Volume: 7 Issues: 47 [September, 2022] pp. 123 - 131
Journal of Islamic, Social, Economics and Development (JISED)
eISSN: 0128-1755
Journal website: www.jised.com
DOI: 10.55573/JISED.074713

FUTURE FOR AIRLINE'S VOLUNTARY CARBON OFFSETS IN MALAYSIA

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Article history
Received date : 1-8-2022
Revised date : 15-8-2022
Accepted date : 20-8-2022
Published date : 1-9-2022

To cite this document:
Shaari, N. F., Aziz, N. A., Majid, M., Ramli, M. F., Ya'acob, F. F., & Mohamad, A. (2022). Future for Airline's Voluntary Carbon Offsets in Malaysia *Journal of Islamic, Social, Economics and Development (JISED)*, 7(47), 123 - 131.

Abstract: *In the past decade, voluntary carbon offsetting has gained popularity, particularly among airlines, to "neutralize" emissions associated with travel. Although there are various carbon offsetting programmes offered by the airline industry worldwide, none of them is implemented in Malaysia. Despite this, few studies have examined the willingness of participation among Malaysian airline passengers voluntarily engage in carbon offsetting. The purpose of this study is to investigate the future of airline carbon offset in Malaysia by looking at the response from the respondent regarding their knowledge and experience of carbon offset. Findings show that Malaysian airline passengers are willing and accept airline carbon offset as one of the methods to reduce the emissions from their travelling. Our results are useful for airlines to design voluntary proposals, improve the corporate image, and for policymakers to support air travellers' environmentally conscious behaviour and airlines' environmentally sustainable strategies. Consequently, this may suggest that social marketing, public discourse, and extensive media coverage in Malaysia must increase climate change mitigation behaviours among Malaysian airline travellers.*

Keywords: *Airline Carbon Offset. Knowledge on Carbon Offset, Airline Passenger, Experience with Carbon Offset*

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Introduction

The aviation industry contributes a substantial amount of greenhouse gas emissions and is a crucial target for efforts to combat climate change. Several aviation-related activities generate carbon dioxide (CO2) emissions, including transportation to and from airports, aircraft and components production, aircraft maintenance, ground handling operations, airport facilities, retail outlets and flight operations (International Air Transport Association, 2022). From all contributors, the largest cause of aviation emissions is passenger flight operations, or when flying with airlines. Before the Covid-19 pandemic, aviation accounted for an estimated 2.8% of global carbon dioxide (CO2) emissions (Le Qu'er'e et al., 2020), driven primarily by the top 1% of polluters (Gössling and Humpe, 2020). Aviation is one of the fastest-growing carbon-emitting industries, and carbon offsets are novel. Few papers examine air travellers' willingness to pay to reduce or offset carbon emissions because only a small number of airlines offer customers the option of making a voluntary contribution, and this market is in its infancy. Numerous airlines are participating in the Carbon Offsetting Scheme for International Aviation (CORSIA) programme, an initiative launched by environmental groups in 2016 in accordance with the Paris Agreement of the United Nations Framework Convention on Climate Change.

In Malaysia, the transportation sector is responsible for 20.4 per cent of the country's total carbon emissions (Worldometer, 2022), and the distribution of domestic and international flights in Malaysia (operated by local airlines) is depicted in Figure 1 (Organisation for Economic Co-Operation and Development, June 2022). Even though emissions are relatively low compared to other modes of transportation (such as road transport), the emissions per passenger-kilometre for air travel are significantly higher. Estimated airline passengers generated 170 grammes of CO2 per passenger-kilometre compared to 50 grammes of CO2 per passenger-kilometre for long-distance automobile travel (Le Quéré et al., 2020; Rotaris, Giansoldati & Scorrano, 2020). In addition, even though only a tiny portion of the population engages in air travel, aviation's contribution to CO2 emissions has increased at an annual rate of 1.8% over the past decade (Rotaris, Giansoldati & Scorrano, 2020). If climate change mitigation efforts are delayed, aviation's share of global CO2 emissions could reach 22 per cent by 2050, according to Cames et al. (2015). Air travel requires a substantial number of resources. Therefore, scarce resources must be utilized efficiently to support the rising demand for air travel. One method for sustainable growth is to fly more efficiently while reducing the environmental footprint through technological, operational, and infrastructural advancements. Simultaneously, several initiatives were developed to reduce emissions to combat climate change, including using new technology to set more efficient flight paths, using sustainable lower-carbon fuels, and operating more fuel-efficient aircraft. However, another method for reducing carbon emissions is to implement carbon offsets. A carbon offset is a reduction of carbon emissions or other greenhouse gases made by individuals to invest in environmental projects, such as replanting trees, reforestation, supporting renewable energy, and purchasing energy-efficient products.

