EERA European Energy Research Alliance BIOENERGY

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EERA BIOENERGY NEWSLETTER

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Joint Programme Coordinator's corner

Andrea Monti
EERA Bioenergy Coordinator

Dear EERA Bioenergy members, dear eebionews readers,

These 4 years in which I had the honor of coordinating this magnificent network have been for me an opportunity for great personal and professional growth. I saw moments of reflection and experiences shared with all of you that made me understand the high level of research and scientific preparation of the community research in bioenergy. I am very confident that this epochal moment of the energy transition will be successfully faced thanks to the passion, ideas and concreteness of all of you. We should start from a basic and common concept: despite the fact that today the interest of the media and politics is focused, sometimes too much, on other energy sources, bioenergy still remains, by far, the main renewable source, and probably will remain so for many years. It is a message that we should always remind in all forums, particularly in today's context in which horizons have narrowed and the energy emergency has become a real threat. It is necessary to reiterate that bioenergy has not reached a point of arrival, as it may mistakenly appear to many, but a starting point; the contribution of bioenergy, although already very significant, is still largely unexplored; bioenergy is often underestimated by predictive models. Strong innovation and great opportunities would be coming out, for the benefit of the community and the environment, if we have the wisdom to seize them.

In these 4 years, I have always tried to do my best to make a significant contribution to our sector; I tried to be the megaphone of our ideas in the many (very many!) discussion tables where I was invited as coordinator of EERA bioenergy. I brought our voice to the ETIP Bioenergy steering committee, to the Core Team of the Implementation Working Group 6 of the Set Plan (Renewable Fuels and Bioenergy), in many consultations with the EC. I have continuously participated in the growth and restructuring process of EERA aisbl, in particular in Task Force 2 devoted to the reform of the Joint Programs. EERA's staff has grown a lot from a numerical and professional point of view, fully meeting the ambitious plan that Nils A. Røkke, the president of EERA, had announced at the general assembly.

A significant part of my time has been aimed at encouraging the entry of new partners. During my tenure, we have expanded greatly by welcoming as many as 14 new members! We are now 45 highly professional public research institutes. I believe we should be proud of it, and also aware of our authoritative scientific representation. The EC cannot fail to consider such an important and representative network, and the constant presence in our meetings of important representatives of different DGs fully corroborate this.

We are now 45 highly professional public research institutes.

In my role as coordinator, I have always tried to keep our JP united and informed. I have convened the Management Board almost monthly to plan our activities. I want to emphasize, once again, the constant and generous commitment of the Subprogramme Coordinators and our Secretariat. Raquel, Jaap, Francisco, Julien and Wolter, Margarita and Paloma my sincere thanks go to you! It was wonderful to work alongside you. Together we have always acted in the sole interest of the JP, with many, many brokerage initiatives to prepare European projects which have been always of the highest quality. I have always firmly believed that the best way to enhance the expertise of a JP like ours is to obtain funded projects that allow us to work together and present concrete examples of sustainable and innovative bioenergy systems. As I have repeatedly pointed out in our technical meetings and general assemblies, I strongly believe that the JP should devote its resources to 'doing' rather than to 'saying what to do'. The policy is not a peculiarity of a JP, but more structured networks in acting in this direction.

Finally, I would like to mention some recent initiatives, such as the new EERA Bioenergy Research Exchange Program and the Ph.D. Award in connection with the annual Doctoral Colloquium BIOENERGY organized by DBFZ in Leipzig, a full member of EERA Bioenergy. I hope it will contribute to increasing our already good internal collaborations and also with new potential members.

One of my regrets is that I was not able, if not to a modest extent, to expand the participation of EERA Bioenergy to Eastern European countries where the short-term deployment of bioenergy seems to have solid and concrete possibilities. Unfortunately, the workshop organized by EERA Bioenergy for this purpose, albeit with rosy prospects, did not have the follow-up I hoped for. I wish the future coordinator to achieve better results in this respect.

I warmly greet you all, wishing the new JP coordinator Myrsini and Subprogramme coordinators Raquel, Wolter, Berend and Marcelo great satisfaction in the interest of EERA and EERA Bioenergy.

Andrea.

EERA Bioenergy news in brief

NEW MEMBERSHIP

We warmly welcome IIASA, the International Institute for Applied Systems Analysis, to the EERA Bioenergy Joint Programme as an associate member.

IIASA International Institute for Applied Systems Analysis

EERA BIOENERGY RESEARCHERS' EXCHANGE PROGRAMME

In the first call launched at the end of 2021 two researchers from DBFZ were awarded, Karl-Friedrich Cyffka and Maria Braune. The research exchanges were conducted in the National Laboratory of Energy and Geology (LNEG) and the Wageningen University & Research, Environmental Technology (ETE) respectively. More information about the research carried out by the two awarded researchers is included in this newsletter in two articles written by them and it's expected that both participate in the next Steering Committee meeting of EERA planned by the end of 2022 to share the main outcomes of their research within the EERA Bioenergy community.

By 2022 new calls are being launched. On the 25th of April 2022, EERA Bioenergy launched the second call of the EERA Bioenergy Researchers' Exchange Programme and the third call was launched on 14 July.

EERA BIOENERGY LAUNCHES FOR THE FIRST TIME THE YEARLY CALL "EERA BIOENERGY Ph.D. THESIS AWARDS"

As a complementary action to the EERA Bioenergy Exchange Research Programme launched in 2021, the Management Board members designed and launched the 'EERA Bioenergy Ph.D. Thesis Awards' for the EERA Bioenergy community. This call will be yearly and the first one opened on 19th April 2022. It was widely disseminated through the EERA Bioenergy website and announcements by email.

This award consists of granting the Doctoral (Ph.D.) graduates in the field of bioenergy and biofuels by supporting the costs for open-access publications or conference fees. Eligible applicants can be Ph.D. graduates (maximum 5 years after finishing their Ph.D.) that belong to entities that are members of the EERA Bioenergy Joint Programme.

Five doctoral graduates were awarded by the funding option they chose, as listed below:

1) Cristina Álvarez from CIEMAT → Open access publication
2) Jörg Kretzschmar from DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH (German Biomass Research Centre) → Conference fee
3) Andrea Parenti from DISTAL → University of Bologna → Open access publication
4) Marco Puglia from Università degli Studi di Modena e Reggio Emilia → Open access publication

The awarded are going to be invited to the next EERA Bioenergy Steering Committee meeting to present their Ph.D. work with the objective to support the visibility of young biomass scientists.

WEBINARS ON COLLABORATIVE PROJECT GENERATION

Two internal webinars for EERA Bioenergy members, were organized in May and June to work on collaborative project generation.

- **SP1 & SP5 WEBINAR: IDENTIFYING HORIZON EUROPE FUNDING OPPORTUNITIES**

EERA Bioenergy sub-programme 1 on Sustainable production of biomass, coordinated by Dr. Wolter Elbersen, from Wageningen University & Research (WUR), and EERA Bioenergy sub-programme 5 on Sustainability / techno-economic analysis / public acceptance coordinated by Raquel S. Jorge, from the Norwegian University of Science and Technology (NTNU), held an online workshop on the 13th of May 2022.

The main objective of this internal workshop was the identification of Horizon Europe funding opportunities in areas of sustainable biomass mobilization (for SP1 members) and sustainability and public acceptance (for SP5 members).

- **SP2, SP3 & SP5 BROKERAGE EVENT ON THE CALL HORIZON-CL5-2022-D3-03**

On 2nd of June 2022, SP2, SP3 and SP5 Coordinators (Jaap Kiel (TNO), Francisco Gírio (LNEG) and Raquel S. Jorge (NTNU) respectively), organized a brokerage event on the call HORIZON-CL5-2022-D3-03-02: Best international practice for scaling up sustainable biofuels, whose (planned) opening date is 6th September 2022 and the deadline date is 10th January 2023.

STEERING COMMITTEE MEETING IN BRUSSELS AND NEW MANAGEMENT BOARD

The EERA Bioenergy Steering Committee meeting took place in a hybrid format (EERA asbl office at Brussels and remotely through Zoom) on the 16th of June. It was the first to-face meeting organized within EERA Bioenergy since November 2019.

Relevant issues related to the Joint Programme structure and actions were addressed by the participants.

The European Commission representatives Maria Georgiadou (DG-RTD) and Johannes Baur (DG ENER), informed on the last news of R&I policy in renewable fuels and bioenergy, also the updates on bioenergy on the revision of the Renewable Directive. Andy Reisinger (IPCC) explained some key findings from the IPCC's 6th Assessment Report and the role of bioenergy in the mitigation of climate change.

In addition, elections were held to appoint a new Management Board, as well as a new Joint Programme Coordinator. As a result, Ms. Myrsini Christou, from the Centre for Renewable Energy Sources and Saving (CRES), was elected as the new EERA Bioenergy Joint Programme Coordinator, whereas the new Management Board was constituted as follows: Mr. Wolter Elbersen from Wageningen University & Research was re-elected as Head of Subprogramme 1 (Sustainable production of biomass) Mr. Berend Vreugdenhil from TNO was elected as SP2 'Thermochemical Platform' Coordinator; Marcelo Domine, from Instituto de Tecnología Química (UPV-CSIC) was appointed as coordinator for Subprogramme 3 'Biochemical Platform', whereas Raquel S. Jorge from the Norwegian University of Science and Technology (NTNU) continued as Head of SP5: 'Sustainability / techno-economic analysis / public acceptance'.

The Subprogramme Coordinators presented the activities and planning for the 2nd semester of 2022, followed by the introduction of the new associated member of EERA Bioenergy JP, IIASA - International Institute for Applied Systems Analysis. Michael Kuhn had the opportunity to present himself and the entity to the participants.

Lastly, the EERA Bioenergy Secretariat summarized the main activities and goals achieved since the last Steering Committee meeting held in December 2021, and EERA asbl Secretariat brought updated information on work and activities that are being carried out by EERA asbl.

