

**MAKE
AGRI-
CULTURE
PART
OF THE
SOLUTION**



ABOUT



Founded in 2019, Shake Climate Change supports and invests in entrepreneurs with bright ideas.

With sponsorship provided by the Societe Generale UK Foundation we are helping early-stage businesses shake up the world of agriculture – and specifically the climate change it causes.

Led by Rothamsted Research in a consortium with three leading universities – Cranfield University, The University of Hertfordshire, and University College London (UCL) – these four institutions offer unrivalled technical expertise in a wide range of sciences relevant to agriculture and climate change.

What's so special about Shake?

We're not a typical fund. Imagine us more like a family – nurturing collective potential to create something truly amazing, by leveraging world class expertise in science, tech, and business.

We have a shared passion and a collective ambition to tackle climate change, and we have the drive, determination, and courage to push the boundaries of the food and farming industry.

We support entrepreneurs and their bright ideas, providing them with access to technical specialists, entrepreneur mentorship and tailored advice well beyond the initial funding to help them turn their ventures into a reality.

2021 was a very exciting year for the Shake Climate Change programme.

Three of our ventures have closed (or are close to closing) their first fundraising round. Others in the portfolio have successfully attracted additional funding to continue developing their business and products. Within four years of starting, Shake is already seeing success from our investments, despite operating for almost half of that time under a global pandemic.

2021 was also a key year for climate change. COP26 in Glasgow was a major focus of attention world-wide as governments met to agree measures to reduce greenhouse gas emissions and transition from fossil-fuel dependency to a zero-carbon society. Rothamsted Research was among those attending, as part of the UKRI delegation, which provided the opportunity to showcase Shake materials to passing delegates.

Seeing agriculture feature high on the agenda at COP26 was welcome news, as was the emphasis on the need for innovations that will move agriculture from a high to a low emissions contributor. Topics such as climate smart solutions for small scale farmers, methane reduction targets, reducing



EXECUTIVE SUMMARY

reliance of soya as animal feed, carbon capture and the importance of soils as carbon stores were all under discussion at different plenary sessions. These are the same topics Shake is addressing and we'll follow with interest the actions spinning out from COP26 as future policy changes will benefit ventures in the Shake portfolio.

During the lead up to COP26, and throughout the conference, it was heartening to see many global business leaders expressing commitment and actively asking for supporting policies from governments to enhance and support the transition to net zero societies. In the programme, we work from the outset with our selected ventures to assist them in analysing the GHG or carbon benefits of their innovations in a robust way, and we continually review and help improve this as the ventures move through the phases.

In early 2021, Shake again pivoted its programme to on-line only as Covid-19 restrictions returned in the UK in response to the Omicron variant. The ventures who participated were equally quick to adapt and were able to progress albeit with revised business plans and adjusted timetables. In delivering the programme online, we needed to be sure that entrepreneur satisfaction remained high, and we are delighted that the feedback we've received reflects just that. For 2022, we aim to organise an in person gathering for the entire Shake community to hear updates and encourage peer-to-peer learning.

Following decisions made at the Investment Panel in late 2021, we expect that three new ventures will be welcomed in our portfolio and that the ventures in the first two Cohort runs will move into the Shake alumni programme.

Shake will continue to support exciting business ideas with real potential to reduce emissions and we are pleased to introduce these in the pages that follow.

For our part, it is always a great pleasure to be able to meet so many new innovators and hear about their ideas. The value we receive from working with these visionaries is irreplaceable and it's great to see these companies growing.

Personally, I wish to thank everyone for their support during 2021, and to our sponsor for agreeing to continue with the programme and a new cohort in 2022.



