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Animal Care – Manure Valorisation and Energy Production

ANIMAL CARE®

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Challenge

Animal Care is looking for innovative ways to transform poultry manure into energy sources and other valuable outputs.

They are seeking suitable technology to convert this waste into other formats such as renewable energy, chemical extraction, specialised compost, etc. in a safe and sustainable way.

A modular, scalable solution would be preferred, located on-site to minimise transport costs, and to benefit business operations directly.

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Animal Care Background

Animal Care Services Konsult (NIG) Ltd, popularly referred to as Animal Care, was established in 1979 as a wholly indigenous Nigerian Company.

They are in the business of providing input and technical support services for **poultry, livestock and aquaculture** across the federal republic of Nigeria.

Animal Care is the **foremost operator in the Nigerian Livestock industry**, pioneering aggressive and innovative people driven and market-oriented strategies for growth and profitability.

They focus on producing, distributing and offering high quality, differentiated products and services for animal health and production.

Their goal is to be a **highly professional and socially responsible organization** with a reputation for meeting the needs of employees; complete customer satisfaction; and creating value for stakeholders.

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Challenge Information 1

Animal Care produces about **25 tonnes of chicken manure daily** that is stored on site and sold to farmers at low cost. They are seeking to valorise this effluent to add value to their supply chain in a circular way, either as an efficient, sustainable energy source and additional commercially viable inputs.

Currently the manure is aggregated using a range of housing systems, comprising:

- High-rise automatic houses using conveyor belts
- High-rise houses with drop down floor mechanisms

Some houses have flushing systems able to separate solid and liquid manure, leading on to **dewatering, ageing and bagging activity**. The manure is aggregated at certain times of year for sale to manure traders in 100kg bags.

The key challenge is finding **suitable technology to convert this waste into other formats** (eg: renewable energy, chemical extraction, specialised compost, etc.) in a safe and sustainable way. They are willing to use this waste stream completely, or as fractions, leaving remnant products for additional uses.

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Challenge Information 2

On-site processes are preferred to minimise transport costs and ensure commercial viability. The ideal usage would be as inputs that directly benefit the business, rather than being sold externally. A modular, scalable solution would be preferred.

Sustainable energy sources have the power to **solve Animal Care's future energy needs** and to remove energy security risks. There are currently no poultry power plants fitting Animal Care's use case.

One way to convert poultry manure into **renewable energy is via anaerobic digestion**, however there are a number of obstacles on this waste-to-wealth pathway. These obstacles include dealing with antibiotics, ammonia, fatty acids, trace elements and organic compounds. Various ways to enhance digestion and/or valorise manure are being tested globally.

Animal Care seeks to avoid bringing animal or plant wastes onto the farm to avoid contamination dangers. Any bio-gas (or similar solutions) must rely on poultry waste only. If any additional materials must be added, please specify these clearly.

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Challenge Information 3

Local or imported materials may be used to build the pilot plant. The initial goal would be to find a way to **generate 10-20 kVA to power test operations**. Animal Care is willing to invest in the winning process to **scale it to 300-500 kVA range**, to provide a permanent power solution that is cost effective. For energy production solutions, please specify the energy output per ton of manure utilised.

It is important to consider the treatment process alongside any benefits of valorisation. How can Animal Care **handle manure in a more environmentally friendly way**.

Note that Animal Care is not seeking a new business line requiring additional complexity for logistics and personnel. They are seeking to transform the manure to benefit their existing operations, so **outputs should be directly valuable to the business**.

One immediate use case would be using the power generated to dry wet brewery waste, which is available locally. Animal Care may **also consider additional opportunities** alongside energy production, eg: chemical extraction.

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Target Audiences

Solutions are invited from, but not limited to, the following sectors:

- Agriculture
- Manufacturing
- Chemistry
- Biotechnology
- Energy
- Design
- Construction

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Functional Requirements

The identified solution must/should address the following:

- Solution must apply to **poultry manure**
- Solution must support the **production of energy and valuable outputs**
- Solution may be integrated at any point in supply chain
- Solution must be sustainable
- **Solution must not rely on additional animal or plant wastes sourced externally**
- If any additional materials must be added, please specify these clearly.

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Technical Requirements

- Solution must follow **circular economy principles**
- Solution may be delivered by external contractor or via in-house team
- Please specify the energy output per ton of manure utilised
- An energy solution should **generate 10-20 kVA power initially**
- An energy solution must be **scalable to 300-500 kVA**

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Operating Conditions

- Solution should operate in context of normal temperatures and humidity
- Solution should be applicable during normal working hours
- **Versatility and capacity to scale** are desirable
- Solution must be **safe to operate**

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Cost Requirement & Market Opportunity

- The solution's operation should aim to be **cost-effective and/or profitable in terms of ROI**
- Winning solution providers may **become long-term partners**, gaining access to Animal Care supply chains
- External contractors and in-house technical arrangements will be considered
- The opportunity may later extend beyond poultry manure to other waste streams also

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Out of Scope

Proposed solutions may not be viable if they are:

- Previously used, unsuccessful, industrial processes
- Unsuitable for processing poultry manure
- Unable to produce reliable quality outputs
- Unable to use Circular Economy thinking
- Unsuitable for Nigerian market conditions

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Application Information

Deployment Timescale

04 Dec 2023 – Competition launch
10 Jan 2024– Information session/Q&A
31 Jan 2024 – Deadline for applications
Feb 2024 – Selection and notification of finalists
Mar 2024 – Pitch day & selection of winner
Apr 2024 – Collaboration discussions
May 2024 – Pilot programme activated

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Eligibility

Entrants to this competition must be:

- **Established businesses, start-ups, SMEs, academics or individual entrepreneurs**
- **Africa-based entrants, UK-based entrants and those from RoW are invited to apply**

Due Diligence requirements for seed funding:

- UK applicants must ensure that receiving the £25k seed funding will not exceed the £315,000* state aid threshold under UK Minimal Financial Assistance regulations over the current and last 2 fiscal years [or *200,000 euros for applicants affected by EC de minimis regulations]
- Further information will be required later relating to company policies, financial history and recent grant funding received.

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Assessment

Applications will be assessed on:

- **Relevance to the topic**
- **Innovative nature of the subject**
- **Coherence of the proposed business model**
- **Feasibility/ economic viability**
- **Development potential**
- **Maturity of project/solution**
- **Ability to launch project quickly/Ease of implementation**
- **Price/quality ratio**
- **Suitability for the Nigerian Market**

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Rewards & Benefits

- Up to GBP 25,000 seed funding (Subject to T&C)
- Opportunity to pitch your solution to Animal Care
- Collaboration/partnership with Animal Care
- Technical support from Animal Care team
- Sector expertise from IUK
- Support in the development of a prototype or pilot
- Invitation to attend or present at IUK events
- Investor introductions (if investment is required)

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