



Insetting Feasibility Study
Project Working Group

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Partnered with



The Brief

Midlands Net Zero Hub (MNZH) is seeking to test if **Area Based Insetting (ABI)** as a framework can enhance traditional offsetting by keeping benefits local within the Local Authority area. Studies were undertaken in Lincolnshire, Leicestershire and Birmingham on the potential of biochar as an ABI method.



The full report outlines the high-level (HL) feasibility, requirements, scope and recommendations for Lincolnshire Consortium (LCC) to evaluate if Energy, Biochar And Carbon Capture (**EBACC**) technology is a financially astute method to deliver carbon insetting results.

The findings have been developed in collaboration between LCC, MNZH, Shropshire Council (SC), Klere Ltd and are summarised in this Exec Report.



Synopsis

This study has identified an opportunity to establish a full-scale **EBACC** pyrolysis plant at Boston, Lincs. Re-purposing a mothballed 12 MWe biomass power station will produce **biochar**, generate carbon-negative **baseload electricity**, and trade high-quality carbon removal certificates (**CORCs**). Locally deployed biochar/CORCs deliver effective area-based insetting.

The Opportunity

- The Lincolnshire Consortium of ten councils collaborated with the Midlands Net Zero Hub, Shropshire Council and Klere Ltd. To investigate innovate routes to local carbon removal.
- The study tested if EBACC technology is a financially sound method of delivering carbon insetting. It examined suitable feedstocks, projections of energy, biochar production and carbon removal.
- Scope covered comparator technologies, regulatory and planning implications, risks, and a cost benefit model using the HM Treasury five-case methodology.
- Nine sites assessed via site visits and a scored SWOT. The clear preferred location is Biomass Building No. 3, Riverside Industrial Estate, Boston.
- A completed waste-wood gasification power station: built, permitted, operated from 2017 – 2022 now stands idle with broad scope for re-use (turbine, grid connection, walking-floor storage, weighbridge, offices & control room).
- **Larger in scale than scope envisaged, Building #3 is a rare asset. The marginal cost of converting to a carbon-negative power station is a fraction of the cost of building one from scratch.**