**PROFESSOR
ANGELA
KARP**

Shake Climate Change
Programme Director



Agriculture is
responsible for



24%

of all greenhouse emissions



1 / 3

of food produced globally
is either lost or wasted

2021



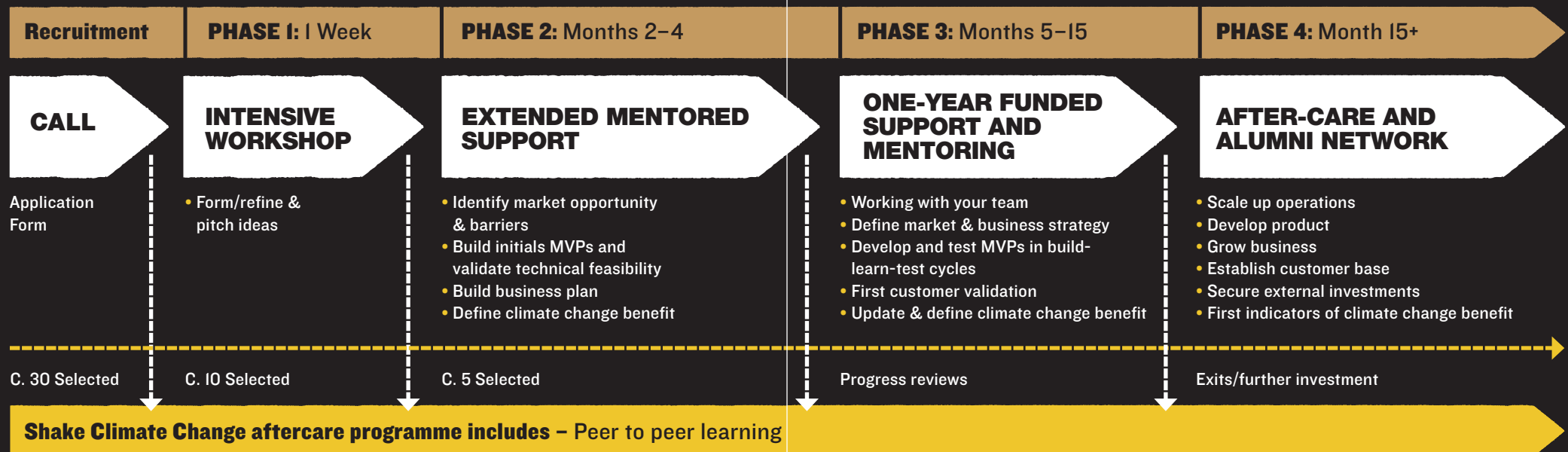
A YEAR IN NUMBERS

- We received **36 applications** by the May deadline.
- The Programme Steering Group selected **17 ventures** to enter Phase I.
- Phase I of the Programme was successfully completed, following which **eight ventures** were selected to enter Phase 2. Sadly, at the start of Phase 2, one of the ventures had to pull out of the programme due to constraints imposed by the COVID-19 situation.
- **Seven ventures** significantly improved their business proposition during Phase 2, with some pivoting during this time frame. Climate change impact was also rigorously developed, with the support of life cycle experts. All seven ventures pitched to the Investment Panel.

- The Investment Panel selected **three ventures** for consideration of the convertible loan funding.
- All **three** selected ventures started their due diligence process and by the end of the year one venture, Tumblebugs (originally called Pacapots), had completed their due diligence process and received their investment from Shake.
- The three ventures from Cohort 2 selected in 2020 all received their investment from Shake in 2021 and have mostly been able to follow their business plan, despite the pandemic.
- **All seven ventures selected** in 2019 and 2020 have ended Phase 3 and have now moved to Phase 4 (aftercare) and joined the Shake Alumni programme.

Whether it's business advice, technical support or coaching in how to pitch, our aim is that all Entrepreneurs will gain value from being involved in Shake – even if they don't progress through each phase.

HOW IT WORKS



WHAT COHORT 3 HAD TO SAY ABOUT US

Our entrepreneurs are our best ambassadors – and they say they will recommend, or have recommended, Shake to others.

On Phase I:

“The workshops were well-organised. The content was helpful and topical, while the engagement with guests/mentors was very valuable.”

“Really valuable and authoritative speakers – the presentations were useful too and good to have access to after the event. The Life Cycle Analysis and the Intellectual Property were particularly useful. The more practical the better.”

On the full programme and working with the mentors:

“Phenomenal organisation and smoothly run – with so much effort behind the scenes – it is a demonstration of what can be achieved via Zoom! Hats off to all behind the scenes and a big thank you.”

“The programme is well organised and encourages doing business with purpose, whilst having a good return on investment. The mentorship is very supportive, and the clinics are useful and handy.”

