

# Technology providers in target countries

This database includes all technology providers who have supplied equipment to at least one bioenergy project in the ten countries targeted under the BSEAA2 study. They are classified into three sections covering 1. Anaerobic digestion systems, 2. Steam boilers and 3. Small-scale steam turbines.

**Classification of services offered:** (a) Technology; (b) Engineering, Procurement and Construction (EPC); (c) Build, Own, Operate and Transfer (BOOT) and/or (d) Project Management,

**Classification of size:** Small (1-49 employees), Medium (50-249) or Large (250+)

## 1. Anaerobic digestion systems

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<a href="#">agriKomp</a>	Germany	75 kW to 2.5 MW	1) 'Indi-plant flex' 100 kW – 2.5 MW, individually planned and constructed. 2) 'Agriselect' 75-250 kW for slurry or slurry/ manure. 3) 'Gullewerk Flex' up to 250 kW; ready-to-run small-scale AD plant.	Technology, EPC	Large. ~500 employees. >950 installations (>50% in Germany).	Kilifi Plantations, Kenya (sisal wastes + cattle manure)	No
<a href="#">AKUT</a>	Germany	30 kW to over 300 kW	1) Industrial size 'Nawaro' plants >300 kW. 2) Small fixed-dome agricultural plants (16-124 m <sup>3</sup> ) for developing countries for cooking and lighting. 3) Agricultural plants 30-100 kW for developing countries.	Technology, EPC	Unknown	James Finlay tea, Kericho, Kenya (soluble tea waste)	No

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<a href="#">Anaergia</a>	Canada	Wide range	Took over UTS Biogastechnik (Germany) under Anaergia global brand. Helios digester for easily biodegradable organic waste. Triton digester for materials needing primary and secondary fermentation, such as energy crops. Additional solutions for pre-treatment, high solids mixing, digestate and nutrient management. Pumps, mixers and separators supplied by a subsidiary, UTS Products.	EPC, BOOT, Project Management	Large. 13 office locations (incl. 4 manufacturing facilities). Over 1,600 installations on 4 continents.	1. Took over operation of AD plant at Bronkhorstspuit, S. Africa for Bio2Watt (cattle manure). 2. Supplied technology to waste-to-energy plant in Cape Town (municipal solid waste).	Yes (South Africa)
<a href="#">Avenam Links</a>	Nigeria	<100 kW	1. Plants comprising greenhouse made with hollow sunlight sheet on metal frame, combo membrane digester/gas storage bag, stainless-steel sink and outlet, biogas filter and gas pump. Optional feeding pump, circulating pump, shredder, electric heater. 2. Anaerobic baffle reactor for sewage treatment, with settling chamber for larger solids plus 3 up-flow chambers.	EPC	Small. 4 in management team	McNichols poultry farm, Ogun State, Nigeria (poultry manure) and numerous other small plants in Nigeria, most for thermal applications only	Yes (Nigeria)
<a href="#">Bio2Watt</a>	South Africa	Large plants (1-5 MW)	One confirmed project is continuous stirred tank reactor from Combigas (Denmark).	EPC	Small	1. Bronkhorstspuit beef feedlot, S. Africa (cattle manure); 2. Cape Dairy Plant, Western Cape (planned, cattle manure).	Yes (South Africa)
<a href="#">Bioenergy Berlin</a>	Germany	Not specified	Planning, design, construction and supervision of biogas facilities, mainly for agricultural waste treatment.	EPC	Small. Set up in 2004. Germany and China offices.	Hale Estate, Tanzania (sisal waste). Additional lagoon-type digesters for sewage in Burkina Faso (confirmed) & Côte d'Ivoire (reported)	No