Bioenergy highlights

TO BE OR NOT TO BE A BIOBASED COMMODITY: ASSESSING REQUIREMENTS AND CANDIDATES FOR LIGNOCELLULOSIC-BASED COMMODITIES

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One of the major challenges in the shift to a biobased economy is making lignocellulosic biomass tradable and transportable in the form of semi-finished products/ commodities. Researchers assessed what a real lignocellulosic commodity should be and what the advantages of a real commodity would be. They define the requirements for these biomass commodities.

What makes a true lignocellulosic commodity?

Lignocellulosic biomass is an underutilised renewable resource. Using this biomass for biobased applications is hampered by a lack of possibilities to efficiently link the biomass to markets which include both energy applications such as heat and electricity production, conversion to transport fuels, chemicals and/or other materials in biorefineries.

Siting conversion facilities near abundant biomass have the benefit of the availability of low-cost biomass, but the locations generally lack security of supply, availability of qualified personnel, and do not benefit from existing infrastructure and possibilities to add value to residues. Furthermore, the scale of conversion systems is limited by the local cost of generally bulky and wet biomass supply.

Lignocellulosic biomass needs to be processed before (long-distance) transport to increase energy density and ease of transportation, handling and storage. This can be done through a wide range of processes such as pelletisation, chipping, pyrolysis, torrefaction, or hydrothermal upgrading. This will require a cost of pre-processing but will reduce the cost of transportation, handling and storage and further conversion and in the end the overall cost of supply.

The development of real lignocellulosic commodities can connect biomass to markets and lower the opportunity costs of the commodities.

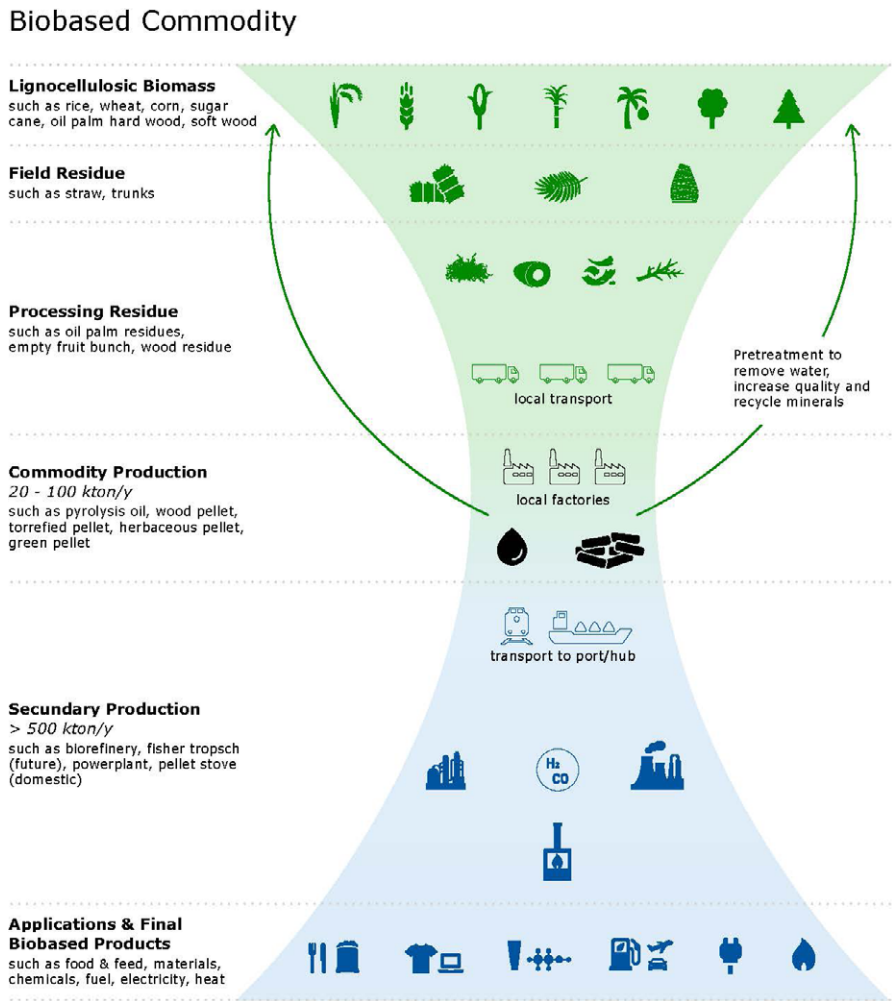
Five requirements of a real lignocellulosic biobased commodity have been defined:

1. Easy to store and transport: High energy density, dry, low ash, nutrient-depleted
2. Fungible: “interchangeable”= uniform, standard quality
3. Standardization of transport, contracting, insurance and conversion systems
4. Functioning markets: trading systems, financial instruments (futures, etc.), high tradability
5. Sustainability: Standard sustainability certification systems

Several candidates as real commodities exist, including wood pellets, pyrolysis oil, herbaceous pellets, torrefied pellets, wood chips and bio-crude. However, they are still not real commodities as they do not fulfil the 5 requirements described above. It is argued that only a few biomass commodities have to be defined that cover all lignocellulosic biomass types (wood, grass, straw, bagasse, processing residues, etc.) and also all applications such as heat, electricity, fuels, chemicals and materials. The standards have to be as wide as possible and avoid frivolous or unnecessary demands. It will require international collaboration to materialize the potential lignocellulosic biomass. The development of real lignocellulosic commodities can connect biomass to markets and lower the cost of biomass supply by lowering transaction costs, as illustrated in the Figure. Commodities can contribute to efficient and circular use of biomass by creating a market for biomass that is currently highly underutilized (stranded biomass).

Development of biobased commodities

Trade-in biomass will be greatly enhanced with the definition of a limited number of standard 'biobased commodities' that cover all lignocellulosic biomass types (wood, grass, straw, bagasse, processing residues, etc.) and also all applications such as heat, electricity, fuels, chemicals and materials. It is necessary that all parties involved in the production chain (biomass producers, machine builders, regulators, insurers, bankers, transport, and final users) work towards creating these commodities that can link all the potentially available and diverse lignocellulosic biomass resources worldwide with global markets.



In 2018, IEA Bioenergy Task 43 (biomass supply) launched an initiative to identify successful examples of biomass logistics and distribution points for bioenergy and the bioeconomy: **bio-hubs**. Pre-treatments and densification at these bio-hubs allow transforming of raw biomass feed streams into commodities with uniform properties. Commodities can then be shipped for remote downstream processing at an industrial scale. Commoditization facilitates biomass supply chains so that biomass can play an increasing role to provide credible alternatives for geopolitically sensitive fossil fuel imports and thereby improve our energy security.

This report, carried out by Wageningen Food & Biobased Research, and financially supported by IEA Bioenergy Task 43 looks into requirements and candidates for lignocellulosic biomass-based commodities.

The full report is available here.

ONLINE ACCESSIBILITY OF BIOMASS POTENTIALS – MAPS AND TOOLS FROM DBFZ'S DATALAB

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The reduction of greenhouse gas emissions is a key objective on the strategic roadmap of many political and economic stakeholders. However, how much of which biomass is available and where? Since the availability and applicability of biomasses provide essential data for decisions and policymakers, biomass potentials have been in high demand lately. This demand is additionally fuelled by the competitive utilization paths for material or energy.

At the DBFZ, the Resource Mobilization group joined forces with the newly established DataLab to make spatially explicit time series of biomass potentials accessible and by means of online tools also visible.

The first version was the DBFZ Resource Database (https://datalab.dbfz.de) which holds data on 77 biomasses at the national level of Germany available for 2015, which any interested party can freely access. Version 2.0 is currently under development and will be upgraded with yearly data, starting 2010 to this year. Within the frame of the CAFIPLA project, biomass potentials for the EU27 member states are under preparation and will extend the existing database by the inclusion of further countries. The integration of countries outside the EU is, although taken into consideration during development, left for future work.

In order to efficiently and sustainably exploit biomass potentials – e.g., in terms of harmonizing locally available resources, infrastructure, and production sites –, a finer spatial resolution than the national level is required. A first BETA version of the DBFZ Dashboard went online in 2021 providing information on biomass potentials of grain straw (Figure 1) and municipal residues (https://datalab.dbfz.de). All data can be displayed either at the federal state or county level and is available for download.

The used data and applied methods compile the gained knowledge from various research projects (AGBioRestMon, Pilot-SBG, MoreBio, BEniVer, PEGGÜ, OpenGeoEdu) where we worked on the estimation of regional biomass potentials for Germany, which are now integrated into freely-accessible online dashboards. These display a map viewer featuring interactive selection tools allowing the user to draw rankings and timeseries. The interactive map is supplemented by additional information on, among others, material flows, database, and FAQs. Background information is also given to support usability and aid in the interpretation of the presented results.

There are, however, various challenges associated with the calculation of regional biomass potentials: for example, the lack of a recognized standard for the calculation of biomass potentials. We address this issue by describing and documenting the input data and calculation method as transparently as possible. This ensures the comparability of different biomasses with each other such that any deviating results of other potential studies can be explained more easily. To ensure that the underlying research complies with the FAIR principles (findable, accessible, interoperable, reusable), all data products are available for download free of charge (under CC BY 4.0 license).

The close cooperation with the DataLab will yield a new platform for data storage and management as well as interactive maps and shared tools. This approach shall facilitate utilization by interested scientific, political, economic, and public parties; e.g., in form of further establishment of web products exploiting our open application programming interfaces (APIs).

