Trade and Sustainable Energy Series



Addressing the Aviation and Climate Change Challenge

A Review of Options

By Markus W. Gehring and Cairo A. R. Robb

ICTSD

International Centre for Trade and Sustainable Development

Issue Paper No. 7

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Published by

International Centre for Trade and Sustainable Development (ICTSD)
International Environment House 2
7 Chemin de Balexert, 1219 Geneva, Switzerland

Tel: +41 22 917 8492 Fax: +41 22 917 8093
E-mail: ictsd@ictsd.ch Internet: www.ictsd.org

Publisher and Director: Ricardo Meléndez-Ortiz
Programme Manager: Ingrid Jegou
Programme Officer: Joachim Monkelbaan

Acknowledgments

This paper stems from and has been informed by extensive multistakeholder Dialogues, networking and research undertaken under the Global Platform of Climate Change, Trade and Sustainable Energy of ICTSD. Notable occasions were policy dialogues on 13 April 2012 in Geneva and on 8 August 2012 in Beijing. Terms of reference, guidance and review has been carried out by Joachim Monkelbaan from ICTSD.

The authors are grateful to various experts for their valuable discussions, constructive comments on drafts and other inputs, notably Andre Stochniol, Bill Hemmings, Freya Baetens, Patrick Reynaud, Moritz Moelle, Avidan Kent and Marie-Claire Cordonier Segger. This paper shares some thoughts with the first author's previous work and his CISDL collaborators.

This paper has been produced under the ICTSD Programme on Climate Change and Energy.

ICTSD wishes gratefully to acknowledge the support of its core and thematic donors, including: the UK Department for International Development (DFID); the Ministry for Foreign Affairs of Finland; the Swedish International Development Cooperation Agency (SIDA); the Netherlands Directorate General of Development Cooperation (DGIS); the Ministry of Foreign Affairs of Denmark, Danida; and the Ministry of Foreign Affairs of Norway.

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ICTSD welcomes feedback and comments on this document. These can be forwarded to Joachim Monkelbaan(jmonkelbaan@ictsd.ch).

Citation: Gehring , Markus W.; Robb, Cairo A. R.; (2013); *Addressing the Aviation and Climate Change Challenge: A Review of Options;* ICTSD Programme on Climate Change and Energy; Issue Paper No. 7; International Centre for Trade and Sustainable Development, Geneva, Switzerland, www.ictsd.org.

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ISSN 1995-6932

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LIST OF ABBREVIATIONS AND ACRONYMS

ATAA	Air Transport Association of America
CAEP	Committee on Aviation Environmental Protection
CBDRRC	Common but differentiated responsibilities and respective capacities
CDM	Clean Development Mechanism
CNG	Carbon-neutral growth
ETS	Emissions Trading System
GHG	Greenhouse gas
IATA	International Air Traffic Association
ICAO	International Civil Aviation Organisation
IMERS	International Maritime Emission Reduction Scheme
IMO	International Marine Organisation
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
LDC	Least-developed countries
MBM	Market-based measure
MRV	Monitoring, reporting and verification
RM	Rebate Mechanism
SARP	Standards and Recommended Practices
UNCLOS	United Nations Convention on the Law of the Sea
UNFCCC	UN Framework Convention on Climate Change
WTO	World Trade Organisation

FOREWORD

Greenhouse gas (GHG) emissions from aviation may be relatively small, but they are rising rapidly. In order to address this, the EU decided to include aviation in its Emissions Trading System (EU ETS) in early 2012. Emissions from transporting imported goods are included in the scheme together with domestic emitters in order to prevent carbon leakage and loss of competitiveness, and increase the impact of the scheme.

This led to great controversy with a mix of different countries outside the EU. Some of these countries which are against the inclusion of aviation in the EU ETS have indicated that they will take the EU to WTO dispute settlement and have adopted legislation that forbids their airlines to comply with the EU ETS as they see the EU measure as a challenge to their sovereignty and commercial interests, and as a violation of related international law. The ruling by the European Court of Justice in December 2011 that the inclusion of aviation into the ETS is legal, has not been able to temper the disagreement. Still, the EU is investigating the inclusion of maritime shipping into the EU ETS as well.

Meanwhile, other countries, including developing and emerging economies, have also taken action on emissions from aviation through more efficient airspace design, consideration of appropriate market-based measures (MBMs), as well as initiatives relating to alternative fuels and the development of a comprehensive emissions inventory.

