



“Robbing Peter to pay Paul”: What do stakeholders think about biochar?

Biochar Demonstrator project slide
pack

UKRI funded research under the Greenhouse Gas
Removal Demonstrator programme

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(Photo courtesy of Simon Watchorn)

About this resource and how to cite it

Since 2022, the social science researchers of the Biochar Demonstrator Project have been engaging with a wide range of stakeholders to gather views and opinions on biochar's potential contribution to greenhouse gas removal (GGR). This slidepack provides an overview of the first phase of this work and is based on a series of PowerPoint presentations. It is hoped this will stimulate further discussion between stakeholders and researchers.

When referring to this resource, it should be cited as follows:

Price, C. and Morris, C. 2024. "Robbing Peter to pay Paul": What do stakeholders think about biochar? Biochar Demonstrator Project - stakeholder research slide pack; School of Geography, University of Nottingham.

Contents

- Context: Climate change, Greenhouse Gas Removal (GGR) and biochar.
- The Biochar Demonstrator project.
- Biochar Demonstrator social science research overview.
- Stakeholder research (phase 1).
 - Methodology and methods.
 - Selected findings from the stakeholder interviews.
- Final points and observations about the findings of the first phase of the stakeholder research.



**Context: Climate change,
GGR and biochar**

Climate change and GGR technologies

- *IPCC Special Report: Global Warming of 1.5°C.*
- Urgent transitions are required in land, energy, urban, and industrial systems to ensure deep reductions in CO₂ emissions.
- Biochar is one of a growing number of land-based GGR technologies that promise to remove carbon dioxide from the atmosphere.



Biochar

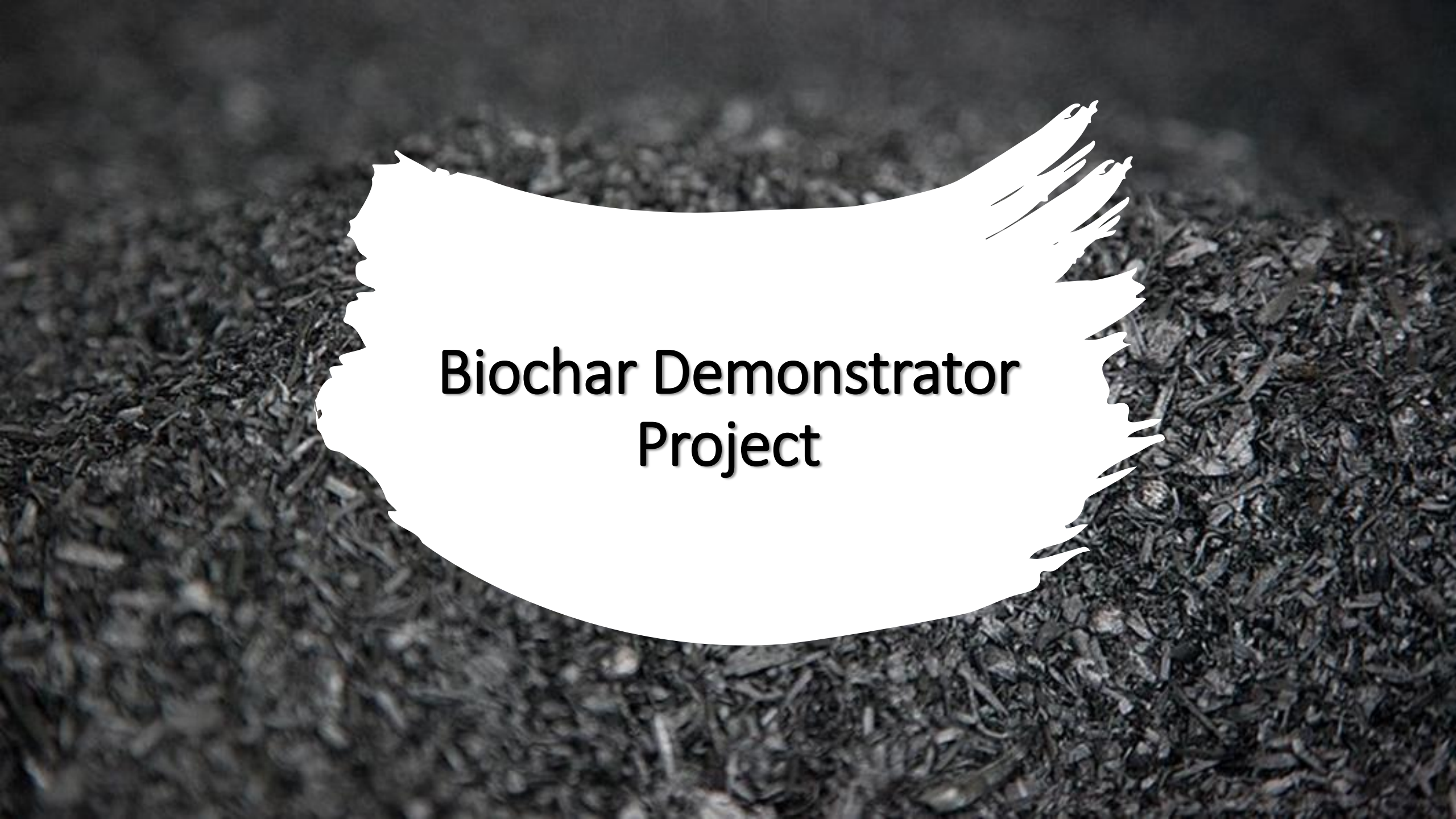
- Biochar is a carbon-rich material produced by a thermochemical process called pyrolysis.
- A lexical compound – ‘biomass’ and ‘charcoal’ – first used in the 1990s.
- Feedstocks include virgin wood, forestry wastes and agricultural crop residues. Other source materials: animal, human, and municipal food wastes.
- Biochar sequesters, for relatively long periods, a proportion of the carbon from its biomass source material that would otherwise be released to the atmosphere if that material was burned for energy production or left to decompose.
- Agricultural (and forestry) land seen as a key deployment site for biochar because it has potential co-benefits for soil health and crop yields.