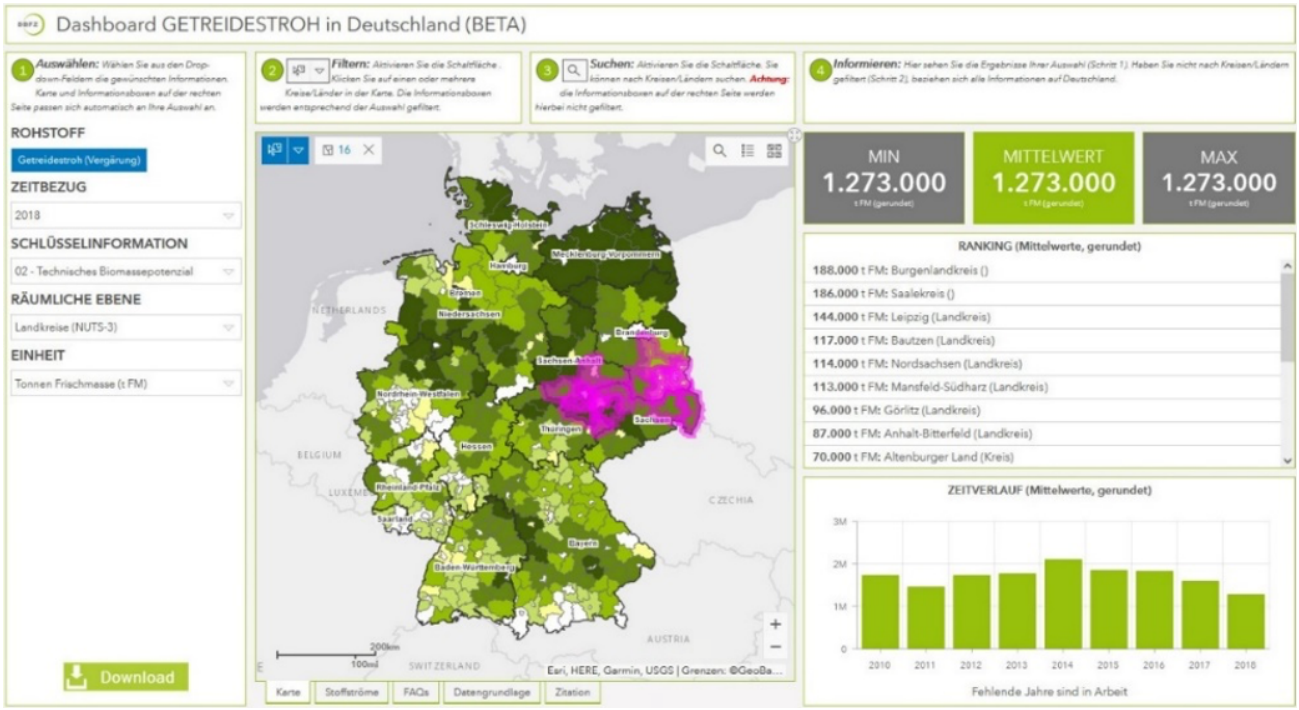

Figure 1. DBFZ Cereal Straw Dashboard with the technical biomass potential of cereal straw with a randomly selected region of interest in magenta.

To this end, we invite you to explore the insightful dataset and web tools provided. We are continuously working on their expansion and improvement. Feedback and suggestions are welcome at any time.

Stay tuned for the next updates!

EMISSION FACTORS, THEIR RELIABILITY AND NEEDS FOR IMPROVEMENT – THE CASE OF WOOD STOVES

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Emission factors are used in national emission inventories for calculating national emissions of a wide range of emission compounds and from a wide range of emission sources. Its further use includes estimation of environmental, climate and health impacts. Hence, the emission factors should be as accurate/representative as possible, enabling a realistic estimation of the emission impacts.

However, the representativeness of many emission factors can be questioned, e.g. for small-scale biomass combustion units and especially wood stoves. Wood stoves are batch-operated combustion units that are manually operated and where the only combustion process control option is the adjustment of the air supply through adjusting the air inlet valve(s). A wide range of operational conditions will in practise occur even for a single wood stove, resulting in varying emission levels of different emission compounds, especially those resulting from incomplete combustion. Representative weighted emission factors should then be derived, taking into account the actual use pattern of the stove, e.g. including also part-load operation.

The variety in wood stove technologies, results further in large variations between the individual wood stove models. Different wood stove type approval testing standards have been developed through the years. They are physically different in their approach, and hence they will not produce the same results when carrying out type approval testing of a new stove. Type approval testing serves one main purpose, i.e. comparing the combustion performance of stoves, under restricted conditions, and ensuring, under the constraints of the test conditions, that the stoves satisfy emissions and efficiency regulations. When it comes to real-life emissions, they can become significantly higher than what was achieved during the type approval testing.

So far so good, wood stoves are indeed challenging combustion units when it comes to combustion process control, and type approval testing is not reflecting real-life use. However, when you look closer at the actual emission factors used in different national emission inventories, you see for some compounds large variations, in some cases even extreme variations. Obviously, this will heavily influence the outcome of analyses where these emission factors are used. You can argue that wood stoves to some degree are different and are operated differently in different countries, however, this is not a plausible reason for the large variations in emission factors that can be seen. In fact, emission factors today are frequently originating from test campaigns following type approval testing standards.

A recent work[1] within the Norwegian knowledge building project SusWoodStoves (https://www.sintef.no/projectweb/suswoodstoves/publications/), carried out a critical review of current emission factors in Norway, and compared them with other Nordic and EU emission factors. A selected result is shown in the figure below, comparing Norway with other Nordic countries.

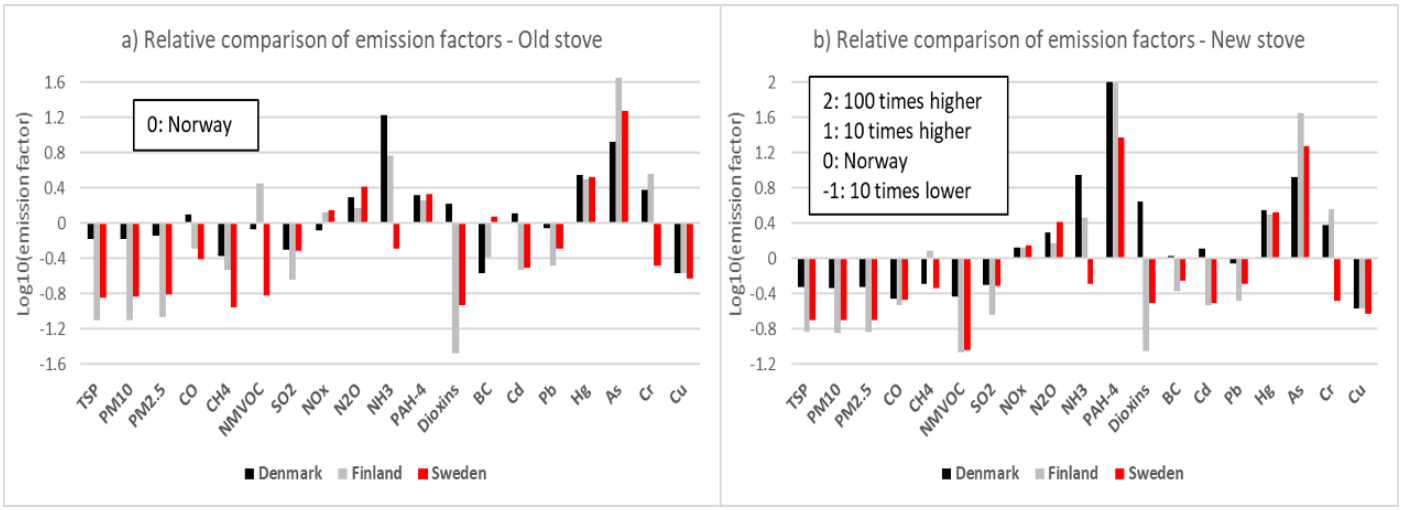

Figure 1. Relative comparison of emission factors - Old (a) and new (b) stove category.

Very large variations in some of the emission factors can clearly be seen (note the logarithmic scale). This is not acceptable considering the importance of having accurate/ representative emission factors when used in further emission impact studies.

This calls for a more thorough and aligned work aiming at deriving more consistent and realistic emission factors, ultimately representing the real-life situation. The large to extreme variations in emission factors used today in national emission inventories are in principle unacceptable, and conclusions drawn from impact studies using the emission factors can become very wrong.

In SusWoodStoves, extensive work is carried out to assess the performance of the modern wood stove category, as there is a real need to distinguish between old wood stoves with high emissions and modern wood stoves which have much-reduced emission levels of emissions of unburnt.

National emission inventories should annually update the emission factors used to account for the improvements resulting from continuous technology development. Today, emission factors are commonly not frequently updated, and hence the emission inventories do not sufficiently reflect the technology improvements, only the improvements caused by removing a wood stove in the old wood stove category with an average performant new wood stove in the modern wood stove category.

[1] * Øyvind Skreiberg, Morten Seljeskog, Franziska Kausch (2022). A critical review and discussion on emission factors for wood stoves. IConBM2022, 5-8 June, Naples, Italy. To be published in Chemical Engineering Transactions.

MUSIC CASE STUDY ON PRODUCTION OF MARINE BIOFUELS FROM PYROLYSIS OIL

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The MUSIC project (www.music-h2020.eu) is a HORIZON2020 initiative that aims to facilitate the market uptake of **intermediate bioenergy carriers (IBC)** by developing **feedstock mobilisation strategies, improved logistics and IBC trade centres**.

IBCs are formed when biomass, such as agricultural or forest residues, is processed into energetically denser, storable and transportable intermediary products analogous to coal, oil and gaseous fossil energy carriers.

IBCs may serve to replace fossil fuels in the energy sector (for power and heat production), the transport sector (for advanced biofuels production), within energy-intensive industries as well as for the production of bio-based materials. IBCs contribute to energy security, reduce greenhouse gas emissions and provide a sustainable alternative to fossil fuels in Europe. IBCs covered in the MUSIC project include both solid (torrefied biomass) and liquid intermediates (pyrolysis oil and microbial oil).

Project results show that IBCs are intermediates inside complex value chains, and that it is their final use that drives the specific collocation inside the biomass, biofuel and bioenergy EU legislation. Promising applications of IBCs include the substitution of fossil fuels in existing power and CHP plants (torrefied biomass and pyrolysis oil), the co-feeding with mineral oil in refineries (pyrolysis oil, microbial oil) for the production of advanced biofuels and bio-based products, as well as the replacement of coal as reducing agent in blast furnaces in the steel industry.

The central part of the MUSIC project are **concrete case studies on full value chain applications of IBCs**, such as the MUSIC Case Study on Pyrolysis oil production and upgrading in Finland and Sweden - Using renewable feedstock from Nordic forest industries to produce pyrolysis oil and upgrading it to advanced, drop-in marine biofuel.

