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LIFE CYCLE ASSESSMENT OF VALORIZATION PROCESSES OF ALTERNATIVE FUELS FROM MUNICIPAL SOLID WASTE RESIDUAL FRACTION

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Abstract

Currently, the use of the Municipal Solid Waste (MSW) residual fraction as an energy source is considered to be one of the most promising solutions for minimizing the environmental impact while avoiding the use of conventional energy resources. However, strict specifications have to be fulfilled by this residual fraction during its pre-treatment process for its subsequent use in energy valorization processes. This results in a challenge when this fraction goes to energy recovery. In this paper the environmental impacts of a new pre-treatment process for Solid Recovered Fuel (SRF) production based on the above-mentioned MSW residual fraction and its application at two kinds of co-combustion facilities (cement kiln and coal-fired thermal power station) is analyzed applying the Life Cycle Assessment (LCA) methodology. Furthermore, a comparison with the direct use of MSW residual fraction in the form of Refuse Derived Fuel (RDF) by incineration was also considered. Results suggest that the partial substitution of conventional fuel in co-combustion facilities by SRF can lead to a significant minimization of environmental impact due to the credits of avoided conventional fuel (coal, petcoke) and electricity use. Furthermore, it has been found that the new SRF conditioning process developed does not represent a concern in terms of environmental impact.

Key words: life cycle assessment, MSW, residual fraction, SRF, valorization

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