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Aviation and Sustainable Development: Some Perspectives from the Asia-Pacific

by

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The attached Occasional Papers have been prepared by a group of scholars associated with the Institute of Air and Space Law (IASL) at McGill University. They are the result of a collaborative effort between the IASL and the Centre for International Sustainable Development Law and are designed to be part of a book prepared by authors from both groups which will eventually be published by the Cambridge University Press under the title *Sustainable International Civil Aviation*.

As the title of the book suggests, bringing together these various scholars and papers is the central theme of the sustainable development of international aviation. In particular, the work of the International Civil Aviation Organization (ICAO), the primary United Nations body tasked with regulating the environmental aspects of international aviation, and the provisions of the Chicago Convention which lays down powers of the Organization and the fundamental rules of international air law, form the primary focus of this collection. At the next ICAO Assembly in September-October of 2016, ICAO has the ambitious mandate to finalise a global scheme to limit CO2 emissions from international aviation. As many of the articles contained in the book are of immediate relevance to the discussions due to take place at ICAO, publishing and disseminating these draft chapters will contribute to the growing interest and debates on the issue of the environmental impact of aviation. It is hoped that these papers will contribute to the work of the Assembly and that informed readers and delegates participating at the ICAO Assembly will have constructive comments to share with the authors.

Readers are invited to send their comments to the authors whose e-mail addresses are set out on the title page of each paper as well as a copy to the following address: edannals.law@mcgill.ca

The authors and the Editors of this collection of papers thank all readers for their attention and their comments.

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SUMMARY

Sustainable Development Solutions in the Asia-Pacific: What are the developments from this region that can potentially provide a global solution in reducing emissions from international civil aviation?

The issue:

- What is the reaction of Asia-Pacific region to the European Union's (EU) Emission Trading Scheme (ETS)?
- What are the different models of national approaches to mitigating aviation emissions?
- What lessons can be learned from the Asia-Pacific region?

Its importance:

- The Asia-Pacific region will experience the highest growth in passenger traffic at 5.8% per year until 2025.
- The rapid growth of passenger and freight traffic in the Asia-Pacific region has come in hand with greater environmental concerns.
- As a significant driver of air transport demand and capacity, the Asia-Pacific region's particular characteristics have become a necessary reference for the development of sustainable aviation policies and regulations in the coming years.

The treaty law:

- United Nations Framework Convention on Climate Change
- Kyoto Protocol
- Chicago Convention

The analysis:

- The Asia-Pacific region opposed the application of the EU ETS to international civil aviation in more political terms. The Asian States highlighted the unacceptable principle that the EU can impose regulations like its ETS on foreign actors without territorial connection – recalling the time when European metropolises ruled over most of the world.
- The Asia-Pacific region contributed significantly in the emergence of the principle of common but differentiated responsibility according to which States that have

greater historical responsibilities for climate change or a higher financial capacity should take the lead in efforts to mitigate GHG emissions, and support other States in adapting to the unavoidable consequences of climate change.

- The national approaches to mitigating aviation's environmental impacts in the Asia-Pacific region can be summed up as follows: a regime that has weak policies on climate change with general goals and only few constraining measures, and without significant impact on the aviation sector; a regime that is starting to establish a carbon-pricing mechanism, with yet little provisions on aviation; and full-fledged legal regime to mitigate climate change.
- A promising alternative from this region is the linking between regional or single-State Emission Trading Scheme. This was exhibited with the expected linking of ETS of Australia and the EU.
- The repetition of bilateral agreements linking the ETS could create a "minilateral" regime over the short term. A "minilateral" approach could most practically be fostered through the auspices of international organizations.

Options for decision-makers:

1) States may encourage the linking of the ETS, which is found in the Asia-Pacific region, as an alternative to multilateral approach.
2) No action on the part of decision-makers that may limit implementation of a market-based measure(s) for aviation through unilateralism or multilateralism.

AVIATION AND SUSTAINABLE DEVELOPMENT: SOME PERSPECTIVES FROM THE ASIA-PACIFIC

by

Jae Woon Lee,* Benoît Mayer• & Joseph Wheeler×

I. INTRODUCTION

The Asia-Pacific region is witnessing a rapid growth in civil aviation activities.[1] The International Civil Aviation Organization (ICAO) notes that the Asia-Pacific region was the world's largest air transport market in 2012, accounting for a 30% share of the world revenue passenger kilometers (RPKs).[2] It also foresaw that airlines of the Asia-Pacific region will experience the highest growth in passenger traffic at 5.8% per year until 2025.[3] Since 2009, the profits margin of Asia-Pacific air carriers has been significantly higher than in any other region.[4] Passenger-kilometres performed in Asia Pacific in recent years has only been outshone by the Middle East.[5] This sectorial development reflects the "rise of Asia" – with two-digit growth figures in several countries of the region despite a context of global economic downturn. Yet, the rapid growth of passenger and freight traffic in the Asia-Pacific region has come in hand with greater environmental concerns. Affirming its growing influence, the Asia-Pacific has widely contributed to recent ICAO actions to develop multilateral bases for market-based environmental measures in international aviation as an avenue to mitigate greenhouse-gas (GHG) emissions. This chapter submits that, as a significant driver of air transport demand

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[1] See for example the presentation given by the Director General of the Association of Asia Pacific Airlines in 2015 which reported that the region accounts for 35% of value of global trade, and is home to 56% of the world's population, online: AAPA <www.aapairlines.org/resource_centre/AAPA_SP_AP59_DG_Presentation_13Nov15.pdf>.

[2] ICAO, "Forecasts of Scheduled Passenger Traffic: Medium-Term Passenger and Freight Traffic Forecasts", online: ICAO <www.icao.int/sustainability/pages/eap_fp_forecastmed.aspx>.

[3] ICAO, "Forecasts of Scheduled Passenger Traffic: Long-Term Traffic and Aircraft Movement Forecasts", online: ICAO <www.icao.int/sustainability/pages/eap_fp_forecast_longterm.aspx>.

[4] IATA, Financial Forecast: Better Structure Offsets Weak Economy, December 2012.

[5] See ICAO, "Forecasts of Scheduled Passenger Traffic: Medium-Term Passenger and Freight Traffic Forecasts", online: ICAO <www.icao.int/sustainability/pages/eap_fp_forecastmed.aspx>.

and capacity, the Asia-Pacific region's particular characteristics have become a necessary reference for the development of sustainable aviation policies and regulations in the coming years.