Both Sweden and Finland have large quantities of woody biomass available in the form of sawmill residues and fresh forest residues that can be used for the production of pyrolysis oil. This pyrolysis oil is transported by ship to the Netherlands, where upgrading to marine biofuel can take place, using a dedicated process that is currently being developed by BTG, one of the MUSIC consortium members.

In the strategic MUSIC case study, the pyrolysis oil quantities were set at 192,000 tonnes/year, which is the equivalent of the yearly production of 8 standard-sized biomass pyrolysis plants. The financial feasibility of these plants was determined, and a choice was made to locate 4 plants in Finland and 4 in Sweden. Minimum costs for pyrolysis oil at the factory gate were determined to lie between 312 and 430 Euro/tonne, dependent on the business case of the pyrolysis oil plants. It should be noted that very recently prices have increased substantially, which is not reflected in these figures.

International transport can take place in various ways (road, rail, water) and volumes. An option involving monthly transport by sea to Rotterdam is considered technically feasible. Total costs for international transport are about 58-91 Euro/tonne, dependent on the transport frequency.

To make pyrolysis oil suitable for transport applications, upgrading of the oil is required. This is a chemical process that requires substantial amounts of hydrogen.

In the base case, production costs for the pyrolysis-based transport fuels would amount to about 1750 Euro/tonne, which is rough twice as much as the current (2021) price of a fossil alternative. It should be noted that since the upgrading technology is still at a lower TRL, there is large uncertainty in the calculated cost price.

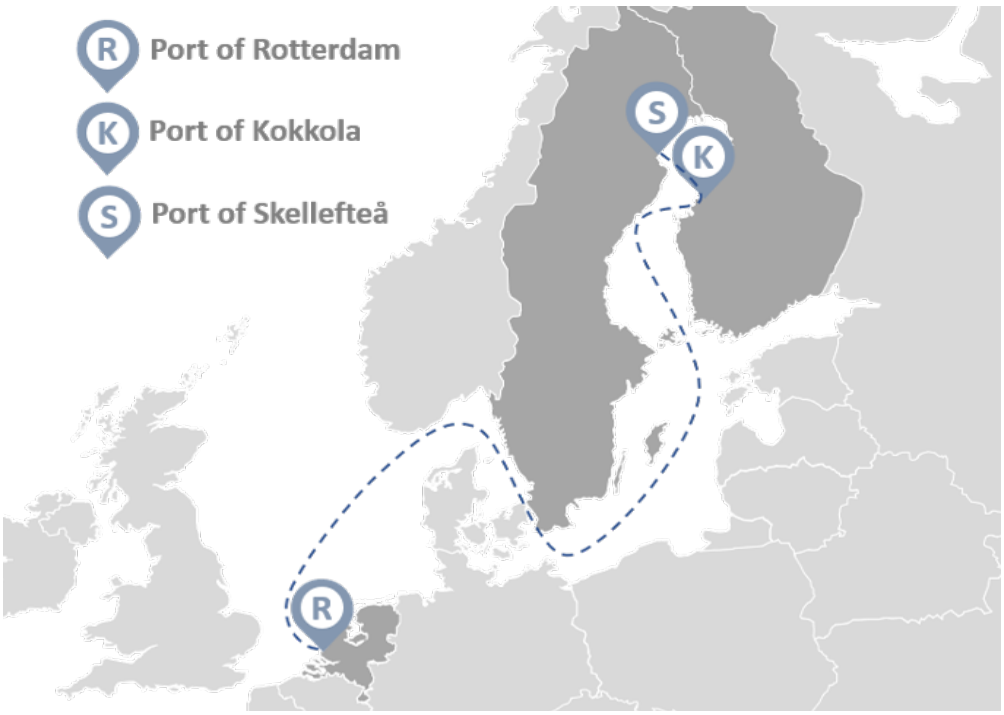

Figure 1. International transport investigated for the MUSIC Case Study on the production of pyrolysis oil in Finland and Sweden and its upgrading to advanced, drop-in marine biofuel in the Netherlands (Source: Biofuel Region, Sweden)

INNOVATIONS IN LIGNOCELLULOSIC BIOMASS VALUE CHAINS – BECOOL PROJECT DELIVERS ITS FINAL RESULTS

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Five years of research and demonstration carried out by the BECOOL project led to significant findings on multiple aspects of lignocellulosic biomass value chains for advanced biofuels and biorefineries.

Advanced biofuels are one of the solutions to decarbonize transport, especially in sectors where electrification and alternative renewable fuels are not available yet, such as aviation, shipping, and long-haul transports. However, the mobilization of large volumes of biomass is required to deploy the full potential of advanced biofuels, so how can we produce them sustainably and at competitive costs, while preserving our environment and without reducing the agricultural land required for food? These are the main research questions that inspired and guided the work of BECOOL, a Horizon 2020 project coordinated by prof. Andrea Monti of the University of Bologna which run between June 2017 and May 2022.

BECOOL carried out a range of research and demonstration activities which led to significant findings on multiple aspects of lignocellulosic biomass: from the production of non-food crops to biomass logistics and harvesting, to the production of bioenergy intermediates and final products, and a full environmental and socio-economic assessment of their large-scale deployment.

Residual biomass from agriculture and forestry activities is an abundant resource in the EU. In addition to cereal straw which is already utilized for advanced biofuels, other residues such as corn cob and cereal chaff are available at million tons scales and still mostly untapped. Innovative harvesting solutions can enable the collection of those residues with traditional combine harvesters, without reducing the performance of grain harvesting, whilst increasing the amount of biomass collected per unit of land.

Growing annual lignocellulosic crops in multi-annual rotations with conventional food and feed crops can be an effective way to diversify and secure the supply of biomass for advanced biofuels. Five years of field observation in BECOOL showed that the grain yields of cereal crops were not affected by the rotation with lignocellulosic crops, while biomass yield per unit of land increased significantly, contributing also to soil health and fertilizer savings for the subsequent crop. Moreover, perennial crops such as giant reed and switchgrass can be successfully grown on marginal and idle land.

By combining these different biomass streams, it could be possible to meet the EU demand for advanced biofuels by 2030 with domestic supply. The full deployment of those advanced biofuels value chains could generate 25,000 full-time direct jobs in a medium biomass mobilization scenario and up to 45,000 in a high mobilization scenario.

The use of liquid energy carriers such as fast pyrolysis bio-oil (FBPO) as feedstock for gasification can also widen the feedstock base for advanced biofuels and enables synergies and integrations with existing fossil routes. Process integration can allow the co-production of bio-based chemicals. The BECOOL project also achieved the successful production of Fischer-Tropsch fuels from sugarcane bagasse with continuous operation. Fischer-Tropsch biofuels from lignocellulosic biomass can achieve high GHG emissions reductions, or even negative emissions, compared to fossil fuel references as required by RED II. Although their production cost is still high, it can be competitive with the costs of other GHG mitigation options.

The activities of BECOOL were aligned with the activities of BioValue, a twin project in Brazil, to diversify the biomass production chains and logistics of advanced biofuels in Brazil, with a focus on aviation biofuels. Building on existing complementarities in scientific expertise and experience, the two projects adopted a synergistic work programme and developed a series of joint activities.

A summary of the main results obtained by BECOOL and their relevance for the current context of biofuels deployment is described in the free publication *Innovations in Lignocellulosic Value Chains for Advanced Biofuels*, all the detailed project outputs and results are available at becoolproject.eu.

BECOOL - Brazil EU Cooperation for the Development of Advanced Lignocellulosic Biofuels has received funding from the European Union's Horizon 2020 Research and Innovation Programme under grant agreement No. 744821.

5th DOCTORAL COLLOQUIUM BIOENERGY

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The 5th Doctoral Colloquium BIOENERGY will take place from 13th to 14th September 2022 at DBFZ - Deutsches Biomasseforschungszentrum gGmbH in Leipzig. Integration of EERA Bioenergy as a partner platform is in development.

BIOENERGY DOC2022 | 5TH DOCTORAL COLLOQUIUM BIOENERGY

Bioenergy as a versatile energy source is indispensable for the success of the energy transition (Energiewende), and also for the implementation of the Sustainable Development Goals (SDGs). The energy system of the future requires sustainable, efficient, flexible and innovative solutions.

Research in this area is already diverse and at a high level. However, networking within the research landscape still needs to be expanded in order to deepen the exchange of knowledge between researchers and to use the synergies and excellence in research more efficiently as well as innovatively.

For this reason, it is highly important to bring together future researchers, industry leaders and policymakers 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 served as an annual 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. 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.

The 5th Doctoral Colloquium BIOENERGY will take place from the 13th to 14th of September 2022 at DBFZ in Leipzig. It will be supported by the international Scientific Advisory Board, consisting of 47 renowned bioenergy scientists from Germany, Austria, Switzerland, Italy and Norway and representing 38 research and higher education institutions.

The 5th Doctoral Colloquium BIOENERGY is organized by the DBFZ - Deutsches Biomasseforschungszentrum gGmbH under the scientific 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 47 renowned bioenergy scientists from Germany, Austria, Switzerland, Italy and Norway and representing 38 research and higher education institutions. The active integration of EERA Bioenergy as a partner platform is targeted for the coming years.

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

EERA Bioenergy Researchers' Exchange Programme

COOPERATION ACTIVITIES BETWEEN DBFZ AND LNEG WITHIN EERA BIOENERGY RESEARCHERS' EXCHANGE PROGRAMME

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As one of the two participants of the research exchange program and with the support of LNEG the following research tasks were performed:

- Comparison of methods of studies for the quantification of biogenic residues in Portugal and Germany.
- Estimation and comparison of the respective national potentials of biogenic residues for the production of advanced biofuels (Annex IX part A) in light of the proposed EU-COM targets (2,2% [2,6 % in Germany] in 2030), considering data of Enspreso (JRC), DBFZ (Brosowski et al.), HyFlexFuel (Bellot et al.) and Ferreira et al.[2]
- Comparison of political and regulatory circumstances for advanced biofuel production and targets (REDII, national legislation in Germany and Portugal, and proposed EU-COM REDII amendment).

