PERENNIAL BIOMASS CROPS

PBC4GGR

GREENHOUSE GAS REMOVAL

Rethinking perennial biomass crops implementation in farmed landscapes: designing opportunities for integration into the farming system

Deliverable 3: Report on stakeholder participatory workshop PBC integration strategies and support mechanisms

Natasha Stonebridge, Julie Ingram and Jane Mills

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1. Introduction

This exploratory online workshop was held on 10 March 2026. It forms part of the research project *Rethinking perennial biomass crops (PBC) implementation in farmed landscapes: designing opportunities for integration into the farming system* and specifically concerns Miscanthus and Short Rotation Coppice (SRC) willow. The workshop is the third stage of a research design: i) **re-analysis of data collected in PBC4GGR Phase 2**, and ii) **in-depth interviews**, both of which have informed the development of the iii) **online workshop**.

A total of ten participants attended the workshop, representing stakeholders concerned with growing, supplying and supporting PBC, as well as those active in land use decision making more generally. These included PBC growers, researchers, supply chain, natural capital and policy representatives (see Appendix 2 for a list of participants). The workshop aims were to present the following to participants and sought their feedback through an interactive discussion:

- Analysis from extensive consultation with growers, farmers, biomass industry and NGO stakeholders exploring experiences and opportunities for PBC integration strategies and the potential public and private sector mechanisms to support them. This included the development of four PBC grower archetypes.
- Future potential strategies and pathways and the conditions that need to be in place for them to be implemented

Deliverable 1: Report on potential integration strategies and Deliverable 2: Report and visualisation of support mechanisms across farming sectors provide the background analysis that informed this workshop. The analysis largely relates to the English context. See Appendix 1 for a copy of the workshop programme.

Section 2 summarises an informative and lively workshop discussion in specific areas of focus. Section 3 then sets out the conditions that need to in place for the integration strategies to be implemented.

2. Findings

2.1 Public policy support mechanisms

Workshop participants discussed policy mechanisms that could support PBC production in farming landscapes. In the absence of direct payments, they considered potential opportunities within government schemes such as the Sustainable Farming Incentive (SFI) and the broader Environmental Land Management (ELM) programme for England, and SFS for Wales. Overall, there was felt to be a lack of consistent

government support, an unclear role of PBC in environmental schemes, and perception challenges within policy and public discourse (see section 2.7).

The policy support mechanisms discussed include:

- Dedicated payments for planting PBC
- Integration with existing environmental schemes (e.g., field margins or undersowing)
- Support for nature-based solutions from regional or local authorities

Participants agreed that there is currently limited policy support. Biomass crops are not included in SFI or SFS and there is no recognition from governments that these crops can have a role in providing public goods.

> *"bearing in mind that a couple of years back, there was a couple of farm-based things you could squeeze Miscanthus in under. But right now, there's just nothing"*

Also one participant pointed out that some ELMS initiatives are often quite place based (for example flood prevention and water quality) and this means *"it has to be the right place to do it, which almost requires a different model than SFI because where your farm is has huge differences to the value."*

Many farmers prefer enrolling marginal land into SFI options rather than planting PBC. There was a feeling that PBC are forgotten and unsupported compared to other options:

> *"there's lots and lots of things that are that [farmers] are being encouraged to do that aren't necessarily food-related for agricultural fields, but the only thing that's not promoted or supported is biomass… we just need some form of support and help and promotion rather than promoting everything else other than what we do"*

In this sense there was a call for "*a level playing field*". One participant suggested that just a small percentage of establishment costs paid though SFI would be sufficient for farmers to get started.

Other public support such as local government biorefinery clusters, or introducing carbon audits, are discussed below. Overall, it was agreed that the political landscape is currently not conducive to supporting these crops (see section 2.7.2).

2.2 Growing alternative commercial markets

Alongside bioenergy feedstock, a number of emerging commercial applications for PBC were highlighted. These include:

- Bio-based construction materials such as "miscrete"
- Animal bedding and compost

- Bio-refineries producing plastics or other bio-based materials
- Pharmaceutical products from SRC willow

Despite these opportunities, participants agreed that markets remain immature or fragmented for biomass products, supply chains are not fully developed and scaling production to commercial viability remain a key challenge.

One of the biggest challenges in diversifying markets is a strong and reliable market:

> *"When we talk about [market] diversification, it would be you're usually thinking about a farmer going into a market where there's a strong revenue base and part of the problem is that there is not the really strong revenue consistent base to use it for farm diversification"*

A need was identified for a strong industry story to support a new market as well as working collaboratively as a group to offer more opportunities.

Bio-refinery clusters was one model discussed for alternative markets which involves investing in local processing infrastructure and creating new jobs in a centralised area like a market town. These can be local government funded initiatives and develop new products and services, with circular economy opportunities.