UK biochar landscape



- Range of other biochar deployment sites (quarries, disused mines, contaminated land, embankments, golf courses) and uses (in construction materials, energy production systems – Bioenergy with Biochar Capture and Storage (BEBCS)) for GGR / carbon ‘offsetting’. Also as a peat substitute for domestic gardeners.
- Interest from a range of actors (regulatory, scientific, business) in biochar’s GGR potential including the National Farmers Union who see biochar as one route to their net zero 2040 target.
- No direct public policy support for biochar production and deployment (potential for support under the Environmental Land Management Scheme (ELMs)).
- Biochar deployment controlled through waste management regulations – one tonne per hectare.
- Interest in biochar as a carbon credit with carbon markets seen as crucial to biochar ‘scale up’.

The image features a close-up, high-angle view of a large pile of dark, granular biochar. The particles are irregular in shape and size, ranging from small specks to larger, elongated fragments. The overall color is a deep, charcoal black. In the center of the image, there is a white, brush-stroke style graphic that serves as a background for the text. The text is centered within this white area and consists of two lines: "Biochar Demonstrator" on the top line and "Project" on the bottom line. The font is a clean, sans-serif typeface in black color.

**Biochar Demonstrator
Project**

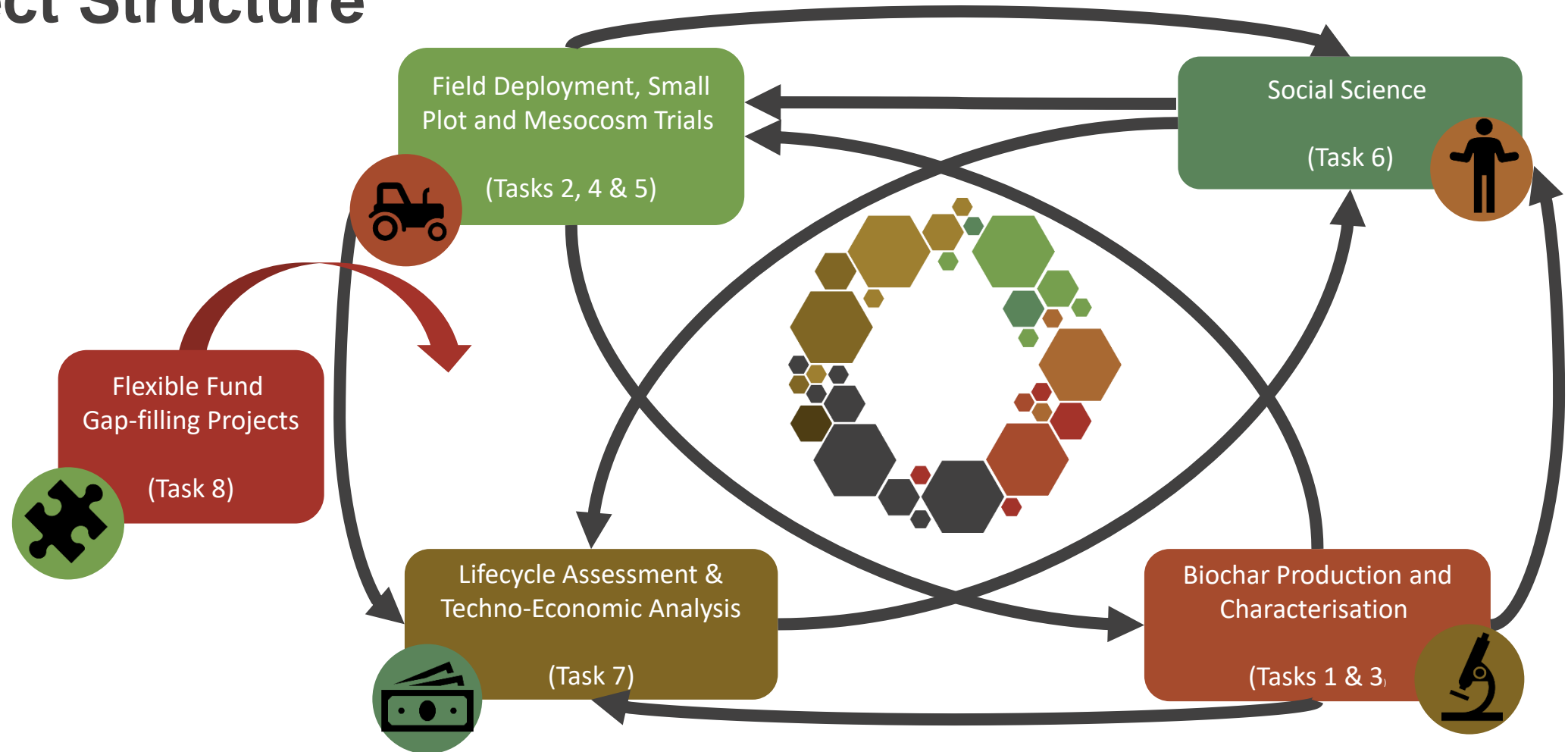


Addressing Key Deployment Barriers for Carbon Sequestration

Colin Snape (Principal Investigator), Co-Investigators: Helen West, Will Meredith, Cheng-gong Sun, Paul Wilson, Jon McKechnie, Carol Morris, Davey Jones, Dave Chadwick, Tim Cockerill, Katja Lehmann, Philippa Ascough and Tony Hutchings



Biochar Demonstrator Project Structure



The tasks (work packages) are integrated and aligned in their over-arching goal to address uncertainties across the entire biochar supply chain and provide evidence to shape regulation and policy



**Overview of the
Biochar Demonstrator
Social Science
work to date**

Overview of the Biochar Demonstrator Social Science work to date (1)



Literature review of social science work on biochar and related climate technologies, climate, energy and environmental justice and just transition, conducted to ascertain the state of the social science literature around biochar and to help develop a theoretical / analytical framework to guide our social science.



Social science questions being addressed: Biochar - who wins, who loses?; whose interests are (not) being served by this new technology?; who (and what) bears the burden of responsibility, who (and what) enjoys most of the benefits?

Overview of the Biochar Demonstrator Social Science work to date (2)



Analysis of UK print news media coverage of biochar.



Stakeholder mapping.



Document analysis to ascertain an initial understanding of arguments and claims about biochar made by stakeholders (UK and international).



