor and trace elements in the wood, this is not the case. Further targeted development and/or new combustion concepts are needed to significantly reduce both black carbon and NOx emissions.

Take home messages from this work are:

- Modern wood stoves have much improved during the last 25 years, resulting in large reductions in most emissions of unburnt, and increased energy efficiency
- Environmental, climate and health impacts are reduced accordingly
- Still, proper operation and wood quality is key
- Automation of the air supply contributes to automatic proper operation
- End-users should preferably operate their appliance at nominal load
- Different wood species give mostly similar emissions of unburnt
- National emission inventories should be updated according to the progress of any technology, including wood stoves, responsible for harmful emissions
- However, too large variations in emission factors for most species can be seen when comparing national emission inventories today

These results from SusWoodStoves will also be used further in the assessment of the value chain performance of the modern wood stoves. Below key findings related to emissions and energetic performance from this SusWoodStoves work are shown.

When comparing the emission factors that today are used in the Norwegian national emission inventory for modern wood stoves with three modern wood stoves.

Then we found that the three modern wood stoves on average have:

- *52 % lower emissions for the smallest (and most dangerous) particles (PM2.5)*
- *72 % lower emissions for CO (carbon monoxide)*
- *76 % lower emissions for CH4 (methane)*
- *77 % lower emissions for other relatively light gases (NMVOC)*
- *70 % lower emissions for the heaviest gas compounds that condense out as liquid particles in the atmosphere*
- ***At the same time the stove efficiency has been improved, being on average 80%, which gives further reduced emissions per kWh net heat output.***

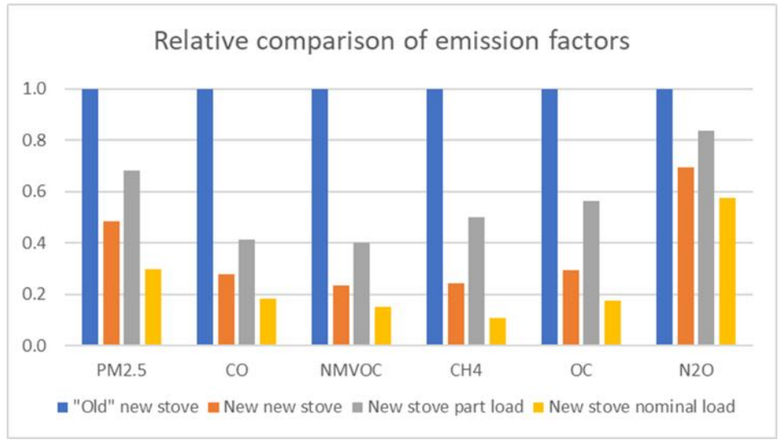

Figure 1: Relative comparison of emission factors for modern wood stoves. "Old" new stove is an average for the stoves produced from 1998 to 2016, while New new stove is an average for representative stove technologies anno 2022, and in addition emissions at nominal and part load operation are shown for these stoves.

For further information, the reader is encouraged to read the connected publications:

- Øyvind Skreiberg, Morten Seljeskog, Franziska Kausch, Roger A. Khalil (2023). Emission levels and emission factors for modern wood stoves. Chemical Engineering Transactions 105:241-246.
- Øyvind Skreiberg, Morten Seljeskog, Franziska Kausch (2023). Energy Efficiency Increase by Improved Operation and Control in Wood Stoves. Chemical Engineering Transactions 99:55-60.
- Morten Seljeskog, Franziska Kausch, Roger A. Khalil, Øyvind Skreiberg (2023). Reducing emissions from current clean-burn wood stove technology by automating the combustion air supply and improving the end-user interaction – two important primary measures. Chemical Engineering Transactions 99:61-66.
- Øyvind Skreiberg, Morten Seljeskog, Franziska Kausch (2022). A critical review and discussion on emission factors for wood stoves. Chemical Engineering Transactions 92:235-240.

DBFZ'S DATALAB – EMPOWERING BIOMASS RESEARCHERS

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"My dad works in a data lab, and my mum works in a real lab" – My 3-year-old.

Despite such commonplace statements, the hard work in a data lab is similar to the hard work in an experimental lab, even if one might think that 'only' databases and algorithms are dealt with instead of substances and protocols. Moreover, the effectiveness of data labs in research is undoubted as they accelerate future R&D efforts. Scientists must therefore not only have a very high level of specialist expertise but are also required to develop excellent digital skills. The mission of the DataLab at DBFZ is to empower researchers to utilise the latest methods of information technology and data science for their projects effortlessly and gainfully.

Easier said than done. It all starts with unstructured, crude, high-throughput raw data, concerns about data quality, and the demand for reliability of the derived results. Furthermore, FAIR [1] scientific data products are to be delivered. The DBFZ's DataLab faces these challenges with a diverse team of natural scientists, arts scholars, and IT specialists. Technically we rely on a high-performance computing cluster, a virtualised web server farm as well as the latest tools and technologies to handle high data volumes. It is crucial to ensure data quality within the utilised complex algorithms, and the DataLab thus plays a key role in managing, harmonising, analysing, and productizing the vast amounts of data generated by our cutting-edge research projects. We work closely with industry partners, policymakers, and the scientific community to translate our efforts into real-world impact. In this way, we promote seamless collaboration between researchers with diverse skills.

Reference project: DBFZ Resource Database

For the purpose of better understanding the DataLab's work, we would like to introduce you to a very practical reference project: The "DBFZ Resource Database". On the way towards a climate-neutral society, the question of how much biogenic by-products, residues, and wastes, hereinafter referred to as resources, are available, when and where, arises frequently. Peers at DBFZ supply this demand in terms of biomass potentials that are derived from various data sources including, among others:

- primary data acquisition, e.g., relative fraction of textiles in municipal waste
- official statistics, e.g., reported harvest quantities
- literature sources, e.g., livestock specific slurry factor
- expert estimates, e.g., relative humus balance

So, our first task was to consolidate all these data points, which were spread across various and non-uniformly formatted Excel files, into one harmonised database. Next, a model for computing biomass potentials and further key information, whose calculation methods differ considerably, was required. Adding a user interface, editor area and views, we arrived at a DBFZ-internal product that ensures data accessibility, integrity, security, and enables semi- and fully automatic computation.

However, data science did not stop here: The final challenge was to make this data treasure discoverable so that scientific peers, policymakers, and further interested parties can gain valuable insights on the limited availability of biomass. You can approach the data with different questions: Which resource are you interested in? – e.g., maize straw. Where and when? – e.g., Saxony in 2024. Which quantity is to be considered? – e.g., the mobilizable technical potential. And from which point of view? – e.g., conservative minimum values. Accordingly, the DataLab developed several interactive views in close collaboration with the subject matter experts, two of which are outlined below:

Firstly, the "DE Biomass Monitor" [2] depicts key information on 77 biomasses with a focus on their time course and utilization flow. Furthermore, this information can be put in relation to the theoretical demand for a concrete bio-based target product in a concrete target market, e.g., biomethane in the transport sector. To date, the data set is unfortunately far from complete, which is why interpolations fill data gaps, where possible, until further data provided by current and future research projects becomes available.

