TimberTransportForum

delivering solutions for a growing UK harvest

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The Carbon Footprint of Timber Transport

The Timber Transport Forum is a voluntary partnership working to promote the sustainable transport of roundwood logs from the forest to the processor. This information note summarises a study to improve understanding of the carbon footprint of timber transport in the UK.

Introduction

The UK Government has set challenging targets to reduce emissions of the greenhouse gases which contribute to climate change.

Forestry and wood processing provide a reliable, low risk and low cost means of reducing our net emissions of carbon dioxide[1]. Trees take carbon dioxide from the atmosphere and turn it into wood. This can then be manufactured into wood products and used to replace more energy-intensive construction materials. Woody biomass is already fueling local-scale renewable energy power stations and boilers.

To supply these industries, around 350,000 lorry loads of sustainably grown logs are transported from UK forests each year for processing in sawmills, pulp and paper mills and in wood energy plants.

In order to better understand the contribution of timber transport to the overall carbon footprint of the industry, The Timber Transport Forum commissioned North Energy, a renewable energy and sustainability consultancy, to examine the greenhouse gas emissions from timber transport. The study is based on a UK softwood production scenario, using existing literature and specialist knowledge from Forest Research. Recognised methods of calculating emissions are followed and presented in a workbook that accompanies the report.

Understanding the Carbon Footprint

The total emissions from timber transport are made up of:

- Direct emissions from the fuel used by lorries and other means of transport.
- Indirect emissions which result from fossil fuel energy being used to manufacture and maintain vehicles, and to construct and repair roads.

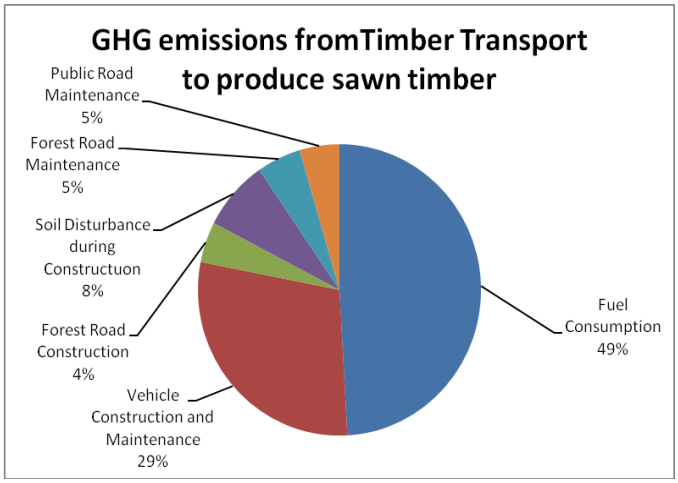
Fuel

Diesel fuel used by the timber lorries makes the largest contribution to greenhouse gas emissions. Working on small rural roads in hilly terrain, the fuel consumption of timber lorries is higher than the average for regular road haulage and fuel use when driving on gravel forest roads is at least a third higher than on public roads.

Alternative modes of transport, such as rail, inland waterways and coastal shipping, can reduce carbon emissions for longer hauls. The Forestry Commission has published a report[2] on the environmental benefits of the TimberLINK coastal shipping service which transports timber from Argyll ports to Ayrshire.

Lorry Manufacture and Maintenance

Working in a tough environment, the life of timber lorries is reduced to around 770,000 km, rather than the 1,000,000 km normally assumed for conventional road haulage vehicles. The indirect emissions resulting from vehicle manufacture are therefore greater, adding between 13% and 18% to the direct emissions from fuel. Vehicle maintenance, including a new set of tyres each year, adds 25% to 33% to direct emissions.



[1] Combating Climate Change: A role for UK Forests. 2009. The Stationery Office, Edinburgh.

[2] TimberLINK Environmental Benefits Review, Transport and Travel Research Ltd., March 2010. Forestry Commission Scotland.

Emissions from Road Construction and Maintenance

The North Energy report also considers the emissions arising from road construction and maintenance. The in-forest gravel roads used for timber haulage require regular maintenance and the minor public roads that link the forests with the trunk roads can also suffer significant wear and tear when used frequently by timber lorries.

The emissions from building forest roads depend significantly on the soil type and the level of disturbance. Peaty soils will release substantial amounts of carbon when they are disturbed. The subsequent life span of forest roads and the management strategies for their maintenance are also relevant. For public roads, the contribution to emissions arising from maintenance depends on the density of the public roads serving the forest, which can vary considerably between regions.

Reducing Emissions

Lorry engine technology has advanced in recent years greatly improving fuel efficiency but there is still scope to reduce diesel use by up to 10% through driver training and fuel monitoring. If biodiesel could be reliably supplied to rural areas and used in place of diesel fuel, this would reduce direct emissions by between 49% and 83% depending on the source of biodiesel supply.