The EU's activism results from its concern over a lack of progress in negotiations on climate change at the International Civil Aviation Organisation (ICAO). After recent hopeful signs for an outcome in ICAO, the European Commission proposed to put the inclusion of aviation in the EU ETS on hold in order to give ICAO time to deliver at its next (38th) triennial ICAO Assembly in September 2013. This linkage of the EU ETS with an outcome in ICAO has put considerable pressure on the global aviation organization to come up with an acceptable work plan on climate change.

In this context, the political will needs to be focused on making decisions that are both feasible and environmentally effective. In order to channel that political will, creative ideas need to be gathered that can resolve outstanding legal and economic concerns.

The purpose of the paper in front of you is to present some ideas and map out options for the related negotiations at ICAO and elsewhere. Amidst conflict over which measures to take, this paper offers a fresh view on some possible options, for example on new generations of biofuels, carbon accounting and smart traffic management.

An earlier ICTSD Issues Paper, written by Jasper Faber and Linda Brinke, focused on the economic and environmental effects of the inclusion of aviation in the EU ETS. The paper found that a carbon price in the aviation sector has small economic impacts overall, with the exception of specific sectors in far-off countries. Some questions on the EU's measure related to its legality under WTO law were addressed in a subsequent paper by Lorand Bartels. That paper found that the inclusion of aviation in the EU ETS is very likely to pass the scrutiny of WTO law.

While the current paper builds on this earlier work done by ICTSD in the field of aviation and climate change, it goes beyond reviewing the legality and economic impacts of specific measures and seeks solutions with an eye on the wider goal of sustainable development.

Dr Markus Gehring is Deputy Director of the Centre for European Legal Studies (CELS), Fellow and Director of Studies in Law at Hughes Hall and a Fellow of the Lauterpacht Centre for International

Law. He serves as Lead Counsel for Sustainable Trade, Investment and Finance Law with the Centre of International Sustainable Development Law (CISDL), based at McGill University. He has been a Visiting Professor in several law faculties around the world and holds a Jean Monnet Chair *ad personam* in Sustainable Development Law at the University of Ottawa Law Faculty in Canada.

Cairo A. R. Robb was called to the Bar of England and Wales in 1993 and works as a freelance legal researcher and editor. She currently serves as a legal research fellow with the CISDL. She edited the International Environmental Law Reports (Cambridge University Press), while she was a Research Fellow at the University of Cambridge. On secondment from the University of Cambridge to the UK Department for Environment, Food and Rural Affairs (DEFRA) in London, Cairo spent two years working as a Policy Advisor at DEFRA's Sustainable Development Unit.

This paper is part of a series of issue papers produced in the context of ICTSD's Global Platform on Climate Change, Trade and Sustainable Energy. Through the Global Platform, ICTSD promotes action on climate change that is prompt but at the same time equitable, effective, and non-discriminatory. This is part of a continuous endeavour to offer constructive solutions within existing but evolutionary policy frameworks. We hope you will find this paper to be stimulating and informative reading material that is useful for your work.

Ricardo Meléndez-Ortiz
Chief Executive, ICTSD

EXECUTIVE SUMMARY

Greenhouse gas emissions from aviation are rapidly increasing. The EU and Norway, Iceland and Switzerland argue there is no other way to reduce greenhouse-gas emissions from aviation but through the inclusion of aviation in the EU Emissions Trading System (ETS). Meanwhile, a coalition of developing and North American countries sees this expansion as a breach of sovereignty and of international law. Based on a complaint by several US airlines, the European Court of Justice ruled in December 2011 that the inclusion of aviation into the ETS is legal under international law. Since then, the two opposing sides have become even more entrenched in their positions.

The EU has included aviation in the EU ETS based on its concern about what it sees as insufficient action on the part of the International Civil Aviation Organisation (ICAO) on climate-change issues, but has acknowledged more recent positive signs. The European Commission has decided to "*stop the clock*" on inclusion of aviation in the EU ETS in order to give ICAO time to deliver at its next (38th) triennial ICAO Assembly in September 2013. In the face of a potential confrontation, ICAO has become much more active in its search to overcome the deadlock. The EU also faces criticism based on a possible violation of the common but differentiated responsibilities and respective capacities (CBDRRC) principle. While the EU argues that this principle only applies to countries and not to international businesses operating through the EU market, others argue in favour of an ETS because depending on its design, it can differentiate burdens between developed and developing countries.

