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# THERMAL SCIENCE

## International Scientific Journal

Anastasia A. Zabaniotou, Vicky K. Skoulou,  
Georgios S. Koufodimos, Zissis C. Samaras

### INVESTIGATION STUDY FOR TECHNOLOGICAL APPLICATION OF ALTERNATIVE METHODS FOR THE ENERGY EXPLOITATION OF BIOMASS-AGRICULTURAL RESIDUES IN NORTHERN GREECE

#### ABSTRACT

Biomass energy potential is addressed to be the most promising among the renewable energy sources, due to its spread and availability worldwide. Apart from that, biomass has the unique advantage among the rest of renewable energy sources, to be able to provide solid, liquid, and gaseous fuels that can be stored, transported, and utilized, far away from the point of origin. For the northern region of Macedonia in Greece, biomass utilization is considered to be a major issue, due to the considerably intensive regional agricultural activities. Wood by-products, fruit cores, rice husk and cotton gin waste provide a promising energy source for the region. The energy potential of the available agricultural biomass produced in the region is much enough to cover the 10% of the annual oil consumption utilized for thermal applications. However, the cost of energy utilization of biomass is considerably high due to the high cost of the logistics concerning the collection, transport, and storage of biomass. The available utilization technologies developed, to handle efficiently all different species of biomass, cover a wide technological range. One of the most promising technologies involving thermal treatment of biomass and the production of a gaseous fuel (biogas) for industrial heat applications and electricity production, is the thermochemical conversion. In the present work, an investigation concerning biomass potential for energy production in the region of central Macedonia in Greece, utilizing several locally produced biomass species, is conducted. Emphasis is put on the energy utilization of agricultural by-products and residues. Agricultural sector is of great importance due to the considerably intensive agricultural activities in the region of Central Macedonia.

#### KEYWORDS

biomass, biomass residues, thermal treatment, energy

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