The Asia-Pacific is admittedly a vast region with stark contrasts. "Asia" itself arguably stands for little more than what lies East of Europe. The Asia-Pacific region gathers roughly half of the world's population, and spans over about the half of the Earth's surface. There are evident contrasts between the states of the region, among others in cultural, political, economic or developmental terms. The rise of Asia is pushed by the four "Asian Tigers" (Hong Kong, Singapore, South Korea and Taiwan) and Japan, as well as by two mastodons (China and India). It is supported by international trade but also by growing endogenous demand in particular in China, India, and Southeast Asian nations. Other countries of the region, however, are among the world's least developed countries (e.g. Afghanistan, Bangladesh, Cambodia, Nepal, several island states of the Pacific). The political regimes range from well-established liberal democracies all the way to some of the world's grimmest regimes. In spite of this heterogeneity, however, the Eastern hemisphere has been seen as animated by a vague unity, linked precisely from its not-being Europe: a "will to differ,"[6] as a regional observer called it in Southeast Asia, or a quest for (yet quite controversial) "Asian values."[7] At the sub-regional level, the Association of Southeast Asian Nations (ASEAN) and the South Asian Association for Regional Cooperation (SAARC) have promoted regional rapprochement. Economic cooperation has also been promoted at the regional scale, for instance through the Asia-Pacific Economic Cooperation (APEC), the ASEAN+3 (ie China, Japan and Korea) initiative, and the ASEAN regional forum.

This context of a regional identity-building by opposition to Europe impacts the Asia-Pacific region's perspectives on aviation and sustainable development. Asia's "takeoff" must be approached as possibly something other than just a historical addendum to the aviation growth and development of the West, or just seen as emulating Western development. In aviation like in other sectors, growth has been highly unequally distributed – and most of the growth of Asian aviation can be attributed to just a few states in the region, whose upwardly economically mobile populations have supported the increase in traffic: China, India, Japan, Malaysia, Singapore, South Korea and Taiwan.[8] This highly contrastive picture is in itself a significant difference from Europe or Northern America – one which may have significant consequences in the position that Asia-Pacific states have taken

[6] Simon Tay, "Human Rights, Culture, and the Singapore Example" (1995) 41 McGill Law Journal 743 at 768.

[7] See in particular Jack Donnelly, *Universal Human Rights in Theory and Practice* (Ithaca: Cornell University Press, 2003) at 108.

[8] See IATA, "Air Passenger Forecasts Global Report", online: IATA <www.iata.org/events/agm/2015/Documents/air-pax-forecasts-executive-summary.pdf>.

with regard to sustainable aviation policies. With regard to sustainable development, the region's efforts have frequently been pushed by extraneous actors such as trade partners, aid donors, international organizations or non-governmental organizations. Yet, in the climate negotiations, the region contributed significantly in the emergence of the principle of a common but differentiated responsibility according to which those states that have greater historical responsibilities for climate change or a higher financial capacity should take the lead in efforts to mitigate GHG emissions and support other states in adapting to the unavoidable consequences of climate change. In accordance with this principle, Australia, Japan, New Zealand and Russia[9] were the only countries of the region listed in Annex B of the Kyoto Protocol specifying binding mitigation goals.

The following sections briefly describe the particular Asia-Pacific complexion of opposition to the unilateral imposition of the European Union (EU) Emissions Trading Scheme (ETS) to foreign air carriers, outline legal and policy measures intended to address aviation's effects on the climate, and where relevant and in the absence of aviation-specific measures, the diverse climate-related efforts of states in the region. It will be seen that the region may hold the key to a potential global solution for market-based measures in reducing international aviation emissions, and that this key is not a new element of public international air law relations.

II. OPPOSITION TO THE EU ETS

States of the Asia-Pacific region have played an important role in contesting the application of the EU ETS to foreign air carriers. Opposition manifested in different ways throughout the region. Russia, for instance, retaliated by delaying approvals on certain European air carrier traffic rights,[10] and has considered imposing fees on European air carriers which overfly Siberia and capping numbers of flights which traverse Siberian airspace.[11] Similarly, in a clear trade-based retaliation, China cancelled significant aircraft orders from the European manufacturer Airbus and banned compliance with the EU ETS to air carriers based in China.[12] At the Council of the ICAO, India, China, Malaysia, Russia Singapore

[9] Russia is not traditionally considered part of Asia, but the majority of its land mass is east of the Urals and is therefore situated in Asia.

[10] Kurt Hofmann, "Russian opposition to ETS delays Lufthansa Cargo's traffic rights approval", Air Transport World (22 March 2012), online: ATW <atwonline.com/international-aviation-regulation/news/russian-opposition-ets-delays-lufthansa-cargo-s-traffic-right>.

[11] Prajakt Samant & Simone Goligorsky, "Non-EU Countries Oppose Inclusion of Emissions from Airlines in EU ETS", National Law Review (8 March 2012), online: National Law Review<www.natlawreview.com/article/non-eu-countries-oppose-inclusion-emissions-airlines-eu-ets>.

[12] Katie Cantle, "Chinese carriers shun EU ETS rules warning; signals retaliation", *Air Transport World* (16 Mary 2012), online: ATW < atwonline.com/aeropolitics/chinese-carriers-shun-eu-ets-rules-

and South Korea (among other non-European states) sponsored the "Delhi declaration" that "oppose[d] the EU's plan to include all flights by non-EU carriers to/from an airport in the territory of an EU Member State in its emissions trading system (EU Directive 2008/101/EC), which is inconsistent with applicable international law."[13] A few months later, the same states backed the strong words of the Moscow declaration – denouncing the "unilateral" action of the EU and affirming a "unanimous position that the EU and its Member States must cease application" of this legislation.

By contrast to the United States or Canada's mostly economic concerns, the Asia-Pacific regional opposition to the EU ETS was often phrased in more political terms. When presenting what would become the "Delhi declaration," an Indian representative argued for instance that "the paper was about affirming and re-affirming the *sovereignty* of ICAO Member States in accordance with the Chicago Convention."[14] Likewise, the representative of Singapore put the emphasis on the issue of applying EU law beyond Europe.[15] These positions elaborated on a critical, "post-colonial" discourse widespread throughout Asia. Beside the purely economic stakes, Asian states were keen to highlight the unacceptable principle that decisions taken in Brussels could be imposed on foreign actors without territorial connection – recalling the time when European metropolises ruled over most of the world. If not uniquely Asian, the post-colonial perspective that Asian states took participated to an effort at framing Asia (or part of it) as the leader of an emancipated "third world."

