Energy generation power: an example of research concerning industrial waste as fuel in furniture industries used in practical classes at a mechanical engineering course

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Abstract – *Furniture industries waste could be used as fuel to co -generation of heat and power in order to minimize its disposal on the environment and environmental impact as well. Research involving 95 enterprises of different sizes and product types was made in the mountain region of Rio Grande do Sul State, Brazil. A division was made in four s egments: wood (21 enterprises), particle board (27 enterprises), MDF (Medium Density Fiber) (33 enterprises) and plywood (13 enterprises). For each segment it was analyzed the waste generation over unities of mass and energy consumed, total (kWh) and speci fic (kWh/m3). The investigation shows that, according to the raw material employed, the energy production percentage could vary as follows: MDF – 85.7%; wood – 70.5%; particle board - 48.7% and plywood – 19.1%. The potentials show that enterprises, in ave rage, are not high electrical energy consumers. The economic interest of enterprises was analyzed as well. This research was used in practical classes of the Mechanical Engineering Course of the Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS) and Universidade de Caxias do Sul (UCS), Rio Grande do Sul, Brazil. The pedagogic procedure involved resources of SPSS statistical software, power point and data show. The objective was offer sbsidies to the students for critical analyses over real data. Frequencies, percents, cross tables, analysis of variance, correlations and regressions were also used to enrich the analyses. The students grades were considered excellent*

Keywords: wood waste, gasification process, power generation, industrial waste us e, statistical analyses.