In this paper, the motivation and the legal positions of the most important actors are identified in the field of aviation and climate change. It analyses the political context and alternatives for the aviation and climate-change challenge, focusing on the growing importance of emerging powers and their perspectives, and drawing on comparative lessons learned from other similar problems such as noise from aircraft.

From this, it can be concluded that adopting a principled approach is more likely to be successful in avoiding a renewal of the deadlock. Applying the fundamental principles of sustainable development in the negotiations would balance the aviation industry's climate and economic concerns. The paper proposes to satisfy ICAO's on-going search into the feasibility of global market-based measures (MBMs) through a scheme focusing on a Rebate Mechanism (RM), which will be added to revenue-raising MBMs such as a levy/charge or ETS. In the aviation industry, a switch to the use of more advanced technologies, for example lighter airplanes which are constructed incorporating less metal and more carbon-based materials, would make the industry more sustainable. Finally, to increase governmental and public support, a wider framework for mitigation efforts against climate change should be created.

ICAO is tasked under the UNFCCC to lead global action to reduce GHG emissions from aviation. The non-binding framework of ICAO creates a haven where States remain free to work within or outside ICAO to develop a consensual treaty-based approach to mitigate carbon emissions. The insistence of ICAO on using MBMs will limit the options for dealing with carbon emissions by airlines. Even global mandatory offsetting of emissions, global mandatory offsetting with some revenue-generating mechanism and a global emissions trading system (cap-and trade system) seem unfeasible and create scepticism.

Against the background of confrontation and looming disruption in the aviation sector, it is important to review all possible options and seek creative solutions that could move the debate. Some of the options which this paper considers are:

- Possibilities of reliance on second or third-generation biofuels,
- Cost–neutral environmental measures,
- Carbon accounting, and
- Smart traffic management.

Creative solutions to this challenge have to go beyond the legal aspects into an economic, social and environmental analysis to find a lasting, sustainable solution for emissions from aviation. It is against this background that the authors propose a state-centred approach creating a legally binding stand-alone treaty, which is administered by ICAO or the UNFCCC secretariat.

1. BACKGROUND / CONTEXT

The challenge that links aviation with climate change is straightforward. As the number of people travelling increases, the use of jet fuel for aviation grows and greenhouse gas (GHG) emissions increase. This threatens to destabilize the world's climatic systems, the consequence of which will cost the global economy billions of dollars. Although figures vary, a report from the Intergovernmental Panel on Climate Change (IPCC) estimates that aircraft currently *"contribute about 3.5 percent of the total radiative forcing (a measure of change in climate) by all human activities."*[1] It is widely accepted that this figure will rise,[2] and the IPCC has predicted that it could rise to as much as 15 per cent by 2050.[3] Carbon dioxide emissions from aviation were expected to grow by 176 per cent between 1990 and 2050;[4] however, newer studies suggest growth in the order of 300 per cent.[5] Concerns over this situation led the European Commission to propose the inclusion of aviation in the EU ETS. The purpose, as stated in the preamble of Directive 2008/101/EC, is to try to prevent growth in aviation from undermining reductions in other sectors: *"If the climate change impact of the aviation sector continues to grow at the current rate, it would significantly undermine reductions made by other sectors to combat climate change."*[6]

Under the 1992 UN Framework Convention on Climate Change (UNFCCC), the 1997 Kyoto Protocol tasks ICAO to secure the reduction of GHGs from aviation.[7] However, progress in ICAO has proven excruciatingly slow. Since the introduction of measures to include aviation in the EU ETS, more notable movement from ICAO may be observed. In July 2012, the ICAO Council's Committee on Aviation Environmental Protection (CAEP) adopted an Aircraft Carbon Dioxide (CO2) Emissions Calculation System as the first building block towards a global CO2 standard for new aircraft.[8] On 9 November 2012, the ICAO Council announced it was forming a special High-level Group (HGCC) to provide near-term recommendations on a series of policy issues which have arisen in the course of ICAO's ongoing research into the feasibility of a global market-based measure (MBM) scheme appropriate to international aviation (i.e. global MBM feasibility). It will also examine ICAO's development of a policy framework to guide the general application of any proposed MBM measures to international air transport activity (i.e. framework for national and regional MBMs).[9] These steps on 12 November 2012 led the EU to propose the suspension of the application of its ETS to international flights.[10]

Given the looming potential for a trade war,[11] these latest developments provide the global community with a unique possibility to explore creative alternative solutions to the challenge. This legal working paper proposes that adopting a principled approach in order to avoid a renewed deadlock at the next triennial ICAO Assembly in September/October 2013 or beyond. While international civil aviation regulation has traditionally been adopted in ICAO, this paper will also discuss whether the exclusive focus on ICAO in the context of aviation and climate change is still warranted (especially if and when the Kyoto Protocol is replaced by a comprehensive, international, and legally binding instrument to be adopted by the parties to the UNFCCC).

