AVIATION

Maintain POSITIVE

Balancing between load factors and the environment

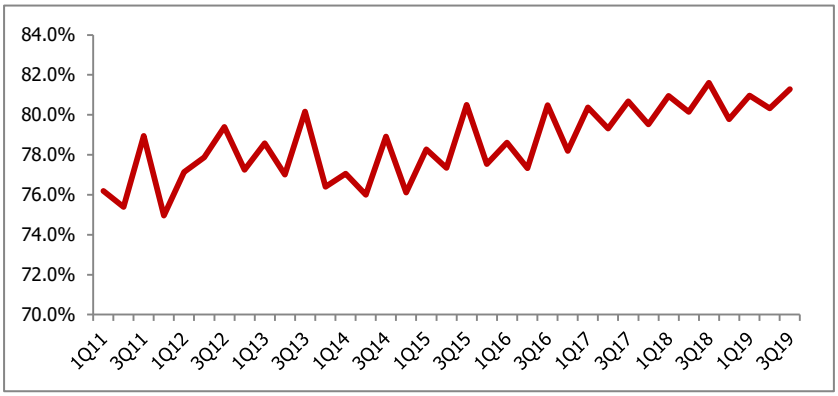
KEY INVESTMENT HIGHLIGHTS

- **Travel demand in Asia to be driven by increasing consumer affluence particularly in ASEAN**
- **Pressure on the industry to minimize its environmental footprint will intensify together with the heightened demand for air travel.**
- **CORSIA adopted by ICAO to cap the emissions of carbon by the aviation industry**
- **CORSIA has accepted the usage of palm oil biofuel for the aviation industry with industry players such as AAGB and even MPOB to play a role in the development of such fuel**
- **Other forms of reduction in carbon emissions indicated by shift towards fuel-efficient aircraft such as Airbus A321neo**
- **Maintain POSITIVE on the aviation sector**

Travel demand in Asia driven by affluence. Asia Pacific is a region which has seen an uptrend in passenger load factors in the past few years. The strong travel demand is evident through the five-year CAGR of at least 3.0% in passenger traffic for ASEAN countries such as Malaysia, Thailand, Indonesia and the Philippines. An underpinning factor for this is the increasing consumer affluence especially in ASEAN. The mass affluent is expected to grow from 57m to 137m by 2030 in ASEAN, accounting for 21% of the region's combined population by the same year. The mass affluent are frequent travelers and globally connected. They make 12 international trips a year, on average with nearly half of them for leisure. Travel spending increases sharply when Southeast Asians enter the ranks of the affluent. A Thai household's average spending per trip leaps nearly nine fold when the family rises from the middle class to the affluent class.

Figure 1: Passenger Load Factor in Asia Pacific

Source: Bloomberg



Fleet expansion in line with growth in travel activity. Throughout 2019 to 2029, narrowbodies are expected to make up the majority of MRO market share at more than 50%, followed by widebodies, regional jets and turboprops. The trend for narrowbodies is already prevalent in ASEAN with **AirAsia Group Berhad (AAGB) (BUY;TP:RM2.04)** targeting to expand its fleet to 519 in 2028 from 226 in 2018. The preference of narrowbodies comes from the expectation of higher air travel demand within Asia especially in ASEAN, prompting low cost carriers to bump up capacity.

COMPANY IN FOCUS

Malaysia Airports Holding Berhad

Maintain **BUY** | Unchanged Target price: RM9.10

Price @ 13th December 2019: RM7.55

- Earnings to grow by +9.3%yoy even with the absence of RAB framework
- VMY2020 to lend support to passenger growth
- On track to meet passenger traffic target of above 100m in 2019

Share price chart

AirAsia Group Berhad

Maintain **BUY** | Unchanged Target price: RM2.04

Price @ 13th December 2019: RM1.65

- Contribution of non-airline ancillary revenue to improve from new products, i.e. BigPay, AirAsia.com
- Expected to gain from lower amount of interest beyond the fifth year of the lease term.
- Passenger load factor to remain intact despite the departure levy

