



Economic and ecological assessment of solid fuels from rewetted peatlands

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The use of biomass from rewetted peatlands can combine the reduction of environmental impacts from peatland drainage with the benefits of the substitution of non-renewable fossil resources by renewable raw material and fuel. The purpose of this contribution is to evaluate costs and ecological impact of the utilisation of this biomass as solid fuels. The scenarios considered in the assessment includes three harvest schemes, summer harvest of hay round bales with adapted grassland machinery, winter harvest of chaff with specialised tracked vehicles and winter harvest of reed for thatching. It covers the use of the biomass as chaff, bales or processed in a mobile pelleting plant. The fuel is combusted in a small 100 kW boiler, an 800 kW boiler within a local heating grid and a hard coal power plant. The assessment is based on direct cost calculation and greenhouse gas and energy balance largely following the guidelines of the ISO standards 14040 and 14044 for life cycle assessments. Primary data was collected on biomass productivity, harvesting, mobile pelleting, fuel properties and small and middle scale combustion. Further data was taken from literature and databases. The results show harvesting costs between 11 and 32 €/MWh, high processing costs for mobile pelleting (139 €/t) and heat generation costs starting from 50 €/MWh mainly influenced by usage rate and fuel costs. The results of the greenhouse gas and energy balance show net savings of around 60 to 85 % compared to the fossil equivalents. The assessment presents direct cost calculations and greenhouse gas and energy balances from harvest to utilisation highlighting benefits as far as greenhouse gas and energy balances are concerned while revealing that heat generation costs are hardly competitive compared to fossil equivalents, mainly because of high investment costs for machinery and boilers.

Keywords:

pelleting, heat generation, GHG balance, energy balance