It is premised on two basic assumptions, though these might in turn be controversial. First, the paper assumes that something needs to be done about climate change in general and GHG emissions from aviation in particular. Second, the paper assumes that a multilateral solution is preferred, rather than leaving it to regional groups or individual countries to act unilaterally.

In order to develop its proposals, the paper starts with a review of the EU Directive alongside so-called counter-initiatives, such as the Delhi Joint Statement by the BASIC countries and the Moscow Declaration by the Coalition against the EU ETS. After briefly explaining the motivation and legal positions of these important actors, it

identifies several steps/ways forward that could avert a major confrontation in this economic sector. It analyzes the political context and alternatives for the aviation and climate change challenge, focusing on the growing importance of emerging powers and their perspectives, and drawing on comparative lessons learned from similar problems such as noise from aircraft. Taking the view that a principled approach is more likely to be successful, it suggests initial guiding principles for creative solutions, analyzes the feasibility of certain proposed solutions, and reviews the potential institutional frameworks that are available. An important part of the paper is devoted to the viability and legality of the various proposals, be they confrontational or consensual. The paper also notes alternatives to economic instruments, such as command and control, efficiency standards, carbon accounting and flight management, before concluding with a set of concrete sustainable development-oriented recommendations.

1.1 Law, Aviation and the EU ETS[12]

1.1.1 Background

Following the Lisbon Treaty, combating climate change is a Treaty objective for the EU with regard to the Union's international relations as well as to its internal environmental laws.[13]

After advocating for carbon taxes in the 1990s, the European Commission shifted its approach in line with the Kyoto Protocol, and now considers emissions trading the best way to address GHG emissions from various sources, given the less significant impacts on economic growth. Emission trading is widely recognized as an important policy and regulatory instrument in the transition to a greener economy.[14]

The EU ETS is a cornerstone of the EU's efforts to curb GHGs and combat climate change. It was established in Directive 2003/87/EC, which set up a scheme for GHG emission allowance trading within the Union.[15] The Directive promotes *"reductions of greenhouse gas emissions in a cost-effective and economically efficient manner."*[16] The EU ETS has a cap that is reduced every year. It is expected to deliver an overall 21 per cent reduction in industrial GHGs by 2020.[17]

In 2008, the EU ETS was expanded to include emissions from the aviation sector, with effect from 2012.[18] Flights are now considered a source, and each airline company must report verified emissions data each year and surrender a number of allowances equal to the amount of GHGs emitted. The justification for the expansion of the EU ETS is elucidated in the Directive, which underlines that *"the Sixth Community Environment Action Programme … provided for the Community to identify and undertake specific actions to reduce greenhouse gas emissions from aviation if no such action were agreed within ICAO by 2002,"* based on the broader environmental concern that "if the climate change impact of the aviation sector continues to grow at the current rate, it would significantly undermine reductions made by other sectors to combat climate change."[19] What this means is that, as of 2012, the number of allowances necessary for each flight to or from the EU is calculated on the basis of the entire flight. Thus, on a flight from Los Angeles to Heathrow, the airline would have to surrender allowances for its voyage over US territory and the high seas – not just over UK airspace. In the absence of any international agreement on the matter, the EU has settled upon a framework that allocates responsibility for aviation emissions to the departure state. Under the EU ETS, incoming flights can be exempted if the EU recognizes that the departure state is taking appropriate measures to limit aviation emissions from departing flights. Where this is not the case, the EU – as the arrival state – has asserted the right to step in.[20]

While the extension of the EU ETS to cover aviation emissions was controversial within the EU,[21] it was greeted with a unique level of hostility from many other parts of the world. Few other policies have united countries as diverse as China, Russia, the US, Canada, India and Saudi Arabia in their opposition to a measure.

1.1.2 Court of Justice of the European Union – *ATAA and Others*

The Air Transport Association of America (ATAA) and individual US and Canadian airlines tried to rely on the UK legal system to challenge the legality of the extension before its implementation, on the grounds that the Directive was unlawful under international law. However, in its preliminary ruling in *ATAA and Others,* the European Court of Justice (CJEU) delivered a ground-breaking decision,[22] which represented a resounding victory for the EU and its Member States in confirming the EU position on the legality of the inclusion of international aviation emissions within the EU ETS.