Biomass Building no #3

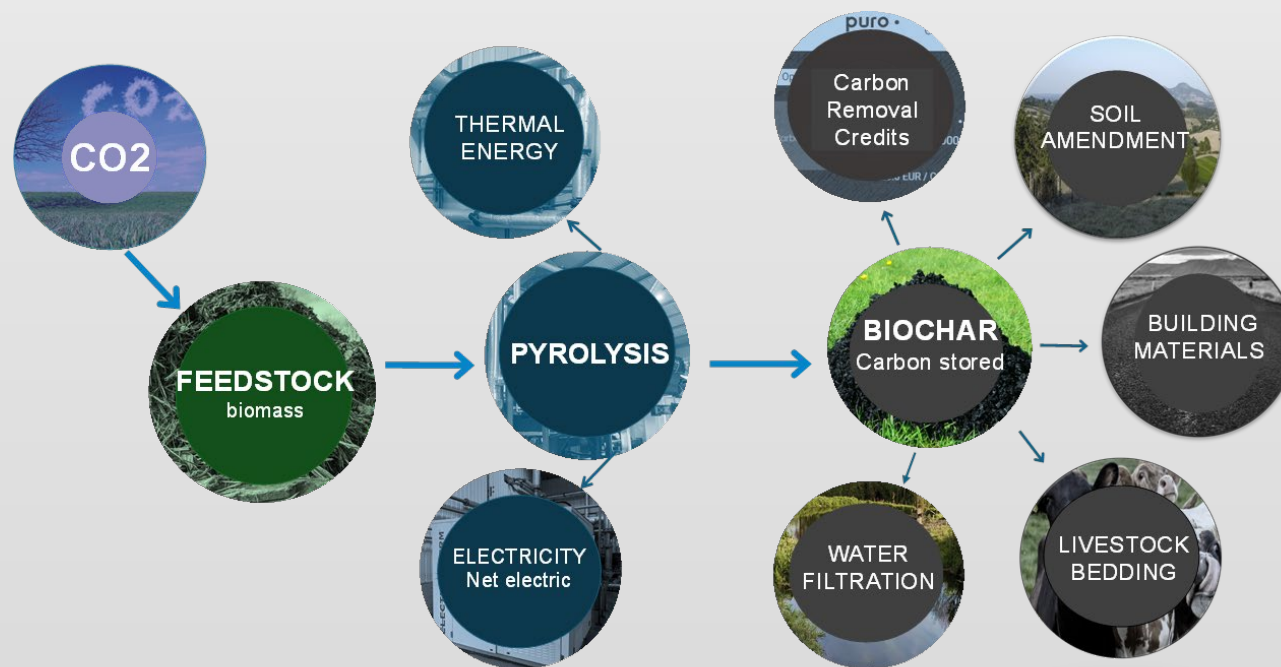


Pyrolysis for biochar production transforms biomass into a valuable product, removes CO₂ from the atmosphere and excess heat from production generates renewable energy. Local biomass for feedstock can support both the financial model and insetting targets.

Once verified by e.g. Puro.earth, biochar can generate Removal Certificates for durably stored CO₂. Retiring certificates sourced within a defined area lets an organisation claim measurable, verifiable negative emissions against that area's insetting target.

Biochar is one product of pyrolysis: the thermal breakdown of biomass (e.g. wood chips, agricultural arisings) in the absence of oxygen. Instead of compost or burning, it turns into 3 income streams:

1. **Biochar** – A stable, high-carbon material
2. **Energy** – Renewable heat and power from burning gases released during pyrolysis
3. **Carbon credits** – Carbon removal CORC credits. 1 tonne of biochar locks away approx. 2.4 tonnes CO₂

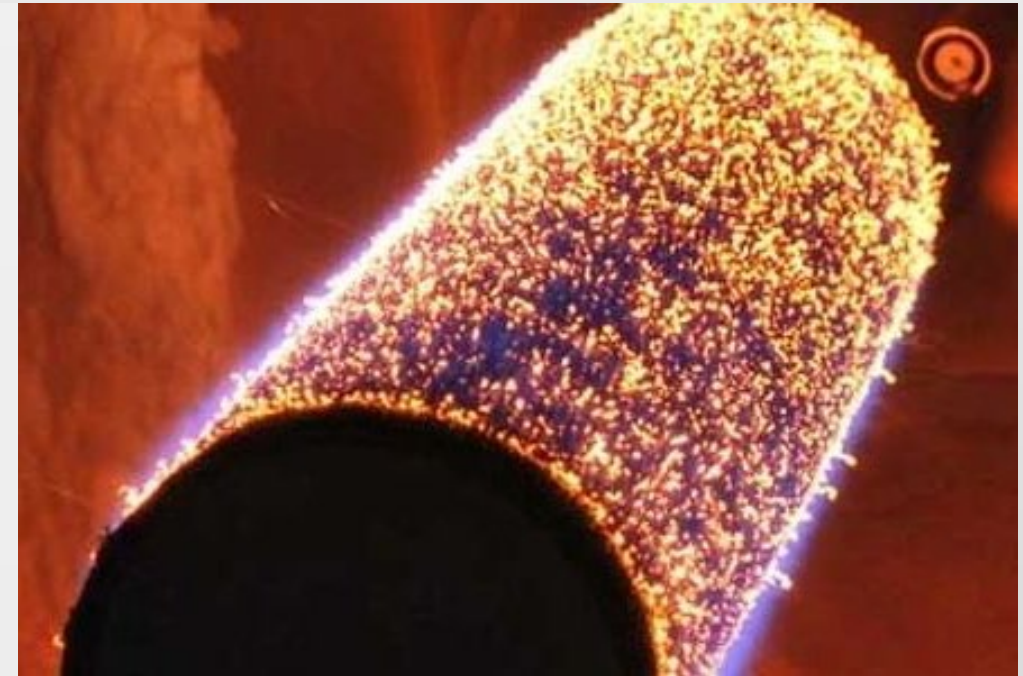


Power from pyrolysis

Biomass no 3 has a 12 MWe turbine that requires ~42 MWth to run efficiently. Connecting multiple pyrolysis lines, of the right technology, can meet this need. The produced CORCs and biochar create revenue streams that enhance the previous operating model which relied on electricity alone. No ongoing subsidy is necessary.

