UNIVERSITI TEKNOLOGI MARA

FEASIBILITY STUDY ON THE USAGE OF ELECTRIC GROUND SUPPORT EQUIPMENT IN AVIATION INDUSTRY

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ABSTRACT

Every year air pollution emitted from air transportation continue to increase due to the emissions released from aircraft engines and ground support equipment (GSE) operations during airport operations. GSE operations involves the use of ground vehicles and machines to aid airside ground handling services at the airport. One of the actions taken to aid the efforts of the aviation industry to reduce pollution emitted from airport operations is by introducing electric vehicles and equipment into GSE operations. Hence, the purpose of this research is to perform a feasibility study on the use of electric GSE in reducing emission to provide strategic choices for stakeholders in the aviation industry to reduce pollution emitted from airport operations. This involves the selection of decisions based on indicators that is used as criteria and alternative strategies in decision making by comparing the regulations from the Indonesia government with other countries from Asia, Europe and the Americas. The research method chosen in this study are analytical networking process, cost benefit analysis and PESTEL analysis. Data were obtained through the preparations of questionnaires and interviewing the informants from ground handling company, airlines, and airport authority. The conceptual model of the analytical networking process showed that two stakeholders mentioned that the most important criterion in determining the feasibility of implementing electrical ground support equipment is the emission standard while another stakeholder states that the most important criterion is the pollution standard. Another important criterion is governmental regulation since airlines, ground handling, and airport authorities must comply with the regulations enforced by their local governments. Results from the optimization of cost benefit analysis shows that investing products with a 25-year lifetime is the best choice for both electric and diesel-powered equipment since both provide similar profit margin but the emission from electric is far lower than diesel. However, there are adversities from companies in investing into new electrical GSE. In conclusion, it is recommended for airport authority, airlines, and ground handling to support the government's regulation to reduce emission in airport operations by introducing electric GSE in airport airside operations since electric GSE operations produces less emission.

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I am aware that this thesis is still imperfect. Thereby, constructive criticism as well as recommendations are highly expected. Hopefully this thesis can be a useful guide especially for those who need it for a to embark in more or less similar research.

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