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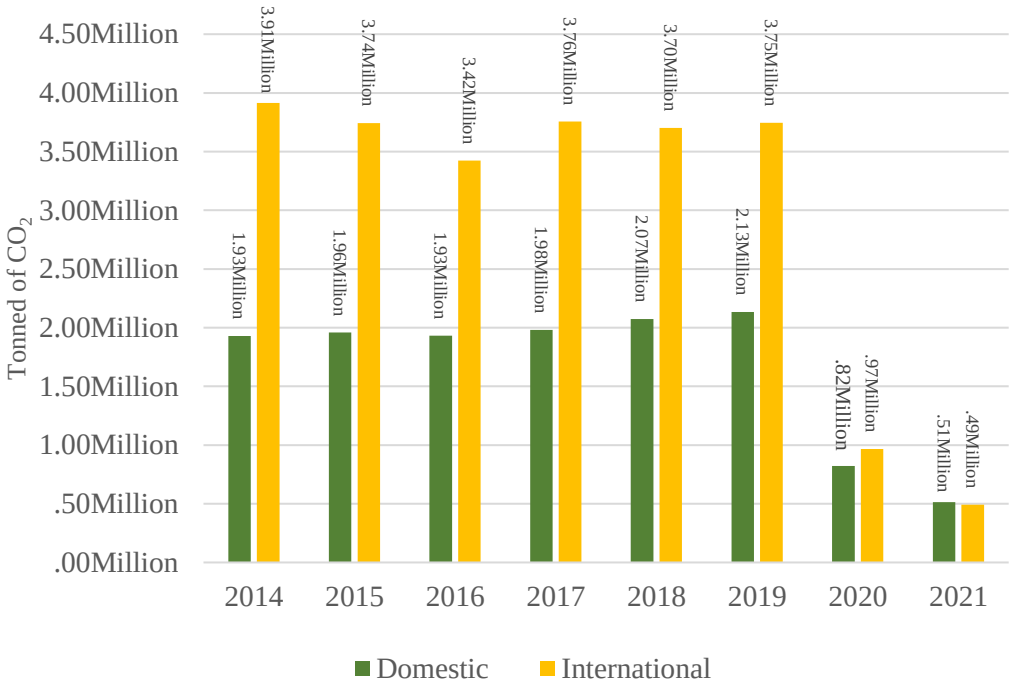

Figure 1: Carbon emissions from Malaysia's domestic and international flight

A small number of international airlines have already implemented both voluntary and mandatory carbon offset programmes. According to the International Air Transport Association (2022), more than 30 IATA member airlines have included an offset programme in their web-sales engines or engaged with a third-party offset provider like The Emirates, Qantas Airways, etc., but only a handful of participants. As a result, passengers voluntarily offset less than 1 per cent of a flight's emissions in 2014 and 2015. Some airlines have been able to execute this program successfully, but others have not been able to do so due to a lack of knowledge about carbon offsets. Malaysia is one country that has been slow to adopt a voluntary carbon offset program for the aviation sector. In 2008, Malaysia Airlines (MAS) pioneered a carbon offset program for airlines in Southeast Asia. However, this scheme has been scrapped due to the lack of interest shown by passengers and the absence of a dedicated advocacy group. The following is a list of airlines that offer carbon offsetting programs to passengers:

i- The Emirates
ii- Qantas Airways
iii- Virgin Australia
iv- Delta Airlines
v- British Airways
vi- Jetstar
vii- Air New Zealand
viii- United Airlines
ix- Air Canada
x- JetBlue Airways
xi- Gulf Air

There will be a 64% drop in demand for air travel in Malaysia in 2020, and just 3 million people will use the airways in the first half of 2021, according to the International Civil Aviation Organization (2022). Local airlines, however, are expected to experience a resurgence in 2022 as they restore their capacity. In addition, since Malaysia re-opened its borders in April 2022,

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the aviation industry in Malaysia is expected to do significantly better than it did in 2021 and 2020. The purpose of this study was to investigate the future of airline carbon offset in Malaysia, by looking at knowledge, experience, and attitudes toward the environment of Malaysian airline passengers in regard to carbon offsets, given the relative unfamiliarity of carbon offset schemes/programs and the small number of industries in Malaysia that have implemented them. The data will aid in better comprehending the extent to which Malaysian airline passengers accept and are willing to contribute to carbon offsetting.