Stakeholder interviews – phase 1. 37 semi-structured interviews with a wide range of stakeholders to gain a deeper and fuller understanding of their arguments and claims about biochar.



Stakeholder interviews – phase 2. 29 semi-structured interviews with farmers involved in the biochar demonstrator field trials and those with an interest in biochar. Analysis ongoing.



Agricultural Biochar Knowledge Exchange Event held on Thursday 4th May 2023 at The Allerton Project, Loddington.



Biochar Regulations Workshop held on Thursday 23rd November 2023 at the University of Nottingham.



Biochar Stakeholder Engagement Webinar held on Wednesday 6th December 2023.

Overview of the Biochar Demonstrator Social Science work to date (3)

Publications

- 'Biochar in the British print news media: an analysis of promissory discourse and the creation of expectations about carbon removal'. *Science as Culture*. Published online 28.11.23.
<https://doi.org/10.1080/09505431.2023.2285057>
- 'Biochar carbon markets: A mitigation deterrence threat'. *Environmental Science and Policy*. Published online 22.02.24 as part of a special issue on mitigation deterrence.
<https://doi.org/10.1016/j.envsci.2024.103704>

Report

- 'Biochar in the UK: Understandings from the Agricultural Sector'. Produced following the Biochar Knowledge Exchange Event held at The Allerton Project, Loddington.

Slidepack

- "Robbing Peter to pay Paul": What do stakeholders think about biochar? Biochar Demonstrator Project - stakeholder research slide pack; School of Geography, University of Nottingham.



**Stakeholder research
(phase one)**

Methodology and methods: how we identified interviewees

- Aim was to engage with and interview as wide a range of stakeholders as possible: individuals and organisations who already had a specified, explicit interest (either positive, negative and neutral) in biochar and had made statements about biochar in one way or another; individuals and organisations who did not currently have a specific interest in biochar, but who may in the future (e.g. owners of potential biochar 'storage' sites), or who had aligned interests (such as environmental NGOs).
- Interviewees were identified in a number of ways:
- Google search conducted on 29 September 2021. The search terms used were: biochar and UK agriculture; and biochar and UK. As the project is specifically focusing on carbon sequestration in a UK context, the UK was used as a search term to ensure we initially identified UK based individuals and organisations.
- Announcement on X/Twitter of the release of reports relating to net zero or climate change. These reports were checked to ensure biochar was included.
- Reports relating to net zero or climate change. These reports were either those obtained from a website or those which had been identified through X/Twitter. These reports were checked to ensure biochar was included.
- Review of the social science literature around biochar.
- Individuals and organisations who directly contacted the project following national and local media coverage.
- Individuals and organisations who were suggested to us by other experts (snowballing).

