

Local Economic and Social Benefits of Bioenergy



BioPAD



Bioenergy Proliferation and Deployment



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A Study of Local Economic and Social Benefits of Bioenergy Installations and their Associated Supply Chains in the West of Ireland

Introduction

SLR Consulting Ltd was commissioned by the Western Development Commission (WDC) in May 2014 to conduct a study of the local economic and social benefits of bioenergy installations and their associated supply chains. Whereas previously studies have been at an aggregated level, the aim of this assignment was to measure and highlight where the employment from bioenergy occurs at a local level and to demonstrate the contribution that bioenergy development can make to rural and peripheral areas.

Purpose of the study

The purpose of the research was to investigate the bioenergy supply chain in the Western Region and examine how this contributes to positive local economic impact. It has a practical emphasis, rather than theoretical, looking at the supply chain from the investigation of existing bioenergy suppliers and projects in the region.

The research used a case study approach, selecting eight examples working within the bioenergy supply chain. Data was gathered through literature review, telephone interviews and web search. This was then analysed in terms of economic and social impact, lessons drawn from the findings and conclusions presented.

The study was conducted at a time when there is an active drive for change in the bioenergy sector in Ireland, through the Energy Green Paper (May 2014) and the newly announced Bioenergy Plan (July 2014). The Green Paper recognises the importance of realising the major opportunity that sustainable energy presents in terms of job creation and economic growth, whilst the Bioenergy Plan will put in place a number of policy and enabling actions to realise the potential of bioenergy deployment in Ireland.

Key findings

The study identified that bioenergy makes a direct, focused and sustainable beneficial impact on the local economy within the rural parts of the WDC region in Ireland.

This overall local impact was broken down into a set of distinctive components and these are summarised below.

Summary of local economic and social impacts derived from bioenergy at supply chain stage

Funding

The provision of funding, such as grant aid, has enabled plant to be acquired that can in turn generate demand for biomass. To avoid double counting that benefit is ascribed to those later processes and consequently, while essential to the creation of a bioenergy sector, the provision of funding does not in itself confer direct benefit to the local area.

Investment / Capital Spend

Spend on bioenergy plant largely flows immediately to the local area to equipment suppliers, mainly in Northern Europe with minimal impact on the local area's economy.

Operation

Plant operation is overwhelmingly automated, creating minimal employment or income opportunities.

Delivery / haulage

Delivery and haulage activities, along with the associated jobs, are not separately distinguished by suppliers who instead allocate tasks flexibly across their multi-skilled workforce. While clearly a significant activity without further financial details the value of this to the local economy cannot therefore be quantified.

Processing

Processing is moderately labour intensive, reflecting the large volumes of wood needed to sustain a plant throughout the year. One case suggests that a (large) 500kW biomass plant will generate 0.15 jobs in the processing of the raw harvested wood to a usable biomass fuel.

Harvesting

Harvesting is not solely linked to taking a biomass resource; there is a forestry management requirement to remove thinnings to allow the remaining trees to maximise their growth. Consequently not all of the cost, or employment benefit, from harvesting should be apportioned to bioenergy. The study finds that at 0.14 jobs per 500kW plant this activity closely matches the economic impact of processing.

Growing

The case studies have highlighted that the biomass crop has been driven by forestry practice in the past, rather than as an intended input for the bioenergy sector, though this is changing. This change in turn renders it impossible to reach firm conclusions as to the scope for beneficial local economic impact from this activity.

Overall assessment of local economic impact by supply chain stage

The above analysis finds that the local impact arising from the supply chain is far from uniform along it, but rather there is a pronounced bulge around the middle, with the harvesting and processing activities responsible for the vast majority of current economic impact, though this could change with the attraction of manufacturing of bioenergy plant to Ireland and/or new approaches to maximising timber generation.

The supply chains reviewed in this study are therefore not fixed in stone, rather they should be considered as indicating where local impact is currently derived and, perhaps more importantly, where additional impact can be obtained in the future.

Jobs

The numbers of jobs provided along the supply chain, scaled for a typical 500 kW plant, is summarised below.