The legal and political implications of the CJEU ruling are significant. The UK High Court Administrative Division requested a preliminary ruling from the CJEU on two sets of legal questions: the first required the Court to consider the direct effect of international law before national courts; the second set required the Court to consider whether the inclusion of international aviation in the EU ETS violated any principles of customary international law or international treaties.

First set of questions: Direct effect of international law in national courts

The first set of questions considered by the Court concerned the direct effect of international law before national courts. The CJEU had to answer questions that were being widely debated in EU external relations law: Can citizens rely on all parts of international law, including customary international law, to challenge EU law?

The CJEU clarified and expanded the existing boundaries of direct effect. The applicants – ATAA, US and Canadian airlines – alleged that the EU law extending the EU ETS to international aviation violated the Chicago Convention, the Kyoto Protocol, and the EU-US Open Skies Agreement, as well as several customary international principles concerning territorial sovereignty and freedom of the high seas.

The Court started with a summary of the previous case law and reinstated the three-part test under which the validity of Union law can be challenged by relying on international law. First, the EU must be bound by the rule of international law; second, the nature and broad logic of the rule must not preclude review of Union law; and third, the rule must also be unconditional and sufficiently precise.

Applying this test, the Court found that the Chicago Convention was not binding on the Union,[23] and that the Kyoto Protocol provisions were not considered sufficiently clear and precise to constitute a basis for review. On the other hand, it found that the EU-US Open Skies Agreement, analyzed through three specific provisions, was sufficiently clear and precise and that, along with recognized customary international law, it did have direct effect. The Court, however, insisted on a lower threshold of judicial review, being willing to find a violation only in cases of manifest error of assessment by the Union institutions.

Second set of questions: Does the EU ETS extension to international aviation breach international law?

The Court then had to consider the second set of questions concerning whether extension of the EU ETS to international aviation violates international law.

The Court reviewed the EU ETS extension to aviation and found no manifest errors regarding customary principles and no violation of the EU-US Open Skies Agreement. The parts of the Court's judgement dealing with jurisdictional principles and the legality of economic instruments are particularly significant.

Jurisdictional principles – a new legal standard

The applicants had asserted a violation of jurisdictional principles. Advocate General Kokott advised the Court in October 2011.[24] In her view, no violation of jurisdictional principles arises in *ATAA and Others*, because the inclusion of aviation in the EU ETS is covered by the EU's territorial jurisdiction. One

of her main arguments was that, even though the scheme does, to some extent, take into account events occurring over the high seas or on the territory of third countries, which might indirectly give airlines an incentive to conduct themselves in a particular way when flying over non-EU territory, *"there is no concrete rule regarding their conduct within airspace outside the European Union."*[25]

She also made a controversial reference to the effects doctrine, traditionally only invoked in competition law, when a cartel has direct impact on a jurisdiction of which it falls outside.[26] Her invocation of this doctrine has interesting consequences for a regulatory matter such as climate change, which arguably affects every country, including all EU Member States. Her argumentation could be used to justify further measures to mitigate climate change that target activities outside of national jurisdiction.[27]

The CJEU largely agreed with the Advocate General. The Court decided that the EU had not overstepped any jurisdictional principle in applying the EU ETS to entire international flights. The Court thus reasserted full territorial jurisdiction over aircraft landing or taking off in the EU and pointed out that overflying aircraft do not have to comply with the ETS as they can choose whether or not to have the EU as a destination.

Building on its findings in the *Ahlstrom*[28] and *Commune de Mesquer*[29] cases, the CJEU opened further regulatory space beyond EU borders for addressing environmental issues such as climate change. More specifically, it adopted a new legal standard, stating:

"the fact that, in the context of applying European Union environmental legislation, certain matters ***contributing to the pollution of the air, sea or land territory of the Member States originate in an event which occurs partly outside that territory*** *is not such as to call into question, in the light of the principles of customary international law capable of being relied upon in the main proceedings, the full applicability of European Union law in that territory."*[30]

The Court's conclusions support and have far-reaching consequences for shaping the EU's position on aviation emissions and climate change. Many environmental problems do not stop at national or even regional borders. This interpretation of the EU's jurisdiction in the international sphere arguably expands the EU's regulatory competence to address environmental challenges of a transnational nature, especially climate change, which is a global challenge.[31]