Interviewed Stakeholders

Type	Number of Stakeholders with an Actual Interest in Biochar	Number of Stakeholders with a Potential Interest in Biochar
Farmer Focused		
Science / R & D	3	0
Representation / Advocacy	4	0
Provision of Goods and Services	0	2
Environmental		
Advocacy	1	1
Government (National and Local)		
National Government	4	0
Local Authorities	3	0
Biochar Producers		
Commercial	6	0
Farmer led	3	0
Community	1	0
Pyrolysis Machine Manufacturer	1	0
Forest Focused		
Tree and Woodland Management	2	0
Biochar Industry Representatives		
Representation / Advocacy	4	0
Carbon Trading		
Carbon Trading Companies	2	0
TOTAL	34	3

Interview approach and analysis

- Semi-structured interviews were conducted in order for us to gain an understanding of the claims being made about biochar.
- We asked interviewees a wide range of questions including their knowledge of biochar, the potential uses of biochar, and the opportunities and risks associated with biochar.
- On average, interviews lasted one hour.
- Interviews were transcribed and were then imported into the *NVivo* 12 software package to undertake coding.
- Data were coded thematically using a bottom-up approach. These were worked through line by line, and codes were generated.
- Codes included themes such as benefits, scales of production, governance challenges, feedstocks, and nuances were identified through sub-coding.



Selected
findings from
the stakeholder
interviews

Interview themes

- 1) Biochar benefits
- 2) Scales of biochar production
- 3) Governance challenges
- 4) Feedstocks

Information about each of these themes is presented in the following slides and includes:

- Simple quantification but emphasis is on qualitative data i.e. theme description in the terms discussed by stakeholders themselves.
- Types of stakeholder and the number of each who discussed the theme.
- Theme details including illustrative quotes.





Theme 1: Biochar benefits

Benefits – Carbon sequestration

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Commercial) x 3

Biochar Producers (Community)

Biochar Producers (Farmer led) x 2

Biochar Producers (Pyrolysis Machine Manufacturer)

Biochar Industry Representatives x 2

Government x 6

Farmer Focused (Science / R & D) x 3

Farmer Focused (Provision of Goods and Services) x 2

Farmer Focused (Representation / Advocacy) x 4

Forest Focused

Total number of stakeholders who discussed the theme = 25

Benefits – Carbon sequestration



- Biochar does not degrade so it is a really stable and secure form of carbon storage.
- Biochar is a way of increasing the amount of carbon stored in soil and making it less vulnerable to rapid loss.
- Biochar is one of the cheaper GGR technologies and is more technologically ready than other GGR technologies.
- Biochar is easy to understand and apply.
- Applying biochar to agricultural land is the most common approach being discussed.
- Huge potential for carbon sequestration when biochar is added to construction materials as carbon is locked away for the lifetime of the product. Lower grade biochar could be used for carbon sequestration in the construction industry.

“There are obvious benefits in terms of the carbon sequestration potential of biochar in terms of locking that carbon in, in an incredibly recalcitrant nature, really stable and secure. So we know that it's not going to degrade too heavily over that 100 year time frame, which is what we're all looking for in terms of verifying our carbon sequestration. So agricultural land is the most common route people talk about now”.

(Biochar producer – community stakeholder)

Benefits – Soil health / quality

Types and numbers of stakeholder who discussed this theme

Government x 4

Biochar Producers (Farmer led) x 3

Biochar Producers (Commercial) x 2

Biochar Producers (Pyrolysis Machine Manufacturer)

Biochar Industry Representatives x 3

Farmer Focused (Science / R & D) x 2

Farmer Focused (Provision of Goods and Services) x 2

Farmer Focused (Representation / Advocacy) x 3

Forest Focused x 2

Environmental Advocacy

Carbon Trading

Total number of stakeholders who discussed the theme = 24

Benefits – Soil health / quality

Improvements to soil structure

Improvements to poor, degraded soil

Substrate for microbial activity

Improved moisture retention

Breaking down clay soils

Roots of plants are stronger

Activated carbon when applied to soil will increase soil carbon

Reduction in chemical inputs

Traps heavy metals in soil

“It's more important to apply to agricultural land because of the degradation we've seen in soils on agricultural land in recent years and recent decades. I think if we're thinking of the win wins we're trying to achieve from improving agricultural soils then we should be looking at the potential of biochar to contribute to those”.

(Farmer focused – science / R & D stakeholder)

Theme 2: Scales of biochar production

Sub-themes: Small scale
Upscaling



Small scale / community-based production

Types and numbers of stakeholder who discussed this theme

Government

Forest Focused x 2

Biochar Industry Representatives x 2

Biochar Producers (Commercial) x 2

Biochar Producers (Farmer led) x 3

Environmental Advocacy

Carbon Trading

Total number of stakeholders who discussed the theme = 12

Small scale / community-based production

- Communities could have their own pyrolysis units and produce their own biochar from local waste streams.
- Farms could host biochar plants.
- Large scale roll out in small systems is straightforward.
- Small scale has the benefit of localism.
- Mobile pyrolysis units are being developed which would be able to move from farm to farm enabling farmers to produce their own biochar.
- For those volunteering with wildlife groups, instead of just burning brush on bonfires, they could have a small kiln and produce biochar.



(Photo courtesy of Simon Watchorn)

“We could roll our plant out. If one in three farms had a biochar plant on it, they would generate electricity and if we had the grid support in the country to take the electric [it would work] ... as well as producing all what you need for the agricultural sector. To put it in context, it's about half the cost of a combine or about the cost of a combine to do it. Large scale rollout in small scale systems is easy”.