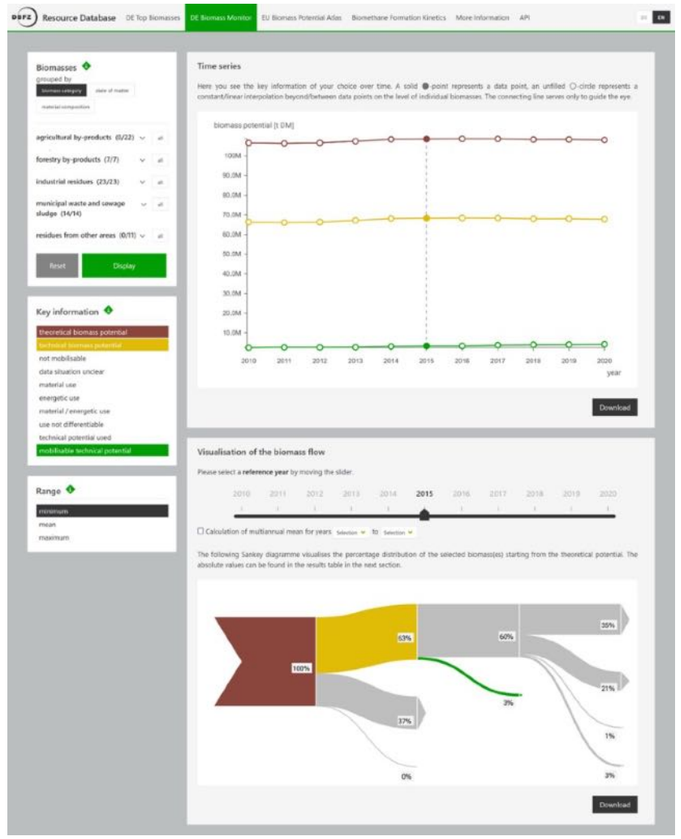

Figure 1. Screenshot of the "DE Biomass Monitor" of the DBFZ Resource Database.

Secondly, the "EU Biomass Potential Atlas" [3, 4] of the DBFZ Resource Database shows the theoretical biomass potentials for currently 13 individual biomasses in all EU-27 member states in an Open Street Map. The resolution can be chosen to study potentials on national down to regional levels. The map is supplemented by locations of major industrial producers, if applicable, as well as a detailed and comparative view.

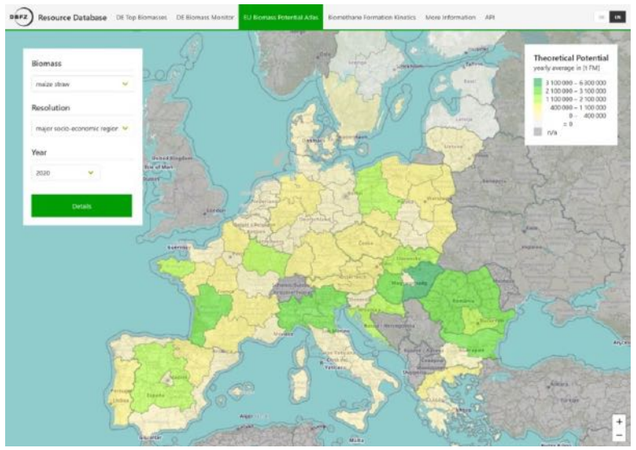

Figure 2. Screenshot of the "EU Biomass Potential Atlas" of the DBFZ Resource Database.

In case this newsletter article caught your interest, and you would like to learn about further data products of the DBFZ's DataLab, visit https://datalab.dbfz.de

DataLab Logo. DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH (Germany) - datalab@dbfz.de

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BIORECAST- BIOBASED RESIDUES CONVERSION TO ADVANCED FUELS FOR SUSTAINABLE STEEL PRODUCTION

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The BIORECAST project, which kicked off in November 2023 with a 3.5-year timeline, brings together organizations from four EU countries—Italy (Coordinator: Polytechnic of Turin, RE-CORD, the Polytechnic of Milan, Rina Consulting, CALVISANO), Spain (SIDENOR), the Czech Republic (HTT Engineering), and Germany (WIP Renewable Energies)—to collaboratively work towards decarbonizing the steel sector. The project aims to address the challenge of decarbonizing the steel sector by exploring the use of residual organic waste, such as sewage sludge, industrial sludge, domestic organic waste, food waste, and agricultural waste, through slow pyrolysis. By producing biocoal and pyrolysis gases and upgrading the biocoal's chemical composition, the project seeks to provide an alternative to fossil coal in the steel-making process. The goal is to validate the application of these sustainable sources, particularly in Electric Arc Furnace (EAF) plants, to foster the decarbonization of the steel sector and enhance its economic viability.

What is BioRECAST?

Research Fund for Coal and Steel co-funded BioRECAST proposes a "New and improved steelmaking technique", reusing Electric Arc Furnace (EAF) waste-heat for the on-site conversion of residual biomass into biocoal and sustainable bioenergy, to be used as alternative sustainable fuels for steelmaking process, increasing the sustainability of EAF process.

BioRECAST Main Objective

Main objective of BioRECAST project is to foster the consumption of biowaste streams as renewable carbon and energy source for the steel sector and, at the same time, to valorise the waste heat of EAF steelmaking. The focus of BIORECAST is on demonstrating the reliability of using low cost and high availability feedstock and wasted heat to produce high value output like pyrogases and upgraded biocoal for the decarbonization of steel sector.

BioRECAST Innovations

The project pathway towards the achievement of this goal is based on three innovative solutions:

1. The production of biocoal from residual biomass streams of suitable quality to be used as coal substitute in EAF steelmaking processes.
2. The valorisation of EAF hot flue gases to supply the thermal energy required for the pyrolysis process, enabling the use of the pyrolysis gases (Pyrogases) as renewable energy source in the steel sector.
3. Assessment of best available solution for pyrogas valorization in the steel making company.

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Figure 1. Kick-off meeting of BioRECAST in Polytechnic of Turin, November 2023

This project has received funding from the European Union's funding programme "The Research Fund for Coal and Steel" under grant agreement No 101112601.

