



**COMPARATIVE LIFE CYCLE
ASSESSMENT OF INCANDESCENT LAMPS
AND COMPACT FLUORESCENT LAMPS
AND ITS USE IN MANAGERIAL DECISION
ANALYSIS**

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Abstract

Comparative life cycle assessment of incandescent bulbs and compact fluorescent lamps(CFL) was made in Sri Lankan perspective to assess the environmental performance of the two product systems throughout life cycle stages from raw material processing; through manufacturing and assembly, distribution, use and to disposal. Impact categories of global warming, acidification, eutrofication, human toxicity, and ecotoxicity were taken into consideration in this assessment. Most of the emissions occur during the usage of both product systems due to the emissions from electrical power generation. The study shows that incandescent lamps causes for most of the emissions compared to CFLs. Life cycle assessment scores finally figured out to be $1.38E-05$ for the incandescent lamps and $3.42E-06$ for CFLs, which shows that CFLs are 4 times environmental friendly than incandescent lamps.

Subsequently, life cycle scores were used in managerial decision making to come to a logical conclusion of choice between two alternative product systems balancing with social and economic considerations such as investment cost, operating cost, replacement due to early failure and maintenance cost, accidents due to disposal, heating effect, and health impact due to Mercury. Final conclusion arrived after having being introduced different values of choice for each criterion was that still CFLs are preferred by approximately 30% over the incandescent lamps.