Share price chart

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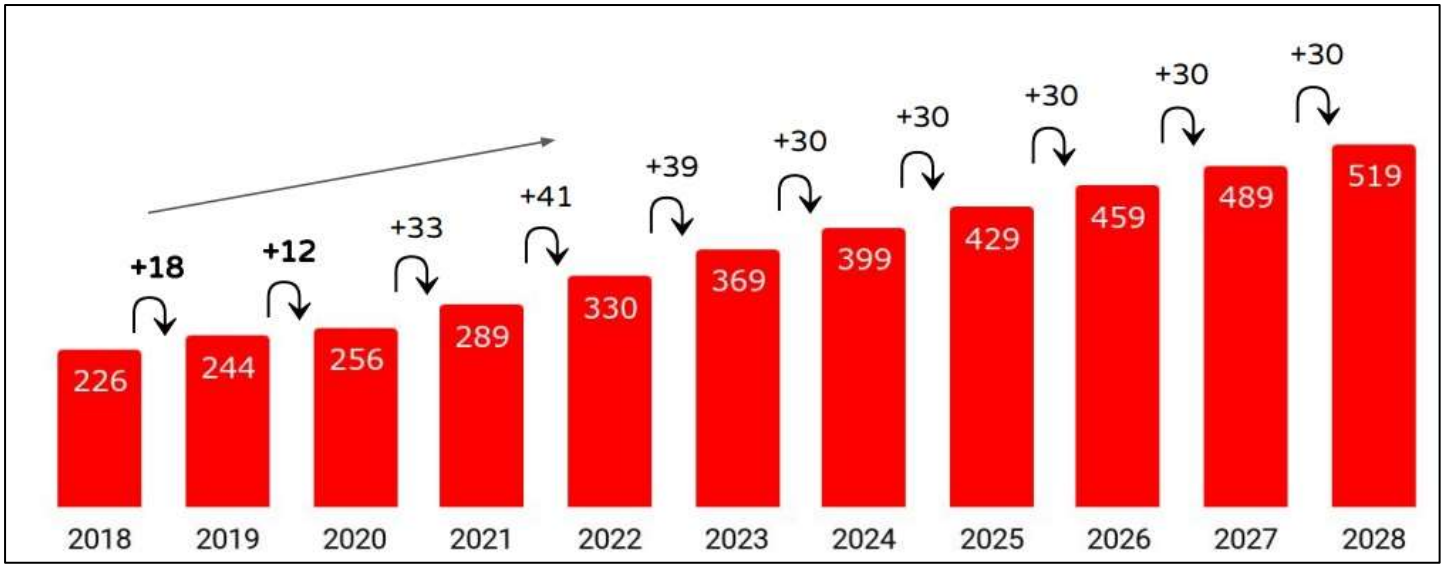
Figure 2: AirAsia Group Berhad's Long Term Fleet Plan



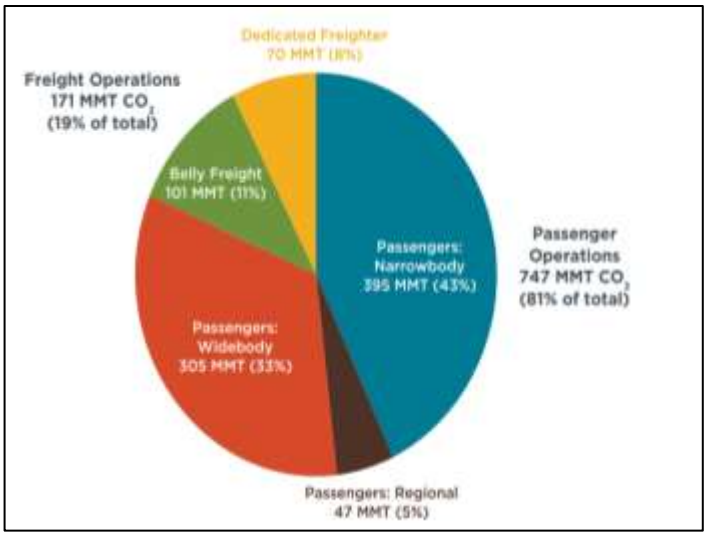
Source:AirAsia Group Berhad

Note:Column chart includes 2 third party leases

Updated fleet plan as at 6 November 2019

Carbon footprint from aviation sector. Like all industrial sectors such as shipping and manufacturing, air travel must be environmentally sustainable. With demand for air transport set to double over the next 20 years, pressure on the industry to minimize its environmental footprint will only intensify**.** The cumulative impact of aviation on man-made climate change in 2005 was estimated at 4.9%, which comprises the impact of greenhouse gas emissions including carbon dioxide and non-carbon dioxide effects such as nitrogen oxides, vapour trails and cloud formation triggered by the altitude at which aircraft operate. Meanwhile in 2018, the carbon dioxide emissions by airplanes reached 918m metric tonnes in 2018 and are expected to triple by 2050 according to the United Nations (UN) aviation body. With this, airplane emissions might account for 25% of the 1.5 degrees Celsius global carbon budget. The bulk of emissions were contributed by narrowbody aircraft at 43%. However, the International Council on Clean Transportation found in another study that emissions from global air travel may be increasing more than 1.5x as fast as what was estimated by the U.N.