Literature Review

In 2016, the International Civil Aviation Organization introduced a program to offset and reduce the carbon emissions of international flights. Voluntary emissions reduction initiatives are given the most weight in the pilot phase. Except for developing and small island states, the plan requires all countries to implement carbon offsets by 2027. Many countries and airlines are taking active measures to lessen the negative effects of air travel on the environment, such as through voluntary carbon offset programmes and air passenger taxes (Choi & Ritchie, 2014). However, although there are many opportunities presented, just 1 to 10% of airline passengers willingly buy offset items (Choi, Ritchie, & Fielding, 2016; Mair, 2011).

A traveller's decision to voluntarily pay for carbon offsets is affected by several factors, including the offset product's design (Choi & Ritchie, 2014; Blasch & Farsi, 2014) and the offset scheme's legitimacy and transparency (Babakhani, Ritchie, & Dolnicar, 2017; Zhang et al., 2020). Thus, the success of any offsetting plan depends critically on the importance of disseminating carbon offsetting messaging and the type of message adopted. Knowledge, awareness and social standards are all examples of individual-level psychological elements.

Many studies have found that factors like income and population have a bearing on whether or not people choose to buy carbon offsets. Quite a bit of literature has been produced on the topic of how psychological elements, including attitudes (Ritchie et al., 2021; Lu & Wang, 2018; Choi, Ritchie, & Fielding, 2016; Choi & Ritchie, 2014; and Mair, 2011) and emotions (Gossling et al., 2009) influence the purchase of carbon offsets. However, knowledge and awareness of offsets are rarely measured (Lu & Wang, 2018; Lu & Shon, 2012; MacKerron et al., 2009; Gossling et al., 2009). Only a few research has looked into how offsetting expertise and experience affect carbon offsetting choices. For example, only 6% of Taiwanese travellers knew how carbon offsetting works. Carbon offsetting systems were only seen as effective by 5% of the population. According to research by Shaari, Abdul-Rahim, and Afandi (2020), just 36% of Malaysian airline passengers are familiar with carbon offset schemes, and less than 1% have purchased carbon offsets. Less than 30% of Australian vacationers in Cheung, Kragt, and Burton's (2015) survey had any idea what carbon offsets were.

Implementing some form of an offsetting system or market-based policy is required. After 2020, the Carbon Offsetting and Reduction Scheme for International Aviation is expected to offset nearly all the increase in international aviation's CO2 emissions. All airlines operating flights between the above states must comply. In addition, the aviation industry is subject to various compulsory market procedures. To further lessen the impact on the environment that air travel has, VCO (Voluntary Carbon Offsetting) is used. Voucher carbon offsetting (VCO) is "a means for people or organizations, in this example airline passengers, to neutralize their portion of an aircraft's carbon emissions on a single voyage by investing in carbon reduction programs." To be effective, VCO must be permanent, independently verified and registered to avoid double counting (Scott et al., 2016). Besides, it must ensure that real and additional

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emission reductions are occurring within a specific project and prevent leakage (when a project that reduces emissions in one location increases emissions in another), among other things.

Methodology

This study implemented a survey-based analysis, in which respondent was distributed with a questionnaire on airline carbon offset. The survey was distributed in different years to compare the result before and after COVID-19. Using data collected in 2018 (before COVID-19) and in the year 2022 (during COVID-19) is compared. This research includes a simple data analysis, such as descriptive analysis, to quantify and compare the acceptance of airline carbon offset in Malaysia. Data included in this research is only on a few segments such as knowledge and experience on carbon offset, knowledge on emissions created from the airline when flying, trip frequency and purposes. The data was analysed using IBM SPSS 26® software.