Market-based measures not qualifying as tax or similar charge

The applicants also asserted that inclusion of aviation in the EU ETS amounted to an illegal tax on fuel in violation of the EU-US Open Skies Agreement and the Chicago Convention. Advocate General Kokott dismissed this further challenge. She argued that *"charges are levied as consideration for a public service used. The amount is set unilaterally by a public body and can be determined in advance. Other charges too, especially taxes, are fixed unilaterally by a public body and laid down according to certain predetermined criteria, such as the tax rate and basis of assessment."*[32] She concluded that the EU ETS, as a MBM, does not qualify for this definition.

The Court agreed. Distinguishing the decision in *Braathens*,[33] and relying on its findings in *Arcelor Atlantique et Lorraine and Others*,[34] the Court examined the design of the EU ETS as an economic instrument, differentiating its *"economic logic"* from a tax or similar charge.[35] The Court took into consideration that *"unlike a duty, tax, fee or charge on fuel consumption, the scheme … apart from the fact that it is not intended to generate revenue for the public authorities, does not in any way enable the establishment, applying a basis of assessment and a rate defined in advance, of an amount that must be payable per tonne of fuel consumed for all the flights carried out in a calendar year."*[36]

This decision is important for the future design of EU economic instruments to internalize environmental costs. While simple fuel consumption taxes might be easier to administer, they may run counter to international obligations, such as the Chicago Convention.[37] In the EU's view, as shaped by the Court, there is clearly flexibility for the Union to introduce or expand emissions trading schemes. Indeed, the further expansion of the EU ETS, for instance to cover shipping, is a further option.

Outstanding issues

While the CJEU found no violation of international law resulting from the inclusion of the aviation sector in the EU ETS, the Court's decision does not, of course, preclude review of the legality of the measure in other fora. From a World Trade Organisation (WTO) law perspective, there may remain open questions, such as the argument that all obstacles to international transport (including air transport) constitute illegal discrimination against foreign traders.[38] If such discrimination were argued, a possible defence may be that the EU ETS is actually a case of reverse discrimination, given that EU traders already have to pay to comply with the EU ETS for internal EU flights. Alternatively, the EU ETS may be justified under the GATT general exception in Article XX – if protection of plant, animal and human life and health are interpreted broadly or the global climate is defined as an exhaustible natural resource.[39]

An argument that the CJEU did not examine is that expansion of the EU ETS in this way may be seen as violating the principle of CBDRRC.[40] This argument has been raised within the EU itself and is high on the agenda of the rising powers opposed to the inclusion of aviation in the EU ETS.[41]

Nor, following the finding that the Kyoto Protocol did not have direct effect, did the CJEU consider the substance of the argument that the expansion of the EU ETS to cover GHG emissions from aviation constituted a violation of the Kyoto Protocol in as much as the Protocol mandates ICAO to deal with GHG emissions from aviation.[42,43] It was, in any case, arguably a moot point, given the failing efforts of ICAO to fulfil its mandate under the Kyoto Protocol.

Nevertheless, the EU's legal review of direct effect, jurisdiction over transboundary problems, and the legality of economic instruments highlight some of the more complex legal problems in this debate. The EU external relations dimension of environment and sustainable development law is still under development. Law and policy-makers are only just starting to understand the international arrangements needed to establish a functioning and accountable carbon pricing system for Europe, and its constitutional and international implications are potentially enormous. It remains preferable – by a wide margin – to come to a multilaterally agreed solution as, ultimately, a global problem like climate change cannot be addressed with a made-in-the-EU solution alone.

1.2 EU Suspension of ETS Applicability to International Flights

In deference to its preference for a multilaterally agreed solution, and despite its victory in the ATAA case, the EU Commissioner for Climate Action has responded to what she views as recent positive developments within ICAO by announcing a suspension of the applicability of the EU ETS scheme to international flights[44] in order to *"create a positive atmosphere" and "[pave] the way for strong decisions to be taken by the next ICAO General Assembly"* taking place in September/October 2013.[45]

The Commissioner is clear however that *"if this exercise does not deliver … then needless to say we are back to where we are … with the EU ETS. Automatically."*[46]

The Commission proposal was approved by the European Parliament and the Council on 24 April 2013. The deferred obligations under the Directive will apply automatically to international flights when the year-long derogation runs out,[47] unless the EU Council and Parliament agree further steps based on a proposal from the Commission in the light of the results of the 38th ICAO Assembly.[48,49]