(Biochar producer – commercial stakeholder)

Upscaling

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Community)

Government x 4

Farmer Focused (Provision of Goods and Services) x 2

Farmer Focused (Representation / Advocacy) x 3

Farmer Focused (Science / R & D)

Forest Focused

Environmental Advocacy

Carbon Trading

Biochar Industry Representatives

Total number of stakeholders who discussed the theme = 15

Upscaling



A need to be realistic about how quickly biochar can be scaled up and what the potential is.



A whole new infrastructure and supply chain is needed for biochar to upscale.



If biochar is scaled at speed, markets have to be able to stand the sudden arrival of extra material.

“There's a will certainly to industrialise pyrolysis and biochar at scale and at speed. And the problem is when you do anything at scale and speed, suddenly there's a lot of it available so the market needs to stand up to that sudden arrival”.

(Biochar producer –
community stakeholder)

Theme 3: Governance challenges

Sub-themes:

The need for incentives

Undeveloped regulatory framework

Lack of a biochar standard

Carbon markets

Monitoring, reporting and verification (MRV)



Governance challenges: The need for incentives

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Farmer Led) x 3

Biochar Producers (Commercial) x 2

Farmer Focused (Representation / Advocacy) x 3

Farmer Focused (Science / R & D) x 3

Farmer Focused (Provision of Goods and Services) x 2

Forest Focused

Biochar Industry Representatives x 2

Carbon Trading x 2

Government x 4

Environmental Advocacy x 2

Total number of stakeholders who discussed the theme = 24

Governance challenges: The need for incentives



- For GGRs to work, each will probably need a tailored policy incentive.
- Farmers will want financial incentives, either as grants, through ELMs or through private funding such as carbon trading so this is going to need to be in place for a high uptake.
- Pro-environmental farmers may apply biochar, but extra incentives will be needed for other farmers.
- Farmers will be paid to look after the land and biochar could fit into this category.

“That will vary depending on who it is, and I think farmers will almost definitely want financial incentives from wherever that comes. It could be grants. It could be through carbon trading and the reality is it will cost more for farmers, tree planters, and foresters to put the biochar in than it would to do normal planting. So, you'd at least need to be covering that cost, in whatever way that comes out, either through ELMs grants possibly or through private funding through carbon trading. But realistically, if you want high uptake then particularly farmers will need to see an annual return on what they've got. They would need proof that it's not going to be detrimental to their income”. (Forest Focused Stakeholder)

Governance challenges: Undeveloped regulatory framework

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Commercial) x 4

Biochar Producers (Community)

Biochar Producers (Farmer Led) x 2

Biochar Producers (Pyrolysis Machine Manufacturer)

Biochar Industry Representatives

Government x 4

Farmer Focused (Science / R & D) x 2

Farmer Focused (Provision of Goods and Services) x 2

Farmer Focused (Representation / Advocacy) x 3

Forest Focused

Carbon Trading

Total number of stakeholders who discussed the theme = 22

Governance challenges: Undeveloped regulatory framework

- New pyrolysis plants are appearing so more biochar is appearing on the market and the regulations are behind.
- Low Risk Waste Position (LRWP) 61 and 62 only allow one tonne of biochar per hectare per annum. This is limiting agricultural application.
- Until Defra makes a proper policy around biochar, the industry relies on guidance notes from the Environment Agency.
- Whether biochar is a waste depends on where it is in the system.
- There needs to be regulation around application so that farmers know whether it is a one-off application, or applied in lower doses but over longer periods.

“We need huge work on policies because as you look into the policy framework, the European policy framework, you could find a lot of sectors and different policies in which biochar could be included. And we have to make a differentiation also between the carbon removal potential and the co-benefits. So we would need really a very broad change and inclusion in the policy framework”.

(Biochar industry
representatives stakeholder)

Governance challenges: Lack of a biochar standard

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Community)

Biochar Producers (Farmer Led) x 3

Biochar Producers (Commercial) x 2

Biochar Producers (Pyrolysis Machine Manufacturer)

Biochar Industry Representatives x 2

Farmer Focused (Representation / Advocacy)

Farmer Focused (Provision of Goods and Services)

Forest Focused

Environmental Advocacy

Carbon Trading x 2

Government x 3

Total number of stakeholders who discussed the theme = 18

Governance challenges:

Lack of a biochar standard

- The UK did have its own scheme but it did not receive funding to continue. It makes more sense to align with the European Biochar Certificate (EBC) because this is already in place.
- If you change the way biochar is produced the end result will always be different so it must be difficult to reach a set standard.
- Different countries are bringing in standards so these will all need to be managed to ensure biochars are safe, stable and sustainable.
- Smallholders who are producing their own biochar for their own use should not be required to meet a standard as the volume will never be meaningful to carbon sequestration.
- Biochar produced in traditional kilns will not reach the EBC standards so there could be 80% of UK biochar not reaching those regulations.



“The idea for us in the UK where we did go our own way, we had our own scheme, it didn't receive the support or funding to carry on. The idea of going back through that all again, granted that work is all there in the background already but you know what's the real benefit of going back through that all again when there's this existing system? If we're going to go our own way, fair enough. But it makes no sense to me not to align with the EBC”.