PYRAGRAF - DECENTRALIZED PYROLYTIC CONVERSION OF AGRICULTURE AND FORESTRY WASTES TOWARDS LOCAL CIRCULAR VALUE CHAINS AND SUSTAINABILITY

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The PYRAGRAF project, spanning four years, aims to utilize agricultural and forestry residues by introducing innovative solutions. Its objective is to empower local circular value chains and advance sustainability efforts. Project's approach comprises five key stages: initial selection of raw materials and refining of pyrolysis methods, creation of a portable pyrolysis unit with solar assistance, showcasing the ecosystem benefits of biochar and wood vinegar at project sites, investigating energy applications for pyrogas and bio-oil, and finally, evaluating the technical, economic, environmental, and social sustainability dimensions.

Background

Agricultural and forestry industries are vital to the EU economy, providing income and employment for millions. Given the world's extreme climate challenges, it's crucial to enhance resilience and minimize environmental impacts in these sectors. They're significant contributors to greenhouse gas emissions, by increasing waste and reliance on fossil fuels for energy. Climate change has led to 13 European countries facing desertification, further escalating emissions, diminishing fertile land, and reducing crop yields.

The Project

Considering the previously described status, EU project PYRAGRAF aims to diversify the feedstock and technology base, accelerate the uptake of biochar and wood vinegar in the fertilizer and bio-pesticides market, and achieve this by utilizing lignocellulosic biomass residues through an innovative path that incorporates solar-assisted pyrolysis. The PYRAGRAF solution comprises a mobile biomass pyrolysis unit enhanced with concentrated solar energy to enable efficient and cost-effective production of biochar and wood vinegar at Technology Readiness Level (TRL) 6. The biochar and wood vinegar produced will be utilized in three target countries (Germany, Turkey, Portugal) with different locations, diverse climatic conditions, and varying soil characteristics to assess their potential in agricultural practices.

The PYRAGRAF project is coordinated by IPP, and the project consortium comprises 13 partners from 7 countries: Portugal, Germany, Turkey, Poland, Sweden, Denmark, and Italy. The consortium includes universities, non-governmental organizations, private and industrial partners, as well as a municipality, ensuring a well-balanced and diverse consortium.

As the PYRAGRAF project reaches its ten-month mark, the completion of the *"Characterization of Local Feedstocks"* report represents a crucial accomplishment. Reaching this milestone is essential to the project's main goal of promoting sustainable forestry and agriculture practices in Portugal, Germany, and Turkey, the project's demonstration countries, by locating and assessing viable feedstock choices for biochar production.

As the project develops, the use of local feedstocks demonstrates a commitment to resource optimization and regional sustainability. Additionally, the project's collaborative nature ensures that the study findings align with the needs of the relevant demonstration countries. Through interdisciplinary collaboration, innovation, and knowledge exchange, PYRAGRAF continues to work on sustainable agriculture and forestry practices, providing positive environmental, social, and economic implications throughout Europe and beyond.

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Figure 1. Participants of the PYRAGRAF Consortium Meeting in Munich, Germany, January 2024.

DOC2024 | 7TH DOCTORAL COLLOQUIUM BIOENERGY AND BIOBASED PRODUCTS

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From 24th to 25th September 2024 the DBFZ - Deutsches Biomasseforschungszentrum gGmbH in Leipzig will host the 7th Doctoral Colloquium BIOENERGY AND BIOBASED PRODUCTS (DOC2024).

EERA Bioenergy supports this event as a Europe-wide partner platform for scientists.

Background

Launched in 2018 with a primary focus on bioenergy topics and German-speaking doctoral students, the Doctoral Colloquium has since evolved into an international platform. This year, it extends its thematic reach to encompass research on biomass-based products, reflecting the current political and economic development.

Biomass is the only renewable carbon source we have available. Its sustainable and efficient utilisation requires newel and innovative approaches and processes (e.g. cascading, coupling). Research on bioenergy and bio-based products, as well as their integration into complete value chains, explores how biomass resources can increasingly contribute to the transformation in the chemical sector and for dedicated bioenergy applications, using all components in production networks by cascading approaches.

Research in this area is already very diverse and at a high level. However, networking within the research community needs to be strengthened in order to deepen the exchange of knowledge between researchers and to exploit synergies and research excellence in a more efficient and innovative way.

Since its foundation, the Doctoral Colloquium has served not only as a platform for the further qualification of young researchers, but also as an opportunity for making contacts, networking and enduring scientific exchange. Doctoral researchers from universities and other research institutions present and discuss their latest results and progress made during their doctoral work.

This year, the 7th Doctoral Colloquium BIOENERGY AND BIOBASED PRODUCTS (DOC2024) will be organised by DBFZ under the scientific coordination and direction of Prof. Dr.-Ing. Daniela Thrän, Senior Scientist at the DBFZ, Head of the Department of Bioenergy at the UFZ (Helmholtz Centre for Environmental Research) and Chair of Bioenergy Systems at the University of Leipzig.

A Scientific Advisory Board consisting of 46 renowned bioenergy scientists from Germany, Austria, Switzerland, Italy and Norway and representing 37 research and higher education institutions significantly ensures scientific quality and shows the magnitude of the event. A detailed list of all participating scientific institutions and members can be found on our website.

DOC2024 will take place at the DBFZ - Deutsches Biomasseforschungszentrum gGmbH in Leipzig

The event received a great resonance and over 50 abstracts were submitted by PhD Students from all over Europe and beyond. The Programme Committee is currently reviewing all the submitted abstracts for oral and/or poster presentation. We are sure to set up an interesting DOC2024 programme by mid/end June 2024 and invite you to register for the event.

Registration for the event will open soon. For more information, please visit our website.

Useful information

Turin Joint Statement on Sustainable Biofuels

On 28 April, coinciding with the Biofuels International Forum that the Italian Ministry for the Environment, Gilberto Pichetto, held in Turin (Italy), 75 companies, trade associations, and R&D organizations signed the Turin Joint Statement on Sustainable Biofuels and submitted it to the G7 Environment Ministers.

"Despite efforts to diversify energy sources, fossil fuels still meet 95% of the overall energy needs of the transport sector, which currently accounts for 26% of global final energy consumption and for 21% of CO_2 emissions", starts a joint statement in which the undersigned express their full support for ambitious climate and energy policies and the need to de-fossilize all modes of transport. In order to do so, they view sustainable biofuels and related value chains among the main pillars of transport decarbonisation together with electrification, energy efficiency and other sustainable fuels and recognise that, during the transition, the role of each technology will vary over time and by country, as a reflection of its own resources, national context and sustainable development priorities.