Figure 3: Carbon dioxide emissions in 2018 by operations and aircraft class



Source: International Council on Clean Transportation

Largest emission of carbon dioxide by the Asia Pacific region. Flights within the Asia Pacific region emitted the largest share of passenger transport-related carbon dioxide at 25% of the global total. This region contains four out of the 10 nations with the most aviation RPKs in Table 1 (China, Japan, India, and Australia). Notwithstanding this, the intra-Asia Pacific route group had a carbon intensity (defined as grams of carbon dioxide emitted per RPK) less than the average of 88g in 2018. In contrast route groups within the Middle East and Africa had higher-than-average carbon intensity primarily due to the use of older, fuel-inefficient aircraft and low passenger load factors in these markets.

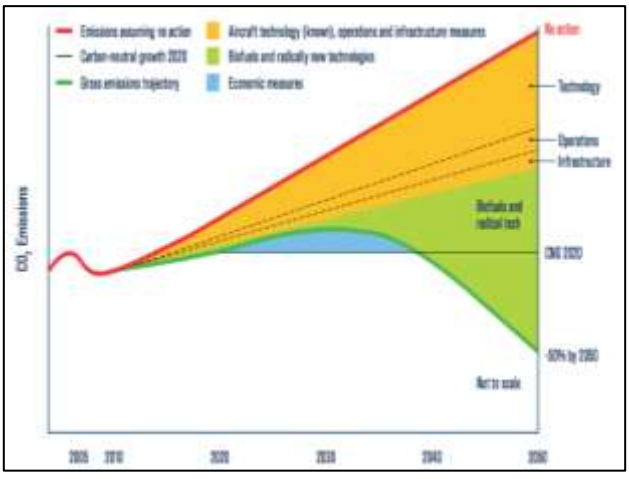
Table 1: Carbon dioxide emissions and carbon intensity from passenger transport in 2018 by regional route group

Rank	Route Group (Not directional specific)	CO_2 [MMT]	% of Total CO_2	RPKs (billions)	% of Total RPKs	Carbon Intensity [g CO_2/RPK]
1	Intra-Asia/Pacific	186	25	2,173	26	86
2	Intra-North America	136	18	1,425	17	96
3	Intra-Europe	103	14	1,189	14	86
4	Europe ↔ North America	50.0	6.7	597	7.0	84
5	Asia/Pacific ↔ Europe	43.4	5.8	523	6.1	83
6	Asia/Pacific ↔ North America	38.7	5.2	459	5.4	84
7	Asia/Pacific ↔ Middle East	33.5	4.5	388	4.6	86
8	Intra-Latin America/Caribbean	29.1	3.9	303	3.6	96
9	Europe ↔ Middle East	25.1	3.4	291	3.4	86
10	Latin America/Caribbean ↔ North America	23.4	3.1	290	3.4	81
11	Europe ↔ Latin America/Caribbean	21.1	2.8	259	3.1	81
12	Africa ↔ Europe	16.5	2.2	197	2.3	84
13	Intra-Middle East	9.18	1.2	79.0	0.9	116
14	Middle East ↔ North America	8.84	1.2	98.8	1.2	89
15	Intra-Africa	8.62	1.2	72.6	0.9	119
16	Africa ↔ Middle East	7.75	1.0	84.8	1.0	91
17	Africa ↔ Asia/Pacific	2.73	0.4	30.0	0.4	91
18	Africa ↔ North America	1.90	0.3	19.4	0.2	98
19	Asia/Pacific ↔ Latin America/Caribbean	0.91	0.1	10.2	0.1	89
20	Latin America/Caribbean ↔ Middle East	0.79	0.1	8.29	0.1	96
21	Africa ↔ Latin America/Caribbean	0.46	0.1	4.73	0.1	97
Total		**747**	**100**	**8,503**	**100**	**88**

Source: International Council on Clean Transportation

CORSIA comes into place. In an attempt to cap carbon emissions from the aviation industry at 2020 levels and reduce 50% of net aviation carbon emissions by 2050 relative to 2005 levels, the International Civil Aviation Organisation (ICAO) adopted the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). Under CORSIA, emissions on all international flights will need to be monitored, verified and reported by the airlines which came into effect on 1 January 2019. Emissions units are required to be purchased by airline operators to offset the growth in carbon dioxide emissions. In short, the principal of CORSIA enables a company to compensate for its emissions by financing a reduction in emissions elsewhere. The scheme is also more effective than a carbon tax which merely requires company to pay for their emissions without any guarantees that the payment will lead to any emission reductions. Malaysia is amongst the initial countries to volunteer for CORSIA before the measure becomes mandatory in 2027.