For a farmer there may be opportunities to upsell on a supply chain with eco-labelling to gain a premium price. With emission trading schemes coming in, this could build the market, as there will be penalties for not using these materials. Examples discussed include Typhaboard and Miscrete (in development) which store carbon effectively.

However, recognising the value of these products in new markets and rewarding farmers needs to have suitable measurement systems.

> *"Willow and Miscanthus are storing a lot of carbon, putting a lot of carbon in products that you can use and store carbon long term… and maybe we do need to get our heads around storing carbon in agriculture as a priority and need to learn how to count carbon properly"*

Other new materials and products from biomass could add economic value, such as bio-based insulation, sustainable packaging, construction materials. Extending the carbon life cycle of products could increase environmental and financial returns. However new business markets need to be environmentally acceptable (with respect to Life Cycle Analysis) to attract subsidies and support. According to one participant, PBC were dropped from previous greening funding because, whilst energy maintenance for the crop is low, it is high for transport and processing.

Whatever the market, high establishment costs create a significant financial risk for farmers, especially smaller farms (around £2,500 per hectare for crops such as SRC willow) with several years before returns begin.

2.3 Natural capital markets

Participants discussed the role of natural capital markets in diversifying incomes for PBC growers, particularly voluntary carbon markets.

These markets are based on potential PBC co-benefits/ ecosystem:

- Soil carbon sequestration
- Flood mitigation
- Water quality improvement
- Nutrient management
- Biodiversity enhancement

However, natural capital markets are still nascent. Participants focused discussions on voluntary carbon markets and expressed concerns about high measurement, reporting and verification (MRV) costs, uncertain carbon prices, and long-term contractual commitments (often 30+ years).

Farmers are hesitant to commit land in the long-term without clearer economic incentives.

> *"I don't believe in sort of tying up too much in the way of carbon at the moment or in terms of carbon sales into the marketplace because nobody knows where it's going to go. Nobody knows what it's going to be worth"*

Participants highlighted difficulties in measuring soil carbon accurately at farm level, with a lack of standardised measurement methods and non-linear carbon accumulation by PBC over time.

> *"We need to get paid for the sequestration that's actually occurring in, you know, in the soil. I don't disagree. But who's calculating it and on what basis?"*

> *"Miscanthus, willow, agriculture in general has done more to reduce carbon than any photovoltaic panel or any windmill built in the last 12 years. But we can't get our heads around capturing it"*

There is also the issue of high transaction costs.

> *"Selling carbon on an annual basis, I mean you're going to need an awful high price to make up for the MRV costs. Doing the baselining in the soil carbon is so expensive that it's kind of a catch 22 of getting the markets right, but you're just at such a big outlay to do the carbon up front"*

Whilst working collaboratively might address this, some schemes like Landscape Recovery Networks are more concerned with long-term permanent changes (not PBC) which suits the carbon market model better.

2.4 Farm footprint

Some participants agreed that PBC had strong potential in helping manage the carbon balance at a farm level. Some devolved administrations are introducing farm carbon footprints (greenhouse gas assessments) as compliance for farm scheme payments although most demand for carbon footprints is from supply chains, which is typically on an enterprise level rather than a whole farm level. However, farmers are thinking about farm carbon footprints and see a role for PBC in improving these.

> *"I always like SRC willow in agroforestry, but partly because the animals love to eat it as well. It kind of goes along with that story of, OK, maybe you're not making a lot of money on willow, but maybe willow is improving the footprint of your farm"*

2.5 Stacking and blended finance

Stacking multiple revenue streams from the same plot of land was discussed as a promising strategy. Possible combinations include:

- Feedstock contracts for biomass or alternative markets
- Natural capital payments (carbon, water, biodiversity)
- Agri-environment scheme payments through SFI for example

However, there was caution in respect to how measurable PBC co-benefits are, in order to access and stack natural capital payments.

> *"Can you also demonstrate that [PBC are] also having a positive impact on creating habitats, increasing the biodiversity; a measurable, quantifiable benefit to water quality, reducing flood risk, all those sorts of things. But I think it does come down to the ability to demonstrate, not just be theoretical"*

2.6 Perception challenges

Improved industry communication and storytelling were highlighted as essential to shift perceptions among farmers, policymakers, and the public.

> *"So, we're still trying to educate what these crops are and where the potential for them is. I think they are in many cases very much orphaned crops. And it does sort of, you know, annoy me greatly that they're not perceived more widely or better for being a viable crop in and of themselves"*

Beyond economics and policy, farmer identity and cultural perceptions influence farmer decisions about PBC.

One example shared during the workshop described a farmer who reduced sheep numbers and planted SRC willow. Although most of their income came from biomass crops, they still identified primarily as a shepherd.

