Green Operational Strategy for Airlines:
Content and Regional Analysis

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EXECUTIVE SUMMARY

This chapter identifies the content of airlines' operations strategy and reports the strategy patterns adopted by the airlines of each region. A detailed configuration of the airlines' green operational strategy is developed, using the content analysis of the sustainability reports from 23 airlines in five regions (North America, Europe, Asia, the Middle East, and South America). The green operational strategy adopted by each region is identified; each region adopted a green pattern that was unlike those of any other region. The indicative models for each region and across regions are developed by using a simple and special tailored quantitative analytical technique. The results of this chapter raise a set of questions about the impact of contextual factors on whichever green strategy pattern is adopted, indicating the need to conduct more in-depth analysis of green actions. This is one of a few studies to have developed a comprehensive definition of airlines' green operations strategy and explore the green strategy patterns adopted by airlines from different regions.

BACKGROUND INFORMATION

Previous studies of airlines' green practices have investigated them from the perspectives of marketing, operations, information technology and technical

specifications, among others. The marketing perspective studies have investigated such aspects as the use of eco-labels (e.g. Baumeister & Onkila, 2017); customers' willingness to pay for airlines' green practices (e.g. Hagmann, Semeijn & Vellenga 2015; Mayer, Ryley & Gillingwater, 2015; Horio, Kumar, Levin & Sung, 2016; Han, Yu & Kim, 2019); and the willingness to purchase green aviation products (e.g. Hinnen, Hille, & Wittmer 2017). Most operational studies have investigated the impact of particular operational practices on green indicators (e.g. Smith, 2016; Teoh & Khoo, 2016; Will et al., 2016; Yan, Cui, & Gil, 2016). The green operations strategy aspect is rarely investigated (e.g. Lin, 2016; Teoh & Khoo, 2016; Lee, Tsai, Yang & Lin, 2017; Migdadi, 2018). Most studies have reported the practices in a single country or a limited number of countries (e.g. Lynes & Dredge, 2006; Harvey, Williams & Probert, 2013; Chapman, 2016; Horio, Kumar, Levin & Sung, 2016; Liu, Zhou, Zhou, & Wang, 2017), or in the context of a single region (e.g. Yan, Cui, & Gil, 2016).

The green operations strategy is a combination of different green operational actions taken by institutions to acknowledge green indicators (Migdadi, 2016). Some previous studies of airlines' green operational actions have classified the green operational actions as either technology based or process based. The technology based ones are related to aircraft design, whether of vehicles or engines, but the process oriented actions are related to such areas as route management, weight management, flight operating ... etc. Previous studies found that the process oriented actions positively affected the airlines' profits and efficiency (Yan, Cui, & Gil, 2016). The technology oriented actions have been a research issue for many scholars, who have focused on investigating the environmental impact of green fleet design (e.g. Teoh & Khoo, 2016). These studies find that the most important action taken by airlines is renewing the aircraft fleet (Will et al., 2016). The new generations of aircraft such as A350 XWB, A380 and Boeing 747-8 and 787 achieve lower CO_2 emissions and reduce noise (Szodruch, Grimme, Blumrich & Schmid, 2011). The adoption of other innovative technologies such as open rotor technology has the potential to reduce CO_2 emissions (Smith, 2016).

The process oriented actions have been put under the spotlight by scholars, who have investigated the use of bio-fuels (Will et al., 2016), the weight management, reduced use of APUs, air traffic management (Lee, Tsai, Yang, & Lin, 2017; Lee, Tsai, Yang & Lin, 2018), route distribution (the distance of flights), rate of fuel consumption, movements (the number of takeoffs and landings), the rate of use of each aircraft (Liu, Zhou, Zhou, & Wang, 2017), and the altitude restrictions (Williams, Noland & Toumi, 2002). These studies find that the use of bio-fuel is affected by economic rather than environmental factors: customers are not willing to pay extra for bio-fuel and it is not expected to make a significant contribution until 2025 (Will et al., 2016). In addition, these studies find that the most important