(Biochar producer- community)

Governance challenges: Biochar carbon markets

Types of stakeholder who discussed this theme

Biochar Producers (Commercial) x 2

Biochar Producers (Community)

Biochar Producers (Farmer Led) x 2

Biochar Producers (Pyrolysis Machine Manufacturer)

Farmer Focused (Provision of Goods and Services)

Farmer Focused (Representation / Advocacy) x 3

Farmer Focused (Science / R & D) x 2

Government x 3

Environmental Advocacy

Carbon Trading x 2

Forest Focused x 2

Biochar Industry Representatives x 2

Total number of stakeholders who discussed the theme = 22

Governance challenges: Biochar carbon markets

- Biochar carbon markets need to be properly regulated.
- There are a number of questions: What is being traded? Who is getting the money? Where is the money going? Can it be verified?
- Biochar producers are currently keeping biochar carbon credits.
- When trading biochar carbon credits, any application of biochar needs to be proven that it will be permanent.
- There is currently no MRV for biochar so this will prevent carbon trading.
- There are uncertainties around how biochar carbon trading will actually work in practice.
- There needs to be a more rigorous system in place. The biochar carbon market is currently quite volatile and there are several methodologies.
- Biochar carbon trading creates a market out of something that should not be a market.
- There might be long term financial damage done to farms who commit to biochar carbon trading and then cannot prove carbon sequestration has occurred.
- Biochar carbon trading may not be a solution to addressing climate change.

“I'm not a great fan of carbon trading full stop. I have a hesitation about anything to do with carbon trading because I don't think it addresses the issues. It creates a market out of something that should not really be a market. I'd be much more comfortable if we had an international agreement on taxation of [fossil fuel] extraction than on carbon trading”.

(Farmer Focused – Representation/Advocacy stakeholder)



Governance challenges: Monitoring, reporting and verification (MRV)

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Commercial) x 2

Biochar Producers (Farmer Led) x 2

Forest Focused

Government x 3

Farmer Focused (Representation / Advocacy) x 3

Farmer Focused (Science / R & D) x 2

Biochar Industry Representatives x 2

Carbon Trading

Total number of stakeholders who discussed the theme = 16

Governance challenges: MRV



- MRV for biochar needs to be agreed upon.
- The markets and farmers need to be confident in what they are doing.
- Private investors will want to know exact figures about how much carbon biochar is storing before they will invest in it.
- It needs to be established how the carbon from biochar is going to be measured in soil over longer periods of time. It will be difficult to measure it is still there in 10 years' time let alone over longer time periods.
- It is not possible to measure soil carbon at present. MRV needs to be established for both soil carbon and biochar.
- There is a lack of a carbon code which biochar would sit within.

“The MVR protocols, monitoring, verification, reporting have yet to be fully built. There are some early guidelines. ... It didn't really proceed far enough, but at least it set the ball rolling”.

(Farmer focused – representation / advocacy stakeholder)



Theme 4: Feedstocks

Sub themes: Opportunities

Sustainability concerns

Land use concerns and tensions

Organic waste materials tensions and concerns

Feedstocks: Opportunities

Types and numbers of stakeholder who discussed this theme

Government x 3

Farmer Focused (Science / R & D) x 3

Farmer Focused (Representation / Advocacy)

Biochar Producers (Commercial) x 4

Biochar Producers (Farmer led) x 3

Biochar Producers (Pyrolysis Machine Manufacturer)

Biochar Industry Representatives x 3

Forest Focused x 2

Environmental Advocacy

Carbon Trading

Total number of stakeholders who discussed the theme = 22

Feedstocks: opportunities

- Feedstocks from residues are not competing with other objectives for land use.
- Local waste streams could be used so there are fewer transport emissions.
- Timber for furniture production – the good quality timber goes for furniture production and the offcuts are turned into biochar.
- Ash trees that have been felled due to ash dieback could be turned into biochar. Japanese knotweed could be turned into biochar.
- Biochar will be more palatable to publics if it is made from waste materials as opposed to cutting down trees.
- Giving value to waste products especially with woodland management.
- Biochar as a means of producing a co-product from a waste material that there is no market for.



“The synergy that [biochar] can have with the circular economy concept and circular models concept because here we’re talking about feedstocks for biochar. We have a huge opportunity to reuse the residues and you don't have to dispose of them, but you can enter them into a circular system”.

(Biochar industry representatives stakeholder)

Feedstocks: Sustainability concerns

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Community)

Biochar Producers (Farmer Led) x 2

Biochar Producers (Commercial)

Biochar Producers (Pyrolysis Machine Manufacturer)

Biochar Industry Representatives

Farmer Focused (Science / R & D)

Farmer Focused (Provision of Goods and Services) x 2

Farmer Focused (Representation / Advocacy)

Government x 3

Environmental Advocacy

Total number of stakeholders who discussed the theme = 14

Feedstocks: Sustainability concerns

- Feedstocks are unsustainable if they are being shipped from the USA or Canada as carbon emissions will not be reduced.
- If biochar is produced on a large scale, large amounts of biomass will be needed, and this means either growing biomass in the UK or importing it.
- Some farmers let their wheat, barley, and rapeseed straw go back to the soil and this is a circular regenerative approach, but if it is burnt and then goes back into the soil, it may not be so sustainable.
- With large scale production, biomass will have to be transported around the country and this will create carbon emissions.
- Monoculture crops such as willow will have to be grown and this will not benefit biodiversity.
- If biomass for biochar cannot be produced in the UK, then biochar should not be produced because other countries need to be dealing with their own carbon emissions.



