

COMPARATIVE LIFE CYCLE ASSESSMENT OF BIOENERGY AND FOSSIL ENERGY SYSTEMS IN GREECE

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ABSTRACT

The environmental performance of selected biofuels has been evaluated compared to the fossil fuels most likely to substitute using a life cycle approach. The comparisons investigated were: (a) sunflower seed oil methyl ester (SME) versus fossil diesel fuel for transportation; (b) wheat straw versus heating oil and natural gas for district heating and (c) biogas from liquid swine manure versus natural gas for combined heat and power production. According to the results, the production and use of all biofuels under study may contribute to net savings both in greenhouse gas emissions and fossil fuel consumption. Additionally, all biofuels may contribute to the reduction of photochemical smog with the exception of wheat straw when it substitutes heating oil. Concerning acidification and eutrophication all biofuels appeared slightly disadvantageous compared to their fossil counterparts.