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<a href="#">Biogas SA (dormant)</a>	South Africa	Up to 0.5 MW	Agency agreements with Sauter (Germany) for 'sprinkled, not stirred' technology; Schumann Tank & Stahlbau (digester panel tanks); Wiefferink (flexible foil covers and storage solutions); and Progeco Biogas (flares and biogas conditioning equipment).	EPC	Small. Was a one-man show (Mark Tiepelt), founded in 2009.	0.4 MW plant at, Springs, S. Africa (abattoir wastes)	Yes (South Africa)
<a href="#">Biotec International</a>	Belgium	1-3 MW	Specialist in tropical agro-industry. 28 AD plants for palm oil mill effluent in Latin America, SE Asia and W Africa. 4 types of digester: (i) Upflow Anaerobic Sludge Blanket; (ii) Contact Anaerobic Reactor; (iii) Contact Upward Flow Anaerobic Reactor; (iv) Dry Anaerobic Reactor. JV with Sauter called Agrogaz to produce household piped gas from planted feedstock.	EPC	Medium. >30 years' experience. Branches in Colombia, Malaysia & Indonesia.	3 plants in West Africa (GOPDC, Ghana; Presco, Nigeria; former Siat-owned mill at Makouké, Gabon, now defunct) (all palm oil mill effluent)	No
<a href="#">Cape Advanced Engineering</a>	South Africa	200-1,000 kW	Membrane digestors based on adapted German tech, with own locally manufactured containerised gas engines.	BOOT, Project Management	Started in 1993 at Stellenbosch Univ. Set up independently in 2008.	Uilenkraal Dairy Farm, S. Africa (cattle manure); piggery in Bapsfontein; wastewater treatment plant in Namibia	Yes (South Africa)
<a href="#">CombiGas</a>	Denmark	Not specified	Thermophilic process; feedstock intake flexibility; GasMix system; fully automated with low OPEX.	Technology	Small. Relunched in 2017 by 2 Danes with Chinese investor.	Bronkhorstspruit beef feedlot, South Africa (cattle manure)	No

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<a href="#">iBERT</a> (seeking rescue 2021)	South Africa	18-210 kW	Biogas Express Reactor Technology (BERT) developed by Innsbruck Univ. Uses natural forces for mixing, saving on costs. Offer DIY systems with assembly and construction plans. Also offer waste separation and pre-treatment unit, 'Bio-grow' organic digestate/slurry and 'BIOCOS' wastewater treatment plant.	EPC	Small (8-11 staff)	6 projects in South Africa (mainly abattoirs & piggeries)	Yes (South Africa)
<a href="#">Mattla Engineering Solutions</a>	South Africa	Not specified	Substation design, control plant design, technical audits, distributed generation design, technical advice on grid code compliance, interpretation of industry standards, SCADA and metering solutions.	EPC	Size unclear. Offices in Pretoria and Johannesburg	1. Bio2Watt Bronkhorstspuit plant (cattle manure). 2. Bio2Watt Cape Dairy plant (planned)	Yes (South Africa)
<a href="#">Nijhuis Industries</a>	Netherlands	Not specified	Specialists in wastewater treatment, for which AD is one solution: 1. AECOMIX-Taurus complete mix reactor suitable for all wastes, manure, sludge and RE crops; 2) AECOMIX-AnMBBR simple system that fits into any tank; 3) AECOMIX-DGF for food and beverage plants to treat wastewaters with high TSS and FOG.	Technology	Large. Work in over 110 countries and employ 240 water specialists.	Complete mix digester for Safi Sana International, Accra, Ghana (mainly market wastes)	No
<a href="#">Olivado Biogas Africa</a>	Kenya	<0.5 MW	Subsidiary of avocado oil processor. Develops AD for own plants in Kenya and Tanzania, now exploring opportunities for other fruit processors. Localised solutions claiming to halve the cost of fully imported technology. Pioneer in biogas upgrading and bottling.	BOOT, Project Management	Small	Olivado Kenya, Murang'a (avocado waste)	Yes (Kenya, Tanzania)
<a href="#">Renen</a> (status unclear)	South Africa	Not specified	Induced blanket reactor prototype, based on US design.	BOOT	Small. 2-10 employees. Founded in 2010.	Sunshine Seedlings, KwaZulu-Natal (plant wastes & cattle manure)	Yes (South Africa)

