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# Life Cycle Analysis for Petroleum Fuels and Renewable Jet Fuels

At the time when the use of fossil fuel means ever increasing energy scarcity and environmental crisis in the world we live, we need greener innovations now more than ever. Growing attention has been drawn to biofuels such as ethanol and biodiesel and they have gradually taken up a certain amount of the total energy supply. Despite preferential development of them, environmental and ecological uncertainties still exist. Life cycle analysis (LCA), with deliberate system boundaries and life cycle inventories, has been applied by scientific literatures to calculate two principal functional units, the energy efficiency and GHG balance, from cradle to grave of different renewable biofuel resources. In order to calculate the particular greenhouse gas (GHG) balance and energy efficiency for selected fuel pathways, life cycle analysis (LCA) should be applied to account and trace the detailed fluxes of energy demand and GHG emission from cradle to grave. This paper focuses on LCA of conventional petroleum fuels and several hydro-processed renewable jet fuels using software SimaPro. The building of life cycle flow tree in SimaPro will combine the input and output with an emphasis on stages of raw material acquisition, liquid fuel production, transport, refueling and end use. With a consistent impact assessment method for simulation, equitable comparisons and comprehensive analysis had been made between selected fuel pathways for cumulative energy demand and global warming potential. However, the results of the entire lifetime estimates varied dramatically in production chains, which make it difficult to take a holistic view about energy intake and yields, economic costs and values, environmental impacts and their benefits. Apart from the diversity in system boundaries and life cycle inventories, a variance in terminologies and the limitations of interdisciplinary communication are the main factors that affect the quality of the results.