Identified solution and options

- Install continuous pyrolysis lines feeding the existing boiler and turbine — modelled as 7 Forged Innovation ZEDE6000 lines at ~42 MWth. Final technology selection subject to full evaluation and procurement.
- Annual output: 134k tonnes of woodchip in → 33.6k tonnes of biochar, ~80.6k CORCs, and over 94k MWh exported to the grid.
- A wholly Council-owned plant is not deliverable — £50+m of capital is beyond LCC's appetite and capacity.
- **Two realistic routes:** a wholly private sector scheme supported by the Council through feedstock supply, site facilitation and planning and permitting; or a 50:50 Joint Venture through a Special Purpose Vehicle.
- Private sector option is preferred following LCC feedback .



Burner from a ZEDE pyrolysis machine

Outline Business Case

Follows the Treasury Five Case model. Options considered (i) do not invest, (ii) invest in a full-scale plant operated as a joint venture, (iii) support development by the private sector. The model compares JV and wholly owned configurations across base, optimistic, and cautious assumptions i.e. 10% higher/lower revenue and costs respectively.

Option	Capital Cost £k	Net Income (20y) £k	NPV (20y) £k	ICR
Wholly Owned — Base Case	53,782	322,406	91,386	2.74
Joint Venture — Base Case	33,881	322,733	43,130	2.30
Joint Venture — Cautious	35,779	207,758	17,995	1.63

- Every modelled scenario returns a positive NPV and an ICR above 1.0, including the cautious cases. Figures are pre-tax.
- Assumptions are deliberately conservative: biochar at £300/t against £600+ observed spot sales; CORCs at £130/t; electricity at £93/MWh; no heat off-take and no gate fees valued.
- If the Council does invest, the majority goes in as a first-ranking loan secured over the plant, not equity at risk, with a par-value equity subscription giving 50% and full board representation.
- No capital commitment is sought now. Exposure at this stage is limited to a £300k Design & Verification budget as many assumptions and technical unknowns need to be clarified ahead of any investment decision.



The Boston opportunity is perhaps unique in the UK. A completed power station with a turbine, grid connection etc, standing idle, is a rare asset; the marginal cost of converting it into a carbon-negative generating station is financially viable.

Set against this, permits have lapsed, planning consent must be obtained afresh, technology selection has not been completed, the condition of the existing plant is unverified, no partner terms exist and the capital estimate has not been market tested.

This report therefore recommends a proportionate first step: approval in principle, a defined budget to mobilise a Design & Verification Phase, and return in early 2027 with a Full Business Case, a selected technology, a planning and permitting strategy and negotiated partner terms, at which point the investment decision can be taken, either private-only or Council JV.

Next Steps

- Private sector delivery is the preferred route; a 50:50 SPV remains viable if there is appetite within Lincolnshire.
- Commence a 4-month D&V (Set-up) Phase, circa £300k: technology evaluation and selection, Full Bus Case, Lifecycle assessment, pre-app planning and permitting, and legal and commercial structuring.
- If the JV route is preferred, LCC should consider part-funding this activity.

Draft Milestones

Key Milestone	Additional Detail	Delivery Date
Complete feasibility review	This report	Sep-26
Decision on D&V Phase	Whether to proceed into D&V, funding contingent.	Oct-26
Set-up Phase 2 — D&V	Appraisal of technology, options & selection; Full bus case.	Jan-27
Cabinet Decision	Required if JV route chosen.	Feb-27
Design & Planning	Full site design, build planning and permit. Technology dependent.	May-27
Build & Site Remediation	Complete build. Aim to commission early with one pyrolysis unit producing biochar before end-2027.	May-28
QA, Test & Commissioning	Final commissioning and test of multiple pyrolysis lines into the shared boiler.	Jun-28
Live	Fully operational.	Jul-28