The sustainable biofuels industry represents a milestone on the path to the full development of integrated biorefineries, contributing to the progressive replacement of the current oil refinery in the production of sustainable chemicals and fuels, a sector to which industry is committed and already investing efforts and resources. "According to the International Energy Agency, the production and use of sustainable biofuels are not currently expanding at the pace and scale to be consistent with a net zero pathway by mid-century", says the statement, identifying the following as the main demands that the signatories wish to convey to G7 environment ministers:

- Recognise the contribution that sustainable biofuels can bring as part of systematic solutions to de-fossilize aviation, maritime and road transport, while generating coproducts in the bio- and circular-economy area, recovering wastes and utilizing residues.
- Design and implement predictable and long-term oriented policies, to facilitate the investments needed for the widespread deployment of innovative, sustainable biofuel technologies and value chains.
- Support technology-agnostic, evidence-based policies that enable GHG emissions reductions from aviation, maritime and road transport based on a full Life-Cycle Assessment (LCA) approach.
- Empower consumers (B2B and private) to choose net-zero and circular products, based on transparent product and environmental carbon footprints, and lead the way through public procurement and private buyer initiatives endorsed by G7 governments.
- Foster innovation across the bioeconomy, to expand biomass feedstock supply through innovation in agricultural markets and value chains such as the adoption of sustainable agricultural practices and crop rotations, cover cropping, inter-cropping and multi-cropping, yield improvements and crop production on marginal and degraded lands, and to commercialize new technologies that can convert a wider range of feedstocks including agricultural and woody residues into biofuels.
- Create an environment that allows for exploring the productive synergies between biofuels, hydrogen and carbon capture usage and storage.
- Build consensus regarding the use of carbon accounting and sustainability standards in policymaking, to reduce regulatory burdens, facilitate trade and increase confidence among consumers, policymakers, and investors regarding the benefits of biofuels across different feedstocks, technology platforms, products and regions.
- Support capacity-building initiatives and knowledge-sharing platforms to facilitate technology transfer, skills development, and best practices exchange among stakeholders in the biofuels sector.

Gilberto Pichetto pointed out the importance of keeping open the signing of the Declaration until the G20 Ministerial in October in Brazil, "as a sign of strong collaboration and common purpose between the G7 and G20 Presidencies", concluded.

Scaling-up Biogases Production: Shared recommendations for the design of future EU research and innovation investments

European Biogas Association (EBA) led on 7 May a joint statement on "Shared recommendations on research needs" for biogas and biomethane in which the association joined forces with a coalition of universities, research institutes, EU-funded projects and associations to champion the advancement of biogas technology towards a greener future. EERA Bioenergy full members such as LNEG, Centre for Renewable Energy Sources and Saving (CRES), DBFZ or TNO were among the signatories.

According to the document, research and development are key to unlocking new potential in biogas and safeguarding European strategic autonomy in biogas technologies. In order to achieve this, the signatories believe that funding must be channelled into innovation and demonstration projects in the biogas field, such as:

- **Feedstock mobilisation:** Exploring new waste valorisation routes will boost biogas production potential. Utilising biomass from degraded lands as a non-food feedstock is sustainable for biogas production. Implementing innovative agricultural practices like the Biogas Done Right concept across Europe's climate zones will enhance farmer trust and knowledge, promoting wider adoption.
- **New technologies** like gasification and methanation can diversify biomethane production in Europe and boost biogas potential. Understanding digestate application, upgrading technologies, and biogenic CO_2 storage and use are vital for sustainable scale-up.
- Efficiency gains are possible with **advanced feedstock pre-treatment technologies**, boosting biogas yields and unlocking new feedstock types. Optimising existing digestion assets, like minimising biogas self-consumption and real-time monitoring, enhances productivity.

EU elections: The European Green Pact may live to see another day

Parliamentary arithmetic after **European Union elections** has brought months of uncertainty about the future of the EU's ecological transition during the next term to an end. The names proposed to captain the EU project and the bloc's strategic agenda 2024-2029 suggest that the European Green Pact may live to see another day.

- At a decisive meeting of the Council of the European Union on 27 June in Brussels, European leaders agreed on designating **Antonio Costa**, the former Portuguese Prime Minister and Socialist leader, as the next **President of the European Council**, succeeding Charles Michel as of 1 December.

- Meanwhile, **Ursula von der Leyen** was nominated for a second term as **President of the European Commission**. She may need the backing of the Greens, since she will undergo a vote of approval by the European Parliament before her formal appointment and faces a narrow margin to secure majority support.

- Lastly, Estonia's **Kaja Kallas** was nominated for the post of **High Representative of the Union for Foreign Affairs and Security Policy**. MEPs will vote on her candidacy in the autumn as part of the full College of Commissioners' package.

In 2019, before the Covid pandemic and Russia's invasion of Ukraine turned the world upside down, the EU-27 adopted the strategic agenda that was to govern Ursula Von der Leyen's first mandate, in which they designated as one of the main priorities "building a climate-neutral, green, fair and social Europe".

The **Strategic Agenda 2024-2029**, which focuses on issues related to security, defense, strategic autonomy, independence and competitiveness, specifically links climate and energy policies to the latter under the heading of "A Prosperous and Competitive Europe".

European leaders have thus maintained this path for the second mandate they have entrusted to Von der Leyen, who seems to be able to obtain the backing of the European Parliament through the pact between the People's Party, Social Democrats and Liberals, which could also be supported by the Greens.

"We will strengthen our competitiveness and become the first climate-neutral continent, making a success of the climate and digital transitions, leaving no one behind," say the heads of state and government in the new agenda.

EU climate policy is linked in the documents approved by the European Council to improving competitiveness, and this to lowering the EU's energy costs, and to this end the EU-27 are working together to build "a genuine energy union, ensuring the supply of abundant, affordable and clean energy".

The approach maintains the objective of strengthening the single market, the jewel in the crown of the European economy, which the EU wants to deepen "even further, especially in the fields of energy, finance and telecommunications".

It stresses that EU countries will continue to move towards the commitment to achieve climate neutrality by 2050, but will be "pragmatic", creating a "stable and predictable framework" and a "more enabling environment" to boost green industries and investments "in extensive cross-border infrastructure for energy, water, transport and communications".

European Commission presents recommendation for 2040 emissions reduction target to set the path to climate neutrality in 2050

The European Commission published on 6 February a detailed impact assessment on possible pathways to reach the agreed goal of making the European Union climate neutral by 2050. Based on this document, the Commission recommends a 90% net greenhouse gas emissions reduction by 2040 compared to 1990 levels. Involving all stakeholders in an open discussion, a legislative proposal shall be made by the next Commission, after the European elections, and agreed with the European Parliament and Member States as required under the EU Climate Law. This recommendation is in line with the advice of the European Scientific Advisory Board on Climate Change (ESABCC) and the EU's commitments under the Paris Agreement.

The communication also set out several enabling policy conditions which are necessary to achieve the 90% target. They include the full implementation of the agreed 2030 framework, ensuring the competitiveness of the European industry, a greater focus on a just transition that leaves no one behind, a level playing field with international partners, and a strategic dialogue on the post-2030 framework, including with industry and the agricultural sector.

"The outcome of COP28 in Dubai showed that the rest of the world is moving in the same direction. The EU has been leading the way on international climate action, and should stay the course, creating opportunities for European industry to thrive in new global markets for clean technology", states the assessment.

