



Project update: GreenShed Phase 2

October 2024



GreenShed

Low carbon beef / Sustainable / Circular farming

Dear UK Agri-Tech Centre member,

You are receiving this update on the pioneering GreenShed project as you are a part of the UK Agri-Tech Centre ecosystem.

An Introduction to GreenShed

GreenShed aims to produce a solution for the livestock farming sector to reduce its greenhouse gas (GHG) emissions, while improving productivity. The shed is designed as an integrated low carbon, circular farming and vertical farming system that utilises waste cattle products to power a methane capturing system to yield low-carbon produce (meat, vegetables and fruits).

Backed by the UK Government, the GreenShed project has received nearly £3 million from [Department for Energy Security and Net Zero \(DESNZ\)](#) and is currently the only system to have capabilities which capture and remove methane from housed cattle. If implemented across the sector, this could allow for a 50% reduction in GHG.

Across the three-year project, you will receive project updates and be the first to hear about the key milestones on the journey to achieve net zero. You can access previous newsletters about the project and its activities on the project lead SRUC's GreenShed [web page](#).

In this fifth newsletter, we bring you an update on the completion of the build and coverage from the official opening event of the GreenShed system.

GreenShed at the Royal Highland Show



In June, representatives from SRUC and the UK Agri-Tech Centre had a successful time at the Royal Highland Show. GreenShed was one of the many innovative projects showcased at SRUC's stand and received positive engagement and interest among attendees from both the public and industry. The commissioned Lego demonstration model was very popular and provided a fantastic touch point for attendees to learn about the shed's technology and circular systems.

You can find out more about SRUC's presence at the show here:

- [SRUC gears up for Royal Highland Show](#)
- ['On Farm' podcast "RHASS 240 years of stories: 50 voices from the Highland Show"](#).
- [SRUC/SAC Rare Earth interview 'The Future of Meat', BBC Sounds \(12/07/24\)](#).

Podcast



GreenShed podcast, hosted by SRUC's podcast channel.

Listen here to the latest episode, 'A farmer's view of GreenShed' with Farms Partnership Coordinator, George Baikie, for a discussion on the project from a farmer's viewpoint.

[Listen here](#)

Progress update - building the GreenShed System

Since the last update, the GreenShed build has been completed.

The construction and installation of the system first started in 2023 at SRUC's Easter Howgate farm, supported by project partners University of Strathclyde, UK Agri-Tech Centre, No Pollution Industrial Systems Ltd, Galebreaker Agri, Organic Power Ireland and Saturn Bioponics.

Within the GreenShed system, there are five core technologies:

- High-volume air recirculation / conditioning / sterilisation system, aligned with a novel solution to capture methane from the shed.
- Micro-anaerobic digester (AD) with built in feedstock pre-treatment to improve efficiency, producing combustible biogas from manure and waste feed.
- Novel ultra-lean combined heat and power (CHP) engine for combustion of biogas and methane-rich air.
- Using reverse osmosis technology, a Wastewater Treatment System (WWTS) removes and cleans the water from the AD digestate, reducing the storage requirements, and providing re-usable water that can be recycled into the system.
- Vertical farm to utilise low-cost, low carbon and nitrogen fixing outputs, returning oxygen-rich air to the shed.