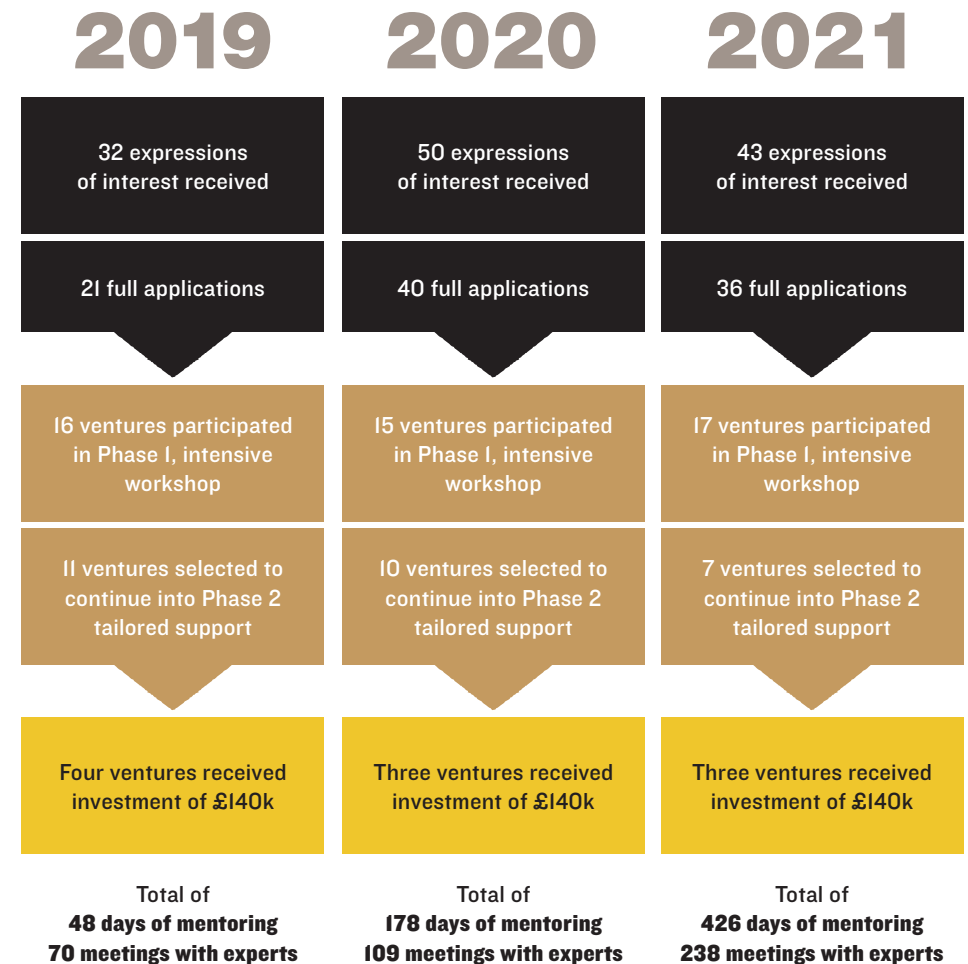
“I really like the way Shake mentors start-ups in a way which makes you feel at home, as they are open to hear about any problems and challenges.”

DELIVERY

AND OUR IMPACT

To date, Shake has completed three cohorts and a call for fourth is underway.

Since the launch in 2019, the programme has received 97 applications from high quality early stage ventures. Of these, 48 entrepreneurs were selected to participate in Phase I's seven day workshop and, 28 participated in Phase 2, which included mentoring, meeting with science experts and workshops.



SO FAR...

Shake has invested £1.12M in eight ventures to date. This will soon rise to be £1.4M in 10 ventures with potentially five more being invested in by the end of Cohort 4 in 2022.

£1.26m

invested in 10 companies (8 investment disbursed, with commitment to complete investment in 2 further ventures from Cohort 3)

36

highly skilled jobs created

£3.2m

of additional grant and equity funding already secured by Shake ventures



Climate Change impact equivalent to removal of the emission of

655,649

passenger cars by end of 2021.

BY INVESTING IN BRILLIANT IDEAS, WE HOPE TO ATTRACT OTHERS TO DO THE SAME.



