

**Open Report on behalf of Richard Wills
Executive Director for Environment and Economy**

Report to:	Environmental Scrutiny Committee
Date:	14 October 2016
Subject:	Harvesting Verge Biomass

Summary:

As Highway Authority, LCC currently maintains 8,750 kms of roadside verges. For 18 months work has been going on to evaluate more sustainable ways to maintain verges at lower cost whilst meeting other objectives (such as ensuring appropriate management of Lincolnshire's road verges designated for wildlife conservation value).

A small pilot is taking place this summer to harvest verge biomass and use it as feedstock in an anaerobic digestion plant producing energy and digestate (fertiliser).

As part of the pilot monitoring and research is being carried out and will be complete by early 2017.

Notwithstanding the final results from that research it is already clear that there are some interesting opportunities and this report aims to bring members up to date with progress and highlight those opportunities.

Actions Required:

Members of the Environmental Scrutiny Committee are invited to consider and comment on the report and highlight any recommendations for consideration.

1. Background

In Lincolnshire there are approximately 8,750 km (5,500 miles) of highway of which 6,173 km are termed 'rural' and largely bounded by grass verges. The majority of road verges are within the public highway and Lincolnshire County Council as the Local Highways Authority is required to keep them in a safe and unobstructed condition. Current practice is to flail mow a 1.1m strip of the verge, and wider swathes around visibility zones at road junctions, leaving the mown vegetation in situ. As a result of budget pressures Council policy has recently been changed reducing the frequency of cuts from three to two for 2016-7 with the potential for further reduction or cessation a real possibility in future.

With the majority of the verge width left uncut and the visibility strip being regularly mulched, the result has been a gradual increase in nutrients, the encouragement of growth of vigorous tall grass and weeds, and suppression of the overall biodiversity potential of the road verges i.e. fewer wildflowers, pollinators etc. In recognition of the issues posed by current practice Lincolnshire County Council's Highways Authority works in partnership with the Lincolnshire Wildlife Trust to manage the most biodiverse verges as Roadside Nature Reserves (RNRs). RNRs constitute less than 1% of the network (80km). On these verges, a late hay cut ensures survival of the rich assemblage of wild flowers and invertebrates, some species of which are nationally rare. In addition to RNRs, a further 233km of wildflower-rich verges have been identified and designated as Local Wildlife Sites as a result of the Life on the Verge project (2009-present).

Over the past 18 months work has been going on to develop a model that might provide better outcomes and value for money. Building on European research and practice, a study¹ was commissioned quantifying the potential resource and how it might be used productively.

The study confirmed several significant opportunities for a wider uptake of innovative road verge management strategies including:

- developing verge harvesting as a new feedstock for Anaerobic Digestion (termed Low Input High Density (LIHD) biomass) for renewable energy generation that does not take agricultural land out of production and does not require fertilisers or other inputs with a high carbon footprint
- providing an additional source of income and employment from the rural landscape by the production and use of a new renewable energy feed stock
- promoting biodiversity through harvesting LIHD verge biomass, thus contributing to Biodiversity 2020 and LCC Natural Environment Strategy objectives and local authority responsibilities under the NERC Act 2006 whilst extending Local Wildlife Sites in positive conservation management (as measured and reported under Single Data List 160.00) and providing benefits for pollinating insects in accordance with The National Pollinator Strategy 2014
- achieving better value through LIHD verge biomass being valued as a resource and reducing the net carbon emissions resulting from the management of the soft landscape around Lincolnshire road network

In theory the LIHD biomass resource available from Lincolnshire verges alone could annually provide sufficient electricity for about 4,500 homes or gas for 1,100 homes. Verge biomass is not the only potential LIHD biomass source. Highways Agency, Network Rail and others have been looking at similar opportunities. There are other potentially significant sources (such as watercourses regularly cleared by Internal Drainage Boards and the Environment Agency, public open spaces, parks and commons, golf courses, MoD sites etc.) that could be used. If those sources could be tapped significantly more energy could be produced. In addition business case and viability is strengthened as greater feedstock is sourced closer to the AD

¹ A Feasibility Study into the utilization of Anaerobic Digestion to sustain the harvesting of road verge biomass (September 2015). [Download from LCC web site](#)

plant. The Lincolnshire study has received national attention and discussion has been held with relevant Government Departments and industry bodies.

As a result of the study an operational pilot was carried out in summer 2016, working with a local anaerobic digestion operator, the Environment Agency, Lincolnshire Wildlife Trust and machinery manufacturers. The pilot had three main objectives

- Test and monitor the logistics of harvesting LIHD verge biomass (costs; environmental impacts; machinery performance)
- Seek to demonstrate the benefits of LIHD to Anaerobic Digestion operators, thereby creating a market
- Inform future mowing regimes and business models

The pilot was carried out in a defined area based on local AD plant. Identified verges were mown in early/mid-June and late July/early August. The LIHD (in the order of 60 tonnes) which was gathered will be used as a component (20%) in the AD plant (probably early 2017). Performance will be closely monitored to ascertain biogas production.

The pilot exercise is supported by ongoing research on

- Biomass yields, composition (including analysis of heavy metals, PAH content), biogas yields etc. (Leeds University)
- Business Case options and analysis (London Business School)
- Biodiversity and ecological impacts (carried out by Lincolnshire Wildlife Trust with support from the University of Lincoln)

Interim conclusions from that research will be available by late November 2016 and final conclusions in spring 2017.

2. Conclusion

Work to date and analysis of parallel research has reinforced initial indications that there are significant opportunities in harvesting verge biomass and using it as feedstock in AD. Amongst the potential benefits are

- Continued maintenance of roadside verges potentially at reduced costs
- The extension of improved management to more rural verges with significant biodiversity and pollinator benefits
- Generation of renewable energy, reduced carbon emissions and improved energy security; this could include community based provision of heat and electricity in some locations (particularly those off the gas grid)
- Utilising feedstock for renewable energy that does not take agricultural land out of production and does not require fertilisers or other inputs with a high carbon footprint (reflecting recent direction of government policy changes). Indeed the process will generate digestate which can be used in place of fertiliser thereby reducing agricultural costs and reducing emissions
- Providing local economic benefit through agricultural diversification and job creation

There are still some other issues that are unresolved. On the regulatory front verge biomass is currently considered by Environment Agency to be a waste and, as such, its use in AD brings with it regulatory requirements. Current requirements would impose significant costs on AD operators and threaten potentially viability. Conversely, minor changes in requirements could facilitate significant growth. Government policy and support (Feed in Tariff, Renewable Heat Incentive) is currently under review but it should be noted that the direction of travel favours wastes rather than grown feedstocks. This is beneficial to the use of LIHD as a feedstock.

How AD operators will perceive the value and technical acceptability of LIHD remains unclear. This is critical to wider implementation.

Consideration of optimum machinery, methods and collection logistics will also need to be further considered and refined.

Next steps are

- To complete and publish research and consider conclusions
- Continue development of potential business models for further consideration
- Continue to lobby, with others, for appropriate regulatory and support framework

3. Consultation

a) Policy Proofing Actions Required

NA

4. Background Papers

No background papers within Section 100D of the Local Government Act 1972 were used in the preparation of this report.

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