Figure 4: Aim of CORSIA



Source: ICAO

Figure 5: Timeline of CORSIA

Source: Air Transport Action Groip

Malaysia's acceptance of CORSIA. Besides using carbon offsetting mechanism to tackle emissions, bio jet fuels derived from palm oil is another alternative. CORSIA has accepted the usage of palm oil biofuel for the aviation industry according to the Malaysia's Minister of Primary Industries. Referring to Figure 4, ICAO suggests that biofuels can ensure that carbon emissions do not exceed 2020 levels. ICAO also noted that the complete replacement of fossil with bio jet fuels by 2050 would require around 170 new large refineries to be built every year from 2020 to 2050 at a range of USD15b to USD60b per year.

Challenges of developing sustainable aviation fuel. Sustainable aviation fuel (SAF) which includes biofuel is currently more expensive than jet fuel, and this cost premium is a key barrier to their wider use. Fuel cost is the single largest overhead expense for airlines, accounting for 22% of direct costs on average, and covering a significant cost premium to jet kerosene (which varies with crude oil price). For all biofuels, obtaining an economic feedstock supply is fundamental to achieve competitiveness, as feedstocks are the major determinant of production costs.

Governmental support for study of bio jet fuel. Malaysia has allocated RM30m for the 2020 Federal Budget for research and development matching grants for collaborations with industry and academia to develop higher value added downstream uses of palm oil specifically tocotrienol in pharmaceuticals and bio-jet fuel. At the moment, only palm fatty acid distillate has only been accepted as feedstock for sustainable aviation fuel so further studies for palm oil to be accepted is required. One of the beneficiaries would include the Malaysian Palm Oil Board (MPOB) which expects to start developing palm-based jet fuel with overseas partners in 1HCY20 including a pilot plant for the fuel. MPOB pointed out that a Malaysia-based airline would require 60,000 tonnes per year of bio jet fuel to meet the 2% blending ratio requirement as outlined by the CORSIA. We opine that the overseas partner could be from China as the country has plans to invest at least RM2.0b in a bio jet fuel plant in addition to purchasing 1.9m tonnes more of palm oil from Malaysia over the next five years.

Private sector involvement in bio jet fuel development. On the private sector front, AAGB has signed a memorandum of agreement to support the development of the Malaysian aerospace industry. The agreement entails the expansion of Airbus in its maintenance, repair and overhaul (MRO) in Malaysia and the establishment of the Airbus Malaysia Digital Initiative to enhance the competitiveness of the local aerospace industry to make the country a regional aerospace hub. Concurrently, Airbus will increase its cooperation with the Aerospace Malaysia Innovation Centre (AMIC) by providing more funds for R&D programmes including bio jet fuels in Malaysia. Approximately USD120m or RM505m has been allocated by Airbus for the abovementioned initiatives. We opine that the potential restriction of palm oil imports by the Indian government to help its local farmers might result in tapering demand from the region and stifle demand growth. More recently the upward trend in palm oil prices have forced buyer in India to the sidelines in November with shipments shrinking almost 11.0% to a five-month low of 696,000 tones. Lower shipments to India will likely lead to an accumulation of inventories in Malaysia. Nonetheless, AMIC and other parties could take advantage of Malaysia's abundance of biomass availability in its search of suitable feedstock for potential applications in aerospace such as bio-aviation fuel production and bio-composite material manufacturing, while also observing the strict sustainability factors. On the macro-economic front, we expect this to increase the contribution of the palm oil industry to the nation's GDP which current stands around 3.0%.