During the programme lifetime (2019-2021), ventures have leveraged Shake's investment to attract significant, additional funding:

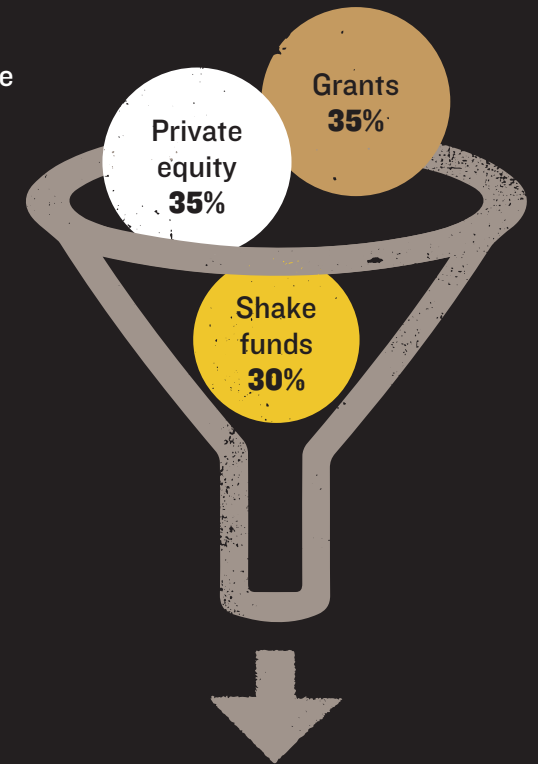
- Shake's ventures have secured additional funding amounting to 2.3x the initial Shake investment

The total funding secured by Shake's venture comes from multiple sources:

- 30% from Shake Climate Change
- 70% from external sources:

Government grants – 35% of total funding

Private equity investors – 35% of total funding



Ventures raised to date total £4.59m

- Shake funds
- Grant
- Equity

Figure 1: Split of funding (Shake investment, other equity investment, non-diluting grants) secured by Shake portfolio ventures by the end of 2021.

ENTREPRENEURS

2021 Cohort

RECOVER, ROTATE, REGENERATE

Idea: There is no waste in nature. Organic matter... matters.

The Tumblebug, or dung beetle, is the unsung hero of the natural world! With over 6000 species worldwide, they pull nutrients from manure and take them down into the soil. This helps feed the good bacteria and microbiology in the soil.

In a similar vein, Tumblebug Ltd have created a technology which draws from the work of the dung beetle. The brainchild of Environmental Scientist and Circular Economy Consultant, Sylvie Verinder and alpaca farmer, Drew Thomas, Tumblebug have created a sustainable solution for capturing and concentrating the nutrient value in livestock manure to return the nutrients efficiently to the soil.

The problem of right nutrients, wrong place has been exacerbated by the increasingly specialised nature of agriculture in the UK. The Tumblebug: Recover, Rotate, Regenerate model works for livestock manure from dairy, pig, alpaca and poultry. The method creates a carbon positive regenerative product and enables the value in manure (and food waste) to be economically and sustainably transported from point of production to where the nutrients are needed.

Farmers buying into the system generate revenue from their 'processed poo' and in doing so become part of a growing cooperative, putting their names to a cleverly crafted peat alternative growing medium and agricultural fertiliser which will enrich the nation's horticultural and agricultural soils.

Tumblebug tackle organic 'waste' at all stages of the 'farm to fork' journey – production, processing, retail and consumption. It supports segregation of organic waste from general waste – and it dewater, sanitises and reduces the mass by up to 90%. Working with stakeholders to secure behaviour change, Tumblebug delivers significant reductions in waste management overheads, calculated carbon emission savings and supports compliance with 2023 mandatory segregation of organic waste.

Founders: Sylvie Verinder

tumblebug.co.uk

SHAKE PORTFOLIO 2021

ECONOMAD



Idea: EcoNomad's waste to energy technology the BioNomad™ brings an affordable waste management solution for sustainable farming. 2021 was a productive year for EcoNomad Solutions.

- Installed 5 BioNomad waste to energy platforms
- First sales of BioNomad systems were realised.
- Started EU Horizon 2020-funded project and welcomed a Senior R&D engineer into the team.
- Commenced field trials of passive solar pump
- PSPP patent was granted for UK, with subsequent patents for the EU, US and China in review.
- Relocated to Rothamsted Research campus and moved into their new warehouse.