The reasons why the EU is more hopeful that ICAO might be the right forum for climate and aviation are principally three-fold. First, there are now concrete discussions about an ICAO framework for MBMs (focused on national and regional measures) with technical discussions on how to implement them. The EU hopes that ICAO will adopt guidance on how to treat international flights, and favours the departing flight approach. Second, there is also the opportunity for at least agreement in principle on a global MBM. Third, the EU is also hopeful that other measures could be adopted: *"There exist several technological and operational measures (e.g. state action plans, CO2 aircraft standards) to reduce the climate impacts of aviation. The EU is in favour of these measures and supports such action. However, the EU considers that these measures are on their own insufficient to deliver the necessary emission reductions."*[50]

1.3 Legal and Policy Reactions from the Rest of the World (with a Focus on BASIC Countries, the US and China).

As noted above, countries that are important for global GHG emission reduction efforts – including China, India and the US – disagree with the EU's steps, including the Court's decision as to EU jurisdiction.

1.3.1 BASIC coalition

The Environment Ministers of the BASIC coalition (Brazil, South Africa, India and China) expressed deep concern about what they called *"unilateral action"* insisting that climate change is a multilateral problem and requires a multilateral approach to address it.[51]

Countries strongly opposed to the EU measures are implementing or considering different policy and legal options, with the aim of barring their airlines from participating in the EU ETS.[52]

1.3.2 India

India is one of the leaders of the opposition. States opposed to the EU ETS met first in New Delhi in September 2011 where they adopted the New Delhi Declaration. The Declaration emphasizes the need to foster development of a full range of solutions that achieve performance improvements and acknowledges ICAO as the international organ which should regulate the issue at stake.[53] India has prohibited its national airlines from buying carbon credits or submitting emissions data to the EU.[54] It was vocal in its opposition to the extension of the EU ETS to international aviation at the Durban and Qatar climate summit and is said to be considering launching a WTO dispute.[55] However, India and the EU started negotiations for a Free Trade Agreement in 2007, which includes the goods and the service sectors. As it may be difficult to bring the agreement through the European Parliament if India ignores the EU's ETS aviation law,[56] there might therefore be scope for a trade-off between the EU and India.

1.3.3 China

China has prohibited its airlines from paying for ETS allowances. It believes that the EU lacks the necessary authority to regulate *"global greenhouse gas emissions resulting from aviation activities."*[57] China also argues that, by adopting the Directive, the EU has disregarded the principle of CBDRRC in the UNFCCC[58] and the Kyoto Protocol, by virtue of which it believes developing states are not obliged to mitigate their greenhouse emissions.[59] In recent international climate negotiations, however, China showed more flexibility in accepting mandatory responsibilities – though it refuses to assume responsibility in the same way as developed states. According to China's own plan, airline emissions will be reduced by three percent per tonne-kilometre in 2015 compared to 2010 levels.[60] In China's view, the EU Member States are bound by the Chicago Convention, and their obligations under it contradict their obligation under European Community law to implement the Directive.[61] China also holds the view that the Directive violates bilateral agreements on Civil Air Transportation between China and twenty-one EU Member States, and potentially challenges the principle of special and differential treatment in WTO GATS.[62] At the recent 4th ICAO Symposium on Aviation and

Climate Change held in May 2013, the Focal Point for China made clear that China will continue to be proactive and cooperate with other countries to make its due contribution to solving the problem of GHG emissions.[63]

1.3.4 Russia

Russia hosted a meeting to coordinate countermeasures with representatives from at least twenty-six nations, resulting in the Moscow Declaration.[64] The Declaration confirms the opposition of signatory countries to the inclusion of international civil aviation in the EU ETS and sets out a basket of nine retaliatory measures for signatories to consider. Russia shows no intention of backing down. In June 2012, Russia refused new overflight rights to Finnair as a response to the EU ETS, and it intends to do so with other EU-based carriers.[65] Russia is concerned that the EU ETS will have *"adverse impacts on international aviation,"*[66] and has emphasized that the basket of possible actions contained in the Moscow Declaration can and will be used at every state's discretion. The Russian Deputy Transport Minister has stated that *"every state will choose the most effective and reliable measures which will help cancel or postpone the implementation of the EU ETS."*[67] Most recently, at the ICAO Symposium on Aviation and Climate Change, Russia's representative firmly rejected MBMs.[68]