The results show that the residue and waste potentials outlined in the analysed sources are sufficient for reaching the required German and Portuguese production of advanced biofuels in 2030 if these resources are actually mobilised for this usage option. However, it is important to highlight that there are factors that the methodologies of the assessed biomass potential quantification sources do not yet include, which could end up overestimating the actual usable biomass potential (implementing / accessible potential) for the production of advanced biofuels. In the case of the Enspreso (JRC) data, the share of the technical biomass potential which is actually already in use should be highlighted separately instead of making broad scenario assumptions for a general distribution of energy and material biomass usages. Especially when comparing the biomass potential data of Enspreso to the biomass potential data of DBFZ (Brosowski et al.), it stands out that the unused biomass potentials (DBFZ) are significantly lower than all biomass potential scenarios outlined in Enspreso for Germany. Hence, the assumption by EU policymakers that biomass potentials are sufficient is true; however, it might also imply that residues that are already in use are redirected towards energy usage purposes.

Further limiting factors, which seem to be not yet sufficiently addressed and can essentially negatively impact the actual usable biomass potentials and their mobilisation for advanced biofuel production, include future biomass demand increases for non-energy applications (e.g. chemical industry and peat replacement products). Other limiting factors relate to land/biomass ownership and the willingness of stakeholders to provide biomass to the market, required infrastructure, sufficient skilled labour, costs (some biomass costs seem to be underestimated), REDII conformity in terms of GHG emission reduction targets of the full supply/production chain, current and future national policies (e.g. maximum land area for bioenergy in Germany is much lower than assumptions in Enspreso data, cap for maize in Germany, EU LULUCF regulation and biodiversity strategy), adequate biomass/residue market trading platforms that connect suppliers and buyers of relevant biomasses as well as future extreme weather/climate change effects.

[2] European Commission, Joint Research Centre (JRC) (2019): ENSPRESO - BIOMASS. Hg. v. European Commission, Joint Research Centre (JRC).
Online verfügbar unter http://data.europa.eu/89h/74ed5a04-7d74-4807-9eab-b94774309d9f, zuletzt geprüft am 29.05.2022.
Brosowski et al. (2019): Ressource data base. DBFZ. Online verfügbar unter https://webapp.dbfz.de/resource-database/?lang=de, zuletzt geprüft am 29.05.2022.
Bellot et al. (2021): Quantification of European Biomass Potentials.
Online verfügbar unter https://www.openagrar.de/receive/openagrar_mods_00073600, zuletzt geprüft am 29.05.2022.
Ferreira et al. (2017): Biomass resources in Portugal: Current status and prospects.
Online verfügbar unter http://valoriza.ipportalegre.pt/papers/RenewableSustainableEnergyReviews.pdf, zuletzt geprüft am 29.05.2022.

As currently most of the residues and wastes for advanced biofuels (mainly residues from the palm oil industry) in Germany and Portugal originate from non-EU countries, a more detailed and specified regulation for advanced biofuels could be needed in order to facilitate the mobilisation of domestic available potentials of usable residues and wastes. While EU policymakers often support policy decision-making (e.g. advanced biofuel quotas) with the message of "available EU potentials", the current legislation seems inadequate to mobilise these potentials. Contrarily, research hints towards the finding that fuel suppliers/the market tend/s to demand the cheapest/most profitable fulfilling option, which is rather linked to non-EU residues as biomass and production prices tend to be lower there. Other studies[3] suggest similar developments: While biomass potentials in Europe are sufficient to meet projected demands, net imports of biomass are projected to increase from non-EU countries in the future.

Throughout the comparison of the regulatory circumstances and discussions of those with Portuguese research colleagues various recommendations were made for potential future policy in Portugal, which focused among others on a GHG reduction target-driven policy (like in Germany and as proposed by the EU-COM), support instruments for the push of electric vehicles and policy options with regard to more specified incentivisation mechanisms that could facilitate the market uptake and mobilisation of domestic residues and biomass qualifying for advanced biofuel production.

The daily conversations and discussions with the Portuguese research colleagues greatly facilitated the comparison as this direct exchange on these matters with research counterparts in another country was very insightful.

Karl-Friedrich Cyffka and researchers of the National Laboratory of Energy and Geology (LNEG)

[3] Mandley, S. J.; Daioglou, V.; Junginger, H. M.; van Vuuren, D. P.; Wicke, B. (2020): EU bioenergy development to 2050. In: Renewable and Sustainable Energy Reviews 127, S. 109858. DOI: 10.1016/j.rser.2020.109858.

EERA BIOENERGY RESEARCHERS' EXCHANGE PROGRAMME: GERMAN RESEARCHER TRAVELLED WITH DOG IN THE NETHERLANDS

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Ms Maria Braune from DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH (German Biomass Research Center) in Leipzig, Germany, was one of the two winners of the first call of the EERA Bioenergy Researchers' Exchange Programme. She undertook a two-month exchange with Wageningen University & Research in the Netherlands, both institutes are full members of EERA, to combine different knowledge and experience into a fruitful cooperation. Both institutes are working intensively on the topic of processing medium-chain carboxylic acids in different ways. The outcome of the exchange was the development of a scientific review article on promising separation technologies of medium-chain carboxylic acids – a study that does not exist yet and will be of great interest for science and industry.

The authorship, consisting of six experienced researchers from Germany and the Netherlands, has been completed and a first draft has been elaborated.

Environmental Technology (ETE) Department of Wageningen University & Research - WUR

Thanks to the grant, Maria Braune was able to establish a network that will support future collaboration, expand existing synergies and get to know the country and its people together with her dog.

Maria Braune and her Dog Cara on a bike ride in the De Hoge Veluwe National Park

New members

ASSOCIATE MEMBERS

IIASA - International Institute for Applied Systems Analysis (IIASA)

International Institute for Applied Systems Analysis
IIASA

Spot on time for its 50th Anniversary, the International Institute for Applied Systems Analysis (IIASA) based in Austria is delighted to join the EERA Bioenergy network, reflecting the mutual interest in transferring research excellence into policy impact in the push towards the urgent transitions towards sustainable, fair and resilient societies and economies in general, and the role of bioenergy in this process in particular.

IIASA is an independent international research institute with National Member Organizations across 21 countries and one Regional Member Organization in sub-Saharan Africa comprising 16 countries. Through its research programs and initiatives, the institute conducts policy-oriented research into issues that are too large or complex to be solved by a single country or academic discipline. To tackle these issues, IIASA takes a leading position in the application of systems analysis and integrated modelling, addressing challenges such as climate change, biodiversity loss, equity and justice, food and water security, sustainable development and how to enable populations to enhance and sustain inclusive wellbeing. Research is organized across six research programs, viz., Advancing Systems Analysis; Biodiversity and Natural Resources; Energy, Climate and Environment; Population and Just Societies; Economic Frontiers; and Strategic Initiatives.

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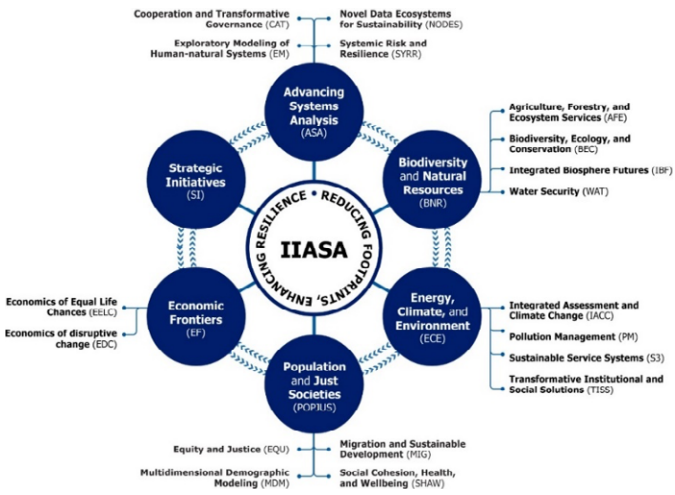


IIASA has a long history in developing and applying large modelling frameworks, such as the Global Biosphere Management Model (GLOBIOM), a global model based on spatially explicit land-use modelling across spatial and temporal scales. This allows detailed analysis of how agricultural and forest activities for the production of food or inputs for bioenergy and other industries are chosen depending on price and cost structures, trade opportunities as well as socio-economic and biophysical development and what these choices imply for food and water security, ecosystem conservation and the development of GHG emissions. Results from this research inform global and national policy initiatives, as well as IPCC, IPBES, and IEA reports. GLOBIOM being itself the land use component of the IIASA Integrated Assessment Modeling framework (MESSAGE-iX).

In the area of bioenergy, IIASA research has contributed, inter alia, to understanding the impacts of indirect land-use changes related to the production of biofuels in the context of the European Commission Renewable Energy Directive, as well as in the context of the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) within the International Civil Aviation Organization (ICAO); the role of sustainable bioenergy in IEA scenarios for attaining net zero emissions in 2050; and the beneficial impacts of supply chain optimization and bioenergy with carbon capture/BECCS strategies on both emission avoidance and job creation. Furthermore, IIASA's BeWhere Model for renewable energy systems optimization has been contributing for decades to local-, regional, and global-scale assessment of a wide range of bioenergy-related feedstock and energy conversion technologies including byproducts such as biochar, while fully tracking supply chain emissions. Linked with IIASA's forestry and agriculture models (G4M and EPIC), special focus is put on all kinds of sustainability aspects with respect to feedstock, but also to technical infrastructure. IIASA envisages to contribute to EERA Bioenergy along these lines and also explore the role of economic incentives through competition and regulation towards the efficient and effective development of biofuels; the macroeconomic repercussions of such developments; and the implications for sustainable development and wellbeing.

IIASA will be represented by Michael Kuhn (Economic Frontiers Program Director) and Stefan Wrzaczek (Research Scholar) as IIASA representatives on the Joint Program Committee as well as on Subprogramme (SP 5); by Petr Havlik (Integrated Biosphere Futures Research Group Leader) as representative on SP 1; and by Florian Kraxner (Agriculture, Forestry and Ecosystem Services Research Group Leader) and Sylvain Leduc (Research Scholar) as representatives on SP 4. All of them look forward to contributing and engaging in collaborations and joint initiatives.