Predictability and sustainability for our economy and society

According to the Commission, setting a 2040 climate target will help European industry, investors, citizens and governments to make decisions in this decade that will keep the EU on track to meet its climate neutrality objective in 2050. "It will send important signals on how to invest and plan effectively for the longer term, minimising the risks of stranded assets". With this forward-planning, it may be possible to shape a prosperous, competitive and fair society, to decarbonise EU industry and energy systems, and to ensure that Europe is a prime destination for investment, with stable future-proof jobs.

It will also serve to boost Europe's resilience against future crises, and notably strengthen the EU's energy independence from fossil fuel imports, which accounted for over 4% of GDP in 2022 as we faced the consequences of Russia's war of aggression against Ukraine. The costs and human impacts of climate change are increasingly large, and visible. "In the last five years alone, climate-related economic damage in Europe is estimated at €170 billion euros. The Commission's impact assessment finds that, even by conservative estimates, higher global warming because of inaction could lower the EU's GDP by about 7% by the end of the century", it points out.

Establishing the conditions for achieving the recommended target

Achieving a 90% emissions reduction by 2040 will require several enabling conditions to be met. The starting point would be the full implementation of the existing legislation to reduce emissions by at least 55% by 2030. The ongoing update of the draft **National Energy and Climate Plans (NECPs)** is a key element in monitoring progress and the Commission is engaging with Member States, industry and social partners to facilitate the necessary action.

The Green Deal should become an industrial decarbonisation deal that builds on existing industrial strengths, like wind power, hydropower, and electrolysers, and continued to increase domestic manufacturing capacity in growth sectors like batteries, electric vehicles, heat pumps, solar PV, CCU/CCS, biogas and biomethane, and the circular economy. Carbon pricing and access to finance are also critical for the delivery of emission reduction targets by European industry. The Commission will set up a dedicated taskforce to develop a global approach to carbon pricing and carbon markets. Europe will also need to mobilise the right mix of private and public sector investment to make our economy both sustainable and competitive. A European approach on finance will be needed in the coming years, in close cooperation with Member States.

"Fairness, solidarity and social policies need to remain at the core of the transition", says the Commission. "Climate action has to bring benefits to everybody in our societies, and climate policies need to take into account those who are most vulnerable or face the greatest challenges to adapt". The Social Climate Fund and Just Transition Fund are examples of such policies which will already help citizens, regions, businesses and workers in this decade.

Finally, open dialogue with all stakeholders is a crucial precondition to delivering the clean transition. The Commission has already established formal dialogues with industry and agricultural stakeholders, and the coming months of political debate in Europe are an important opportunity to secure public engagement on the next steps and policy choices. Structured dialogue with social partners should be strengthened to ensure their contribution, focusing on employment, mobility, job quality, investments in reskilling and upskilling. This ongoing outreach will help the next Commission to table legislative proposals for the post-2030 policy framework which will deliver the 2040 target in a fair and cost-efficient manner. The pace of decarbonisation will depend on the availability of technologies that deliver carbon-free solutions, and on an efficient use of resources in a circular economy.

Achieving the 90% recommended target will require both emissions reductions and carbon removals. It will require deployment of carbon capture and storage technologies, as well as the use of captured carbon in industry. The EU's Industrial Carbon Management strategy will support the development of CO_2 supply chains and the required CO_2 transport infrastructure. Carbon capture should be targeted to hard-to-abate sectors where alternatives are less economically viable. Carbon removals will also be needed to generate negative emissions after 2050.

REPowerEU celebrates its second birthday with much of the homework already done

In May 2022, the European Commission launched the REPowerEU plan in response to Russia's invasion of Ukraine and Russia's use of energy resources as an economic weapon. The main objectives of the plan were to save energy, diversify the EU's energy supply and increase domestic production of clean energy. According to the Commission, these objectives have been achieved, although the energy transition is far from complete.

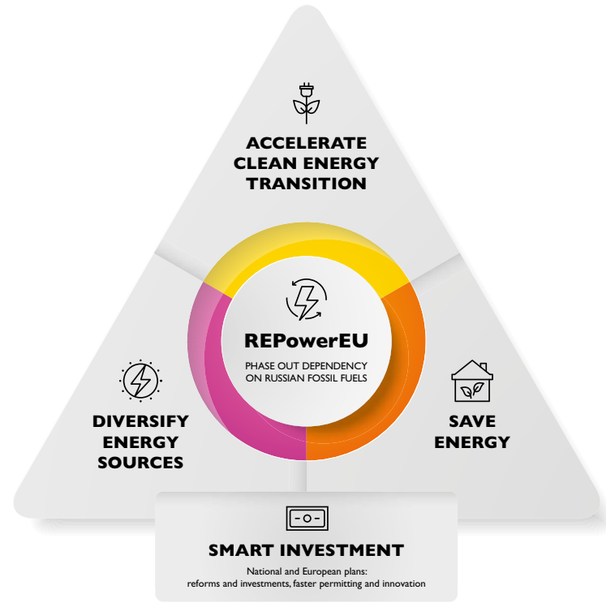
"The results show that REPowerEU has played a key role in protecting EU citizens and businesses from energy shortages, while at the same time providing vital support to Ukraine by weakening Russia's military stockpiles", says the European Commission in an official statement issued on the occasion of the plan's second anniversary. "Through joint efforts, Europe has not only achieved a massive cut in Russian energy imports, but also accelerated its transition to clean energy and stabilised prices", it adds.

According to the Commission, they have redrawn the energy landscape and taken a major step forward in Europe's green transformation and thus they are now pressing ahead with their efforts to completely eliminate Russian fossil fuel imports, and to provide more secure, clean and affordable energy to European citizens and strengthen the competitiveness of our industries.

These are the REPowerEU plan key achievements so far:

- Reduce **natural gas consumption** by 18% between August 2022 and March 2024.
- Overcoming our **dependence on Russian fossil fuels**: the share of gas imports from Russia fell from 45% to 15% between 2021 and 2023.
- Produce for the first time, from 2022, **more electricity from wind and solar power** than from gas.
- **Rapidly increase renewable energy installations**. Since 2022, a record of almost 96 GW of new solar power capacity has been installed and wind capacity has been increased by 33 GW

The Commission has mobilised close to €300 billion to finance the REPowerEU plan, with the Recovery and Resilience Mechanism being at the heart of this funding. "The EU is now on track to eliminate its dependence on Russian fossil fuels while continuing to make progress on the ecological transition and maintaining its support for Ukraine", the Commission concludes.



European Commission provides new evidence for approach to R&I for a more competitive Europe

Over the past two decades, there has been an increase in EU investments in R&I which has contributed to the EU's competitiveness in green tech especially, and to the overall high quality of EU research. In fact, the EU is only surpassed by China in terms of scientific output and represents 18% of the global scientific production, maintaining a leading position in global patent filings related to renewables (29%) and energy efficiency (24%).

