



Biomass expertise for the EU Green Deal

The document addresses policy makers dealing with biomass issues in the EU Green Deal and aims to provide information on expertise of the DBFZ for supporting effective and efficient biomass-related policies.

IMPRINT

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Biomass expertise for the EU Green Deal

DBFZ, the German institute for biomass research

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Energy Directive

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About the DBFZ

- The DBFZ Deutsches Biomasseforschungszentrum gemeinnützige GmbH is a German federal research organisation with a thematic focus on the integrated use of biogenic resources for bioenergy and material production.
- The DBFZ conducts applied research & development and investigates, develops and assesses technologies for the use of biogenic resources. Its findings pave the way for the innovation of sustainable products and services to ensure a rapid transition to a climate-neutral economy.
- The DBFZ has continuously expanded its international position for more than ten years as part of 21 EU projects with more than 184 partners and as an active member and national team leader in prominent international research networks such as the International Energy Agency (IEA), the European Energy Research Alliance (EERA) and the European Technology and Innovation Platform Bioenergy (ETIP Bioenergy). Through its participation in more than 70 different national and international committees and associations, the DBFZ supports sustainable developments in the bioenergy sector worldwide.

Technical research infrastructure



RESEARCH BIOGAS PLANT



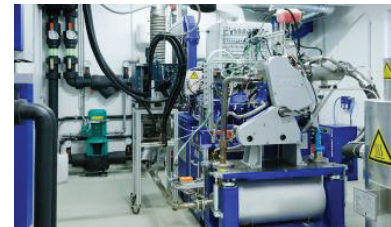
COMBUSTION LAB



FUEL CONDITIONING LAB



FUEL TECHNICAL CENTER



ENGINE TEST BED



ANALYTICAL LAB

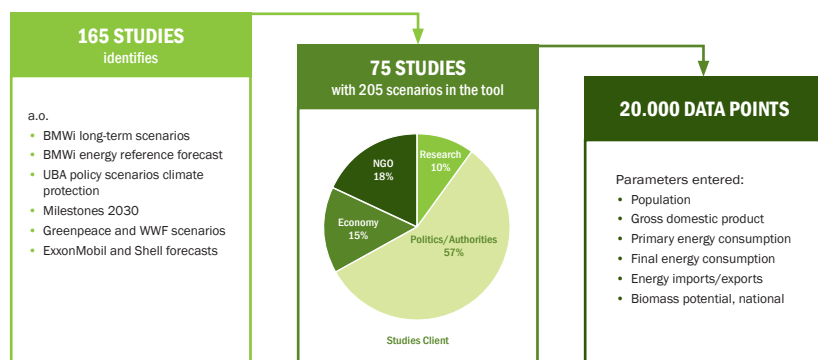
Revision of Renewable Energy Directive

EXPERTISE

- Application and further development of greenhouse gas accounting methods
- Impact assessment of biofuel legislation
- Scenario development for optimised biomass use for energy in 2030 and 2050

RESOURCES

- State-of-the-art Life Cycle Assessment tools
- Techno-economic assessment (TEA) and techno-economic environment (TEE)
- Scenario tools



SQL database of scenarios

EXPERIENCE

- Scientific advice to the EU Commission / DG CLIMA on biofuel-related technology availability and scenarios in the context of RED II
- Assessment of aspects of RED II impacts in Germany for the Federal Ministry of Food and Agriculture (BMEL) and Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU)
- Provision of scientific expertise on the delegated act regarding ILUC for the Federal Ministry of Agriculture (BMEL)
- National task leaders IEA Bioenergy Technology Cooperation Programme
- Member of EERA Bioenergy and ETIP Bioenergy
- Member of Committee on the sustainability of biofuels and bio-liquids (EC / DG ENER)
- Member of the National Platform Future of Mobility (NPM)



IEA Bioenergy task 44 workshop „Flexible bioenergy and system integration“ on 24 January 2020 in Graz (Austria)