Tyre pressure control systems which can optimise tyre pressures to suit different loads and road types may improve fuel efficiency slightly. However, lowering tyre pressure when driving on rough forest roads also results in less vehicle maintenance and tyre damage, extending the working life of lorries. In addition, lorries fitted with tyre pressure control systems can help to reduce damage to both forest roads and weaker public roads.

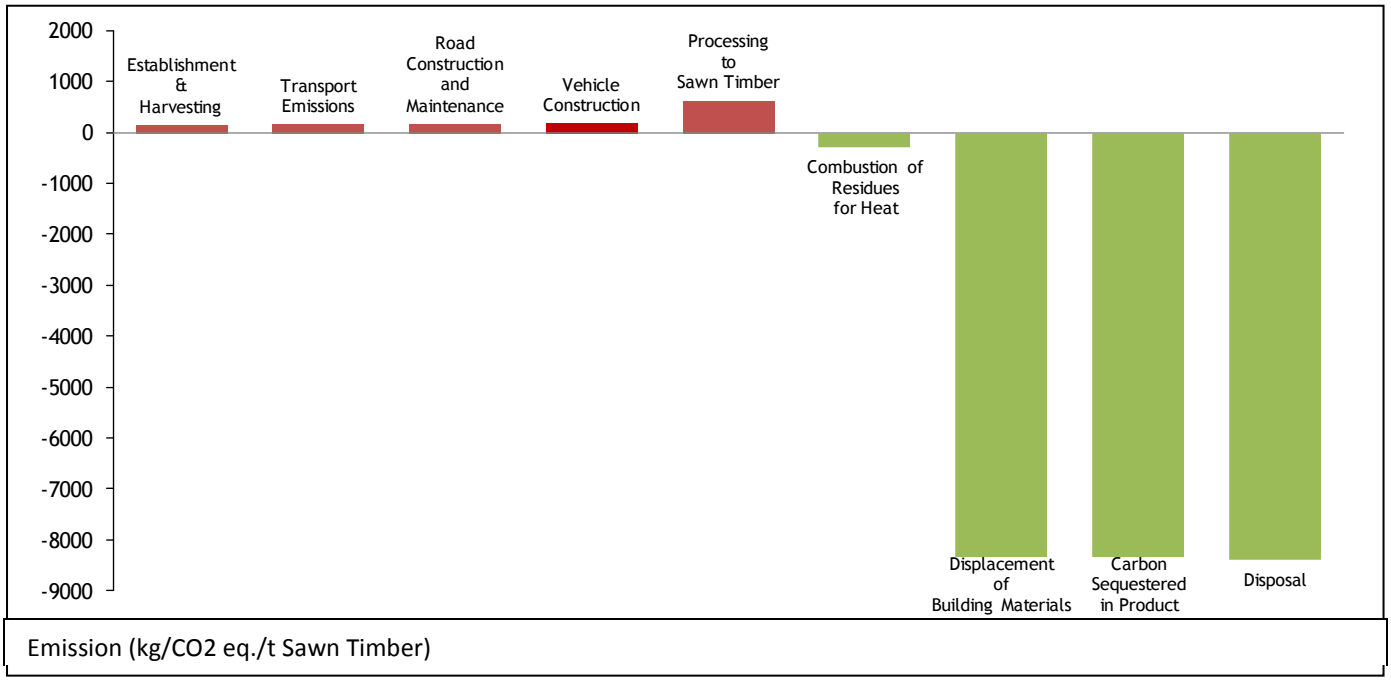
Overall Emissions

To put the contribution of timber transport in context, the report considers the emissions arising from the wider supply chain of growing, harvesting, transporting and processing timber.

Timber transport emissions are relatively small, accounting for 6% of the emissions arising from producing one tonne of sawn timber and 15% for producing one tonne of biomass fuel.

The report also considers a full life cycle approach, taking account of how the timber is used, what it replaces, and, ultimately, how it is disposed of. If the timber is used to displace more energy-intensive construction materials such as steel, brick or concrete, or burnt in place of fossil fuels, the net benefit of the forestry and timber production system in reducing our overall carbon emissions is substantial. The relative contribution of timber transport emissions is also significantly reduced.

Figure: <u>Cumulative</u> emissions from the growth, production, use (in place of brick cladding) and disposal (incineration with heat recovery) of 1 (oven dry) tonne of sawn timber



Understanding the carbon footprint of timber transport in the UK was commissioned from North Energy Associates Ltd by ConFor (Confederation of Forest Industries) on behalf of the Timber Transport Forum and funded by the Strategic Timber Transport Fund. The report and accompanying workbook can be downloaded from www.timbertransportforum.org.uk