IIASA at Schloss Laxenburg

Useful information

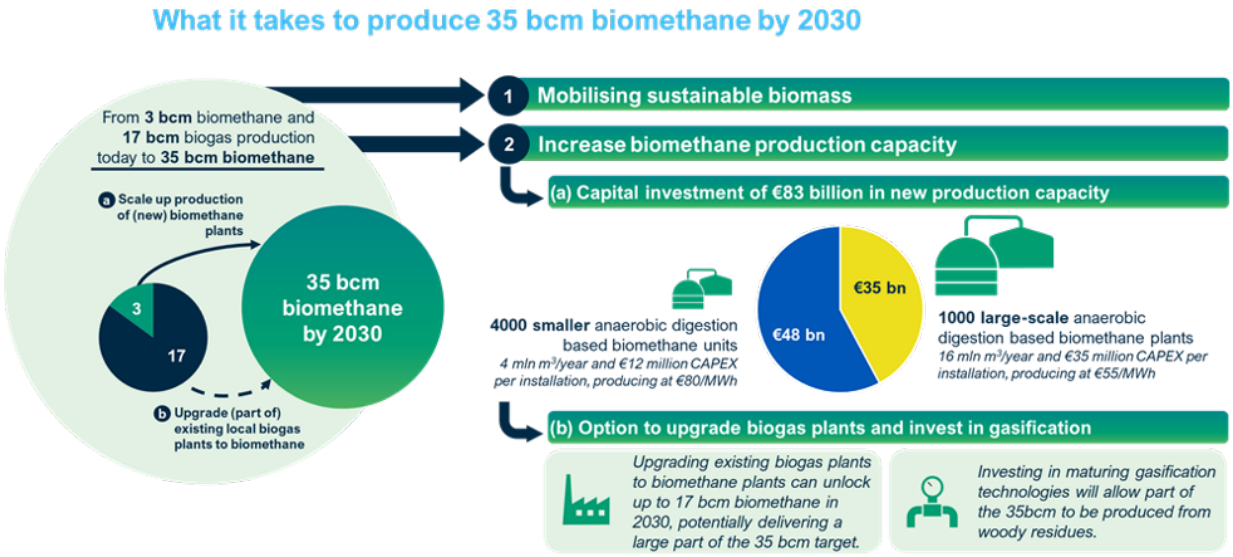
REPowerEU puts forward a Biomethane Action Plan to scale-up the sector by 2030

The European Commission presented on 18th of May the REPowerEU Plan, its response to the hardships and global energy market disruption caused by Russia's invasion of Ukraine. There is a double urgency to transform Europe's energy system: **ending the EU's dependence on Russian fossil fuels**, which are used as an economic and political weapon and cost European taxpayers nearly €100 billion per year and tackling the climate crisis. By acting as a Union, Europe can phase out its dependency on Russian fossil fuels faster.

The measures in the REPowerEU Plan can respond to this ambition, through energy savings, diversification of energy supplies, and accelerated roll-out of renewable energy to replace fossil fuels in homes, industry and power generation.

The Commission proposes to enhance long-term energy efficiency measures, including an increase from 9% to 13% of the binding Energy Efficiency Target under the 'Fit for 55' package of European Green Deal legislation.

Also, the Commission proposes to increase the headline 2030 target for renewables from 40% to 45% under the Fit for 55 package. Setting this overall increased ambition will create the framework for other initiatives, including, among others, A Biomethane Action Plan that sets out tools including a new biomethane industrial partnership and financial incentives to increase production to 35bcm by 2030, including through the Common Agricultural Policy.



The proposed measures would not only facilitate the increase in production of biogas but would also boost its subsequent conversion into bio-methane, respecting strict environmental criteria agreed in the REDII. Recognising existing barriers to entry, the actions also target the facilitation of biomethane integration into the EU internal gas market. Further coordination of support to biogas and bio-methane at the EU, national and regional levels is needed to achieve the 35bcm target. Challenges also include improving infrastructure deployment, improving access to finance, and supporting research, development and innovation.

European Council adopts its position on three texts relating to the transport sector

On 2nd of June 2022, European transport ministers adopted a common position ('general approach') on each of the three legislative proposals of the **fit for 55 package** that relate to the transport sector (alternative fuels infrastructure (AFIR), FuelEU Maritime and ReFuelEU Aviation).

This is an important step in the implementation of the fit for 55 legislative package, which should enable the EU to meet its climate objectives: reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels and achieving carbon neutrality by 2050. For the transport sector, in particular, the objective is to **reduce** greenhouse gas emissions **by 90%** (the sector currently accounts for more than a quarter of EU emissions).

Alternative fuels infrastructure (AFIR)

The Council adopted a general approach on the draft regulation on the deployment of alternative fuels infrastructure (AFIR). The main objective of the proposed regulation is to ensure that the public has access to a sufficient infrastructure network for recharging or refuelling road vehicles or ships with alternative fuels.

It also aims to provide alternative solutions so that ships moored at the quayside and stationary aircraft do not need to keep their engines running. Lastly, the goal is to achieve full interoperability throughout the EU and to make sure that the infrastructure is easy to use.

The proposed regulation will play an important role in speeding up the deployment of this infrastructure so that the adoption of zero- and low-emission vehicles and ships will not be impeded, initiating a virtuous circle, and enabling the transport sector to significantly reduce its carbon footprint.

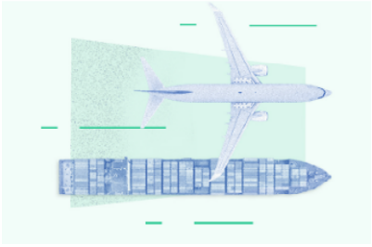
Renewable and low-carbon fuels in maritime transport

The Council also adopted a general approach on a proposal to promote the use of renewable and low-carbon fuels in maritime transport (FuelEU Maritime).The proposal aims to increase demand for and consistent use of renewable and low-carbon fuels in the maritime sector, while ensuring the smooth operation of maritime traffic and avoiding distortions in the internal market. As in the case of air transport, this proposal is key to getting maritime transport on track to meet the EU's 2030 and 2050 climate targets. The proposal is based on the principle of technology neutrality, given the wide range of technologies used in the maritime sector, and therefore focuses on fuel demand.

Sustainable air transport

The Council adopted its general approach on a proposal aimed at creating a level playing field for a sustainable air transport sector (ReFuelEU Aviation initiative).The proposal aims to increase both demand for and supply of sustainable aviation fuels (SAF), including synthetic aviation fuels, while ensuring a level playing field across the EU air transport market. It is a major proposal that aims to put air transport on the trajectory of the EU's climate targets for 2030 and 2050, as SAF are one of the key short- and medium-term levers for decarbonising aviation. It should provide a way out of the situation which is hindering their development: low supply, low demand and prices that are still much higher than fossil fuels.

Infographic - Fit for 55: increasing the uptake of greener fuels in the aviation and maritime sectors



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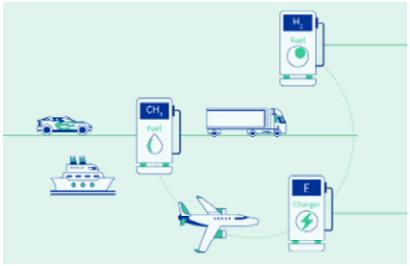
Infographic - Fit for 55: towards more sustainable transport



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Source: European Commission

Fit for 55 package: Higher targets for renewables and energy efficiency

On 27th of June 2022, The Council adopted its negotiating positions (general approaches) on two legislative proposals that tackle the energy aspects of the EU's climate transition under the 'Fit for 55' package: the renewable energies directive and the energy efficiency directive. The agreements pave the way for the Council to start negotiations with the European Parliament.

Energy production and use account for 75% of the EU's emissions and the more ambitious targets agreed today will be a significant contribution towards meeting the EU's overall goal of reducing net greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels.

Renewable energies

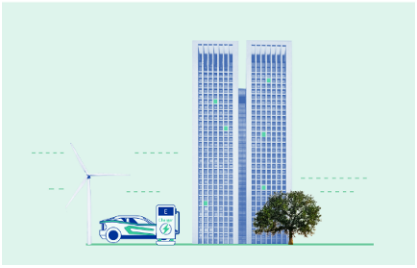
The Council agreed to set a binding EU-level target of **40% of energy from renewable sources in the overall energy mix by 2030**. The current EU-level target is at least 32%. Member states will need to increase their national contributions set in their integrated national energy and climate plans (NECPs), to be updated in 2023 and 2024, in order to collectively achieve the new target.

In addition, to advance the integration of renewables in sectors where incorporation has been slower, the Council agreed on more ambitious sector-specific targets and measures.

Energy efficiency

The Council agreed to **reducing energy consumption** at EU level by 36 % for final energy consumption and 39 % for primary energy consumption by 2030. The key target of 36 % reduction at EU level for final energy consumption would be binding. The targets use a new baseline and correspond to a 9% reduction target compared to 2020. Final energy consumption represents the energy consumed by end-users, while primary energy consumption also includes what is used for the production and supply of energy.

Infographic - Fit for 55: how the EU will become more energy-efficient



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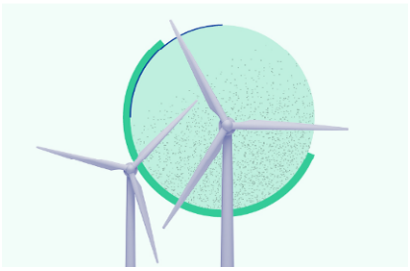
Infographic - Fit for 55: how the EU plans to boost renewable energy



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Source: European Commission

The biomethane industry smashed all records in 2021: Europe has now 1,023 production plants

Europe has around 20,000 units in operation (total number of biogas and biomethane plants). Sustainable biomethane can cover up to 30-40% of the EU gas consumption expected for 2050, with an estimated production of at least 1,000 TWh.Biomethane plants are exponentially growing across Europe: the Biomethane Map shows that almost 300 new units started operation in the past one and a half year. Europe has today 40% more biomethane plants compared to the previous edition released in 2020. The fast implementation of biomethane technologies will speed-up the decarbonisation of the EU economy. Yet, the sector will need relevant legislative support in the coming years to harness its full potential.

