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A comparative exergoeconomic analysis of two biomass post-firing and co-firing combined power plants

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Biomass energy is a promising potential replacement for fossil fuels in future, because it is relatively abundant, clean and carbon dioxide neutral. Biomass can be converted using thermo-chemical and bio-chemical processes into solid, liquid and gas bio-fuels, which can then be used for generating heat and/or electricity. In the present lecture, the application of gasification for electricity production is investigated via energy, exergy and exergoeconomic analyses for two configurations: (1) Externally fired biomass combined cycle and (2) combined cycle with co-firing of biomass and natural gas. The second configuration is found to be more economic (on a large scale) as its relative cost difference and exergoeconomic factor are less than those for the first configuration. The results also indicate that the energy and exergy efficiencies of combined cycle with co-firing could be about 2% and 4% higher than those of the externally fired combined cycle, respectively.

Biography

Saeid Soltani is a PhD student at the University of Sejong South Korea. He received his 1st PhD in 2013 at the Faculty of Mechanical Engineering University of Tabriz. He is the author or co-author of 22 publications. His fields of interest are renewable energy, exergy analysis, exergoeconomic analysis and advanced exergy analysis.

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