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<a href="#">Sauter Biogas</a>	Germany	75 kW to >1 MW	1) SM Mini LEA: Compact, digester suitable for all biomass types, <75 kW. 2) SB Midi: Mid-range, compact, 150 - 800 kW. 3) SB Maxi: 0.5 - 1.5 MW. 4) SB Mega: >1 MW. Patented sprinkler system requires no agitators.	Technology, EPC	Small. 6 staff. 50 installations, of which 42 in Germany.	James Finlay tea, Kericho, Kenya (soluble tea waste)	No
<a href="#">Selectra</a>	South Africa	Not specified	Pioneer of biogas in S. Africa. Digesters based on EKO GEA H2E technology platform, include wastewater treatment and energy solutions.	Technology, EPC	Small. Established in 1987.	100 kW dairy project in Botswana (cattle manure); possibly additional projects	Yes (South Africa)
<a href="#">Snow Leopard</a>	Germany	10 kW - 4 MW	High performance temp-controlled AD plant. Small modular unit. Front-end batch hydrolysis treatment to prepare fibrous biomass facilitates digestion of nearly every biomass.	Technology	Small. Founded by Walter & Katharina Danner. 2-10 employees.	2 MW biogas plant, Gorge Farm, Naivasha, Kenya (horticulture residues)	No
<a href="#">Southern BioPower</a>	Zambia	Not specified	Underground, fixed-dome digesters made from local materials, without heating and stirring.	EPC	Not known	Agro-industrial project in Zambia for BORDA. Unclear if implemented.	Yes (Zambia)
<a href="#">Sustain Power</a>	South Africa	100-550 kW	Specialised gas generators for biogas, landfill gas and natural gas, designed and assembled in S. Africa.	Technology	Small	220 kW biogas CHP for unspecified abattoir in S. Africa	Yes (South Africa)
<a href="#">Tropical Power</a>	Kenya	Not specified	Tech supplied by Snow Leopard. Based in Oxford with subsidiary in Kenya. Associate companies Biojoule and Solarjoule contract Tropical Power to build utility-scale power plants. Conduct feasibility studies for potential clients.	EPC, BOOT, Project Management	Small. 4 management staff	2 MW biogas plant, Gorge Farm, Naivasha, Kenya (horticulture residues). Feasibility study for Migotiyo Plantations, Kenya (sisal residues).	Yes (Kenya)
<a href="#">Veolia</a>	UK	Not specified; generally large	Multinational offering waste, water and energy services in different sectors. Dry AD systems for municipal waste; wet AD for waste from agri and food processing industries.	Technology, EPC	Large	Woodlands Dairy, Humansdorp, South Africa (milk processing residues)	Yes (South Africa)

## 2. Steam boilers

Name	Head office	System size	Technology specifications	Services offered	Company Size	Projects in SSA	Presence in Africa?
<a href="#">Boilermech</a>	Malaysia	6-130 t/h	Leading biomass boiler manufacturer in SE Asia. Bi-drum water tube boiler, paired with fixed, vibrating or moving grate combustion systems. Steam boilers designed for numerous wastes, incl. oil palm residues, bagasse, rice husk, wood chips and sawdust, with customisable fuel feeding systems.	Technology, EPC	Medium (TBC)	Large oil palm mills, e.g. Benso Oil Palm and Norpalm, Ghana (oil palm residues)	No
<a href="#">ISGEC Heavy Engineering</a>	India	Not specified	Multi-product, multi-location public company. Supply biomass and bagasse fired boilers, including travelling gate, reciprocating grate, dumping grate and pinhole grate type.	Technology	Large. >850 high-capacity and high-pressure boiler installations in 48 countries.	Reports supplying 27 boilers to agri-businesses in Africa	No
<a href="#">John Thompson</a>	South Africa	1-13 t/h (Torripac boiler)	'Simpac' wood-fired boiler with fixed grate in 3 sizes and 'Torripac' hybrid biomass boiler designed for pellets, briquettes and loose biomass.	Technology	Large. Have supplied >4,000 firetube boilers worldwide over 60 yrs.	KTDA factories, Kenya (fuelwood)	Yes (South Africa)
<a href="#">Mechmar</a>	Malaysia	Not specified	Manufactures and supplies industrial steam boilers, including water-tube steam and hot tube boilers (biomass and solid fuel), with primary market in SE Asia	Technology	Medium. 40 yrs' experience. Offices in Indonesia & Sri Lanka	TANWAT, Njombe, Tanzania (wood processing residues)	No
<a href="#">Thermax</a>	India	Not specified	Have worked in Africa for >30 years. Oil, gas, coal and biomass-fired boilers, hot water generators and fluid heaters across numerous industries. Have also built thermal power/co-generation plants in Kenya, fired using coal and biomass fuels.	Technology	Large. Offices in Nairobi and Lagos.	KTDA factories, Kenya (fuelwood); REA Vipingo, Dwa, Kenya (sisal residues).	Yes (Kenya & Nigeria)
<a href="#">Zhengzhou Boiler Group</a>	China	10-160 t/h (DHL boiler series)	Various biomass boilers suitable for different feedstocks such as rice husk, woodfuel, bagasse, straw and biomass pellets. Now supplying boilers to tea factories in Kenya	Technology	Large	Unspecified tea factories in Kenya (fuelwood)	No

