

Mapping the Woodfuel System

Stakeholders involved in growing, processing and use of woodfuel have complex characteristics and inter-relationships that can be viewed as a system. However this is rarely studied as a whole, with research instead focusing on specific constituent parts. This study adopted a systems approach in an attempt to map the sector, emphasise the interactions between its parts, and identify key barriers to the increased production of biomass for energy.



"Take one [part of the system] out and the whole thing doesn't work!"
(Welsh land-manager)

Background

Biomass is expected to form a significant part of the UK's renewable 'energy mix', mitigating climate change through reductions in fossil fuel use and associated carbon and greenhouse gas emissions. Woodfuel, from sustainably managed forests, is a critical element of this and the Forestry Commission is strongly supporting the development of this sector. Research into the various individual aspects of woodfuel, such as heating technology, is now widespread, however very little investigation has been done of the sector as a whole. This project adopted a systems analysis approach to 'map' the key elements of the woodfuel sector, their internal characteristics and their inter-relationships. This can inform a targeted approach by the Forestry Commission to intervention in the sector to address barriers to increasing biomass production, and strengthen those parts of the system which drive growth and production.

Objectives

This research aimed to:

- apply a systems analysis to understanding the woodfuel sector;
- identify the key elements in the woodfuel 'system' and understand the relationships between them;
- improve understanding of where and when the Forestry Commission can intervene in the woodfuel system to encourage increased production and use of biomass energy.

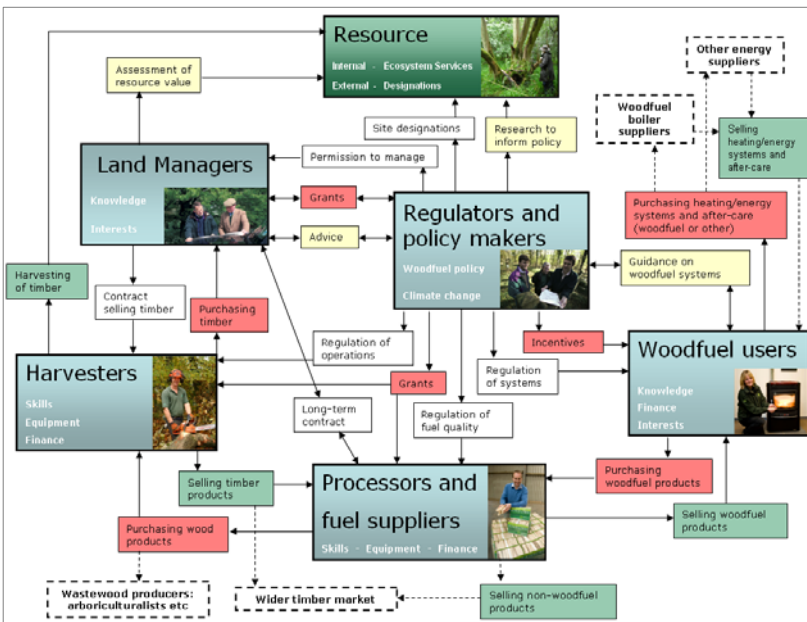
Methods

- Literature review to provide context and develop understanding of systems analysis, the woodfuel sector, and knowledge regarding barriers to and drivers of biomass production;
- Simple systems analysis to produce a 'map' of the woodfuel sector as a system;
- Expert stakeholder interviews and workshops to critique and revise the 'map'.

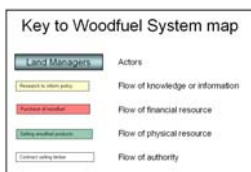
Findings

The key constituents of the woodfuel system were identified as the resource; land-managers; harvesters; processors & suppliers; users; and regulators and policy-makers. These have numerous important internal characteristics that influence their decisions and actions.

Relationships between them can be categorised as flows of authority, knowledge or information,



finance, or physical resources. A boundary around the woodfuel system proved hard to define as the influence on the sector from external factors, such as other energy and timber markets, was considered to be very significant. Stakeholders seek to combine roles and activities to reduce the number of relationships and hence simplify the system. The 'map' was well received by experts in interviews and workshops and proved a very useful resource with which to stimulate discussion about barriers to and drivers of biomass production.



Amongst the most significant barriers to increased biomass production were the diverse interests of woodland owners, the knowledge of potential woodfuel users, and decisions based on perceptions of other forms of energy as less costly. Financial and resource relationships between harvesters, processors, and users were considered the most important drivers of biomass production.

Recommendations

- Engagement of land managers is critical and needs to reflect the diversity of objectives, management scale, and be communicated via channels that resonate with their interests.
- Information for woodfuel users needs to be consistent and recognise scale of use.
- Interventions should be aimed at facilitating the flow of biomass resource and finance between harvesters, producers, and users. This could include providing market information, supporting transport costs, and advising on contractual arrangements.
- Recognising the sector as a system highlights the importance of social networks. Building stronger networks within the sector would increase the capacity of the industry.
- Consistency in policy and regulation will simplify the system and is considered essential for growth.

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Reports and Publications

Robinson, D (2011) *Mapping the Woodfuel System*. Forest Research, Farnham