



Potentials to mitigate climate change using biochar – the Austrian perspective

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Biomass utilization is seen as one of various promising strategies to reduce additional carbon emissions. A recent project on potentials of biochar to mitigate climate change (FOREBIOM) goes even a step further towards bioenergy in combination of CCS or “BECS” and tries to assess the current potentials, from sustainable biomass availability to biochar amendment in soils, including the identification of potential disadvantages and current research needs. The current report represents an outcome of the 1st FOREBIOM Workshop held in Vienna in April, 2013 and tries to characterize the Austrian perspective of biochar for climate change mitigation. The survey shows that for a widespread utilization of biochar in climate change mitigation strategies, still a number of obstacles have to be overcome. There are concerns regarding production and application costs, contamination and health issues for both producers and customers besides a fragmentary knowledge about biochar-soil interactions specifically in terms of long-term behavior, biochar stability and the effects on nutrient cycles.

However, there are a number of positive examples showing that biochar indeed has the potential to sequester large amounts of carbon while improving soil properties and subsequently leading to a secondary carbon sink via rising soil productivity. Diversification, cascadic utilization and purpose designed biochar production are key strategies overcoming initial concerns, especially regarding economic aspects. A theoretical scenario calculation showed that relatively small amounts of biomass that is currently utilized for energy can reduce the gap between Austria’s current GHG emissions and the Kyoto target by about 30% if biomass residues are pyrolyzed and biochar subsequently used as soil amendment. However, by using a more conservative approach that is representing the aims of the underlying FOREBIOM project (assuming that 10% of the annual biomass increment from forests is used for biochar production), each year 0.38 megatons CO₂e could potentially be mitigated in Austria, which is 0.4% of total or 5% of all GHG emissions caused by agriculture in Austria in 2010. In order to produce this amount of biochar annually, about 27 medium-scale or 220 small-scale pyrolysis plants would be required. The economic analysis revealed that biochar yield, carbon sequestration and feedstock costs have the highest influence on GHG abatement costs.

Further reading: Bruckman, V.J. and Klinglmüller, M. (2014): Potentials to Mitigate Climate Change Using Biochar - the Austrian Perspective. In: Bruckman, V.J., Liu, J., Başak, B.B. and Apaydın-Varol, E. (Eds.) Potentials to Mitigate Climate Change Using Biochar. IUFRO Occasional Papers 27.