### 3.Small-scale steam turbines

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<b>Steam turbine manufacturers and/or suppliers with known projects in Africa in the relevant BSEAA2 target demand sectors</b>							
<a href="#">Dresser-Rand/Siemens</a>	Germany	10 kW-25 MW	Steam turbines suitable for small-scale systems D-R R/RS and D-R B being the most suitable for biomass applications. Can provide either bare steam turbine drivers to OEMs, or supply complete packages including gears, lube oil systems and controls.	Technology	Large	GOPDC, Ghana (oil palm residues) and at least 5 other locations in Africa	No
<a href="#">Shinko</a>	Japan	Not known	Supply steam turbines to various industries such as petrochemical industries, fertilizer factories, palm oil mills, paper mills, sugar factories, incineration plants, commercial ships etc.	Technology	Large	Benso Oil Palm Plantations, Ghana (palm oil residues)	No
<a href="#">Triveni Turbines</a>	India	up to 100 MW	Back-pressure and condensing steam turbines designed for a wide range of pressure and flow applications including biomass IPP, municipal solid waste IPP, district heating, palm oil, paper, sugar, etc. Their sub-30 MW turbines are particularly suited for renewable power solutions.	Technology	Large	TANWAT, Njombe, Tanzania (wood processing residues). Also supply to many sugar factories in SSA.	No
<a href="#">Vyncke</a>	Belgium	0.5 - 15 MW	Designs and builds green and clean energy plants burning biomass and waste to produce thermal energy from 1 – 100 MW <sub>th</sub> and electrical power from 0.5 – 15 MW <sub>el</sub> . 5 models of CHP (boiler+steam turbine) systems advertised.	Technology	Large	GOPDC, Ghana (oil palm residues)	No

Name	Head office	System size	Technology specifications	Services offered	Size	Projects in SSA	Presence in Africa?
<b>Other steam turbine manufacturers known to have technology offerings suitable for deployment in SSA</b>							
<a href="#">Elliot Steam Turbines</a>	Japan	15 kW-100 MW	Turbines in a variety of sizes from small, 20-HP (15 kW) single-stage units, to large 135,000 HP (100,000 kW) multi-valve, multi-stage extraction condensing units. Their turbines are used in industries as diverse as oil and gas, chemical and petrochemical, pulp and paper, power generation and food processing.	Technology	Large	Not known	No
<a href="#">G-Team</a>	Czech Republic	80 kW - 5 MW	Specialist manufacturer of small steam turbines with six models ranging from 80 kW (TR HI 150) to 5 MW (TRM).	Technology	Large	Not known	No
<a href="#">MAN Diesel &amp; Turbo</a>	Germany	0.5-180 MW	Steam turbines for both power generation and mechanical drive applications covering a 1-180 MW range. Possible applications in waste to energy, biomass/pulp and paper, geothermal, CSP, combined cycle, waste heat recovery refineries and others.	Technology	Large	Not known	No
<a href="#">Mitsubishi Hitachi Power Systems</a>	Japan	up to 40 MW	Offer small and mid-sized steam turbines for industrial applications, as well as large steam turbines for steam, nuclear, and geothermal power plants. Amongst the available steam turbines, the geared turbine category is used for small-scale power plants of up to ~40 MW.	Technology	Large	Not known	No



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