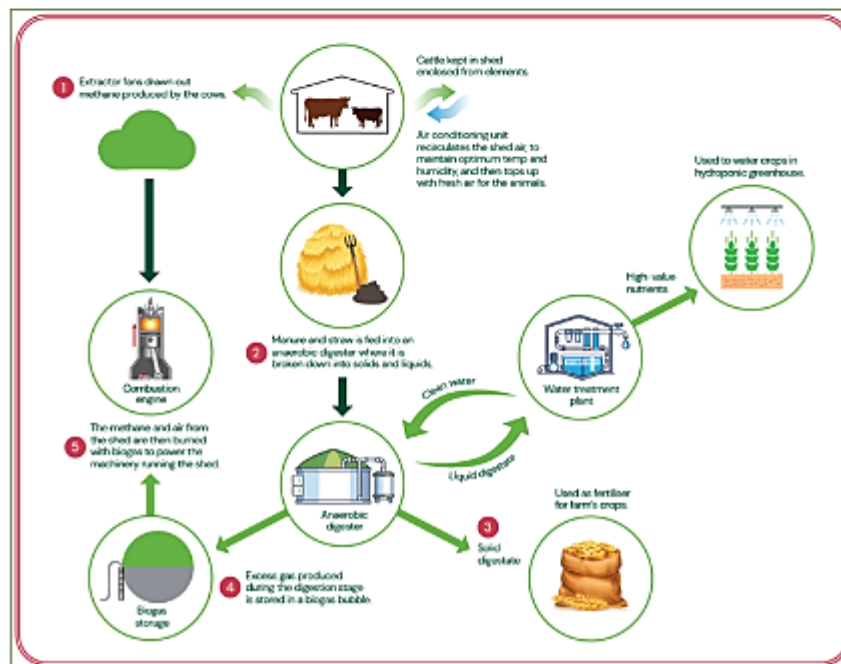


Diagram of how the GreenShed System works.

Watch the timelapse of the build below.



Micro-anaerobic digesters produce biogas from cattle manure to power efficient combined heat and power (CHP) engines to run the air conditioning and methane capture systems.

World's first GreenShed opens its doors



In September, the GreenShed system officially opened its doors for the first time.

More than 80 members of the beef industry attended the opening of GreenShed at SRUC's research farm at Easter Howgate, near Edinburgh. Martin Kennedy, President of National Farmers Union Scotland, and Kate Rowell, Chair of Quality Meat Scotland, were among the invited guests to enjoy a tour of the new facility.

Industry representatives from across the supply chain, alongside UK and Scottish Government officials, also toured [GreenCow](#) and [GreenSheep](#).

Sascha Grierson from SAC Consulting chaired a panel session on the Carbon Story of Beef, featuring Professor Steven Thomson from SRUC, Seamus Murphy from SAC Consulting and Julian Bell from AgreCalc, as well as Lisa Hislop from NFUS and Amanda Watson from Morrisons.

Professor Carol-Anne Duthie, who leads the GreenShed project, said:

"Beef farming is facing greater pressure than ever before to reduce its environmental impact while also maintaining or increasing productivity as well as improving its broader sustainability.

"The GreenShed consortium offers a blueprint for the future of low-carbon circular beef farming. It's a brilliant example of innovative collaboration between research and industry and we were delighted with the levels of engagement on the day."

[Read the full article](#)



Attendees listening to Wayne Powell, SRUC Principal and Chief Executive introduce the launch event

Reflecting on the opening event, Dr Jimmy Hyslop, Livestock Specialist at the UK Agri-Tech Centre, who leads supply chain engagement, said:

"Farmers and the wider beef supply chain were glad to see that alongside scientific R&D; this project addressed the practical and financial issues important in translating the GreenShed concept into real farm businesses."

"Whilst additional skills and expertise would be needed to implement GreenShed on-farm; the opportunities to see, hear about and experience the various GreenShed components and associated enterprises on the ground, went a long way to demonstrate the basic usability for commercial farmers."

“GreenShed really is an exciting opportunity to tackle some of the big challenges British farming, especially emissions,” said Duthie. “So, we’ve been working with farmers, working with consultants, working with other scientists to find new options for the sector to address this challenge.”

The benefit of this project is that it will remove more than 90 percent of the bovine methane during their time in the shed, totalling around third of methane over the course of their lives.

It works by air-conditioning units pump fresh air into the shed, while vents extract the unwanted gases. Meanwhile, the cow’s straw bedding and manure is mucked out and fed into an anaerobic digestion machine where it is broken down into solid and liquid matter. Any gases created in this process, as well as the naturally produced methane, are stored in a biogas chamber before being fed into a combustion engine to power basic functions, such as heating and lighting, as well as the digestion machines.

Leftover solid matter is spread on the farm’s crops fields as a nutrient-rich fertiliser, whilst the liquid is filtered and used to water plants, including lettuce, in a nearby hydroponic greenhouse.

You can learn more about the GreenShed system and its impacts on farming practices by reading the full article featured in The Times.

[Read here](#)

Feeling inspired? We want to hear from you!

Contact the UK Agri-Tech Centre at info@ukagritechcentre.com



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