Modeling and Verifying an Innovative Biomass-based Thermal Energy System

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Biomass exploitation systems are able to supply heat, steam and electricity for home or industrial users. However, modern utilization methods of biomass do not deal with the problem globally but usually get confined to empirical and non-optimal approaches. The innovative energy production unit which is designed and implemented in this paper suggests a universal processing and exploitation strategy using several different types of biomass while aiming at an effective combustion with minimum losses. System identification and modeling of the combustion process is implemented using a simplified linear model which can adequately describe the above process and lay strong foundations for a prospective robust control.

Keywords: thermal systems, combustion modeling, energy systems simulation