To this extent, attention should be given to an article on "EU Climate Change Unilateralism" that Lavanya Rajamani of the Center for Policy Research in New Delhi co-authored with Joanne Scott of the University College London.[16] Unlike the position of many Asian authors and virtually all Asian states, the European-Indian tandem "do[es] not take issue with [the EU's] unilateral *means*."[17] Referring to Keohane and Victor's theory of a "regime complex for climate change"[18] where many different forms of regulations are used to make up for insufficient centralized governance,[19] they consider that "the EU may be thought to be acting as a 'norm

warning-signals-retaliation>.

[13] ICAO Council Declaration 194/2, 2 November 2011.

[14] ICAO Council, 194th Sess., Summary minutes of the second meeting, C-MIN 194/2, 18/11/11, at para. 10 (emphasis added).

[15] *Ibid*, para. 83.

[16] Joanne Scott and Lavanya Rajamani, "EU Climate Change Unilateralism" (2012) 23 European Journal of International Law 469.

[17] *Ibid* at 469 (emphasis added).

[18] See Robert O Keohane & David G Victor, "The Regme Complex for Climate Change", The Harvard Project on International Climate Agreements (January 2010), online: Harvard University <belfercenter.ksg.harvard.edu/files/Keohane_Victor_Final_2.pdf>.

[19] *Ibid* at 470. See also Robert O Keohane and David G Victor, "The Regime Complex for Climate

entrepreneur', using (the threat of) unilateral action to stimulate climate action elsewhere."[20] Political influence through trade is, after all, current practice, and such an influence is quite widely accepted as long as it does not breach any specific legal obligation.

If not the *means*, what seems to disturb Scott and Rajamani is the *outcomes* of such contingent unilateralism: the consequences of unilateral exercise of power on the substance of the regime complex for climate change. In the course of multilateral negotiations on an emissions reduction scheme, developing countries would have a strong claim for certain derogations in consideration of their lower past and current emissions and of their lower financial capacities. These claims are reflected by the notion that states have common but differentiated responsibilities for climate change.[21] Yet, Scott and Rajamani argue, the EU ETS is rooted in the EU's principle of *equal* treatment, not in the international climate law principle of common but differentiated responsibility.[22] This reflects the critical dimension of the choice of forum in the regime complex for climate change. Scott and Rajamani conclude that the "EU Climate Change unilateralism is likely to disregard important aspects of the recognized ethics of international relations."[23]

Asian nations and their allies have exhibited strong opinions in relation to emissions reduction. The Association of Asia Pacific Airlines[24] resolved in 2009 to call on governments to adopt a global sectoral approach to aviation emissions developed through ICAO.[25] More recently a powerful group containing two Asian powerhouse nations ("BASIC" which consists of Brazil, South Africa, India and China) has reinstated their similar commitments including voluntary participation, multilateralism, and a focus on the entire "basket" of measures available to mitigate climate change from emissions, including non-market-based measures. Following the 14th BASIC Ministerial Meeting on Climate Change, in Chennai, India) a joint statement concluded:[26]

Change" (2011) 9 Perspectives on Politics 7.

[20] Scott and Rajamani, *supra note 19* at 472-73.

[21] See in particular United Nations Framework Convention on Climate Change, 9 May 1992, art. 3(1) and 4. See generally Lavanya Rajamani, *Differential Treatment in International Environmental Law* (Oxford University Press, 2006).

[22] Scott and Rajamnit, *supra* note 19, at 493.

[23] *Ibid*.

[24] AAPA is a forum for the expression of views on matters of mutual interest to the aviation industry in the Asia Pacific region and has 15 member airlines including flag carriers and some privately owned carriers, like Bangkok Airways.

[25] AAPA Resolution No. 7 of 2009, online: AAPA <www.aapairlines.org/resource_centre/AAPA_53AP_Reso07_Environment_20Nov09.pdf>.

[26] See Joint Statement Issues at the Conclisuon ot eh 14th BASIC Ministerial Meeting on Climate Change, 16 February 2013. A copy of the full statement is available online: Scribd <www.scribd.com/doc/126015048/XIV-BASIC-Joint-Statement-Final>.

> The discussion on market based measures in ICAO, even if these market based measures are undertaken within the national jurisdiction, should be based on the principles of the UNFCCC, environmental integrity, voluntary participation and not prejudge the outcome of the negotiations in the UNFCCC.[27]

Yet this attitude of the Asian nations and groups thereof, for example the views of BASIC set out above, do not bode well for a sectoral approach through ICAO, unless a final proposal settled on a way to satisfy the perceived inequities which would arise for these nations if a mandatory multilateral aviation market based measure was considered. BASIC nations argue that developing countries are protected somewhat by the climate law principle which ensures climate action is proportionate to each state's ability to respond and their responsibility for historical emissions.

III. MITIGATION EFFORTS IN THE ASIA-PACIFIC REGION

States in the Asia-Pacific regions have engaged in some laws and policies aimed at contributing to climate change mitigation in particular by reducing GHG emissions. Yet, there is no broad consistency in the measures undertaken, nor a particular focus on international aviation. This is especially so if one considers the dramatic policy efforts of the EU, described above and elsewhere in this treatise.

A. THE ADVOCACY OF SMALL ISLAND DEVELOPING STATES (SIDS) AND OTHERS

Extraneous pressure, in particular from Europe, has anecdotally played an instrumental role in putting climate change mitigation and adaptation on political agendas in the Asia-Pacific region. However, some countries in the region have also been particularly vocal in calling for international efforts. This is in particular the case of SIDS of the Pacific and Indian Oceans,[28] which are particularly vulnerable to the effects of global climate change. These islands are indeed highly vulnerable to some of the consequences of climate change – sea level rise, but also increases in the frequency and intensity of cyclones and storm surges, drought, acidification of the oceans (damaging the coral reefs), and increase in the temperature. Some of them –

[27] *Ibid*. See also John Parnell, "BASIC countries threaten to block aviation emissions deal", *Climate Change News* (19 February 2013), online: Climate Change News <www.climatechangenews.com/2013/02/19/basic-countries-threaten-to-block-aviation-emissions-deal/>.

