



Comments from the Biomass Energy Centre on the “Dirtier than Coal” report

The “Dirtier than Coal” (DtC) report is based on a paper from a US researcher, Tim Searchinger, which specifically decries the use of “whole trees” for energy. The Searchinger paper in turn refers to a peer-reviewed report by Forest Research (FR) and North Energy Associates Ltd. (NEA) commissioned by the UK Department of Energy and Climate Change (DECC) in order to inform UK government policy.

In the UK when mature trees are harvested, if they are of sufficient size and quality they will be cut into suitable lengths and those lengths over a certain diameter will be taken to a sawmill to be cut into sawn wood. These lengths are called sawlogs, and are a sub-set of what is termed roundwood which refers to logs (stemwood) of any diameter. The remaining stemwood (generally referred to as small roundwood) has many uses including for paper, wood-based panels and sometimes for fuel. The use of whole trees including all of the roundwood for energy in the UK is simply not an economically realistic approach. The Biomass Energy Centre thoroughly endorses an approach that involves timber of sufficient size and quality for economic sawmill processing for construction or joinery being used for that purpose first and foremost, not energy. Both the environmental and economic arguments support this view. However, in order to allow joists, planks and other sawn timber to be produced from a log, it must be of both sufficient diameter to allow these products to be cut economically, and also sufficiently straight over the whole length. It is important to recognise that trees of different sizes and stem qualities develop over the normal lifecycle of a forest stand. The establishment of new and regenerated young stands of trees typically involves relatively high densities of seedlings and saplings. Over time a proportion of these trees die due to competition or may be “thinned” out to allow the best trees to thrive. Some of these thinnings, particularly the very earliest ones, may be utilised as “whole trees” for fuel. Later thinnings will involve trees with larger stems, which can produce sawlogs and small roundwood, alongside fuel.

In addition, as part of the production of sawn wood, typically 50% of a sawlog ends up as co-products such as slabwood, chips, sawdust, offcuts, etc. Broadleaf trees also have a significant proportion of branches (conifers typically much less), while conifer tops taper to wood of small diameter. If these types of wood are not used for wood-based panels (for which they are not always suitable), paper or energy, they will simply be disposed of, and will still break down to carbon dioxide. Consequently the appropriate use of these types of wood for energy, displacing fossil fuel, is beneficial. As discussed later in this note, the research undertaken by FR and NEA for DECC and related research by FR clearly demonstrates that the production of mixtures of sawn wood, wood-based panels, paper and fuel (including a proportion from small, young thinnings as whole trees) results in significant overall greenhouse gas benefits.



The term “carbon debt” is used in the DtC report, and is regularly used in the context of biomass. It is a term with complex implications that is frequently used very loosely, but can be used to describe three different, though related, phenomena. The first applies to the time delay between the reduction of carbon stocks on a site (generally at a local scale) due to harvesting, and its replacement by new growth. The second refers to the permanent reduction in carbon stocks within a forest because of increased levels of harvesting (such as potentially involved when bringing unmanaged woodland into management). The third refers to the theoretical potential for managed forest to sequester more carbon if left unharvested. Critically, the analysis carried out in the study by FR and NEA for DECC fully addresses and accounts for all three forms of carbon debt, and its impact on a wide range of forest management and timber utilisation scenarios. The rigorous assessment of lifecycle carbon impacts, including carbon debt, formed the rationale for the work. It is, however, important also to consider the role of timber products in displacing more carbon intensive products. Where these products are long-lived they can also sequester carbon for a significant period.

Concern over “indirect substitution emissions” is also raised in the DtC report, and this is based on an assumption that power generation will attract sawlogs away from construction and joinery, thus reducing the greenhouse gas benefits that would be due to the use of sawlogs to make sawn wood and other material products. For this to happen to any significant extent would require that the price payable by power generators to exceed the value of sawlogs. Even with Renewable Obligation Certificates (ROCs) the price currently paid for biomass fuel for power generation is significantly lower than that for quality sawlogs. Behaviour of commercial markets is complex, especially those operating internationally, but if biomass fuel prices were to rise, the effect would be unlikely to divert high value timber from other markets, but could help stimulate the management of the vast majority of woodlands in the UK (not owned by the Forestry Commission), including those which are currently unmanaged or in an otherwise neglected state. Already many power generators currently use a range of agricultural residues from the UK and around the world, and this market too is likely to help buffer demand for higher quality timber.