Further help from technological advancements. In addition to sustainable aviation fuel, there has been a trend in airlines to opt for aircraft with fuel-saving features. AAGB has converted its order of 253 Airbus planes from the A320neo to the larger A321neo whereby AAGB will be having four A321neos by year end before getting another six of it in FY20. Meanwhile, **AirAsia X Berhad (NEUTRAL;TP:RM0.17)** has also placed a firm order with Airbus for 12 A321XLR and 30 additional A330neos in late August 2019. Prior to that in July 2018, AAX confirmed the order of 66 A330neos which was firm while another 34 orders for the same aircraft were not finalised at that time. Both of these airlines share a common overarching strategy of shifting towards aircraft with equipped fuel efficient technology will lead to fuel savings while expanding capacity. For instance, the A321neo is expected to fuel savings of circa 15% translating into 10% reduction in cost per seat as it has 50 additional seats compared to the A320neo. The A321XLR will induce higher cost-saving via reduction in fuel burn per seat by more than 20% than similar older generation aircraft and competitor aircraft. Specifically for A321XLR, the aircraft will be able to deliver an extra-long range of up to 4,700 nautical miles or 8,700km, 15% more than the A321LR variant with the same fuel efficiency. All in, this indicates the airlines' effort in minimising carbon emissions via the deployment of fuel-efficient aircraft

MRO activities to follow suit. AirAsia's position as one of Airbus's biggest clients would necessitate the expansion of aerospace related activities. The reason being is that Airbus has a strong presence in Malaysia involving tier 1 and tier 2 suppliers with its sourcing and services businesses valued at roughly USD400m annually for the local economy. Local aerospace companies such as Spirit Aerosystems (Tier 1 supplier) assemble the Wing Leading Edge for the Airbus A350XWB while 60% of composite parts for the Airbus A320 come from CTRM (Tier 2 supplier) facilities in Melaka. Therefore, we do not discount the possibility that these companies will extend their offerings to cater for AAGB and AAX's upcoming fleet. Aside from this, we expect a positive spillover effect towards **Malaysia Airports Holdings Berhad (MAHB) (BUY; TP:RM9.10),** via the 58-acre Subang Aerotech Park, out of which circa 34.7 acres will be granted the rights to sublease for the JV company formed between MAHB and BP Aerotech (Subang) Sdn Bhd ("BP Aerotech")

Figure 6: Airbus A321neo Infographic

Source:Airbus

Figure 7: Airbus A321XLR Infographic

Source:Airbus

Maintain POSITIVE on Aviation sector. We remain optimistic on the aviation sector amidst the gradual progress in reducing carbon emissions albeit the infancy in the development of bio jet fuel. Malaysia's abundance of biomass availability would serve as a predicament to expedite the study for the usage of jet fuel derived from palm oil. Moreover, local airlines such as **AirAsia Group Berhad (BUY;TP:RM2.04)** has put forward their plans operate a bio jet fuel powered flight in the future while opting for more fuel-efficient aircraft such as the Airbus A321neo. With more fuel-efficient aircraft in the orderbook of airlines, it is crucial for Malaysia to secure more "design and build" work packages and become a "risk sharing partner" with original equipment manufacturers from the early stages of the aircraft's life cycle. We also expect MAHB to be a major beneficiary of a growing aerospace industry given its ample landbanks surrounding KLIA (over 9,000 hectares) and Subang Airport (430 hectares).

PEER COMPARISON TABLE

Stock	FYE	Recommendation	Price @ 13-Dec-19	Target Price (RM)	EPS (sen)		PER (x)		Net DPS (sen)		Net Divd Yield (%)	
					FY19E	FY20F	FY19E	FY20F	FY19E	FY20F	FY19E	FY20F
MAHB	Dec	BUY	7.55	9.10	33.6	36.8	22.4	20.5	14.0	14.0	1.9	1.9
AAGB	Dec	BUY	1.65	2.04	6.0	13.6	27.7	12.2	102.0*	12.0	61.8	7.3
AAX	Dec	NEUTRAL	0.15	0.17	-5	1.1	-3.0	13.6	0.0	0.0	0.0	0.0

Source: Company MIDFR

**Includes special dividend of RM0.90*

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BUY	Total return is expected to be >10% over the next 12 months.
TRADING BUY	Stock price is expected to *rise* by >10% within 3-months after a Trading Buy rating has been assigned due to positive newsflow.
NEUTRAL	Total return is expected to be between -10% and +10% over the next 12 months.
SELL	Total return is expected to be <10% over the next 12 months.
TRADING SELL	Stock price is expected to *fall* by >10% within 3-months after a Trading Sell rating has been assigned due to negative newsflow.
SECTOR RECOMMENDATIONS	
POSITIVE	The sector is expected to outperform the overall market over the next 12 months.
NEUTRAL	The sector is to perform in line with the overall market over the next 12 months.
NEGATIVE	The sector is expected to underperform the overall market over the next 12 months.