Strategy for Smart Sector Integration

EXPERTISE

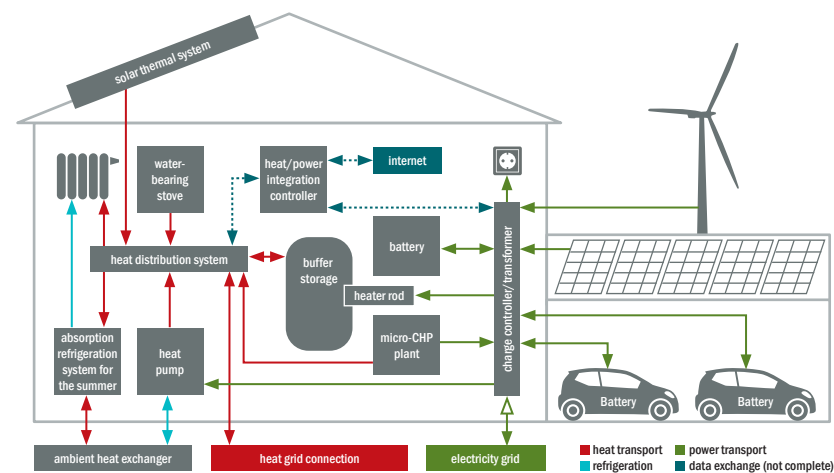
- Concepts for and demonstration of secure energy supply by flexible biogas plants and integrated power-heating systems combining wind, solar and biomass technologies
- Modelling of integrated, local specific energy supply systems (e.g., for end users)
- Development of automatic control systems for the smart integration of power and heat producers and consumers (prosumers)
- Biogas and bio-methane production from residues and waste streams and conditioning for injection into gas grids
- Development of synergies between bioenergy and Power-to-X approaches (SynBioPTx)
- Techno-economic assessment (TEA) and techno-economic environment (TEE)

RESOURCES

- Decentralised energy system models at district and individual building level
- Research biogas plant for flexible and combined heat and power (CHP) production
- Comprehensive DBFZ Smart Sector Integration assessment tool

EXPERIENCE

- Scientific advice on agricultural residues for biofuels for the federal parliament (Bundestag)
- Enhancing biorefinery processes by hydrogen injection
- Technical assistance regarding the role of biomass within Combined Heat and Power Act (KWKG) for the Federal Ministry of Food and Agriculture (BMEL)
- Input paper on the role of digitalisation for bioenergy for the Federal Ministry of Food and Agriculture (BMEL)



Example of a smart interplay of different renewable energy technologies to provide demand-driven heat and electricity (not all technologies will be used at the same time)

Renovation wave initiative for the building sector

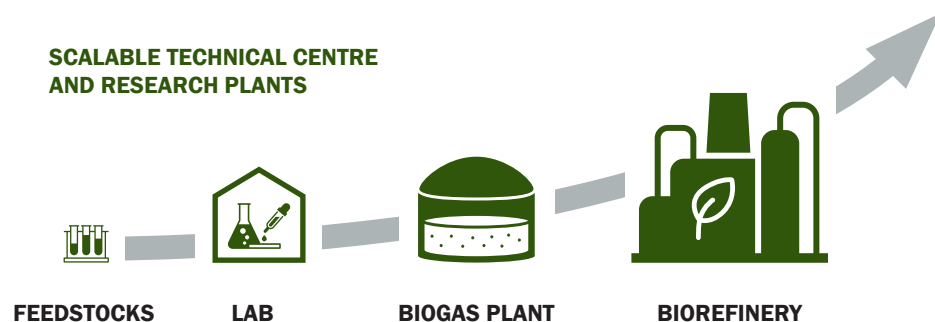
EXPERTISE

- Development and demonstration of cost-efficient residential biomass boiler systems with maximum efficiency and low emissions
- Development of intelligent heating/cooling and electricity technologies as integral part of the energy transition in the building sector
- Setting standards for minimising air pollutants of small-scale combustion units
- Development of local, sustainable renewable energy supply concepts for vulnerable communities in arid and semi-arid Mediterranean zones

RESOURCES

- Laboratory for vertical emission measurements
- Scalable technical centre (small-scale furnaces) and research plants (combined heat and power biogas plant and engine test bed)

SCALABLE TECHNICAL CENTRE AND RESEARCH PLANTS



EXPERIENCE

- Development of national air emission standard for small-scale combustion units ("Blauer Engel") for the German Environment Agency (UBA)
- Scientific advice on the development of a national heat strategy for members of the federal parliament and government
- Scientific advice on the German Buildings Energy Act (Gebäudeenergiegesetz, GEG) and German Federal Funding Mechanism for Efficient buildings and for Efficient Heat Grid (Bundesförderung effiziente Gebäude, BEG und Bundesförderung effiziente Wärmenetze, BEW) for Federal Ministry of Food and Agriculture (BMEL)
- Scientific advice for European institutions as a member of EERA Bioenergy and ETIP Bioenergy



Photo: Sam Kittner, Brookhaven National Laboratory

Wood Stove Design Challenge" in Washington, D.C in 2014 second place, in 2016 first place and in 2018 again first place in two categories („Automated“ and „Thermoelectric“)

Legislative waste reforms

EXPERTISE

- Analysis and mobilisation of biomass potentials from urban and rural organic waste streams
- Management concepts for the organic fraction of household waste
- Scientific support and monitoring for circular material use of organic waste and residues
- Concepts for nutrient recycling, e.g., low-emission manure management
- Development of strategies and technologies for the valorisation of waste and agricultural residues, e.g. by co-fermentation

