

## STSM Summary Report: COST ACTION FP 1301

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### **Monitoring systems in stored wood chip piles and energetic characterization of willow SRC**

#### *Purpose of the STSM*

This STSM was focused on the study of the fuel quality of willow chips samples coming from a short rotation coppice plantation of central Sweden. Moreover, the goal of the mission was to evaluate a new system for monitoring temperature called FireWorm® inside a wood chip pile, which is currently the focus of research studies at the SLU department of energy and technology (Uppsala, Sweden)

#### *Description of the work carried out*

A willow SRC plantation was harvested in the locality of Kolback (middle of Sweden) with the machine Class Jaguar 695. After harvesting, eight wood chip samples were analyzed with respect to moisture content, heating value and ash content according the respective European standard. The FireWorm® temperature monitoring system was compared with the traditional system (dataloggers Tiny Tag®) in a wood chip pile of spruce logging residues.

#### *Description of the main results obtained*

Wood chip displayed moisture content between 51 and 54,8%; the higher heating value was between 19,60 and 19.80 MJ/Kg, while the average ash content was 1,57%. The temperature increase measured with the two systems was nearly identical during the period from the experiment set up until the end. The temperature measured with Tiny Tag ranged from 27.9 ° C to 45.8 ° C, while the temperature measured with the Fireworm sensor system ranged from 27.6 ° C to 45.8 ° C.

#### *Discussions and conclusions*

Wood chip samples characterization revealed very similar moisture content, ash content and heating values. During storage, these parameters tend to modify in function of the microbial degradation. The temperature monitoring systems showed very similar results. However, because of its design, the

FireWorm system has furnished much more data than data logger, giving a more complete view of the temperature dynamics in a wood chip pile.

*Future collaboration with the host institution*

This STSM has enforced the already existing partnership between CRA-ING and SLU. Therefore other collaborations focused on the study of storage dynamics of wood chips are expected in the next future.