

VALORISATION OF MISCANTHUS GIGANTEUS BIOMASS AND AGRICULTURAL RESIDUES FOR SUSTAINABLE SUPPLY OF THERMAL ENERGY IN RURAL AREAS

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Abstract

New trends regarding thermal conversion of different type of solid biomass to provide renewable bioenergy for rural communities include the use of energy crops and agricultural residues in an efficient way. Romanian policy for bioenergy asks for considering alternative options to demonstrate sustainability of biomass supply chain (logistics by available quantities, transport, processing equipments, customers' needs) and facilitating the development and competitiveness of market availability for biomass including pressed products (pellets, briquettes) to create optimal conversion of biomass in local heating systems. In this perspective the actual study shows the potential of C4 perennial grass *Miscanthus giganteus* and some indigenous resources as cereal straw, wood biomass (orchard trees pruning, saw dust, wood chips) or other agricultural residues (home grown biomass) to ensure the local requirements for heating by promoting low-carbon technologies and to achieve European and national target for renewable energy by 2020. *Miscanthus giganteus* biomass harvest from the scientific farm Moara Domneasca was tested, by varying mass percentage (20%, 60% or 80%), for pressing capacity in briquetting installations, in combination with different kind of vegetable biomass, in order to identify optimal blends by ensuring improved energy efficiency and cost-effective production. Lower calorific power (net calorific value - NCV) of different *Miscanthus* blends with agricultural vegetable residues have presented values varying from 15.8 MJ/kg up to 18.1 MJ/kg depending on elemental contents (C, H, N, S) and lignin concentration, respectively the type of biomass burned. The study pointed out a great potential of using solid biofuels, available in rural areas and therefore the opportunity of developing energy plants for local heating systems using sustainable biomass resources.

Key words: bioenergy, *Miscanthus giganteus*, agri-residues, energy efficiency