Local Employment by Supply Chain Stage: example 500kW plant

Supply Chain Stage	Jobs impact	Commentary
Funding	Nil	An enabling measure where the jobs impact arises under later stages
Investment / Capital Spend	Minimal	very low reflecting no local manufacturing
Operation	0.02	Linked to monthly check = 0.02 jobs
Delivery / haulage	Not separately identified	shared task with processing operatives
Processing	0.15	processing operatives typically male, as some heavy work, and semi-skilled
Harvesting (including 'forwarding' - taking cut timber to collection point)	0.14	again overwhelmingly male and semi-skilled
Growing	Changing, currently very low	as biomass take has been a consequence of historical planting. Now rising in significance as biomass oriented planting occurring.
Multiplier	1.48	Source: IrBEA DECC study (2012) (see references)
TOTAL Employment	0.46	

Local Incomes

The amount of money which remains in the local economy as a result of using a local bioenergy fuel rather than an imported fossil fuel is significant. Essentially almost all of the cost of the displaced fuel (eg oil) remains in the local economy either as a saving to the plant owner (if biomass is cheaper) or as earnings for those working in the supply chain, or as payment for the raw timber (if farmers or other woodland owners).

However there will be some leakage, as machinery running from chipping plant to new chain saws parts are bought, along with the diesel and other consumables required, particularly for transport. This has been estimated at 20% in the Money Flow Chart (Joensuu 2013). It is therefore taken that 80% of the avoided fuel cost can be taken as adding to local incomes.

Investment

The 'new rural paradigm' identified in the OECD report (2012) on renewable energy and the rural economy places an emphasis on investment rather than subsidy as the new plant provides a decades long positive economic impact, one that can of course be further geared if low cost energy stimulates other activity and the rise in local incomes encourages other enterprising activity.

Wider business opportunities

This is an area where the case studies show some learning, but arguably more is needed to realise full potential, though one company is demonstrating a pronounced willingness to develop new offerings.

Wider benefits

There is, despite the short time that projects have been running, evidence of emerging benefits, in the generation of training opportunities that will also benefit other sectors and the strengthening of community and member based organisations.

Innovation and competitiveness

It is too early to reach a considered verdict on the nature and level of innovation and competitiveness within the bioenergy sector, but there is likely to be a contribution to the wider economy as the sector contributes resources, a business network and exposure to business success, the three factors that are critical to encouraging business start up in any sector.

Maximising benefit

The small number of case study projects precludes any attempt to be definitively quantitative as to the types of supply chains and bioenergy activities which provide greatest benefits to the local economy.

However the preceding analysis identifies certain key characteristics of a bioenergy supply chain that will maximise benefit. It should also be noted that the best outcome for the region will not necessarily be a focus on a single 'best' approach, but rather encouraging what works best at a very local level. Thus the approach employed in very rural parts will likely differ to that in and near to settlements where there may be more scope for larger plants or those which favour a different technology. The solutions identified below are then prescriptive rather than constrictive, encouraging best practice but not seeking to prevent other approaches that are locally superior.

Overall Assessment of Bioenergy and its local impact

The case studies illuminated the complexity that lies behind the question ‘how does bioenergy impact on local economies?’ They highlight that there is considerable uncertainty over definitions (what is ‘local?’), a lack of consistent data records over a considerable period (data are available over short periods only and unadjusted for weather or other external influences) and poor identification of the counterfactual (what would our alternative energy costs have been?). All this is occurring in a time of change, exemplified by the publication of a National Bioenergy Plan during the study.

Nevertheless the study suggests a few robust conclusions:

- Individual bioenergy projects will have relatively small direct and immediate impacts, with notably any funding and other local resources that are gathered to pay for investment in plant being immediately directed outside of not only the local area, but also of Ireland
- The ongoing impact that does arise from a bioenergy plant is however likely to be both significant and very enduring. It is this long timespan over which the valuable impacts in relation to harvesting and processing activities arise that makes bioenergy projects of considerable value
- Moving from the individual project to mainstreaming will greatly multiply this benefit. Seeing, for example, a biomass boiler in every school would transform the steady and enduring impact to the large and growing. This stresses the need to move away from pilot exercises and one-off funding approaches (all the case studies were treated differently for grant and procured different equipment in different ways) and towards standardising and mass procuring. This in turn could open the door to local manufacture which would transform the economic impact of the investment spending
- The specific characteristics of bioenergy related employment, being targeted on remote areas with little alternative employment opportunities and on a key group, semi skilled men within those areas, makes it exceptionally valuable in terms of making an area sustainable. Coupled with increased income from those activities and from the greater sales of timber, the result is to directly address areas of disadvantage and vulnerability, and to do so in way that requires support only once, at the outset, thereby breeding self reliance rather than dependence
- Bioenergy is therefore to be encouraged and the report details some of the ways this can be achieved. However a key insight is that bioenergy is not to be taken in isolation but rather to be included in an holistic understanding of energy needs, and of economic development potential. It should be understood as an integral element to an area’s sustainability over decades rather than a silver bullet that brings immediate relief.