Founders: Dr. Ilan Adler and Alexander Demenko.

Website: economad.co.uk

Video: youtube.com/watch?v=d72K235XvGs

Glaia

GLAIA

Idea: Glaia's biostimulants technology allows plants to harvest light more efficiently resulting in enhanced photosynthesis and increased crop yields. With this technology, Glaia aim to improve food security as well as reduce the carbon footprint of agricultural food production.

- Spring 2021: start of second validation trials in strawberries and tomatoes in commercially relevant set-up.
- Summer 2021: two lead investors for the seed round were identified.
- Autumn 2021: the second validation trials produced very positive results.

Founders: Dr. David Benito-Alifonso and Dr. Imke Sittel

Website: glaia.co.uk

Video: youtube.com/watch?v=A4m_TRXrPFO

HE FEEDS

Idea: HE Feeds is developing a new type of animal feed with improved nutritional characteristics and sustainability. HE Feeds will initially target hens feed by substituting soya and reducing the impact on climate and tropical forest of soya farming.

Despite many obstacles from the ripple effects of Covid, HE Feeds has made positive strides forward in 2021.

- Prototype installed and commissioned
- Testing trials for feed productivity, benefits and bird welfare conducted
- Confirmed attractiveness of the feed
- Initial scientific testing has shown a 60%+ increase in crude protein

Founders: Gordon Whiteford

SHAKE ALUMNI UPDATE



PHEROSYN

Idea: Effective pest management through pheromone-based integrated pest management strategies. This reduces the use of pesticides in agriculture and helps to mitigate climate change.

- Spring 2021: Started 18-month Innovate UK Smart Grant to scale-up pheromone production and field validate our products by working with the UK's leading legume agronomists, Processors and Growers Research Organisation (PGRO).
- Spring 2021: recruited a full-time lead Development Chemist for pheromone production and scale-up.
- Spring 2021: set up and moved into own office and synthetic chemistry lab facility at Rothamsted Enterprises.
- Autumn 2021: achieved initial sales and successful field validation trials in Germany in cereal commercial field sites. Achieved successful field validation trials in the UK on pea crops in commercial field sites.

Founders: Dr. Mike Birkett, Dr. John Caulfield, Dr. David Withall and Daniel Bahia.

Website: pherosyn.com

Video: youtube.com/watch?v=hU0xuHkS8U4

CLIMATE EDGE



Idea: An all-in-one engagement platform, providing agritech information businesses with all the tools they need to have exceptional last mile interactions with smallholder farmers.

Unlocking the potential of small farms in 2021.

- The company took a successful proof of concept to market. With the help of Shake's investment and excellent mentorship, the company demonstrated clear product-market fit, essential to take the business to the next level.
- A successful pilot was run with CropNuts to digitise their soil testing process for smallholder farmers, now in 2022 CropNuts are scaling to an additional 60,000 farmers with the Climate Edge platform at the core

“Partnering with Climate Edge enables us to deliver a seamless, real-time experience to our farmers. Our soil test sales continue to grow, and farmers are delighted to see their test results and recommendations through a simple SMS.”

CropNuts CEO Jeremy Cordingley

- Efforts begun to scale their platform as a full self-serve SaaS product. To date over 300 organisations have joined their platform, reaching over 120,000 farmers in total. The company's goal is to reach 1 million farmers by the end of 2022.
- Additional seed funding was secured from Regenerate Ventures, an institutional investor with a unique focus on sustainable agriculture and climate change.

Founders: Paul Baranowski and James Alden.

Website: climate-edge.com



ENTIO

Idea: Entio is optimising the transformation of natural waste into edible insect protein for

animal feed and natural fertiliser with low CO2 emissions.

A great first year.