[28] These include, in the Pacific Ocean, Cook Islands, Fiji, Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu, and, in the Indian Ocean, Comoros, the Maldives, Mauritius and Seychelles.

the Maldives, Tuvalu, Kiribati – might even become uninhabitable in the decades to come. Yet, given the size of these countries, their own contributions to global GHG emissions is marginal.

Most of these countries are represented in the Alliance of Small Island States (AOSIS). Through AOSIS or individual initiatives, small island states have represented an influential lobby in the international climate negotiations, calling for radical mitigation efforts and larger North-South adaptation funding. At the 17th Conference of the Parties (COP 17) to the UN Framework Convention on Climate Change (UNFCCC) Samoa's ambassador to the United States, Aliioaiga Feturi Elisaia noted "[w]e are at the frontline of the impacts of climate change in the Pacific, so for us it is not something that is theoretical."[29] Yet, given their geography, and the role aviation plays in fostering connectivity between island states and the home countries of tourists and diaspora communities, SIDS have a particularly strong reliance on aviation.

B. TECHNICAL COOPERATION

Notably for the region, there have been broad technical cooperative measures seeking to reduce the impact of aviation emissions. Typically these seek to promote best practice through more efficient and effective operational procedures by Air Navigation Service Providers (ANSPs) and airlines. In particular, the Asia and South Pacific Initiative to Reduce Emissions (ASPIRE) agreement was signed in Singapore on 18 February 2008 by the ANSPs of Australia and New-Zealand, soon to be expanded to their Japanese, Singaporean and Thai counterparts.[30] The strategic plan of the partnership notes:[31]

> In order to meet the growing regional demand for air transportation, while maintaining the industry's leadership position, it is essential for Asia and Pacific aviation partners to collaborate on environmental stewardship.[32]

[29] See Pacific Islands Forum Secretariat, "PACIFIC IN DURBAN: Updates from COP17", online: Pacific Islands Forum Secretariat <www.forumsec.org/pages.cfm/newsroom/press-statements/2011/pacific-in-durban-updates-from-cop17.html>.

[30] The original signatories were Airservices Australia, Airways New Zealand, Federal Aviation Administration. Japan Civil Aviation Bureau (JCAB) joined in October 2009. The Civil Aviation Authority of Singapore (CAAS) joined in 2010. AeroThai joined in 2011. See ASPIRE, "What is ASPIRE", online: ASPIRE <www.aspire-green.com/about/default.asp>.

[31] See ASPIRE, *Asia and Pacific Initiative to Reduce Emissions: Strategic Plan*, online: ASPIRE <http://www.aspire-green.com/mediapub/docs/strategic_plan_2011.pdf>

[32] *Ibid* at 4.

C. THEE MODELS OF NATIONAL APPROACHES TO MITIGATING AVIATION IMPACTS

Individual states in the Asia-Pacific region have approached the objective of mitigating aviation impacts very differently, depending in particular on their obligations under the international climate regime and other national circumstances. States can be situated on a long continuum between mere inaction and strong engagement. It is beyond the scope of this chapter to canvas every climate change initiative in any of the states of the Asia-Pacific region. However, some commonalities can be recognizes among these countries, and some call for more attention.

Thus, the next three sections will discuss three different models on this continuum. At one extreme, most least-developed or developing countries (mostly most low-income and lower-middle-income ones) of the region have only adopted some weak policies on climate change, with general goals and only few constraining measures, and without significant impact on the aviation sector In the middle of the continuum, some upper-middle-income or high-income countries are starting to establish a carbon-pricing mechanism, with yet little provisions on aviation At the other edge of the continuum, some other upper-middle-income or high-income countries developed a full-fledged legal regime to mitigate climate change through a full-fledged carbon-pricing (in particular market-based) mechanism which may apply to the aviation sector

IV. COUNTRIES WITH EMBRYONIC CLIMATE LAWS

In many developing countries of the region (as certainly elsewhere), climate change policies are usually very general, rarely followed by strict implementation measures. They put a relative large emphasis on adaptation to climate change, although they may also contain some principled statements or limited concrete policies on mitigation. Such efforts are often carried out by coordinating agencies or sub-national authorities rather than driven by a centralised body. This is largely due to the nature of adaptation, extending to many different sectors (from land-use to constructions, from education to industrial policies), and the limited specificity of such policies.

For example, the *Climate Change Act 2009*[33] in the Philippines mandates that local governments draft local Climate Change Action Plans and, in Pakistan, a special Provincial Climate Change Policy Implementation Committee has been established.[34] Similarly, Bangladesh has through it Ministry of Environment and

[33] Republic Act No. 9729, Climate Change Act of 2009, online: <www.lawphil.net/statutes/repacts/ra2009/ra_9729_2009.html>.

[34] Government of Pakistan, Ministry of Climate Change, National Climate Change Policy, September

Forests published a Climate Change Strategy and Action Plan (2008),[35] and passed the *Sustainable and Renewable Energy Development Authority Act*, which is designed to promote the production and use of green energy. As a country with only 49% of citizens having access to electricity, renewable forms of energy are pursued to complementarily contribute to the provision of enhanced and secure energy supply, while also reducing fossil fuel use.[36]

Malaysia has passed the *Sustainable Energy Development Authority Act 2011*, which establishes an authority to provide for functions under sustainable energy laws, such as advising the Government on matters relating to sustainable energy, implementing national policy objectives for renewable energy and to conduct other research and assessments as needed to enhance investment and public participation and awareness on matters relating to sustainable energy.[37]

Some significant steps have however been taken. India, in particular, has initiated a levy on coal with the revenue raised being used to fund clean energy research. It also published its twelfth Five-Year Plan as approved by the National Development Council in December 2012.[38] While this is not legislation, the Plan sets the aspirational strategic direction of the economy, and includes recommendations put forward by the Low Carbon Expert Group, including measures to promote and diversify domestic sources of energy and reduce the energy intensity of production processes.[39]

Vietnam approved its national United Nations Reducing Emissions from Deforestation and forest Degradation (REDD+) Action Programme in June 2012.[40] This is designed to reduce emissions by setting up a legal framework for pilot REDD+ programmes and activities. It includes a target to reduce emissions from the agricultural sector by 20% and to increase the natural forest cover to 44–45%, both

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2012, online: <oneunjpe.org/NCCP.pdf>.

[35] Ministry of Environment and Forests, Government of the People's Republic of Bangladesh, *Bangladesh Climate Change Strategy and Action Plan 2008*, online: <www.sdnbd.org/moef.pdf>.

