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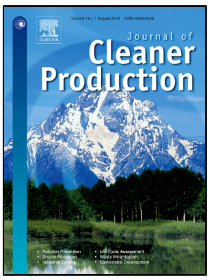

Advanced life cycle integrated exergoeconomic analysis of building heating systems: An application and proposing new indices

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Advanced life cycle integrated exergoeconomic analysis of building heating systems: An application and proposing new indices

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ABSTRACT

Advanced exergy-based analysis and assessment tools have been considered very useful tools for detecting the interactions among components of energy-conversion systems and the real potential for improving each component in any system. In this study, a building heating system is analyzed using advanced life cycle integrated (LCI)exergoeconomic analysis method, which combines cost and environmental impacts. Some new indices (metrics) such as advanced exergy destruction ratio, advanced LCIexergoeconomic ratio, advanced LCIexergoeconomic sustainability index and advanced indices are presented. These metrics are also applied to the main components of the system. The boiler has the maximum LCI endogenous exergy destruction cost ratio while the maximum LCI exogenous destruction ratio is due to the water heater. The advanced LCIexergoeconomic depletion ratios are 0.187, 0.599, 0.414 and 0.371 for the endogenous, exogenous, unavoidable and avoidable parts, respectively.

Keywords: Advanced exergy, Exergoeconomic analysis, Advanced life cycle integrated exergoeconomic analysis, Buildings, Space heating

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