- In 2021 Entio received a grant and support from the German Agency for International Cooperation (GIZ) to explore the local market in Colombia.
- Two grants were received from the UKIPO to define Entio's IP strategy and then to execute it. An additional grant from London helped to further refine Entio's intelligent sensor platform with the help of London Southbank University.
- Entio also completed its pilot phase and further developed innovation in: Dynamic digital platform for tracking performance of multiple plants; natural waste sanitation and preservation; feed preparation and formula for polygastric animals; enhanced fertiliser from fermentation process; and new feed additives for Black Soldier Fly larvae.
- In 2021 Entio hired Mr Jhonnattan Quintero, an expert in animal nutrition and organic agriculture, as Chief Product Officer.
- Finally in 2021, Entio moved to a new location to start the construction of its first large scale bioconversion plant, capable of processing up to 10 tonnes of waste per day.

Founders: Dr. Rafael Cepeda-Lopez and Mr. Camilo Wilisch.

Website: ent-io.com

SUGAROX



Idea: Single-molecule biostimulant formulations that increase the productivity and resilience of crop systems whilst improving farmers' profitability and reducing the carbon impact of food production.

In 2021, its first year of operation, SugaROx:

- Recruited a CEO with 30+ years of chemical industry experience, a CTO with 12+ years of plant biology experience, and a Business Development Director with 15+ years of agri-tech experience.
- Optimised the synthesis process for its Active Ingredient (AI), a proprietary version of a natural molecule that plays a key role in sugar use and allocation in all plants.
- Designed prototype formulations for its first product, a wheat biostimulant, and through glasshouse trials demonstrated their potential to deliver up to 22% yield gain.
- Identified that the main element of its proprietary AI should be easily registrable and launched toxicology studies to demonstrate the safety of the additional element in its AI.
- Secured a £120K grant from Defra's Farming Innovation Programme to enable some of the work above and other activity and closed a £150K SEIS Round to access the match funding required.

Founders: Dr Cara Griffiths and Dr Matthew Paul (Rothamsted Research) and Prof Ben Davis (Oxford University).

Website: sugarox.co.uk

SHAKE
CLIMATE CHANGE

**OUR IMPACT
AND FUTURE**

CLIMATE CHANGE IMPACT

Shake Climate Change invests in, and supports, entrepreneurs with new and innovative business ideas to combat climate change in agriculture and the food supply chain.



Sustainable Development Goal No. 13 Climate action

“Take urgent action to combat climate change and its impacts”
(UN, 2015)

Climate Change impact is an integrated part of the programme and each venture selected for investment must continually demonstrate to the investment panel that their business impacts climate change and can be part of the solution to get to net-zero emissions by 2050. In so doing, Shake is also contributing to achieving Sustainable Development Goal No 13 Climate Action.

OUR FUTURE

- Run a fourth cohort in 2022, thanks to a kind contribution from **Societe Generale UK Foundation**
- Promotion of the program and its benefits to attract the best entrepreneurs to Cohort 4
- Delivering of an exceptional experience for our entrepreneurs, continuing to refine the programme content, maintaining a key focus on the climate change impact of Shake
- Developing a multi-funder model for Shake to continue beyond 2022, developing relationships and collaboration with new partners
- Running our first year of the Shake Climate Change Alumni network and arranging an annual meeting and showcase event in summer 2022

PEOPLE

We have a strong governance framework drawing on structures laid out in a grant agreement between Societe Generale UK Foundation (SGUKF) and Rothamsted Research (RRes) and between RRes and the consortium partners. This includes regular meetings and check-ins to ensure progress is being managed. Furthermore, there is structured reporting and meetings between the Trustees at SGUKF and the Shake management team.

Shake Climate Change operates dual management, so that entrepreneur support is separated from decisions made as to the investments of the fund.

We've recruited a range of top experts who we can call on: Ventures who are part of the programme will get to work closely with a dedicated mentor and have the opportunity to talk with specialist expert advisors sourced from within the consortium partners.



Prof. Angela Karp
Programme Director



Nigel Titchener-Hooker
Programme Steering Group Member



Dr. Nigel Culkin
Programme Steering Group Member



Paul Rous
Programme Steering Group Member and Mentor



Dr Claudio Marinelli
Programme Steering Group Member and Mentor



Prof. Jim Harris
Programme Steering Group Member



Tinne Midtgaard
Programme Manager



Kate Ashworth
Programme Steering Group Observer

SPECIALIST ADVISORS

Shake has an incredible network of specialist scientific advisers coming from a range of fields, and during the programme we also connect entrepreneurs with experts who can provide very situation-specific help to their business, such as validation and pilot testing.