[36] Islam, MS, Khan, AMHR, Nasreen, S, Rabbi, F, and Islam MR, "Renewable Energy; The Key to Achieving Sustainable Development of Rural Bangladesh", Journal of Chemical Engineering, Vol ChE 26, No. 1, December 2011.

[37] See *Sustainable Energy Development Authority Act 2011* (Malaysia), Act No. 726, Laws of Malaysia.

[38] See "National Development Council approves 12th Five Year Plan", *The Indian Express* (27 December 2012), online: The Indian Express <archive.indianexpress.com/news/national-development-council-approves-12th-five-year-plan/1051012/ The Twelfth Plan is for 2012-17>.

[39] These include "increasing green cover by one million hectare every year and adding 30,000 MW of renewable energy generation capacity in the Plan period and reducing "emission intensity of the GDP in line with the target of 20-25 reduction by 2020 over 2005 levels"; see *ibid*.

[40] The United Nations REDD Global Programme supports REDD+ national readiness efforts in 46 countries in Africa, Asia Pacific and Latin America; see online: UN REDD <www.un-redd.org/AboutUN-REDDProgramme/tabid/102613/Default.aspx>.

by 2020.[41]

In Mongolia the Ministry of Nature, Environment and Tourism released the Mongolia Second National Communication Under the UNFCCC in 2010 summarizing its government policy and strategies to solve climate change challenges, and the key findings and results of climate change research and studies conducted in Mongolia.[42] More recently, a Mongolian law has been introduced which regulates air pollution and introduces measures for reduction and monitoring of emissions of air pollutants.[43] Yet, this legislation aims at struggling against atmospheric pollution in the valley of Ulaanbaatar rather than at mitigating climate change and it might have a relatively low impact on GHG emissions.

Singapore's National Climate Change Strategy of 2012 gives an indication of the city-state's priorities with regard to mitigation "[t]hrough fuel taxes, controlling vehicle ownership and usage, energy efficiency incentives and other policies, Singapore has proactively reduced the growth of carbon emissions."[44] The Strategy emphasises technology and highlights their low capacity to develop renewable energy for lack of territory (despite the promises of tidal power in Singapore strait). Singapore, as a major regional hub, also participates in ASPIRE (as discussed above) and the Airport Carbon Accreditation Programme, an initiative by the Airports Council International (Asia Pacific) which is supported by the ICAO. Under this initiative, the Changi Airport Group will work towards reducing its carbon emissions to eventually achieve carbon neutrality.

V. COUNTRIES WITH CARBON-PRICING MECHANISMS BUT LITTLE PRESENT APPLICATION TO AVIATION

The last few years have witnessed a significant move towards pricing carbon, primarily through carbon trading but also using carbon taxes, as a tool with which to tackle GHG emissions. Many of these regimes and frameworks have been entered into but not pursued into implementation for various local political reasons. The global hesitations as to the post-2012 regime (until the last-minute agreement to some prolongation at COP 18 in December 2012) may also have discouraged some developed countries like Japan and South Korea.

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41 See *The Global Climate Legislation Study, 2015,* online: Globe International <www.globeinternational.org/index.php/summit-home/62-policy-and-legislation/climate-legislation-study/>.

42 See Mongolia Second National Communication under the United Nations Framework Convention on Climate Change, online: UNFCC <unfccc.int/resource/docs/natc/mongnc2.pdf>.

43 *Mongolian law on Air*, 17 May 2012, art 1.

44 National Climate Change Strategy of 2012 at 13.

A. JAPAN

The 1998 Law Concerning the Promotion of the Measures to Address Global Warming[45] is the centrepiece of Japanese climate policy, even though it does not set legally binding national targets.[46] Under this Law Japan has operated a voluntary emissions trading scheme since 2005 that covers carbon dioxide emissions from fuel consumption, electricity and heat, waste management and industrial process from over 300 companies of which six are aviation companies.[47] Although Article 22 of the Law provides that designated transportation companies and cargo owners have obligations to report their emissions annually, air transportation is not included.

Japan, the world's fifth-biggest greenhouse gas emitter, had been expected to launch a trading scheme that would curb companies' emissions from 2013.[48] However, after witnessing uncertainty over a global climate framework beyond 2012 in the 16th session of the Conference of the Parties of the UNFCCC (COP 16) in Cancun, and strong opposition by powerful Japanese business groups that warned of job losses as they compete against overseas rivals facing fewer emissions regulations, Japan shelved their plan.[49] While there is a possibility of reviving the carbon trading discussion,[50] nothing has been confirmed at the time of writing.

B. INDONESIA

The first Indonesian domestic carbon market, or Skema Karbon Nusantara is being considered by the National Council on Climate Change of Indonesia.[51] The goals of this voluntary mechanism are to raise awareness before implementing a mandatory scheme. Raising awareness is a major issue as Indonesia has been cited

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[45] Japan, *Law Concerning the Promotion of the Measures to Cope with Global Warming,* online: Ministry of Environment <www.env.go.jp/en/laws/global/warming.html>. Law No. 117 of 1998 (effective 9 October, 1998).

[46] Climate Change Liability – Transnational Law and Practice, Edited by Richard Lord, Silke Goldberg, Lavanya Rajamani, Jutta Brunnee, Cambridge (2012, New York) "Chapter 9 Japan" – Yukari Takamura p 210

[47] See Japan's Voluntary Emissions Trading Scheme (JVETS) March 19, 2009, presentation by the Office of Market Mechanisms, Climate Change Policy Division, Global Environment Bureau, Ministry of the Environment, Japan, online: <www.env.go.jp/en/earth/ets/jvets090319.pdf>.

[48] Risa Maeda, "Japan shelves carbone missions trading scheme", Reuters (28 December 2010), online: Reuters <www.reuters.com/article/2010/12/28/us-climate-japan-idUSTRE6BR06120101228>.

[49] *Ibid.*

[50] Chisaki Watanabe, "Japan may revive carbon trading discussion after election", Bloomberg (10 March 2013), online: Bloomberg <www.bloomberg.com/news/2013-03-10/japan-may-revive-carbon-trading-discussion-after-election.html>.