This is one of the conclusions drawn from the 2024 edition of the Science, Research and Innovation (R&I) Performance report (SRIP) that published the **European Commission** on 27 June. This is the fifth edition of a biennial publication that analyses research and innovation dynamics and its drivers. It combines indicator-based analysis with deep dives into topical policy issues and speaks to an audience of both research and innovation as well as economic-finance policymakers and analysts.

Some of the **key findings** of the science, research and innovation performance of the EU report are:

- As regards the global share in top 10% most-cited publications, the EU is performing similarly to the US but behind China. However, compared to the US and China, the EU is less specialised in key productivity-enhancing technologies, particularly in the fields of artificial intelligence, internet of things, blockchain technologies and quantum computers.
- The venture capital market in the EU is limited compared to other regions of the world, hindering private investments in innovative companies.

The report also highlights three main **challenges** for EU R&I:

On the one hand, there is an underutilised R&I ecosystems. The EU is a top global player in scientific research, but it is facing several obstacles in exploiting its rich R&I ecosystem at its best. The sharp variations in research & development (R&D) efforts across Member States put the 3% of GDP target still far from being achieved.

The second challenge would be persistent R&I divide, since research activities tend to concentrate in certain places –which can be reinforced through provision of support to the highest achieving activities and actors–.

On the other hand, there is a persistent technological gap compared to other regions of the world, also caused by the complexities in raising private sector investment for R&I at the EU level. While the EU has made strong progress with the green transition, there is still progress to be made in the digital area.

Only four European countries respect the deadline for the delivery of the NECP update

The European Commission has revealed that, just before the deadline for the submission of updated **National Energy and Climate Plans (NECPs)** on 30 June, only four countries —the Netherlands, Denmark, Finland and Sweden— had met their commitment in a timely manner, with the remaining 23 Member States still outstanding. "We have only received four plans. The Commission is obviously strongly urging the remaining Member States to send in their plans as soon as possible," said EU climate spokesman, Tim McPhie.

The Integrated National Energy and Climate Plan (NECP) is the document that lays the foundations for each country's energy and climate policy for 2030, with the aim of meeting the emissions reduction target set by Brussels. Most countries already submitted their updated drafts last December and based on a preliminary analysis of these plans, the Commission called on member states to redouble their efforts. Brussels highlighted, among other points, projections indicating that the EU-27 would only reduce their CO_2 emissions by 51% by 2030 compared to 1990 and would fall short of the 55% they have committed to by law.

The submission of final plans is a legal obligation for member states.

European Commission sources argue that their timely submission will help "trigger the investments needed to meet our 2030 targets and advance the clean transition and decarbonisation of our industry", as well as being a "vital tool to ensure secure, affordable and sustainable energy supplies for Europe".

The Commission says it has worked hard to agree ambitious, science-based legislative targets with the European Parliament and Member States and now it is time for national authorities to turn them into concrete plans and deliver the benefits of the green transition to European citizens and businesses. "The Commission has been working closely in recent months with all Member States and continues to do so to ensure that they can submit their final National Energy and Climate Plans as soon as possible," they add.

Energy Commissioner Kadri Simson and her environment counterpart Virginijus Sinkevicius can be expected to issue a short reprimand to these non-compliant countries during the informal Environment and Energy Councils to be held between 11-16 July.

EU approves controversial Nature Restoration Law on the edge of defeat

On 17 June, the **European Union** finally approved one of the most controversial laws in its recent history: the Nature Restoration Act. This law, the first to oblige member states to restore nature, and not only to protect it, focuses on the preservation of biodiversity and has been met with frontal opposition led by, among others, EU farmers and the extreme right across the continent.

The legislation requires at least 20% of the EU's degraded terrestrial and marine ecosystems to be repaired by 2030. This would be extended to almost 100% by 2050, including farmland.

The member states have brought it forward after a tortuous process with surprises until the last moment to close a dossier that almost knocked down Hungary and that Austria has ended up saving. On the eve of the vote, the Austrian government switched to the "yes" side, allowing the EU Council to reach the necessary qualified majority by the minimum: 66.07% of the EU population, just above the required 65%.

Against all odds, Austria's environment minister, a member of the Green party, defied her conservative coalition partners and Austrian Chancellor Karl Nehammer to announce that she would support the initiative, tipping the balance. Paradoxically, the country will appeal to the European Court of Justice to have the law annulled, a spokesman for the Federal Chancellery announced.

The aim of the law was to bring EU legislation into line with UN biodiversity agreements, but the text has become a symbol of the ideological battle over the green agenda, gaining in intensity as the European elections on 9 June approached. The law has undergone changes in the EU Council and has narrowly survived a long series of agonising votes in the European Parliament, where it has been the target of an aggressive campaign by European People's Party and European Parliament group chairman Manfred Weber, the influential agricultural lobby Copa-Cogeca and far-right parties.

Finally, and among other points, it establishes obligations to correct the decline in pollinators, to recover 30% of peatlands emptied for agricultural use, not to reduce urban green spaces or to eliminate artificial barriers in the EU's rivers.

The law was supported by 20 member states, with Belgium abstaining and Finland, Italy, Hungary, the Netherlands, Poland and Sweden rejecting it. Slovakia also joined Austria in the group of those in favour of the measure at the last minute, allowing it to go ahead.

Publications

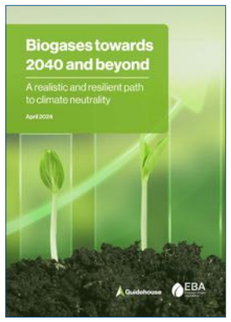
Statistical Report 2024 – Pellets

PDF

Bioenergy Europe

The European Biomass Association (Bioenergy Europe) has published the first chapter of its statistical report in 2024. As the reference source on the pellet market for sector professionals, investors, and decision-makers, this report analyses the development of the world's pellet market over the past year with a deep dive into the European market.

Biogases towards 2040 and beyond



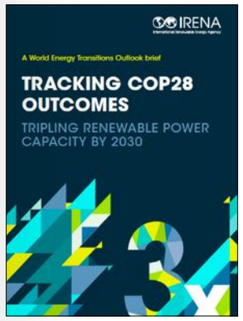
PDF

European Biogas Association (EBA)

This paper provides a refresh of the 2022 Gas for Climate study, incorporating latest data and insights to update the potential estimates for 2030 and 2050, and turns the focus to 2040 to provide a realistic estimate of how the potential for biomethane production in Europe can continue to develop.