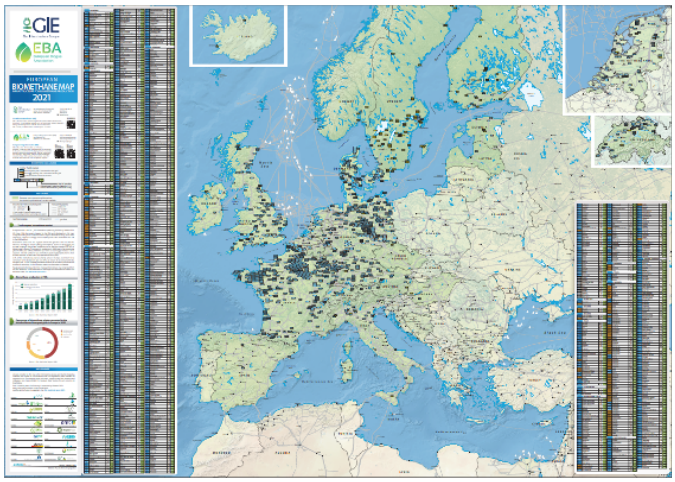
Biomethane deployment around Europe

France, Italy, and Denmark are the countries with the largest increase on the number of biomethane plants. No less than 91 new units began operation in France in 2020 and 123 plants started operation between January and October 2021. After France, the countries which saw the biggest growth in their number of biomethane plants are Italy (+11 plants in 2020) and Denmark (+ 10 plants in 2020).

Biomethane Map 2021

The Biomethane Map 2021 has been made in cooperation between two organisations promoting the development of renewable gases: the European Biogas Association (EBA) and Gas Infrastructure Europe (GIE). This comprehensive map locates and lists all known biomethane installations running in Europe. It has been produced with the information gathered from national biogas associations, energy agencies and companies.

The map provides specific details about each biomethane plant, including location, production capacity, start of operation and status of grid connection. The map also includes information on cross-border interconnection points, gas reserve areas and transport by pipeline.; and it brings additional data about the evolution of biomethane production in Europe and the percentage of biomethane plants connected to the distribution and transport grids.



EU Taxonomy: natural gas and nuclear power plants labeling as climate-friendly investments

The European European Parliament on 6th July voted in favor of the Complementary Delegated Act on climate change mitigation and adaptation covering certain gas and nuclear activities.

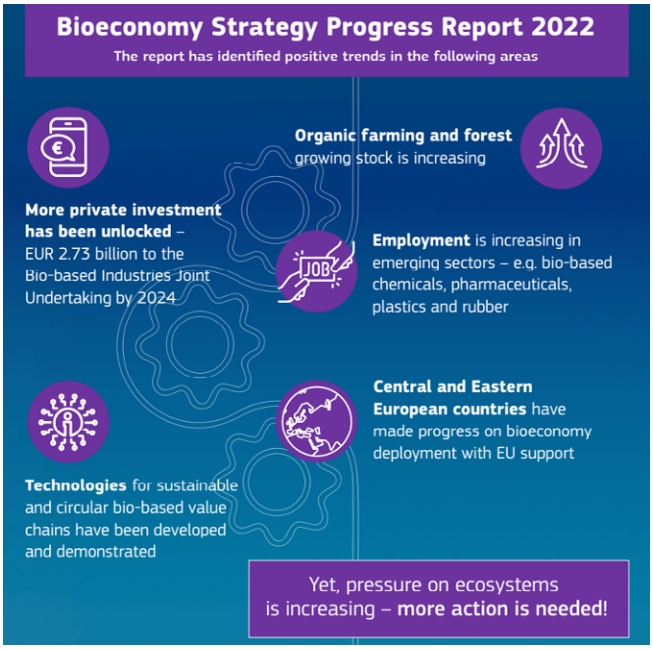
Gas and nuclear will now be included in the Taxonomy as transitional activities in a limited number of circumstances and under strict conditions. This aligns with our pathway to net zero, where they are recognised as stepping stones in the transition towards more renewables. Targeted investments in both are still needed in the medium term.

The inclusion of the transitional activities of gas and nuclear is a small, albeit necessary part of the whole EU Taxonomy, which is focused on renewable energies. Renewables will continue to be the focus for green investors and the creation of green financial products.

Source: European Commission

Adoption of the bioeconomy strategy progress report 2022

Requested by the Council of the European Union in 2019, this report assesses the progress made in the implementation of the EU Bioeconomy Strategy from 2018 and its action plan, and identifies gaps for possible future EU bioeconomy action and initiatives.



The report reflects on the increased importance of the bioeconomy in the new political environment, framed by the European Green Deal. With our current fossil-based economy having reached its limits, the transition towards a new societal and economic model, based on the sustainable and circular use of biological resources, has become one of the Union's core tasks. The bioeconomy, with its potential to improve policy coherence, and identify and resolve trade-offs, for example on land and biomass demands, enables countries and regions to design transition pathways according to their specific challenges and opportunities. Hence, the bioeconomy plays a crucial role in achieving the objectives of the European Green Deal and help us to find solutions for the current food security and energy independence crisis caused by the Russian invasion of Ukraine.

The report further shows that the actions set out in the Bioeconomy Strategy of 2018 are on track in achieving the strategy's main objectives:

- An increasing number of national and regional bioeconomy strategies promote cross-sectoral cooperation and sustainability principles and invest in bioeconomy innovation.
- Progress on bioeconomy deployment has been achieved in Central and Eastern European countries, aided by significant EU funding contributions and the establishment of new fora and networks.
- Mobilisation of private investments, start-ups and research and innovation in food and other bio-based industries are increasing and show promising developments. Europe has a strong position in the global market for bio-based chemicals and materials.

The report also identified gaps in the implementation of the action plan that require further action. First, increased focus on how to better manage land and biomass demands to meet environment and economic requirements in a climate neutral Europe. Second, work on more sustainable consumption patterns to enhance environmental integrity.

EU Bioeconomy strategy progress report

EU Bioeconomy strategy progress report (Infographic)

CBE JU strategic priorities set for 2030

The CBE JU founding partners, the European Commission and the Bio-based Industries Consortium, have set out the partnership's priorities in the CBE JU Strategic Research and Innovation Agenda (SRIA) for the 2022-2030 period.

The SRIA puts forward a strategy for the CBE JU operation consisting **of three main partnership objectives**:

1. Accelerate the innovation process and development of bio-based innovative solutions
2. Accelerate market deployment of existing mature and innovative bio-based solutions
3. Ensure a high level of environmental performance of bio-based industrial systems

Each of these objectives is deployed via specific objectives and priorities.

The SRIA begins by outlining the legal and policy context and the success factors of the Bio-based Industries Joint Undertaking (BBI JU) - CBE JU's predecessor -, on which the partnership is building, as well as defining the priorities of both founding partners. The remaining chapters detail the governance and financing of the partnership and provide an overview of synergies with other EU innovation programmes and funding instruments.

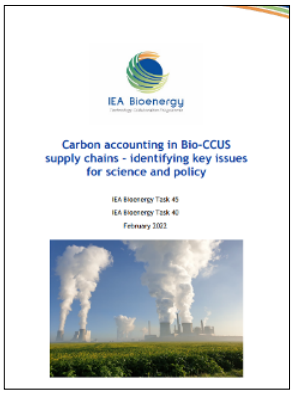
New European Innovation Agenda to spearhead the new innovation wave

On 5th July, the Commission adopted a New European Innovation Agenda to position Europe at the forefront of the new wave of deep tech innovation and start-ups. It will help Europe to develop new technologies to address the most pressing societal challenges, and to bring them on the market. The New European Innovation Agenda is designed to position Europe as a leading player on the global innovation scene. Europe wants to be the place where the best talent work hand in hand with the best companies and where deep-tech innovation thrives and creates breakthrough innovative solutions across the continent that will inspire the world.

By leading on innovation, in particular, on the new wave of deep-tech innovation requiring breakthrough R&D and large capital investment, Europe will reinforce its central role in shaping the green and digital transitions. Deep tech innovation will reinforce Europe's technological leadership and generate innovative solutions to pressing societal challenges, such as climate change and cyberthreats. Such innovations are likely to irrigate and benefit all sectors from renewable energy to agri-tech, from construction to mobility and health, thereby tackling food security, reducing energy dependency, improving people's health and making our economies more competitive. The severe consequences of Russia's war of aggression has given these issues even greater urgency and prompted strategic policy changes to ensure the EU's prosperity and security.

Source: European Commission

Publications



Carbon accounting in Bio-CCUS supply chains – identifying key issues for science and policy

IEA Bioenergy

Bio-CCUS (Bioenergy with capture and utilization or storage) are increasingly becoming more available and although technological aspects of capture, utilization, and storage of biogenic CO2 are rather understood, there are still policy and governance gaps, in relation to how to quantify the climate impact of Bio-CCUS systems and how to include these elements in policy frameworks.

In this report, members of the IEA Bioenergy Task 40 & 45 review key issues on policy, taking a holistic approach on how to tackle them by first focusing in, quantify how the climate impact of CCU products depends on CO2 storage permanence, and second, how these aspects can be integrated into policy frameworks.

PDF

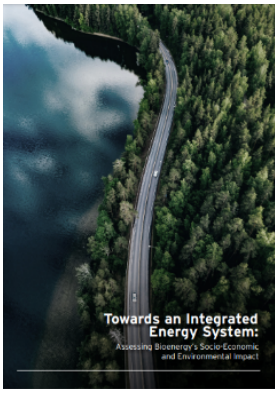
EurObserv'ER Solid biomass fuels Energy Barometer 2021

EurObserv'ER

The abnormally mild winter and warm weather experienced across Europe curbed the demand for solid biofuels, which are susceptible to temperature changes and weather conditions. At 94.4 Mtoe, solid biofuels primary energy.

consumption in the EU of 27 improved marginally – by 0.3% – on its 2019 level in 2020. Primary energy production from solid biofuels contracted slightly. It is put at 92 Mtoe in 2020, which is a 0.3% drop. While primary energy consumption remained almost stable across the EU, individual Member States' variations are more mixed. The strongest increase can be credited to the Netherlands, whose consumption rose from 1.6 Mtoe in 2019 to 2.3 Mtoe in 2020. Over the same period, consumption fell in France, Finland, and Germany.