[51] See for example, Dicky Edwin Hindarto, "Indoenisa's Perspectives on Future Carbon Market", online: Institute for Global Environmental Strategies <www.iges.or.jp/jp/archive/cdm/pdf/indonesia/20120216/DNPI_Dicky_NMM.pdf >.

as the world's third largest producer of greenhouse gas emissions (from often illegal deforestation). Forests are sought to be protected through government categorization as village forests rather than participation in programs such as "Reducing Emissions from Deforestation and Forest Degradation" (REDD) in which developed countries can offset their carbon emissions by paying developing nations to protect their forests.[52]

ICAO has made moves to assist Indonesia with the creation of appropriate mechanisms.[53] ICAO's press release on the initiative[54] notes the agreed objectives include:

> ... a Master Plan for Indonesian legislative improvements on emissions, Green Flights and Green Airports operational programmes, more efficient airspace design utilizing Performance-based Navigation guidelines, advice on appropriate market-based measures, as well as initiatives relating to alternative fuels and the development of a comprehensive emissions inventory.

C. CHINA

China is yet to enact a dedicated law on climate change.[55] There are only policy-level plans and white paper that have been issued. The National Plan for Addressing Climate Change in 2007 is the first overall policy document addressing climate change.[56] In 2008, China also issued a White Paper on China's Policies and Actions on Addressing Climate Change which discusses the impact of climate change on the country and its responses to climate change.[57]

Recently, there is an interesting development in emission trading systems. China has proceeded with the development of pilot emissions trading systems in 7 municipalities and provinces, due to begin in 2013, with a view to a national scheme before 2020 and, in 2012, Shenzhen is one of seven designated areas in which the central government plans to roll out experimental carbon trading programmes

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[52] Angela Dewan, "Indonesian Forest community rejects emissions trading", *Voice of America* (21 July 2010), online: VOA News <www.voanews.com/content/ndonesian-forest-community-rejects-emissions-trading-99010114/122414.html>

[53] ICAO, "ICAO to Assist Indonesia with New Aviation Emissions Reduction Initiatives", PRess Release (27 March 2013), online: ICAO <www.icao.int/Newsroom/Pages/ICAO-to-assist-Indonesia-with-new-aviation-emissions-reduction-initiatives.aspx>

[54] *Ibid*., per Indonesia's Vice Minister of Transportation, Dr. Bambang Susantono.

[55] Climate Change Liability – Transnational Law and Practice, Edited by Richard Lord, Silke Goldberg, Lavanya Rajamani, Jutta Brunnee, Cambridge (2012, New York) "Chapter 6 China" –Deng Haifeng, 117.

[56] *Ibid*.

[57] *Ibid*.

before 2014.[58] The trading scheme will cover 638 companies responsible for 38% of the city's total emissions and eventually expand to include transportation.[59] However, it is doubtful if the scheme will include air transportation.

D. SOUTH KOREA

"Low Carbon, Green Growth" was one of the guiding principles of the former President, Lee Myung-bak's administration. Accordingly, the Presidential Committee on Green Growth was established in January 2009 and the Framework Act on Low Carbon, Green Growth was enacted in December 2009. The foremost reason for the enactment of the Framework Act on Low Carbon, Green Growth is to implement measures to effectively address climate change and energy issues and promote sustainable development.[60] With regard to the transportation field, the Article 53 (Establishment of Low-Carbon Traffic Systems) of the Act set out the principle[61] and the Article 41 of the Enforcement Decree of the Framework Act on Low Carbon, Green Growth provides an obligation of implementing targets.[62] However, air transportation is not included.

As to emissions trading, the Act on *Allocation and Trading of Greenhouse Gas Emissions Allowances* was passed by the Korean parliament in May 2012 with bipartisan support for the legislation, and the Act was followed by the presidential decree which set out the detailed rules governing the scheme. In November 2012, the presidential decree implementing the Korea's emissions trading scheme received official approval which paves the way for the commencement of the ETS

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[58] Jonathan Kaiman, "China unveils details of pilot carbo-trading programme", *The Guardian* (22 May 2013), online: The Guardian <www.guardian.co.uk/environment/2013/may/22/china-carbon-trading-shenzhen>.

[59] Ibid.

[60] Ground for the enactment.

[61] Article 53 (1) The Government shall set and manage goals, etc. for the reduction of greenhouse gases, as prescribed by Presidential Decree, in order to develop the environment for reducing greenhouse gases in the traffic sector and to manage emission of greenhouse gases and energy efficiently.

[62] Article 41 (Targets for Greenhouse Gas Reduction in Traffic Sector)
According to Article 53 (1) of the Act, the Minister of Land, Transport and Maritime Affairs shall establish and implement targets for greenhouse gas reduction, energy saving, and energy efficiency in the traffic sector including each of the following, based on consultation with the heads of the central administrative agencies concerned:

1. Status of greenhouse gases emission and the rate of energy consumption by each means of transportation including automobiles, trains, airplanes, and vessels;
2. Status of greenhouse gases emitted by type of energy;
3. Five-year targets for greenhouse gas reduction, energy saving, and energy efficiency and the implementation plans; and
4. Annual targets for greenhouse gas reduction, energy saving, and energy efficiency and the implementation plans.

in 2015.[63] Although it is confirmed that a sectoral approach will be applied to the ETS, the question as to whether air transportation will be included has not been discussed.

More recently the Global Green Growth Institute (GGGI) was formed - an international organization dedicated to supporting and promoting sustainable economic growth in developing countries and emerging economies. The GGGI was formed in 2012, at the Rio+20 United Nations Conference on Sustainable Development.

According to GGGI, "in contrast to conventional development models that rely on the unsustainable depletion and destruction of natural resources, green growth is a coordinated advancement of economic growth, environmental sustainability, poverty reduction and social inclusion driven by the sustainable development and use of global resources.

GGGI is an interdisciplinary, multi-stakeholder organization that believes economic growth and environmental sustainability are not merely compatible objectives; their integration is essential for the future of humankind."[64] GGGI is headquartered in Seoul.

VI. FULLY OPERATIONAL CARBON-PRICING SCHEMES

Only two countries in the Asia-Pacific region can be said to have developed a full-fledged carbon-pricing mechanism with possible implications for the aviation sector: Australia and New Zealand.

A. NEW ZEALAND

New Zealand's ETS has been in operation since 2008 and was established by *Climate Change Response (Emissions Trading) Amendment Act 2008* which amended the *Climate Change Response Act 2002*.[65] The mandatory NZ ETS currently covers emissions from forestry, stationary energy, industrial processes and liquid fossil fuels, which are collectively responsible for roughly 50 per cent of New Zealand's emissions. Similar to the well understood EU ETS the purpose of the scheme is to create a financial incentive for emitters of carbon to reduce their emissions. It operates by way of some organizations surrendering carbon credits[66] to account for

[63] "Next Steps for Korea's Emissiong Trading Scheme", *Law 360* (2 January 2013), online: Law 360 <www.law360.com/articles/403793/next-steps-for-korea-s-emission-trading-scheme>.

