Ghana

DBFZ Research and Project Country Profile
Activities & Partners

DBFZ Activities

DBFZ established contact to Ghana in 2018 when its expertise was asked for the evaluation of bioenergy feasibility studies, which were executed under the patronage of West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), an international organization in West Africa with financial support by the Federal Ministry of Education and Research (BMBF).
In the next year, DBFZ realized a first comprehensive project. After a widespread potential analysis of agricultural residues apt for bioenergy provision on the national, regional and local level, a feasibility study for a biogas plant on a local spot was conducted. It provided the needed data basis for the implementation of a hybrid waste-to-energy concept that in 2020 began.
In 2019 started a PhD project on the material and energetic use of agricultural residues from Ghana.

DBFZ R&D and Project Focus

The focus of DBFZ activities in Ghana is on the knowledge transfer, in particular on biogas technologies, and consultancy on the improvement of framework conditions for the use of bioenergy.

- Assessment of (unused) agricultural residues on a national, provincial and local level;
- Knowledge transfer and scientific exchange
- Technical consultancy for biogas production in rural areas
- Technical consultancy for biogas production with household waste
- Technical consultancy for the distribution of pyrolysis cook stoves in rural areas
- Sustainable integration of bioenergy in already existing infrastructures

DBFZ Future Activities

DBFZ will consult on Ghana's use of its high potential of available biomass residues for sustainable material and integrated energetic applications. This applies for topics like food security, soil improvement, reduction of deforestation and emissions, (industrial) heating concepts, and concepts for the use of the organic fraction of household waste. The development of the bioenergy sector in Ghana should consider the possible impacts on the national economy, climate and environment.

Picture: www.nationalflaggen.de

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Project References

DBFZ would like to strengthen its activities in the following fields:

- Potential analysis together with Ghanaian and WASCAL partners
- Mass flow analysis
- Feasibility studies, in particular for organic waste and biogas use
- Knowledge transfer and vocational training
- Research and academic exchange

DBFZ Partners

DBFZ has initiated partnerships with Ghanaian partners in science and society.

Cooperation Agreements	
Project Partners	West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL) Ghana Innovation and Research Commercialization Centre (GIRC) Council for Scientific and Industrial Research (CSIR) Centre for Energy, Environment and Sustainable Development (CEESD) Kwame Nkrumah University of Science and Technology (KNUST) Kumasi Technical University University of Energy and Natural Resources (UENR) Fresh & Dry Ltd. FVConstruction Ltd. Community of Gyankobaa (Atwima Nwabiagya Municipal Assembly, Ashanti Region)

DBFZ Reference Projects (selected)

2/2019-8/2019	**Feasibility study on the biogenic residues potential in Togo und Ghana** The project quantified and screened the spatial distribution of relevant biogenic by-products from agriculture and food waste in Togo and Ghana. It identified and evaluated the country-specific biogas technology and biogas utilisation options.
06/2019-12/2022	**Thermo-chemical conversion of silicon rich biomass residues for the production of heat and power, and the combined generation of mesoporous biogenic silica for material application (BiOx)** The project proposal will investigate the efficient use of silicon rich agricultural residues in Ghana and South Africa for bioenergy and material applications. It focusses on the chemical pretreatment of biomass residues from food production and its combustion and gasification characteristics for combined heat and power production. Furthermore, material use of the biogenic silica is considered. The comprehensive, innovative approach addresses aspects of climate change (i.e. climate neutral energy provision), efficiency and sustainability of agricultural production (i.e. use of residues, circular economy), soil degradation (i.e. biogenic fertilizer) and new transformation processes of the agricultural production (i.e. new value chains).

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1/2020- 12/2023	**Hybrid Waste to energy as a sustainable Solution for Ghana (WaSSGhan)** This project aims to treat solid waste in Ghana by recycling the waste to produce energy. Besides energy, the whole value chain of the treated waste will be considered in a way that the carbon and nutrient cycle is closed to ensure sustainability. A novel 400 kW hybrid PV, biogas and pyrolysis plant will be proposed as the first pilot plant for waste treatment in a community. The pilot plant, which will consist of up to 200 kW solar PV, up to 100 kW biogas and up to 100 kW pyrolysis depending on the availability and quality of the waste streams, will be customized based on physical, chemical and thermal properties.

About DBFZ

DBFZ is the leading German research institute in the field of energetic and related material use of biomass. DBFZ monitors and evaluates the most promising applications for bioenergy in theory and practice, realizing research and collaborative research projects at both national and international level, with partners and stakeholders from industry, administration, politics and academia. Currently about 180 scientists in the departments of Bioenergy Systems, Biochemical Conversion, Thermo-chemical Conversion and Biorefineries carry out application-oriented R&D and provide scientifically-based results to support informed political decision making.

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