

For subject 5: Economic and environmental issues of bioenergy technologies:

## **Calculation of GHG emission reductions during cultivation and processing of switchgrass**

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### **Aim of the presentation**

One of the goals of the “Pellets for Power” project is to develop a sustainable business model for biomass production in Ukraine for export to EU, in line with international sustainability standards, whilst contributing to local development, local energy needs and GHG emission reductions.

For certification of the biomass chain it is obligatory that the overall GHG balance is positive and better compared to fossil fuels. In addition the biomass chain should not have a negative environmental impact. Within the project the GHG balance and impacts on soil, water and air will be assessed for the newly implemented crop in Ukraine.

Finally, the outcomes of the project will help to inform policy makers regarding iLUC avoidance and sustainable biomass supply chain arrangements, based on switchgrass.

According to NTA 8080, the Dutch Sustainability criteria for biomass for energy purposes, biomass consumption should reduce net GHG emissions for the whole supply chain. Compared to the fossil fuel reference the following reductions should be obtained:

- At least 70% for electricity and heat from coal fired power plants;
- At least 50% for electricity and heat from natural gas fired power plants;
- At least 50% in case innovative technologies are demonstrably used to increase availability and/or applicability of sustainable biomass.

The purpose of this study was, within the requirements of NTA 8080, to develop a greenhouse gas emission model and to quantify the impact of switchgrass chain supply on GHG emissions, soil, water and air.

Additionally, the valuable contribution from scientific point of view is the comparison of GHG emission, including soil carbon sequestration, of switchgrass cultivation on high fertile and degraded soils. This should provide data and insights whether energy crop production on marginal land while avoiding indirect land use changes (ILUC) is possible.

### **Results of work**

At the conference we will present the developed GHG balance model and the results of the calculations for the switchgrass biomass chain. We will present and discuss two cases, one for switchgrass cultivated on fertile soils and one on degraded soils. The possibilities for cultivation of switchgrass on degraded lands for pellets production and their GHG and environmental impact will be discussed.

In addition, we will also present the GHG balance for two different end uses: 1) export of pellets to the Netherlands for electricity production, and 2) local use of pellets for heat production in boilers.