



SteamBioAfrica

Turning woody overgrowth into clean secure and affordable energy in Southern Africa



Huw Parry: SteamBio Ltd 15th June 2023





.....



N-BiG







15 partners 2 continents 8 countries Researchers & Academia

SteamBio

Solutions for soil use and protection

Industry & Entrepreneurs



ekasi.energy solutions

ΠΑΠΙΒΙΑ

UNIVERSITY

TECHNOLOGY

OF SCIENCE AND







This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036401

Celignis



TIMELINE



2012	Identified opportunity: validated concept at pilot / laboratory scale
2015	Successful EU Grant Application SteamBio (Grant No.636865): €5.8 million grant funding
2016	SteamBio Ltd incorporated to commercialise the technology
2017	SteamBio and N-BiG meet at EUBCE (European Biomass Conference and Exhibition) Stockholm
2018	SteamBio demonstrated 150kg/hour, 3 months Northern Spain – EU SteamBio project ends
2019	Biomass Technology Expo 2019, Otjiwa Safari Park Namibia, SteamBio exhibited Huw Parry presented
2021	Successful EU Grant Application SteamBioAfrica (Grant No. 101036401): €9.9 million grant funding
2022	Advanced SteamBioAfrica biomass processing unit (BPU) design and construction (250kg/hour)
2023	Installation, commissioning & operation of BPU at CCF in Namibia
2024	Produce over 500 tonnes clean burning fuel from encroacher bush at CCF, demonstrate & validate
2025	Commercial roll-out of SteamBioAfrica technology across Namibia and wider Southern Africa
_	

CONTEXT: BIOENERGY the only renewable available on demand

GLOBAL MARKETS Wood pellets: 55 million metric tonnes p.a. Charcoal: 530 million metric tonnes p.a. Coal: over 7000 million metric tonnes p.a.

OPPORTUNITIES

Use biomass to substitute coal in: power generation, industry and domestic use

CHALLENGE

wood pellets and chips require high capital investment to convert coal power plants









CONTEXT: AFRICA

ENERGY SUPPLY polluting options: coal, firewood or charcoal (homes & industry) expensive, polluting, unreliable, not secure

Electric Grid Less than 10% have access Major grid in SA is ageing, unreliable, frequent outages, industry need on site generators OPEN FIRE cooking & heating in SSA results in 600k early deaths every year (4 million globally)

ENCROACHER BUSH & INVASIVE SPECIES 120 million ha across Southern Africa depletes farmland & wildlife **Over 1000 million metric tonnes of unused resource**

We need to create MORE VALUE from this BIOMASS than it COSTS to HARVEST This needs to be at LARGE SCALE & SUSTAINABLE to stimulate bush removal, create jobs & wealth in Africa



OUR INNOVATIVE TECHNOLOGY

Superheated Steam Processing: an established drying technology Efficient heat transfer, moisture is drawn out of substrate with no crust formation leads to quicker more uniform drying Our Approach: Steam from substrate, once steam saturated drying stops, we continually remove moisture to maintain superheated state, enabling continuous process.

Superheated Steam presents an inert atmosphere it does not react with substrate, results in no reaction compounds formed Our Innovations: Elevation temperature of superheated steam process to torrefaction conditions is novel. We can control outputs; clean burning fuels and biochemicals in removed condensate





Project Focus

CURRENT STATUS Energy Insecurity Climate Impacts Water Shortage Bush Encroachment High Unemployment Gender inequality Social exclusion and marginalization

STEAMBIOAFRICA

IMPACTS

Clean & Secure Sustainable & Affordable Energy Supply Rural Employment Land Restoration Gender equality Social inclusion

SteamBioAfrica

Builds on prior work

Robust and

resilient

design

Process optimised to input feedstocks and market needs

SteamBio

Temperatures up to 260°C

Confirm benefits in Africa

Profit & Value Incentivise/stimulate bush clearance Clean burning Soil restoration Logistics optimised Social & environmental sustaining Domestic households & Industry Job creation STEAM BIO AFRICA

> Prepare and progress post project roll-out

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101036401





General Arrangement of Equipment





Mechanical Design Principles

- Robust construction
- Easy to maintain
- Fabricated from standard materials

STEAMBIOAFRICA

- Simple to operate
- Commonality of parts





Demonstration Unit at CCF









Complete commissioning at CCF: Operate for 12 months (250kg/hour 24/7 operation) Produce over 500 tonnes of torrefied clean burning fuel from encroacher bush

We will demonstrate and validate:

Technical and economic robustness Market acceptance (landowners, industry, and domestic consumers) Positive sustainable social and environmental impact Route to market with strong local benefit Local market engagement

> We will develop: Local supply and value chains Secondary co-product opportunities Customers and investors This will enable Large Scale Post-Project Roll-Out







Work Plan

11





Enabling large scale post project replication and scale up of the project results to deliver significant positive economic, social and environmental change across Southern Africa

Work Package 13 Ethics

Verify ethical compliance of project work and impacts, the participation of humans, data protection, health & safety, environmental compliance, and benefit sharing between EU and non-EU countries

Specific focus in domestic value chain analysis and development to ensure gender equality in male traditional male dominated value chains

Technology Development Work Package 2-6 Land & Ecosystems Work Package 7 & 8 **Market & Value Chain** Work Package 9 & 10 **Life Cycle Studies** Work Package 11 **Project Impact Outcomes** Work Package 12 & 13



Do you have any questions?

www.steambioafrica.com