The updated estimate shows that up to 44 bcm of biomethane could be produced in Europe in 2030 and 165 bcm in 2050 (of which 40 bcm in 2030 and 150 bcm in 2050 are for the EU-27). The estimated biomethane production potentials in this study are broadly consistent with the 2022 Gas for Climate study, given that the underlying methodology and key assumptions have not fundamentally changed.

Tracking COP28 outcomes: Tripling renewable power capacity by 2030



PDF

International Renewable Energy Agency (IRENA)

This World Energy Transitions Outlook brief provides the latest tracking data and analysis of global progress towards the goal to triple global renewable power capacity to 11 000+ terawatts by 2030 and outlines the key enablers and priority actions required to achieve it. The 28th Conference of the Parties (COP28) to the United Nations Framework Convention on Climate Change (UNFCCC) agreed to transition away from fossil fuels, triple renewable power and double energy efficiency by 2030. This historic commitment provides the only viable means available to align the world with the goal of limiting global temperature increase to 1.5°C of pre-industrial levels.

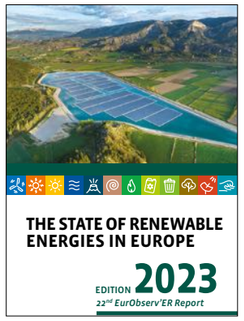
Exploring foresight scenarios for the EU bioeconomy

PDF

European Commission's Joint Research Centre (JRC)

In 2022 and 2023, the European Commission's Knowledge Centre for Bioeconomy organised three workshops to explore bioeconomy foresight scenarios developed in 2020. With the help of a scientific game and foresight tool called the Scenario Exploration System, stakeholders in various bioeconomy sectors were involved in a role-playing exercise involving highly interactive discussions. The findings from those workshops have been used as a basis for this report to formulate policy implications that could contribute to the policy debate on the bioeconomy.

The State of Renewable Energies in Europe



PDF

EurObserv'ER

The EurObserv'ER barometer has published the 22nd edition of its annual report 'The State of Renewable Energy in Europe', a document that provides an overview of the energy dimension of all industrially developed renewable sectors in the European Union based on official data obtained by Eurostat between 2021 and 2022.

By the end of 2022, almost a quarter of final energy consumption in the European Union was renewable (23%), a figure that must grow exponentially to reach the new target of 42.5% set by RED III by the end of 2030.

Progress in Commercialization of Biojet /Sustainable Aviation Fuels (SAF): Technologies and policies

PDF

IEA Bioenergy

This report has a dominant focus on technologies, key developments in commercialization and recent research and development trends. As well as the technical challenges outlined in this report, it is probable that SAF-specific policies will have the greatest impact on SAF expansion. Although the lipid-to-biojet process supplies the vast majority of SAF that is used to date, there will be increasing competition for lipid feedstocks from bio/renewable diesel producers. While technology developments, aiming at a broader feedstock base, will play a role in resolving this dilemma, it will likely be the use of enabling policies that will facilitate the aviation sector to attain its 2030 and 2050 decarbonisation targets.

World Energy Investment 2024

PDF

International Energy Agency (IEA)

This edition of the World Energy Investment provides a full update on the investment picture in 2023 and an initial reading of the emerging picture for 2024. It shows a global benchmark for tracking capital flows in the energy sector and examines how investors are assessing risks and opportunities across all areas of fuel and electricity supply, critical minerals, efficiency, research and development and energy finance. The report also highlights several key aspects of the current investment landscape, including persistent cost and interest rates pressures, the new industrial strategies being adopted by major economies to boost clean energy manufacturing, and the policies that support incentives for clean energy spending, notably from the increasingly important viewpoints of energy security and affordability.

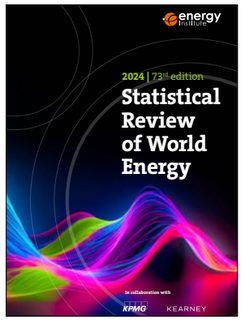
2nd EBA Investment Outlook on Biomethane

PDF

European Biogas Association

The European Biogas Association (EBA) monitors biomethane investments yearly to forecast the growth of the sector and better identify market trends, drivers and gaps. This second biomethane investment outlook identifies a growing commitment from industry with a total of 27 billion EUR allocated to invest in biomethane production. This marks a growth of 9 billion EUR compared to investments identified one year ago. The figures presented in this outlook are based on replies from 26 investors and project developers within the EBA, 2 more compared to the previous edition. The investments are projected to deliver 6.3 bcm/year of biomethane capacity to Europe by 2030.

Statistical Review of World Energy



PDF

Energy Institute (EI)

The Energy Institute has published its World Energy Statistics Report, bringing together data on global energy markets from the previous year to provide an objective, independent and comprehensive basis for decision-makers in government, business and civil society. 2023 stands as a year of record production and consumption across the board, even though energy markets experienced the continuing effects of geopolitical and economic disruption.

EU needs more from bioeconomy

PDF

Natural Resources Institute Finland - Luonnonvarakeskus (LUKE)

The Natural Resources Institute of Finland (LUKE) has published its position paper 2024, that echoes the crisis in Europe, calling for the transition of the bioeconomy from niche to the new norm. Due to the EU's competitiveness weakening by geopolitical tensions, the COVID pandemic and the faster economic development of other competing markets, the paper highlights the global need for long-term solutions to biodiversity loss and climate change adaptation, and how the sustainable bioeconomy can provide solutions to these challenges.

Save the date! International bioenergy events

JULY 2024

21-23 July 2024
9th International Conference on Green Energy Technologies (ICGET 2024)
Berlin, Germany

23 July 2024
International Conference on Bioenergy and Innovative Biotechnology (ICBIB 2024)
Barcelona, Spain

AUGUST 2024

2-4 August 2024
International Conference on Clean and Green Energy 2024 (ICCGE)
Harbin, China

5-7 August 2024
14th International Conference on Sustainable Energy Information Technology (SEIT-2024)
Huntington, USAs

SEPTEMBER 2024

2-4 September 2024
International Conference Progress in Biogas VI
Stuttgart, Germany

3 September 2024
Sustainable Road Transport Europe 2024
Amsterdam, The Netherlands

24-25 September 2024
Greencities & S-Moving 2024
Malaga, Spain

24-25 September 2024
7th Doctoral Colloquium Bioenergy and Biobased products
Leipzig, Germany

25-26 September 2024
Biogas PowerON 2024
Copenhaguen, Denmark

OCTOBER 2024

3-4 October 2024
International Forum on Industrial Biotechnology and Bioeconomy (IFIB)
Bologna, Italy

3-5 October 2024
Bio-Energy Pavilion 2024
New Delhi, India

9-10 October 2025
Biomass PowerON 2024
Copenhaguen, Denmark

21-22 October 2024
5th International Conference on Biofuels and Bioenergy
Tokyo, Japan