RESOURCES

- Fully equipped biogas laboratory for waste characterisation and assessment of biogas potential
- Excellent scientific expertise for waste treatment
- Comprehensive resource database tool for national organic waste streams as blueprint for EU member states
- Top-level industrial and institutional stakeholder network, e.g. ALBA, TILIA, German Association for Waste Management (Deutsche Gesellschaft für Abfallwirtschaft, DGAW), German RETech Partnership Recycling and Waste Management, International Waste Working Group (IWWG)

EXPERIENCE

- International waste treatment projects, e.g. in the EU, in Africa, Asia and South America
- Pilot projects on circular material use of organic waste in Shanghai, Shenyang and Hefei
- Scientific advice to the municipality of Paris on the construction and demonstration of a sewage sludge and waste treatment plants, in cooperation with German business partners



Resource utilization analysis

Sustainable alternative fuels for different transport modes

EXPERTISE

- Concepts and scenarios for greenhouse gas emission reduction by using biofuels
- Emissions standards for biofuels
- Development and application of technologies for alternative liquid and gaseous fuels based on biomass (including Power-to-X)
- Integration of sustainable aviation fuels in existing airport infrastructure
- Quantification of biomass potentials for advanced fuel production
- Techno-economic assessment (TEA) and techno-economic environment (TEE)

RESOURCES

- Comprehensive database on biogenic resources, utilisation pathways and related conversion technologies at national level
- Biorefinery technical lab and engine test bed for transport fuels
- Sustainability certification methods

EXPERIENCE

- Scientific advice on the National Mobility and Fuels Strategy for the Federal Ministry of Transport and Digital Infrastructure (BMVI)
- Demonstration project on Multi-blend Jet A-1 for aviation for the Federal Ministry of Transport and Digital Infrastructure (BMVI)
- Expertise on resources for maritime biofuels for emission reduction for Sustainable shipping Initiative
- Provision of expertise on synthetic diesel for the Federal Ministry for Food and Agriculture (BMEL)
- Member of Committee on the sustainability of biofuels and bio-liquids (EU Commission / DG ENER)
- National task leaders IEA Bioenergy Technology Cooperation Programme
- Member National Platform Future of Mobility (NPM) of the Federal Ministry of Transport and Digital Infrastructure (BMVI)



BIOREFINERY LABORATORY

- 1 Chemical Biomass refining processes
- 2 Fuel & Fractionation Processes
- 3 Synthesis gas processes
- 4 Overall system assessment

Graphic: Hochschule Merseburg, A. Stephan, K. Kretschmer, M. Hollerbach, P. Schwanbeck

Green Agenda for the Western Balkan

EXPERTISE

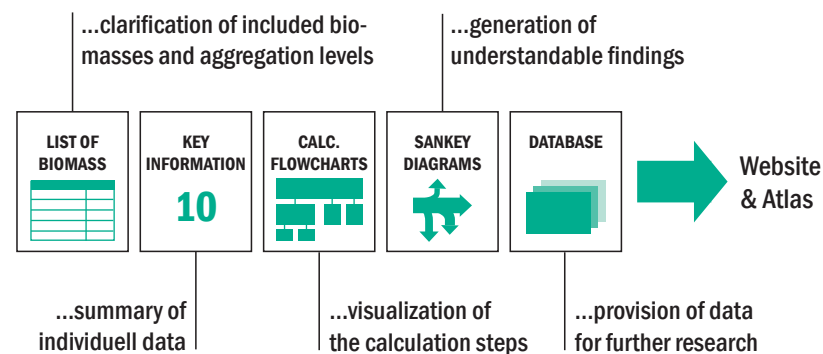
- Development of concepts for bioeconomy related value chains in different regions in Europe
- Identification of bioeconomy transition pathways for coal regions
- Establishment of transnational cluster networks on bioenergy as integral part of renewable energy systems in the Danube region
- Quantification of biomass potentials and biomass potential mapping in Western Balkan

RESOURCES

- Database on biogenic resources, utilisation pathways and related conversion technologies in Western Balkan countries
- Biomass potential geodatabase for Bosnia and Herzegovina
- Bioeconomy geodatabase for transition regions
- Expert network of renewable energy cluster in Eastern Europe

EXPERIENCE

- Scientific advice on EU-aligned testing services to fuel wood producers for GIZ in Serbia
- Provision of scientific expertise on the biomass potential and mapping for the Agencija za statistiku Bosne i Hercegovine (BHAS) in Bosnia and Herzegovina
- Coordination of regional bioeconomy strategies in several Eastern European countries
- Member of Transnational Renewable Energy Cluster Danube (TREC)
- Member of the standardization committee on biogas (ISO TC 2.5 Biogas)
- Editor of book "Das System Bioökonomie"



Visualisation of the experience

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