Future Fuel Scenarios and Their Potential Impact to Aviation

In recent years fuel prices have been growing at a rapid pace. Current conservative projections predict that this is only a function of the natural volatility of oil prices, similar to the oil price spikes experienced in the 1970s. However, there is growing concern among analysts that the current price increases may not only be permanent, but that prices may continue to increase into the future before settling down at a much higher level than today. At high enough fuel prices, the aircraft industry would become very sensitive to fuel price. In this paper, the likelihood of fuel price increase is considered in three different price increase scenarios: "low," "medium," and "high." The impact of these scenarios on the aviation industry and alternatives are also addressed.

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I. Introduction

ACCORDING to the Boeing Current Market Outlook, air travel is projected to continue expanding at an average growth rate of about 5 percent per year. Underlying this projection of continued growth is an assumption that the industry will not be constrained by petroleum-based fuel availability. The purpose of the present discussion is to assess the validity of this assumption. If fuel is not available from various energy sources[1-3] in quantities required for such growth, alternative technologies for fuel and improved aircraft efficiency will need to be considered.

Over the past 40 years, airplane fuel efficiency has improved dramatically (Fig. 1).

However, the current rate of gains in efficiency will be outpaced by the projected growth in traffic, and the aircraft industry will thus require an increasing amount of fuel. This is true not only of the aviation industry, but of worldwide transportation energy uses in general (Fig. 2).

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