[64] See Global Green Growth Institute, "Council", online: GGGI <gggi.org/about-gggi/people-2/council/>.

[65] Climate Change Response (Emissions Trading) Amendment Act 2008, online: Parliamentary Counsel Office, New Zealand <www.legislation.govt.nz/act/public/2008/0085/latest/whole.html#DLM1130938>.

[66] Known as New Zealand Units (NZUs). One NZU is equivalent to one tonne of carbon dioxide

their direct emissions or those associated with their products. NZUs may be earned or granted by the Government in certain cases.

The NZ ETS addresses emissions from the use of all liquid fossil fuels used in New Zealand such as petrol, diesel, aviation gasoline, jet kerosene, light fuel oil and heavy fuel oil. Consistent with New Zealand's international obligations under the UNFCCC and the Kyoto Protocol,[67] emissions from international aviation and marine transport are excluded from the scheme, but emissions from domestic flights are covered by the ETS regardless of the carrier which purchases the fuel.[68] The importance of domestic aviation in New Zealand should not be understated, even though it is a (relatively) small nation, with a population of only just above 4 million. A 2011 report indicated over 200,000 domestic flights make over 13 million seats annually available to passengers.[69]

B. AUSTRALIA

Australia passed legislation in 2011 to develop a national ETS.[70] The scheme commenced operation on 1 July 2012 and involves a carbon-pricing mechanism fixed for the first three years (2012-15), which will rise at 2.5 per cent in real terms per year. It applies to emissions from domestic aviation, domestic shipping, rail transport, and non-transport use of fuels, but does not apply to household transport fuels, light vehicle business transport and off-road fuel use by the agriculture, forestry and fishing industries. The price is fixed each year for 2012 – 2015, starting at $23 a tonne in 2012–13. From 2015–16 the price was to be set by the market. In place now, following a change in federal government, is a legislative safeguard mechanism which uses historical information on those companies which produce the most greenhouse gas emissions, to in effect cap them.[71] Under the present

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equivalent emissions. Other units can be traded: Ministry for the Environment <http://www.climatechange.govt.nz/emissions-trading-scheme/obligations/surrendering-units.html>.

[67] *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 16 March 1998, 2303 UNTS 148 (entered into force 16 February 2005) [*Kyoto Protocol*].

[68] These are called "obligation fuels" under Regulation 4 of the *Climate Change (Liquid Fossil Fuels) Regulations 2008*, online: Parliamentary Counsel Office, New Zealand <www.legislation.govt.nz/regulation/public/2008/0356/latest/DLM1635601.html>.

[69] See the Oxford Economics Report "Economic Benefits from Air Transport in New Zealand", online: IATA <www.benefitsofaviation.aero/Documents/Benefits-of-Aviation-New-Zealand-2011.pdf>.

[70] See *Clean Energy Act 2011*; *Clean Energy (Consequential Amendments) Act 2011*; Cli*mate Change Authority Act 2011*; *Clean Energy (Unit Shortfall Charge–General) Act 2011*; *Clean Energy (Unit Issue Charge–Fixed Charge) Act 2011*; *Clean Energy (Unit Issue Charge–Auctions) Act 2011*; *Clean Energy (Charges–Excise) Act 2011; Ozone Protection and Synthetic Greenhouse Gas (Manufacture Levy) Amendment Act 2011*; *Carbon Credits (Carbon Farming Initiative) Act 2011*; *Clean Energy Regulations 2011*; *Australian National Registry of Emissions Units Regulations 2011.*

[71] See Australia, National Greehouse and Energy Reporting Act 2007, online: Department of the

Government's policy emissions must be kept under a government mandated limit, and those companies can then pay for credits to pay for emissions that exceed the will cap.

Australia's (then) Department of Infrastructure and Transport noted this measure would fully capture domestic aviation emissions from 1 July 2012, and on the international level "discussions are continuing within ICAO on the development of a market-based measures framework for international aviation … through ICAO".[72]

The carbon price was expected to transition to a flexible price cap and trade emissions trading scheme from 1 July 2015, but due to a change in government policy a new Emissions Reduction Fund, part of the Government's Direct Action Plan to cut greenhouse gas emissions to 5% below 2000 levels by 2020 and to 26 to 28 % below 2005 levels by 2030 was developed and was in consultation at the time of writing. It comprises "a fund to purchase emissions reductions and a safeguard mechanism to ensure that these reductions are not displaced by a significant rise in emissions above business-as-usual levels elsewhere in the economy".[73]

Legislation for the Emissions Reduction Fund was passed in November 2014. This established the framework for the safeguard mechanism in the *National Greenhouse and Energy Reporting Act 200*. The entity with operational control of a designated large facility will be responsible for meeting safeguard requirements, including that the facility must keep net emissions at or below certain baseline emissions levels. The safeguard mechanism will commence on 1 July 2016.

On 28 August 2012, the Australian Minister for Climate Change and Energy Efficiency, and the European Commissioner for Climate Action, announced Australia and the EU will link their ETSs by no later than 1 July 2018,[74] an initiative which has not been retracted, and which would, if pursued, increase the prospect of an inter-continental carbon price in the medium term. This linking of ETSs, as the EU puts it, will form the basis of "bottom-up" linking of compatible emissions

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Environment and Energy <www.environment.gov.au/system/files/pages/dbabd13c-f8f1-49cd-ab40-621f056de35a/files/es-safeguard-rule.pdf>.

[72] *Managing the Carbon Footprint of Australian Aviation*, Australia's Action Plan developed in response to the ICAO 2010 Assembly Resolution A37-10, November 2012.

[73] The Exposure Draft Explanatory Statement sets out the policy behind the reform, and is available online: Department of the Environment and Energy <www.environment.gov.au/system/files/pages/dbabd13c-f8f1-49cd-ab40-621f056de35a/files/es-safeguard-rule.pdf>.