Disaggregation of impact must however be treated with care. Typically investment is centred on equipment sourced from outside the region, with no immediate direct local benefit. However this then generates a decades’ long demand for biomass which creates local jobs and raises income in the area. Any given installation is likely to generate only a

fraction of a job across the supply chain but developing installations in every school, hospital, supermarket, clinic, factory, office and district housing scheme creates a vast potential.

Realising this potential will require a number of specific weaknesses in different parts of the economic and social environment to be addressed. These range from developing forestry culture to encouraging innovative financial mechanisms that can allow communities to participate fully in investment and retain profits that would otherwise flow away from the area in terms of interest payments and dividends. These can then be spent or reinvested locally. Success will be greatly magnified if progress can be made on all, or most, of these fronts as such comprehensive change will help transform attitudes to bioenergy, arguably the critical issue.

More information and acknowledgements

For more information about this study of the Local Economic and Social Benefits of Bioenergy please contact:

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This study of the Local Economic and Social Benefits of Bioenergy was undertaken by [SLR Consulting Limited](#) for the WDC as part of the BioPAD project.

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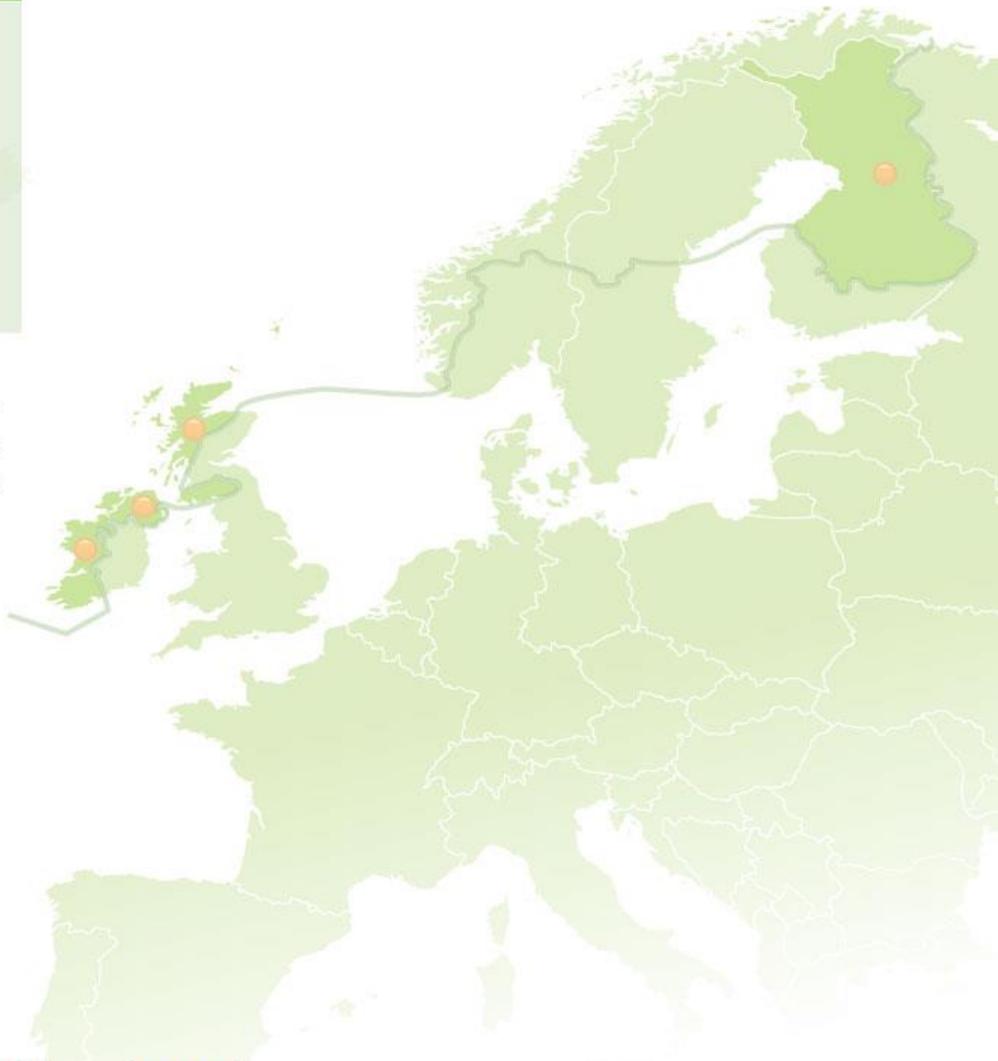
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BioPAD is promoting the wider use of bioenergy and developing applications targeting the whole process from supplying fuel to producing energy.

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