“We can't pretend that there's just tons and tons of biomass material out there waiting to be turned into biochar. It's simply not compatible with the urgent need to protect forests and land, restore soil and leave the land the heck alone in order to let nature have some space. So those are very competing and fundamental concerns”.

(Environmental advocacy stakeholder)

Feedstocks: Land use concerns and tensions

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Commercial) x 3

Biochar Producers (Farmer Led)

Farmer Focused (Representation / Advocacy)

Environmental Advocacy

Farmer Focused (Science / R & D) x 2

Farmer Focused (Provision of Goods and Services)

Forest Focused

Government

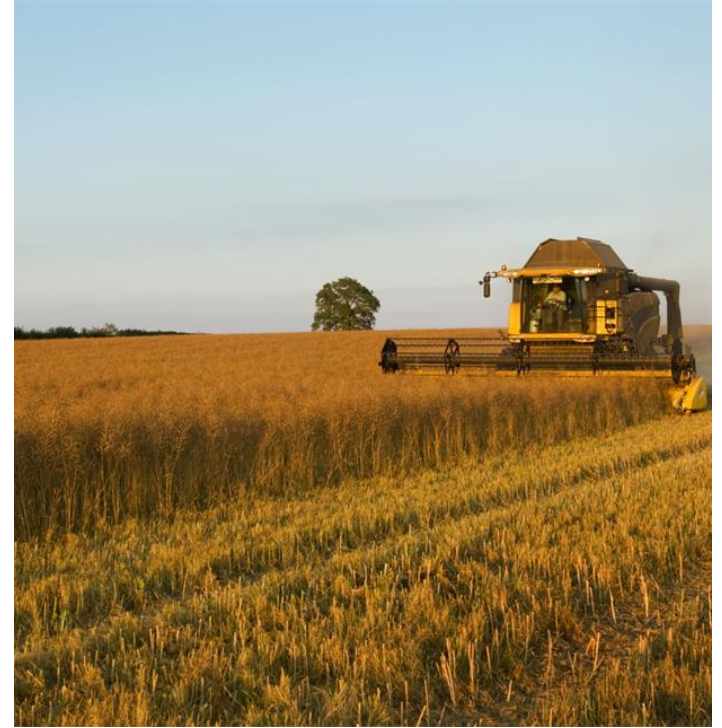
Carbon Trading

Biochar Industry Representatives

Total number of stakeholders who discussed the theme = 13

Feedstocks: Land use concerns and tensions

- Biomass prices are continuing to rise and this may lead to tensions between using land for food production and for biochar feedstock production.
- Land is used inefficiently for livestock production so biomass production for biochar is another tension added to the mix, adding to food insecurity.
- There are enough residues from agriculture, the food industry, forestry, and sawmills, so land is not needed for growing biomass.
- If land is given over to biochar feedstock production and food is imported from Spain, then it is counter-productive.



“It depends on your feedstock and I think there is going to be this huge growing tension between land use and feedstock particularly as the biomass price is going to rise and keep rising”.

(Biochar producer – commercial stakeholder)

Feedstocks: Organic waste materials tensions and concerns

Types and numbers of stakeholder who discussed this theme

Biochar Producers (Commercial)

Government x 4

Farmer Focused (Science / R & D) x 2

Farmer Focused (Provision of Goods and Services)

Farmer Focused (Representation / Advocacy) x 2

Forest Focused x 2

Environmental Advocacy

Total number of stakeholders who discussed the theme = 13

Feedstocks: Organic waste materials tensions and concerns

- How to ensure a relatively stable feedstock as each load will vary.
- Adequate volumes of organic residues will need to be sourced otherwise small volumes will be transported from all over the country.
- There is competition between different GGR approaches for feedstocks (agricultural residues, forestry wastes, or grown biomass).
- There is competition for agricultural residues for animal feed and bedding, as well as for use in anaerobic digestion plants.
- Transporting waste materials may produce more carbon emissions than using timber and producing biochar on site in a forest.
- Green waste compost materials are a useful soil input for farmers in their own right.
- Agricultural residues turned to biochar is carbon removed from the soil and farmers see these residues as a resource.
- Good quality biochar can only be made from good quality feedstock.



