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# BIOFUELS AND BIOENERGY

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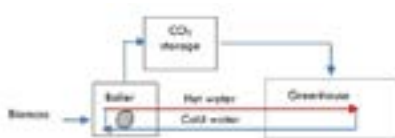
## Processing of crop residues for heating and CO<sub>2</sub> enrichment in greenhouses

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Development of adequate strategies to manage greenhouse crop residues to use it as energy and CO<sub>2</sub> source are presented. Although greenhouse crop residues can potentially be used as fuel in greenhouses, still some difficulties need to be solved to do this technology suitable. Major bottlenecks are related with the high moisture and ash content, in addition to low energetic density of these residues. In this work, three relevant properties for solid fuels have been studied (moisture, ash content and calorific value) for different biomass samples which usually are released at Almería, Spain. In addition, two different options have been tested in order to enhance the performance of this biomass kind at combustion facilities. One previous drying in order to reduce its moisture content of greenhouse crop residues, whereas the second is related to reduction on ash content. Results allow concluding that both strategies were successful. The gross calorific value (dry basis) of the biomass treated was higher up to 25 MJ/kg, and ash content was lower than untreated, as low as 10% d.w.t. These values are closer to the ones usually presented by standard biomass kinds regularly employed at combustion applications. The biomass obtained was successfully tested on commercial boilers in which thermal efficiencies up to 70% were reached. In conclusion, developed methods allow reusing greenhouse crop residues as fuel in greenhouses, to provide heat and CO<sub>2</sub>, thus its utilization can suppose an economic yield and, also, enhance sustainability for this commercial activity.



### Biography

José Vicente Reinoso Moreno is a PhD student whose experience is related to the biomass fuel field. He has been collaborating for the RNM-6141 project (Greenhouse crop residues reutilization with energy purpose). As a result of this research developed for the project, he participated in a study related to combustion properties of different biomass residues usually released at Almería province (south east of Spain) from agriculture. He also collaborated with the testing and development of different strategies to enhance biomass properties quality for combustion applications. He collaborated in the optimization of a pilot scale system designed for heating and supplying heat from biomass. Finally, he collaborated in a study to optimize combustion factor inside a boiler for biomass fuels.

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