[74] See <www.cleanenergyfuture.gov.au/international-linking/> and European Commission, "Australia and European Commission agree on pathway towards fully linking emissions trading systems (28 August 2012), online: European Commission <ec.europa.eu/clima/news/articles/news_2012082801_en.htm>

trading systems.[75] The benefits advanced by the EU include "reducing the cost of cutting emissions, increasing market liquidity, making the carbon price more stable, leveling the international playing field and supporting global cooperation on climate change."[76] Both Australia and the EU are considering further bilateral links with compatible or "credible international schemes."[77] The EU ETS was also extended to several EU neighbors and negotiations are ongoing for a bilateral EU-Switzerland agreement.[78]

The Australian legislation, at present, contains some flexibility to allow Australian domestic airlines to better manage their carbon-cost liability, somewhat similarly to the way they hedge against fuel prices. Thus, Associate Professor David Hodgkinson notes airlines may opt-in[79] to the Australian ETS from mid-2013 through an arrangement provided for in the *Clean Energy Act 2011* rather than pay a carbon price through amendments to fuel tax credit and excise schemes.[80]

VII. POTENTIAL LESSONS FROM THE REGION GOING FORWARD

The outlook for the international legal resolution of a market based measure for aviation emissions reduction is bleak. But perhaps it is this pessimism which needs to be acknowledged and accepted, to encourage and secure the kind of cooperation needed within ICAO to reach a workable solution.[81]

The alternatives may well stem from the "bottom-up" collective linkages being created between regional or single-state ETSs, such as the bilateral trade link which will be forged between the EU and Australia. This model of cooperation could be an alternative to stalling multilateral negotiations on a global regime.[82] The repetition of bilateral agreements could develop a "minilateral" regime over the

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[75] International Carbon Market (Policies on Emissions Trading System), online: European Commission <ec.europa.eu/clima/policies/ets/linking/index_en.htm>.

[76] *Ibid*.

[77] See *supra*, note 27.

[78] *Ibid*. see also European Commission, "International carbon market", online: European Commission <ec.europa.eu/clima/policies/ets/markets/index_en.htm>.

[79] See "See you in court: solving aviation emissions is an international mess", The Conversation (7 February 2012), online: The Conversation <theconversation.com/see-you-in-court-solving-aviation-emissions-is-an-international-mess-5183>.

[80] Part 3, Division 7 of the *Clean Energy Act 2011*, and *Clean Energy Regulations 2011*.

[81] See comments by Associate Professor David Hodgkinson at online: the Conversation <theconversation.com/not-even-nobel-prize-winners-can-fix-aviation-emissions-13266>.

[82] See David Hodgkinson , "Airlines, climate change and carbon pricing", online: Clayton UTZ <www.claytonutz.com.au/publications/edition/08_december_2011/20111208/airlines_climate_change_and_carbon_pricing.page>.

shorter term.[83] In such a "minilateral" regime, umbrella global agreements would only need to define how these national or regional regimes interact with each other in relation to, for example, the controversial charging of aviation emissions over the high seas. Whereas the "minilateral" regime on ETS could be cross-sectoral, global agreements may be more efficiently negotiated where they seek to address international aviation emissions, within the auspices of specialized organizations such as, with regard to aviation, ICAO.

With regard to aviation at least, a "minilateral" approach could most practically be fostered through the auspices of international organizations, whereas a purely multilateral approach on the market based measures themselves, and their multilateral harmonization, would necessitate considerable aero-political wrangling. If the regional clusters of ETSs produce and accede to their own acceptable regional aviation market-based measures (minus international aviation emissions), then ICAO need only broker a deal amongst the regional clusters to agree on how those clusters will deal with each other in terms of *international* emissions (e.g. each region bilaterally and reciprocally agree to include provisions for 50% of the emissions over the high seas for flights between both regional clusters, to avoid double imposition (or payments) by carriers of all the relevant states). Such proposals may find favour with airlines.[84]

A further advantage of a bilateral approach is that, while it is not the most elegant or logically satisfying of solutions, bilateralism and regionalism has a strong history of *actually working* in public international, and public international *aviation* relations. The complex patchwork of air services agreements in place around the world was arguably brought about by the failure of the International Civil Aviation Conference of 1944[85] to accomplish a multilateral exchange of traffic rights (except in a limited sense, as a side agreement).[86] However, that system has been a workable and productive means of ensuring the growth of international air transport, and has ensured its economic sustainability since ICAO's inception. Notably, not a single multilateral agreement on the commercial aspects of international air transport has been successfully implemented thus far."[87]

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[83] Kati Kulovesi, "Addressing Sectoral Emissions outside the United Nations Framework Convention on Climate Change: What Roles for Multilateralism, Minilateralism and Unilateralism?", (2012) 21(3) Review of European Community and International Environmental Law 193.

[84] Airlines typically need certainty of regulation on which to base their operations, and it is their shoulders (and on whose customers' shoulders) imposts from market based measures will ultimately fall.

[85] The conference resulted in the adoption of the Convention on International Civil Aviation signed at Chicago.

[86] Paul S Dempsey, *Public International Air Law*, (Montreal: Centre for Research in Air and Space Law, 2008) at 43.

[87] For example, in 2001 the United States signed the Multilateral Agreement on the Liberalization of International Air Transportation (MALIAT) with Brunei, Chile, New Zealand, and Singapore. Likewise, there is the EU-US Open Skies Agreement signed in 2007 and which became effective 30

VIII. CONCLUSION

Albeit challenging, it is important to make every effort to come up with a global approach through ICAO. IATA's resolution on "Implementation of the Aviation Carbon-Neutral Growth (CNG2020) Strategy" shows that the principal stakeholders who will be regulated by, and be required to comply with, any multilateral market based measure could in fact reach a global compromise, despite the very different circumstances faced by fast-growing airlines in emerging markets, and those in more mature markets. If, however, the 38th ICAO General Assembly were to conclude without substantial results contrary to the high expectations, alternative approaches should be considered.

Whether the EU-Australia approach, or others like it will succeed and thereby prompt the kind of "minilateralism" discussed herein, remains to be seen. The authors consider the Asia Pacific region may hold the conceptual key to a potential global solution for market based measures in reducing international aviation emissions, in the potential experimental joining of the Australian and EU carbon markets. As with the current state of play with air services agreements, which has taken over 60 years to develop, it may be a considerable time before such an approach (without further guidance from ICAO) results in the newly emerging Australia-EU type arrangement spurning further partners in the region, and thereafter stimulating expansion of such clusters elsewhere. However, it is clear that the needs of the region demand acceleration of international emissions mitigation regulatory progress.

March 2008, and the ASEAN Multilateral Agreement on Air Services adopted on 12 November 2010.

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