Shake has engaged with more than 40 specialist advisers and during the programme lifetime entrepreneurs have held a total of 238 meetings with these specialist advisers.

We also held two thematic workshops and one showcase event with our entrepreneurs from both cohorts.



Jackie Hunter
Chair of the Investment Panel



Louise Warren
Secretary of the Investment Panel



John Oberman
Investment Panel Observer



Prof. Leon Terry
Investment Panel Member



Tom Ritchie
Investment Panel Member



Dr. Andrew Muir
Investment Panel Member



Martin Carr
Investment Panel Member



Yuri Andersson
Mentor



Rob Hill
Mentor



David Priseman
Mentor

MENTORS

The entrepreneurs in the Shake program benefit from working closely with a group of experienced Mentors, who help the ventures to:

- Develop and implement their business ideas
- Find and test the market application for the science and/or technology that they seek to commercialize
- Build effective teams and/or outsourcing strategies
- Establish valuable networks
- Advance their business and entrepreneurial skills and increase their confidence
- Build a venture pitch deck

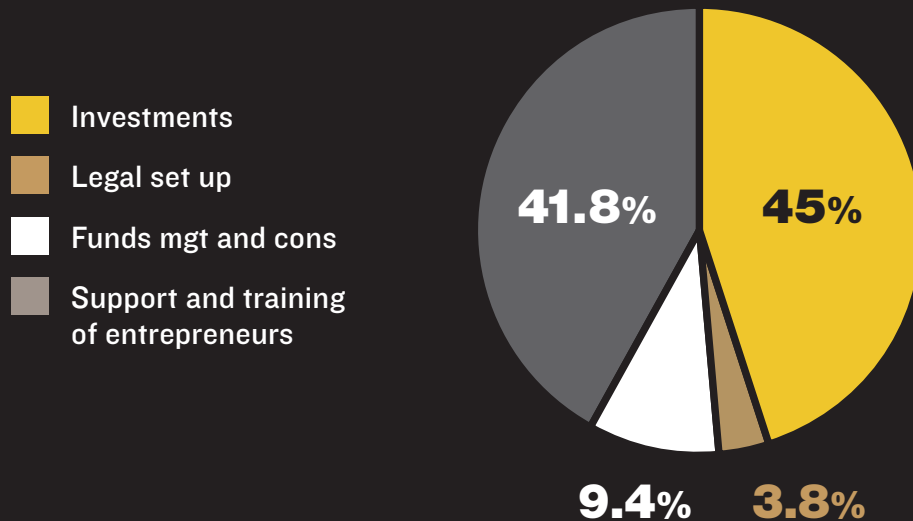


AND GOVERNANCE

FINANCE

During the programme lifetime (2019–2021), the budget has been allocated as follows:

- A total of £1,260,000 was invested directly in 8 ventures to build their business (45% of total budget)
- The remainder of the budget spent was split in the following way:
 - Almost equal to the direct investments, the majority of the programme spending supports the entrepreneurs by providing free workshops, meetings with science experts and business mentoring
 - Funds management and consortium partners
 - Set-up costs such as legal, communication and marketing



Curious to hear about some of the Ventures?

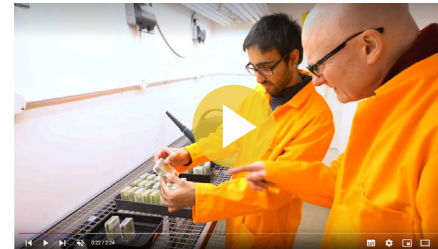
WATCH



Glai: Using nanotech to improve photosynthesis



Economad: Turning farm waste into biogas and fertiliser



PheroSyn: Can insect pheromones help us reduce pesticide use?



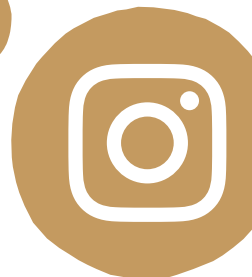
VISIT

Our online presence shakeclimate.org.

Shake [Linkedin page](#) with news and updates.

info@shakeclimatechange.org

GET SOCIAL WITH US



SHAKE

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