PDF

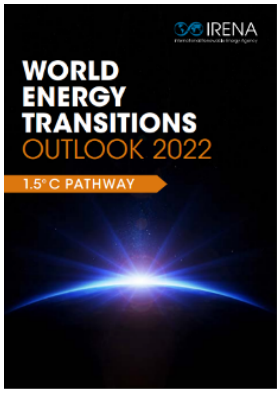


Towards an Integrated Energy System: Assessing Bioenergy's Socio-Economic and Environmental Impact

Bioenergy Europe - Deloitte

In this report, Deloitte analyses the future role of bioenergy in achieving climate neutrality, as well as its contribution to society considering the socio-economic and environmental impacts not only today but also on the 2050 horizon. The assessment carried out estimates the impact of bioenergy on the economy in terms of GDP and employment creation, paying particular attention to its effect on the rural environment, while also considering the impacts of bioenergy on the mitigation of carbon emissions, the contribution to forest health, the security of the energy supply and the development of a circular economy as well as the complementarities of bioenergy with other renewable energies and the adoption of clean hydrogen solutions.

PDF



World Energy Transitions Outlook 2022: 1.5°C Pathway

IRENA – International Renewable Energy Agency

By laying out a map for the next eight years, IRENA's World Energy Transitions Outlook (WETO) 2022 enables policymakers to stay on the pathway towards the 2050 goal. The report provides an in-depth analysis of two areas particularly relevant for the decarbonization of end-use sectors: electrification and bioenergy. It also explores the socio-economic impacts of the 1.5°C pathway suggesting ways to speed progress towards universal access to clean energy.

PDF

Bioenergy Europe Statistical Report 2022

Bioenergy Europe

BIOENERGY EUROPE STATISTICAL REPORT 2022

Bioelectricity Statistical Report 2022

Bioenergy Europe's 2022 Report on Bioelectricity unveils the role of bioelectricity for energy transition, providing the reader with detailed data analysis on current dynamics of electricity, renewable and not, with a focus on electricity produced from biomass (bioelectricity). Most of the figures included in the report are filtered by country, helping policy makers and investors to better calibrate their decision-making.

PDF

Biogas Statistical Report 2022

Bioenergy Europe's 2022 Report on Biogas focuses on the biogas sector in Europe and its upgraded version, bio-methane. The report takes a look at the biogas consumption and production in the EU and provides an in-depth analysis on the sectors state of play. Readers will be able to access state of the art information on the number of biogas plants in the EU countries and the type of feedstock that they use, among other matters.

PDF

Brief on jobs and growth in the EU bioeconomy 2008-2019

European Commission's Knowledge Centre for Bioeconomy

This brief on 'jobs and growth in the EU bioeconomy 2008-2019' is one out of a series of Knowledge Centre for Bioeconomy's briefs which intend to provide independent evidence for EU policy in this field.

The biomass producing and converting sectors of the EU bioeconomy created up to EUR 657 billion of value added (4.7% of the EU's gross domestic product) and employed 17.4 million people (8.3% of the labour force) in the EU-27 in 2019. Concomitant growth in value added and reduction in number of people employed resulted in apparent labour productivity gains in all bioeconomy sectors over the 2009-2019 period, especially in the agriculture sector. After a steep rise in value added generated in 2017, compared to the previous year, the EU bioeconomy showed a slower but continued growth.

Since 2008, the bioeconomies in the EU Member States have been following different trajectories in terms of jobs and growth. The apparent labour productivity has mostly increased while the concentration of national labour markets towards the bioeconomy did not substantially change.

PDF

Renewables 2022 Global Status Report

REN21

REN21's Renewables 2022 Global Status Report (GSR 2022) sends a clear warning that the global clean energy transition is not happening, making it unlikely that the world will be able to meet critical climate goals this decade. The second half of 2021 saw the beginning of the biggest energy crisis in modern history, exacerbated by the Russian Federation's invasion of Ukraine in early 2022 and unprecedented global commodity shock.

The GSR annually takes stock of renewable energy deployment worldwide. The 2022 report is the 17th consecutive edition and provides proof of what experts have been warning about: the overall share of renewables in the world's final energy consumption has stagnated – rising only minimally from 8.7% in 2009 to 11.7% in 2019 – and the global shift of the energy system to renewables is not happening.

PDF

Save the date! International bioenergy events

SEPTEMBER 2022

7 – 9 September 2022
World BioEconomy Forum
Online + Ruka, Finland
link

13 – 14 September 2022
5th Doctoral Colloquium BIOENERGY
Leipzig, Germany
link

14 - 15 September 2022
8th Advanced Biofuels Conference (ABC 2022)
Stockholm, Sweden
link

28 -29 September 2022
4th European Conference Biomass PowerON
Hamburg, Germany
link

OCTOBER 2022

4-5 October 2022
Nordic Biogas Conference 2022
Linköping, Sweden
link

11-13 October 2022
Progress in biomethane mobility
Schwäbisch Hall, Germany
link

17 October 2022
IEA Bioenergy: WS28, Technology advances in liquid biofuels and renewable gas
Vien, Austria
link

25-26 October, 2022
European Biogas Conference 2022
Brussels, Belgium
link

NOVEMBER 2022

8-10 November 2022
World Ethanol & Biofuels
Online + Brussels, Belgium
link

9-10 November 2022
11th European Biomass to Power Summit
London, United Kinhdom
link

23-24 November 2022
Future of Biogas Summit 2022
Amsterdam, Netherlands
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

Agricultural University of Plovdiv
(Bulgary)
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

CoLAB BIOREF
Collaborative Laboratory for the Biorefineries
(Portugal)
web

CREA
Italian Council for Agricultural Research and Economics Location (Italy)
web

CSIC
Agencia Estatal Consejo Superior de Investigaciones Científicas
(Spain)
web

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

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

ETA-Florence Renewable Energies
(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

IIASA
International Institute for Applied Systems Analysis (Austria)
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

TNO
(Netherlands)
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

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

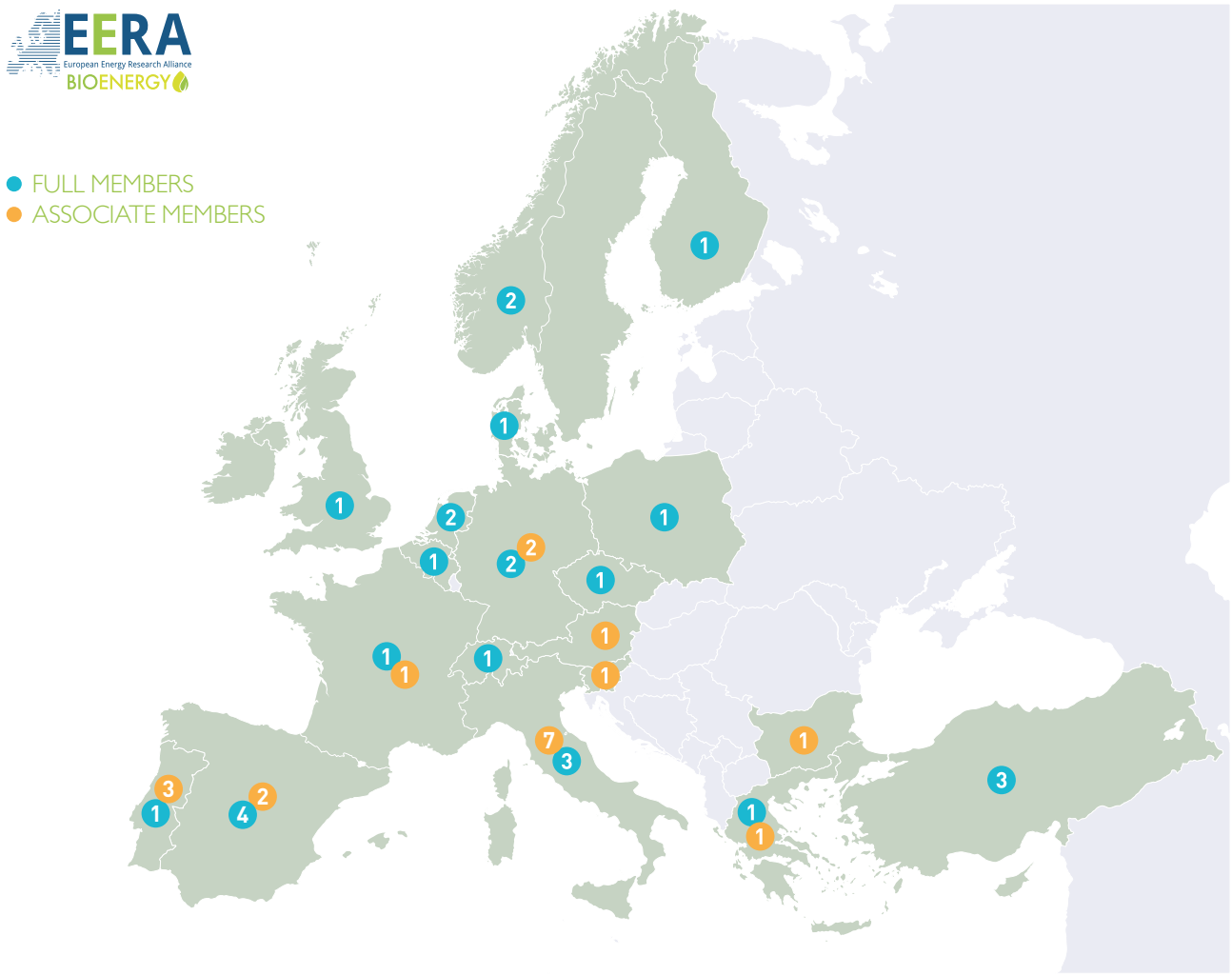


Figure 1: The EERA Bioenergy Joint Programme consists of 45 members (26 Full members and 19 Associate members) from a total of 18 countries. Link

www.eera-bioenergy.eu

Contacts

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