Prospects of Fuel Cell Auxiliary Power Units in the Civil Markets

abstract

Auxiliary Power Units (APUs), devices designed to provide additional onboard power in vehicles, are believed to represent a potentially suitable entry point for Fuel Cell (FC) technology into commercial markets. The two principle fuel cell technologies under consideration for this market are solid oxide fuel cells (SOFCs) and proton exchange membrane fuel cells (PEMFCs). By comparing the concept of Total, Addressable and the Potential Market and Market Shares, this paper tries to get a sense of the opportunities and challenges of Fuel Cell Auxiliary Power Unites (FC APUs) to provide on-board electric power. It an be concluded that it is not clear whether FC APUs offer increased fuel efficiency in meeting electrical demand while the main engine is in use for propulsion (as opposed to idling), and when electricity would otherwise have been available from the alternator. Applications for transit buses and ordinary light vehicles therefore seem limited. Potential markets begin to open up in vehicles that either have a very large electricity demand due to many high energy onboard functions, such as luxury limousines, or that require electrical power whilst stationary. Examples in the latter category include law enforcement vehicles, recreational vehicles, and most importantly heavy duty trucks. The major challenges to the market penetration of FC APUs are reducing volume and start up time. As the functional benefits of FC APUs over existing technologies are not always clear, the former must also be able to compete on a cost basis. The intense activities of APU manufacturers suggest a confidence either in the potential for cost reductions or in the consumers' willingness to pay.