23-24 October 2024
European Biogas Conference
Copenhaguen, Denmark

NOVEMBER 2024

6-8 November 2024
3rd Bioenergy International Conference
Jaén, Spain

13-14 November 2024
15th International Conference on Biofuels and Bioenergy
Dubai, UAE

14-15 November 2024
2nd International Conference & Expo on Biofuels and Bioenergy
London, UK

20-21 November 2024
European Bioenergy Future 2024 (EBF 2024)
Brussels, Belgium

NOVEMBER 2024

21-23 November 2024
5th International Conference on Advances in Energy Research and Applications (ICAERA 2024)
Lisbon, Portugal

22-24 November 2024
9th International Conference on Renewable Energy and Conservation (ICREC 2024)
Rome, Italy

27-28 November 2024
Future of Biogas Europe Summit 2024
Barcelona, Spain

DECEMBER 2024

3-4 December 2024
European Biocarbon Summit 2024
Amsterdam, The Netherlands

5 December 2024
Global Conference on Energy & AI (IEA)
Paris, France

12-13 December 2024
9th Biogas Congress & Expo
Warsaw, Poland

EERA Bioenergy in Europe

Table 1. Full members of the EERA Bioenergy Joint Programme.

Aalborg University
Department of Energy Technology (Denmark)

BERA
Belgian Energy Research Aliance (Belgium)

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

BOUN
Boğaziçi University (Turkey)

CEA
French Alternative Energies and Atomic Energy Commission (France)

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

CNR
Istituto Motori del Consiglio Nazionale delle Ricerche (Italy)

CRES
Center for Renewable Energy Sources and Saving (Greece)

CSIC
Agencia Estatal Consejo Superior de Investigaciones Científicas (Spain)

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

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

IEN
The Institute of Power Engineering (Poland)

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

LNEG
Laboratório Nacional de Energia e Geologia (Portugal)

NTNU
Norwegian University of Science and Technology (Norway)

PSI
Paul Scherrer Institut (Switzerland)

SINTEF
(Norway)

TNO
(Netherlands)

TÜBITAK
Scientific and Technological Research Council of Turkey (Turkey)

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

UNIBO
Universitá di Bologna (Italy)

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

VŠB
Technical University of Ostrava (Czech Republic)

VTT
Technical Research Centre of Finland Ltd (Finland)

WUR
Wageningen University & Research (The Netherlands)

Table 2. Associate members of the EERA Bioenergy Joint Programme.

Agricultural University of Plovdiv (Bulgary)	**CAMPUS IBERUS** Campus de Excelencia Internacional del Valle del Ebro (Spain) Campus / Universidad	**CIRCE** Centro de Investigación de Recursos y Consumos Energéticos (Spain)
CNRS Centre National de la Recherche Scientifique (France)	**CoLAB BIOREF** Collaborative Laboratory for the Biorefineries (Portugal)	**Çukurova Üniversitesi** University of Cukurova, Faculty of Agriculture, Department of Field Crops (Turkey)
Energy Agency of Plovdiv (Bulgaria)	**ETA-Florence Renewable Energies** (Italy)	**FCiências.ID** Associação para a Investigação Desenvolvimento de Ciências (Portugal)
IIASA International Institute for Applied Systems Analysis (Austria)	**NIC** National Institute of Chemistry (Slovenia)	

NTUA The National Technical University of Athens (Greece) web / web	**RE-CORD** Renewable Energy Consortium for Research and Demonstration (Italy)	**UNICT** Università degli studi di Catania (Italy)
UNIMORE University of Modena and Reggio Emilia (Italy)	**UNIPD** Università degli Studi di Padova (Italy)	**UNITO** Università di Torino (Italy)
UNL Universidade NOVA de Lisboa, Faculdade de Ciências e Tecnologia (Portugal)	**WIP** WIP Renewable Energies (Germany)	**IFK Stuttgart** Institute of Combustion and Power Plant Technology (Germany)

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

EERA European Energy Research Alliance BIOENERGY

● FULL MEMBERS
● ASSOCIATE MEMBERS

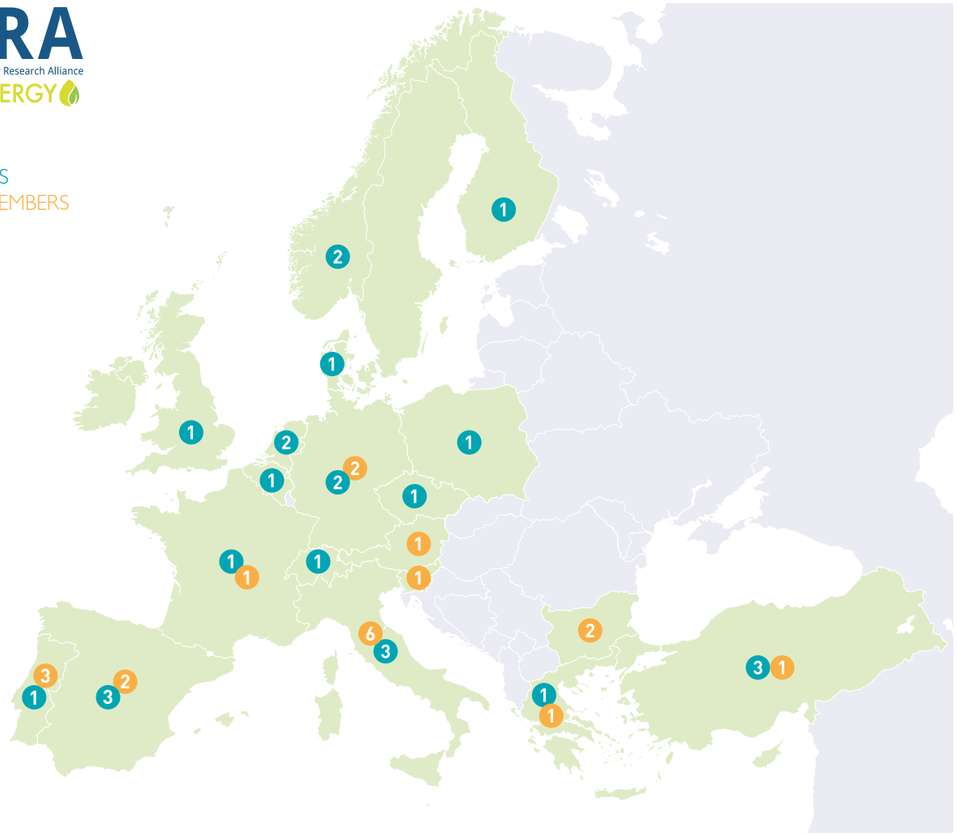


Figure 1: The EERA Bioenergy Joint Programme consists of 45 members (25 Full members and 20 Associate members) from a total of 19 countries. Link

www.eera-bioenergy.eu

Contacts

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BIOMASS FOR THE BIOECONOMY

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