Questionnaire Design

The questionnaire used for both years, 2018 and 2022, contained the same question and results to compare both answers. Even though different respondents answered both questionnaires, they were collected from the same locations, Kuala Lumpur International Airport (KLIA) and Kuala Lumpur International Airport 2 (KLIA2). The characteristics required for both respondents are those flying using Malaysia Airlines (MAS) and AirAsia for domestic and international flights. The questionnaire includes four main sections; the first section asked about demographic such as age, gender, income, race, educational level and occupation. Section two on the flying information includes questions on flying frequency, flying purposes, and choice of flight. Section three asked about knowledge and experience on airline carbon offset, together with knowledge on emissions created when flying, and the last section is on the economic valuation question. However, the questionnaire was distributed differently in 2018 and 2022. The questionnaire used in 2022 included a question about COVID-19 safety when travelling.

Since the notion of carbon offset is considered new in Malaysia, thus the researcher prepared a picture and explanation of carbon offset and how it works if respondents choose to contribute or are willing to pay for it. Figure 1 shows the process of the carbon offset program.

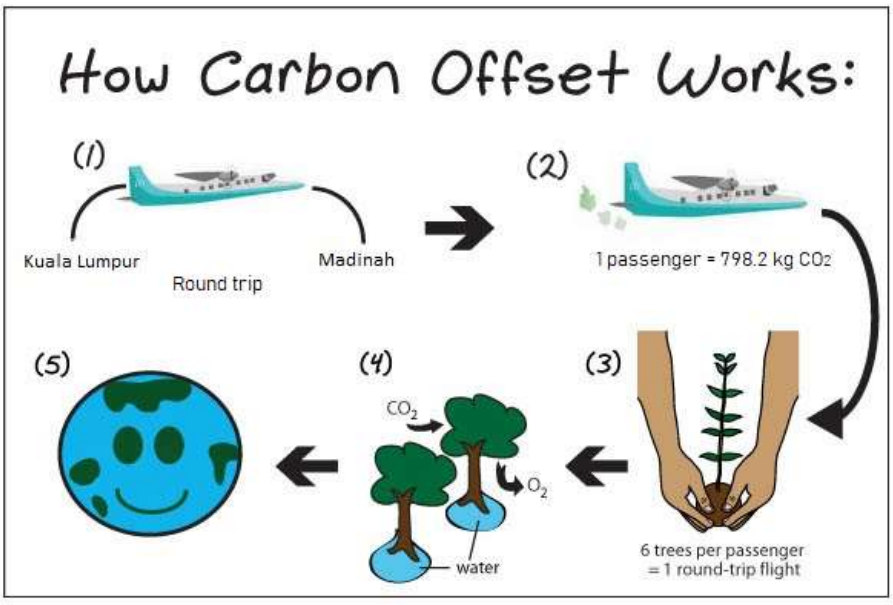

Figure 1: Process of Carbon Offset Program

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Based on Figure 1, respondents are explained based on which trip or location they are travelling. The researcher also helps respondents to calculate the emission created when travelling to selected locations by using the ICAO carbon offset calculator from the ICAO website.

Results and Discussion

Acceptance of Malaysian passengers for Carbon Offset

The acceptance of Malaysian airline passengers for carbon offset is analyzed and compared using a data survey before the COVID-19 pandemic in 2018 and during the COVID-19 pandemic, done from March until April 2022. Based on the results, more than half of respondents are willing to pay and accept airline carbon offset (68.66 per cent) in 2022, and 64.52 per cent of respondents accept and are willing to pay for carbon offset in 2018. The difference between these two years does not show a large gap, which shows that some Malaysian already have an awareness and responsibility to care about climate change.

Table 1: Number of flying trips

Flying Trip in past 12 months	Sample (%)	
	Before COVID-19	During COVID-19
1 - 2 times	18.2	52.78
3 - 4 times	43.2	4.44
More than 5 times	38.6	3.89
None	0	38.89

Table 1 shows respondents' descriptive number of flying trips before and after COVID-19. Before the COVID-19 pandemic detected hitting the country, people were free and able to fly anywhere and anytime they wanted. Based on Table 1, the number of passengers flying by air transportation more than five times before the COVID-19 pandemic is 38.6 per cent, and zero per cent never travelled by air transportation before COVID-19. It is proof that the researcher only included respondents with experience travelling by air transportation, and those who had never flown by aeroplane were excluded from the survey. However, the situation is different during the COVID-19 pandemic. 52.78 per cent of respondents travelled 1 to 2 times by air transportation during and after COVID-19, and 38.89 per cent chose not to travel by air transportation because they still feel afraid to use public transportation and to gather in a crowded place. When travelling by aeroplane, people come from different places and health statuses.