> *"There's a big, big perception difference there. Being a shepherd of trees doesn't quite have the same cachet as being an actual shepherd of sheep"*

This illustrates how social identity within farming communities can affect willingness to consider integrating new crops.

It was felt that the political landscape is not conducive at the moment for these crops as they have a perception issue (public and ministerial) and are seen as a "political hot potato" with a perception barrier which spills over into industry and farming.

2.7 A conducive political landscape

With DESNZ planning to develop BECCS capacity, demand for domestically produced biomass will increase. Whether they decide that incentivisation is needed for growers to meet this demand, or continue to rely on the market demand, is unknown according to participants. Defra will also need to develop a policy position on this.

Participants agreed that there is also a need to recognise and address the disconnect between the two departments due to different political responsibilities and interests. PBC meet DESNZ's energy and net zero objectives while for Defra, they see PBC as more problematic with potential socio, cultural, economic and biodiversity impacts. This has led to an underlying barrier:

> *"there's a, there's almost a psychological barrier, you know, that we need to sort of address in the first place… it's the right energy crops in the right place for the right reason"*

This speaks to the smaller scale integration options discussed in the workshop.

2.8 Integration strategies – two models

The political landscape has implications for PBC integration model explored in this research. The integration strategies discussed have been small scale and were observed to align better with regenerative agriculture and environmental goals. However, future feedstock demand from BECCS plants will require large-scale centralised monocrop planting to produce high volumes of biomass, together with efficient logistics and crops grown close to processing facilities. Although farmer collaboration on contiguous land might offer some options for planting at scale, the logistics are challenging with respect to contractors, harvesting and feedstock collection.

> *"The management regime that leads you towards sort of the ecological resilience in terms of biodiversity, agroforestry or natural capital is a very different management style than if you're really doing it like a [feedstock] crop"*

Opportunities to combine the two models however exist, depending on geography and farm sector[1]. In terms of farm profitability, while larger operations benefit from economies of scale, small-scale operations can be profitable.

3. Conditions for successful implementation of strategies

Overall participants recognised the potential benefits of integrating PBC with respect to:

- Stable long-term income streams for farmers
- Reduced agricultural inputs
- Farm business resilience
- Carbon sequestration and climate mitigation
- New bio-economy industries

However, unlocking these benefits will require coordinated policy support, market development, and improved measurement systems.

Specifically, participants identified the following as conditions needed to support implementation of the strategies:

- Clear policy recognition of PBC as energy crops with co-benefits; creating a level playing field
- Create conducive political landscape, change perceptions
- Alternative market development and supply chain infrastructure; telling a good story
- Alternative markets need localised processing infrastructure at scale
- Reduced transaction costs for natural capital markets
- Improved measurement frameworks for alternative markets, for co-benefits for natural capital markets and for farm footprint

[1] A recent survey of 6 Miscanthus growers by Terravesta found that a larger Miscanthus area (e.g., 110 ha) benefited from economies of scale, achieving competitive net margins per hectare (£672.77). However there is also potential for profitable small-scale operations, where yield and operational efficiency are high.

Appendix 1: Workshop programme

Workshop facilitators: Julie Ingram, Jane Mills, Natasha Stonebridge, Fern Baker, CCRI, University of Gloucestershire.

Workshop: Strategies for PBC

Online: 10 March, 11.00 – 12.30

INTERNAL PROGRAMME

The aims of the workshop are to:

- Present analysis from extensive consultation with stakeholders on PBC integration strategies and potential support mechanisms
- Collectively identify potential strategies and what conditions need to be place for them to be implemented

11.00	Plenary **Welcome** **Introduction** to the research and workshop aims
11.05	Plenary **Findings from the research to date** ○ **PBC integration strategies** identified ○ Clarification questions ○ **Support mechanisms** (policy, market, advisory, finance) ○ Key tensions or uncertainties ○ Clarification questions
11.20	**Collective Evaluation of Strategies**
11.35	**Collective Evaluation of Strategies** ○ breakout session and the questions ○ evaluation framework and pathways
11.40	Break out -
12.05	Feedback from each group- cross group synthesis
12.25	Final summary, next steps, and farewell
End	

Appendix 2: Participant list

List of workshop participants by specialism and sector/ agency.

Researcher, farm manager and PBC grower	Agricultural academic institution
Consultant and PBC grower	PBC supply chain
Farmer and PBC grower	Arable farming
Account manager	PBC supply chain
Consultant	PBC specialist and biomaterials company
Manager and consultant	PBC supply chain and grower cooperative
Climate mitigation scientist	Defra
Climate mitigation scientist	Defra
Agriculture food chain specialist	Defra
Farm futures and sustainability consultant	Farm innovation and support NGO