

COMPANY PROFILE



NUCARBON Technology

Nucarbon Technology Proprietary Limited (NCT)

Company No.: BW00006906726 Incorporated: June 19, 2025

Headquarters: Plot 2482b, Tshekedi Crescent, Extension 9, Gaborone, Botswana

Overview

Nucarbon Technology Proprietary Limited (NCT) is a Botswana-based Original Equipment Manufacturer (OEM) specializing in sustainable waste-to-energy solutions. NCT commercializes proprietary pyrolysis technology to convert organic waste and biomass—such as poultry litter, agricultural residues, industrial waste, and high-volatile coal—into valuable products including biodiesel, biochar, biofuel, pyrolytic acid, and syngas. This promotes a circular economy, addressing waste management and renewable energy challenges across Africa and beyond.

As the successor to Pyro Carbon Energy (Pty) Ltd (PCE, est. 2014, Company No. BW00000301576), NCT acquired all intellectual property, assets, and operations from PCE in January 2026, with consent from the Botswana Digital & Innovation Hub (BDIH). This includes a registered industrial design for the "Containerized Pyrolysis Unit" (No. BW/F/2019/00010, issued September 2019) and a 2 TPD Proof-of-Concept plant funded by the Botswana Innovation Fund (BIF, March 2019).

NCT operates three key business units: (1) CPP Manufacturing Facility in Selebi Phikwe for high-efficiency production; (2) Richmark Chicken Reference Site as a flagship demonstration; (3) Research and Development Department at Botswana International University of Science and Technology (BIUST) for innovation and testing.

Vision:

To lead Africa's circular economy revolution through innovation and sustainable resource transformation, spearheading the continent's shift towards a zero-waste future, fostering a cleaner and greener planet for generations to come.

Mission:

Our mission is to provide localized, scalable pyrolysis solutions that transform organic waste into valuable resources. We empower industries, farmers, and communities across the continent to turn environmental challenges into economic opportunities, fostering a cleaner, more prosperous, and sustainable future.

Business Objectives

Pillar 1: Establish Foundational Infrastructure

- **Reference Site Establishment:** Successfully commission and operate a fully functional, profitable reference site at Richmark Chicken Farm by early Q3 2026.
- **Manufacturing Facility:** Establish a CPP manufacturing facility in Botswana with a production capacity of 2 units per month by early Q3 2026.

Pillar 2: Drive Commercialization and Growth

- **Market Penetration & Sales:** Achieve initial market penetration in Botswana and key Southern African markets by securing contracts for a minimum of 12 CPP units in SADC within the first 18 months of manufacturing.

Pillar 3: Brand & Operational Excellence

- **Brand & Industry Presence:** Establish Nucarbon Technology (NCT) as a leading, trusted brand in Africa's circular economy, waste-to-energy and biomass-to-energy sectors within 24 months.

Human Capital Development: Recruit and retain a skilled workforce of 130 staff across manufacturing, engineering, and sales within the first five years of operations.

Technology and Products

NCT's pyrolysis process thermally decomposes carbonaceous materials at around 500°C in a controlled, oxygen-depleted environment, producing minimal emissions and converting feedstocks into bio-oil (liquid fuel), syngas (combustible gas), biochar (solid, carbon-rich material), and pyrolytic acid (organic liquid fertilizer and insecticide).

Key offerings:

- **Containerized Pyrolysis Plants (CPPs):** Modular units in 5 TPD (CPP5), 10 TPD, and 100 TPD capacities. The CPP5 is currently the core product, with modularity

for scalability (start with one unit, add more), simplified plug-and-play deployment (containerized, factory-assembled), and guaranteed performance via rigorous factory acceptance testing.

- **Byproducts:** Bio-oil/tars for fuels (e.g., biodiesel via further processing), char/biochar for soil enhancement/metallurgy, syngas for energy, and pyrolytic acid for fertilizers/insecticides. **Applications:** Biomass (e.g., wood chips, nut shells), waste (e.g., tyres, plastics), agricultural residues (e.g., poultry litter), industrial wastes, and coal mixtures, emphasizing circular economy benefits like reduced environmental impact.

Services:

Pre-Sales Services:

- High-Level Business Model: Free Excel tool for quick profitability assessment during initial client visits.
- Business Case Development: Fee-based analysis with lab testing of feedstock samples for verified technical and financial data.
- Full-Scale Feasibility Study: Comprehensive for large clients, including market/economic study, technical analysis, financial/operational modeling, and environmental management plan.

After-Sales Support:

- Operations handover and staff training on daily operations, maintenance, and safety.
- Customized service/maintenance plans, continuous remote monitoring, and integrated early warning systems to minimize downtime and extend plant lifespan.

Research and Development:

NCT's R&D focuses on continuous improvement of proprietary pyrolysis technology, feedstock expansion, and new product lines to maintain competitive edge. Strategy includes IP protection via speed-to-market and trade secrets, academic partnerships with BIUST and Montanuniversität Leoben (Austria), conference participation, and knowledge management to mitigate key-man risk through documentation and training.

Marketing Strategy

NCT positions as an OEM with differentiation through unique, customizable technology and market development in new regions.

Value proposition: Transform waste (e.g., poultry litter) from cost burden to revenue via bio-based products. Promotion via corporate profile, product brochures,

website/multimedia (e.g., animated videos, social media links), and engagement at conferences/exhibitions. Brand management emphasizes consistent equity-building across platforms.

Key Projects and Achievements

- **Richmark Reference Site:** Deployment of two CPP5 units with mini-diesel refinery at Richmark Chicken Farm, Moletemane, to produce biodiesel and biochar from poultry litter. Feasibility study completed September 2025. De-risked with environmental permit; serves as key demonstration for sales.
- **CPP Manufacturing Factory:** Facility in Lobatse
- **Proof-of-Concept:** Operational 2 TPD plant at BIUST Technology Park, Palapye, demonstrating commercial viability.

Leadership Team

- **Dr. Daniel E. Botha (Co-Founder & Director):** PhD Chemical Engineering (BIUST, 2023, thesis: "Poultry Litter Pyrolysis to Address Agricultural and Energy Challenges in Botswana"); BEng/MEng Mechanical Engineering (University of Pretoria, 1986/1989). 38+ years in thermochemical conversion, gasification, nuclear testing, and project management. Registered Professional Engineer (ERB Botswana since 2018; ECSA 1995–2017); Mechanical Engineer's Certificate of Competency (1995). Key roles: EPC for BIUST Pyrolysis Pilot Plant (2017/2018); Director of PCE (2014–2025).
- **Mr. Michael M. Mogopa (Co-Founder & Director):** BSc (Hons) Geology (University of Nottingham), MSc GIS (University of Edinburgh); 37+ years in mining, exploration, and environmental consultancy. Independent non-executive director at Okavango Diamond Company; founder of African Astra (renewable energy investments).

Human Capital

NCT aims for 130 staff within five years across head office, factory, reference site, and operations, with gradual role population as orders grow. NCT prioritizes Botswana citizen employment (minimal expatriates), skill transfer via BIUST/Montanuniversität collaborations, and succession planning (talent assessment, key positions, knowledge documentation). An ESG policy will be developed in inaugural year for CSR, aligning with SDGs for clean energy and responsible production.

Contact Details

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