Table 2: Passengers' experience with carbon offsets

Statement	Sample (%)	
	Before COVID-19	During COVID-19
Do you know about the emissions from airlines?		
Yes	42.0	49.72
No	38.8	28.49
Maybe	19.2	21.79
How familiar are you with the notion of carbon offsets?		
I do not know what carbon offsets are	53.0	45.25
I slightly know what carbon offsets are	34.9	41.34

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I know what carbon offsets are	12.1	13.41
Have you ever bought carbon offsets for any flight in the past?		
Yes	1.5	6.15
No	89.9	63.69
I am not sure	8.6	30.17

The notion of carbon offset in Malaysia is still in a new phase, as not many industries and firms have implemented carbon offsets. The awareness of carbon offsets is not officially advertised to the public in Malaysia. Several companies in the aviation industry, including Lufthansa Group (2016), Japan Airlines (2020), and United Airlines (2020), inform their customers about flight-related carbon emissions during the booking process. Passengers are given an option to pay a carbon offset fee in addition to the price of their airline ticket (Günther, Staake and Tiefenbeck, 2020). Table 2 describes passengers' knowledge and experience with carbon offsets. Before COVID-19, almost half of respondents (53 per cent) did not know about carbon offset. Only 12.1 per cent know what carbon offsets are, and a small number of respondents, 1.5 per cent, have experience with carbon offset, probably when travelling on an international flight. Clearly shown in Table 2, 89.9 per cent of Malaysian respondents never had an experience with carbon offset since it is a new thing in Malaysia. Nowadays, people are starting to gain knowledge and awareness about the environment, and they are mostly starting to practice and implement ways to reduce emissions in daily life. Undeniable, recently, Malaysians started to recognize carbon offset from social media platforms and are willing to contribute to the carbon offset program as a way to support reducing the emissions.

Conclusion and recommendations

This paper mainly studies the future of airline carbon offset in Malaysia by looking at the acceptance and knowledge of Malaysian airline passengers towards carbon offset. It is proved that Malaysian are willing to accept and contribute with carbon offset if implemented in Malaysia. Even though only a few industries offer this method as one of the ways to reduce emissions, Malaysians still can get information and knowledge on carbon offset using any website online. Our study offers some fresh insights into the future of airline carbon offset in Malaysia, and the limitation found during the study. The notion of carbon offset is new to Malaysians, especially in the airline industry. However, Malaysian nowadays started to gain knowledge and experience with carbon offset because they are more aware and understand how the carbon offset process works. Therefore, it is vital to expose Malaysia to carbon offset because it is believed that carbon offset will help to reduce the emission when flying, although it cannot make it to zero. Just because you cannot see the emissions does not mean it is not there. Now everyone can get information through social media and can easily access any website if they want a better description of airline carbon offset. Towards a greener planet exposed people to becoming more environmentally friendly and aware of the importance of taking care of our planet.

Our finding contributes to research critical of carbon offset, especially in Malaysia. This research has pointed out the problem of introducing airline carbon offset among Malaysia's airlines, such as awareness and contribution of Malaysian for carbon offset. Passengers must clearly explain airline carbon offset, the process of carbon offset and how this program reduces carbon emissions from the flight. Airline companies must play a role in promoting and educating passengers to contribute with carbon offset. Airline companies and the government must do more advertising to support carbon offset.

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Throughout this study, the researcher found some limitations that should be addressed in the future. For example, the current research focused solely on respondents flying from Kuala Lumpur International Airport (KLIA) and Kuala Lumpur International Airport 2 (KLIA2), flying with Malaysia Airlines Berhad (MAS) and AirAsia only. Future research may consider distributing a survey to Malaysians from other airports in the state. Furthermore, the research might be expanded by including current passengers (endemic phase) since the country is ready to move out from the pandemic stage and reopen borders from 1 April 2022. Thus, it is believed that passengers have changed their pattern of flying and are more open to the importance of reducing the emissions from their flights.

Acknowledgements
The author thanks to the anonymous reviewers for the great time spend to review this paper. The financial support from Geran Penyelidikan Bestari Fasa 2/2021 Universiti Teknologi MARA Cawangan Johor is also acknowledged.