Increased management of UK woodlands would also bring many other benefits, in particular biodiversity, a benefit acknowledged in the “Position statement by Wildlife and Countryside Link on the Forestry Commission’s Woodfuel Strategy for England”, endorsed by 13 wildlife and environmental organizations, including Friends of the Earth and RSPB ([www.forestry.gov.uk/pdf/eng-woodfuel-linkstatement-030709.pdf/\\$FILE/eng-woodfuel-linkstatement-030709.pdf](http://www.forestry.gov.uk/pdf/eng-woodfuel-linkstatement-030709.pdf/$FILE/eng-woodfuel-linkstatement-030709.pdf)). When forest is unmanaged, the rate of growth, and uptake of carbon, drops off as it ages, and canopy closure also severely restricts understorey growth. Active management and periodic thinning and harvesting maintains a stock of actively growing trees as well as the undergrowth, forest flowers, birds, mammals and invertebrates. In addition,



unmanaged/unharvested commercial plantations in the UK are very prone to significant losses from wind damage, rendering this an unrealistic option in practice.

The paper by Tim Searchinger, a Research Scholar and Lecturer at Princeton University, which appears to have been neither peer-reviewed nor submitted to any journal for formal publication, contains no new research but numerous factual errors and misinterpretation. Whilst claiming special insight, the paper chooses just one scenario from the peer reviewed study by FR and NEA for DECC, amongst the hundreds examined, but that is explicitly rejected by the DECC study. Although this particular scenario clearly does not represent UK practice, the Searchinger Paper and the DtC report use it to allege that biomass is “dirtier than coal”, ignoring all the other scenarios that show carbon saving benefits in the form of lower GHG emissions ranging from marginal to very substantial. There is nothing “flawed” about the detailed life cycle assessment (LCA) studies that have been performed by UK experts, including those in Forest Research and North Energy Associates Ltd, whose data and results Searchinger misunderstands and misinterprets. Instead, the DECC study shows that there are many ways of using forests and that, for managed forest in the UK, almost all of the scenarios provide considerably greater GHG emissions reductions than simply leaving the trees unharvested. It also shows that there is an unrealistic scenario, selectively picked by Searchinger, which is slightly less good under certain circumstances, in GHG emissions terms, than leaving them unharvested. This scenario does not make economic sense, and does not represent UK practice. In addition, the UK government sustainability requirements demand genuine GHG emissions reductions, so this scenario would not attract government support in the form of ROC payments and, hence, there is no incentive to power generators to use it. The reason this study was commissioned was to allow government support to be directed only to those fuels which genuinely do deliver real lifecycle GHG benefits.

Unfortunately Searchinger appears not to have understood the scenarios in the FR/NEA study. As an example he states “Yet, all of these favorable alternatives involve using wood first for various products and then burning the wood for energy only after their useful product lives”, which is simply wrong. These more favourable alternatives, which reflect the range of current UK practice, include use of sawlogs for timber, and forest and sawmill co-products for a range of purposes, including energy in addition to the use of waste wood for energy at the end of its life as a material product.

The Government has worked extensively with industry and NGOs to develop sustainability criteria for biomass to ensure not just genuine GHG emissions savings, but also to avoid other negative environmental and social impacts. Many countries already have good regulation of their forest sectors, however, other countries will need to put robust regulation in place if they are to supply the UK with sustainable woodfuel.



In summary, like all energy technologies, biomass can be exploited well or badly. The government is working hard to put safeguards in place to ensure that the use of unsustainable biomass is not supported. We should never be complacent, and it is a challenge to put robust safeguards in place worldwide and enforce them rigorously from day one. However, work to develop and tighten such essential regulations is ongoing. It is vital to study different management and wood utilization scenarios using the best scientific understanding so that optimum scenarios are developed and undesirable ones avoided. This is the reason the DECC study from Forest Research and North Energy Associates Ltd was commissioned. The Searchinger paper bases its main contention on the (rejected) worst case scenario, and the “Dirtier than Coal” report appears to base its fundamental arguments on this misleading and uninformed contribution.