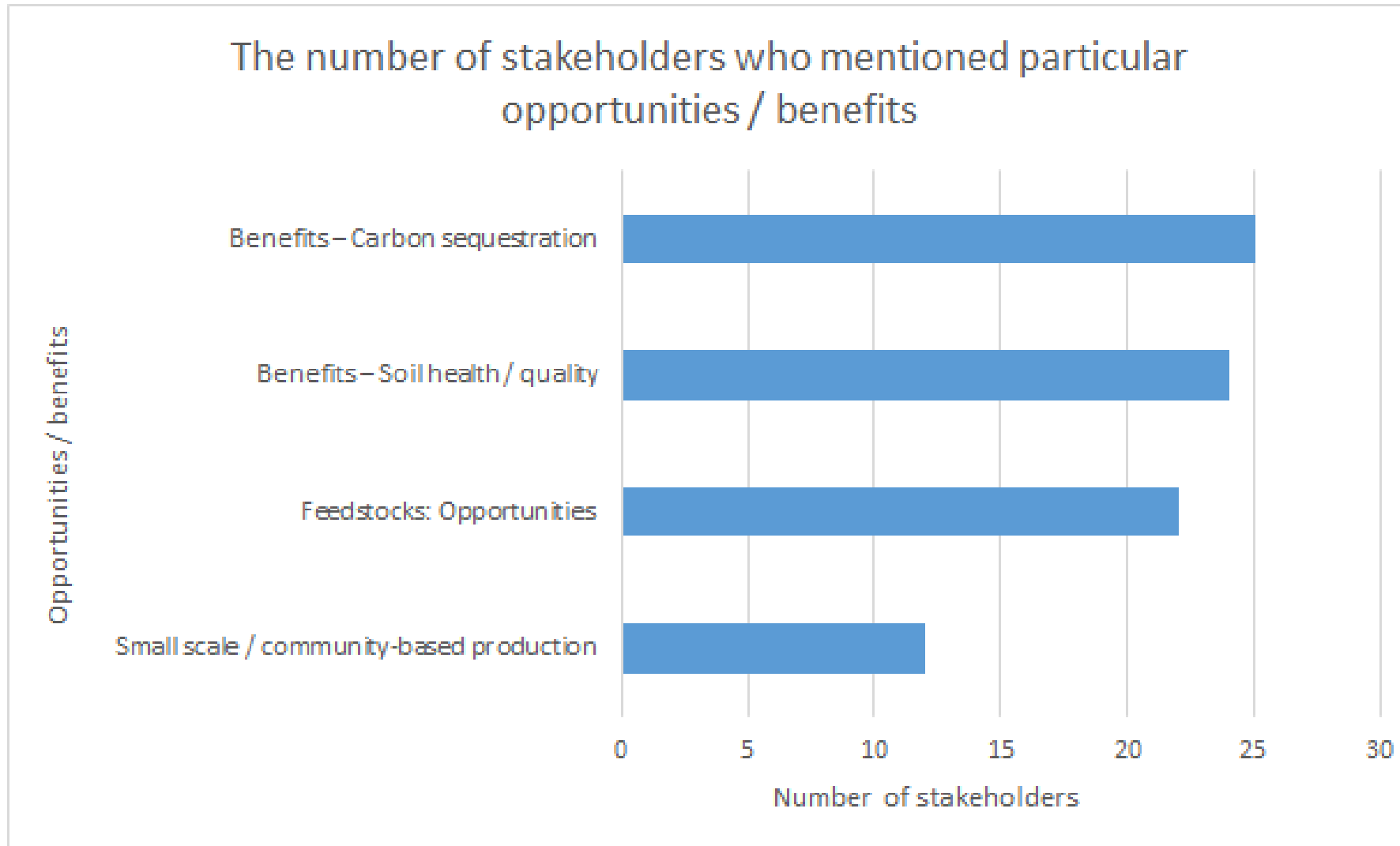
“Robbing Peter to pay Paul is one of the things that possibly comes to mind when you mention the green waste compost type materials, because actually that's a useful soil input in its own right. A lot of farmers need to get organic matter into the soil and that's a really easy source. So if we start taking it from there by putting it into something else I'm uncomfortable”.

(Farmer focused – science / R & D stakeholder)



Final points and observations about the findings of the first phase of the stakeholder research

Overview of opportunities / benefits as mentioned by stakeholders



Overview of tensions / concerns as mentioned by stakeholders



Key points from the graphs

- Stakeholders are as likely to conceptualise biochar as a soil amendment as they are as a carbon removal approach.
- Governance challenges are the most common tension / concern for stakeholders.



Governance

- Biochar governance landscape particularly unsettled. Governance challenges identified by all the different stakeholder types.
- Resolutions to these challenges are likely to be shaped by the wider political context i.e. the ideology of the government. This needs to be better recognised and be part of the conversation around this dimension of biochar.



Breadth and complexity

- Breadth and complexity of interview material; many key issues raised by stakeholders are political rather than scientific and challenging to resolve.
- Biochar is very similar to other scientific and technological developments in that it is almost impossible to keep politics away from a technology once it leaves the lab and enters society.

Fairness and justice

- Questions of fairness and justice are raised by a wide range of stakeholders and cut across many of the themes and will need to be addressed if biochar is to be taken forward as a greenhouse gas removal approach.
- This speaks to the social science questions: who wins, who loses; whose interests are (not) being served by a new technology like biochar; who / what bears the burden of responsibility, who / what enjoys most of the benefits?



A challenge

- How and by whom can the concerns, risks and uncertainties raised by stakeholders about biochar be addressed?



We gratefully acknowledge
the time given by all
stakeholders who have
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(Photo courtesy of Simon Watchorn)