References

Babakhani, N., Ritchie, B. W., & Dolnicar, S. (2017). Improving carbon offsetting appeals in online airplane ticket purchasing: Testing new messages, and using new test methods. *Journal of Sustainable Tourism*, *25*(7), 955-969.

Blasch, J., & Farsi, M. (2014). Context effects and heterogeneity in voluntary carbon offsetting–a choice experiment in Switzerland. *Journal of Environmental Economics and Policy*, *3*(1), 1-24.

Cames, M., Graichen, J., Siemons, A., & Cook, V. (2015). Emission reduction targets for international aviation and shipping.

Cheung, J., Kragt, M., & Burton, M. (2015). *The awareness and willingness of air travellers to pay for voluntary carbon offsets and their co-benefits* (No. 1784-2016-141867).

Choi, A. S., & Ritchie, B. W. (2014). Willingness to pay for flying carbon neutral in Australia: an exploratory study of offsetter profiles. *Journal of Sustainable Tourism*, *22*(8), 1236-1256.

Choi, A. S., Ritchie, B. W., & Fielding, K. S. (2016). A mediation model of air travelers' voluntary climate action. *Journal of Travel Research*, *55*(6), 709-723.

Gössling, S., Haglund, L., Kallgren, H., Revahl, M., & Hultman, J. (2009). Swedish air travellers and voluntary carbon offsets: towards the co-creation of environmental value?. *Current Issues in Tourism*, *12*(1), 1-19.

Gössling, S., Humpe, A., & Bausch, T. (2020). Does 'flight shame'affect social norms? Changing perspectives on the desirability of air travel in Germany. *Journal of Cleaner Production*, *266*, 122015.

International Civil Aviation Organization 2022 High-level conference on COVID-19. Retrieved from https://www.icao.int/Meetings/HLCC2021/Documents/Statements/Malaysia_Statement_01_en.pdf on 20 May 2022.

Le Quéré, C., Jackson, R. B., Jones, M. W., Smith, A. J., Abernethy, S., Andrew, R. M., ... & Peters, G. P. (2020). Temporary reduction in daily global CO 2 emissions during the COVID-19 forced confinement. *Nature climate change*, *10*(7), 647-653.

Lu, J. L., & Shon, Z. Y. (2012). Exploring airline passengers' willingness to pay for carbon offsets. *Transportation Research Part D: Transport and Environment*, *17*(2), 124-128.

MacKerron, G. J., Egerton, C., Gaskell, C., Parpia, A., & Mourato, S. (2009). Willingness to pay for carbon offset certification and co-benefits among (high-) flying young adults in the

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Journal of Islamic, Social, Economics and Development (JISED)
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Journal website: www.jised.com
DOI: 10.55573/JISED.074713

UK. *Energy policy*, *37*(4), 1372-1381.

Mair, J. (2011). Exploring air travellers' voluntary carbon-offsetting behaviour. *Journal of Sustainable Tourism*, *19*(2), 215-230.

Ritchie, B. W., Kemperman, A., & Dolnicar, S. (2021). Which types of product attributes lead to aviation voluntary carbon offsetting among air passengers?. *Tourism Management*, *85*, 104276.

Rotaris, L., Giansoldati, M., & Scorrano, M. (2020). Are air travellers willing to pay for reducing or offsetting carbon emissions? Evidence from Italy. *Transportation Research Part A: Policy and Practice*, *142*, 71-84.

Scott, D., Gössling, S., Hall, C. M., & Peeters, P. (2016). Can tourism be part of the decarbonized global economy? The costs and risks of alternate carbon reduction policy pathways. *Journal of Sustainable Tourism*, *24*(1), 52-72.

Shaari, N. F., Abdul-Rahim, A. S., & Afandi, S. H. M. (2020). Are Malaysian airline passengers willing to pay to offset carbon emissions?. *Environmental Science and Pollution Research*, *27*(19), 24242-24252.

Worldometer, June 2022 Malaysia CO_2 emissions. Retreived from https://www.worldometers.info/co2-emissions/malaysia-co2-emissions/

Zhang, Y., Xiao, C., & Zhou, G. (2020). Willingness to pay a price premium for energy-saving appliances: Role of perceived value and energy efficiency labeling. *Journal of Cleaner Production*, *242*, 118555.