1.3.5 United States

The US passed the European Union Emissions Trading Scheme Prohibition Act of 2011 on 27 November 2012. The statute gives the US Secretary of Transportation the power to prohibit US airlines from complying with the EU ETS if he considers US interests are being harmed.[69] It has not escaped the notice of commentators that there is a certain irony in the US position. Outside the aviation sector, the US routinely adopts laws with extraterritorial implications. It has many laws with much more tenuous connection to activities in foreign countries, for example in securities regulation or international taxation.[70] The US continues to advocate the view that any national or regional MBM should relate only to emissions in its national airspace or Flight Information Region.[71]

1.3.6 Countries seeking to link with EU ETS

In contrast to those opposing the EU measures, other countries are seeking to link their schemes with the EU ETS. The environmental integrity group (Switzerland, Mexico and South Korea) have all adopted national legislation concerning emissions trading. Switzerland may link its national ETS market with the EU ETS by 2014 and has drawn up national legislation that includes civil aviation in its national ETS, which might now be in jeopardy after the EU Commission's U-turn.[72] Australia and the EU have now also formally agreed to start negotiations to link the EU ETS and the Australian emission trading scheme which will follow their existing carbon tax, and Brussels is hoping to negotiate similar agreements with California (the eighth biggest economy in the world), South Korea and China.[73]

1.4 International Politics of ICAO and GHG Emission Reduction Actions[74]

ICAO was tasked, under the Kyoto Protocol, to lead global action to reduce GHG emissions from the aviation industry. While it asserts that it can take a leading role in tackling the environmental impact of air transport, ICAO has faced various challenges in the adoption of effective climate change measures.

ICAO Mandate Under the Kyoto Protocol

In the negotiations leading to the Kyoto Protocol, states party to the UNFCCC discussed how to include emissions from the international aviation sector in a global climate change agreement.[75] These discussions focused on how to allocate international aviation GHG emissions among contracting States.[76] Various options were debated, including a division of emissions between the countries of origin and destination, assigning allowances based on the countries that purchased or sold jet fuel, or assigning allowances based on the nationality of aircraft.[77] No agreement on this issue was reached. Although states party to the Kyoto Protocol must

report emissions from the international aviation sector in their national GHG inventories, these emissions are not included in the calculation of developed countries' emission reduction commitments.[78] As a compromise, Article 2.2 was inserted into the Kyoto Protocol with the aim of promoting continued dialogue: *"The Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively."*[79]

As such, the Parties are to pursue emission reductions from aviation, working through ICAO. In 1944, ICAO was established by the Chicago Convention[80] with the mandate to promote the safe and orderly growth of civil aviation and to foster the planning and development of international air transport.[81] The Chicago Convention does not address GHG emissions from the aviation sector. However, ICAO has developed binding international standards and regulations on environmental issues.[82]

At the 37th ICAO Assembly held in Montreal in November 2010, ICAO maintained that it holds a leading role in tackling the environmental impact of aviation and acknowledged its responsibility in this area.[83]

ICAO Progress on Aviation GHG Emissions

Since ICAO was delegated responsibility in 1997 to regulate and limit international aviation emissions, commentators have characterised its progress as slow at best.[84] In 2004, ICAO adopted three major environmental goals, one of which was *"to limit or reduce the impact of aviation greenhouse gas emissions on the global climate."*[85] ICAO has invited Member States to submit voluntary national action plans outlining their CO_2-reduction policies and activities,[86] and has received voluntary action plans from at least 53 members representing 75per cent of global international air traffic.[87] In 2010, Member States resolved to achieve a global annual average fuel efficiency improvement of 2 per cent through to 2020, and an aspirational goal of a global fuel efficiency improvement rate of 2 per cent per annum from 2021 to 2050.[88] In addition, Member States adopted a collective medium-term global aspirational goal (from 2020) of maintaining global net carbon emissions from international aviation at 2020 levels.[89]

There has been agreement in principle between ICAO Member States on the desirability of a market-based mechanism that could include emissions trading.[90,91] A set of guiding principles for the development and design of market-based mechanisms by Member States, either bilaterally or multilaterally were considered in 2010.[92] In addition, Resolution A37-19 requested the Council – with the support of Member States – to develop a framework for MBMs in international aviation, including further elaboration of the guiding principles, for consideration by the 38th Session of the ICAO Assembly in 2013.[93] The same Resolution also requested the Council – with the support of Member States and international organizations – to continue to explore the feasibility of a global MBM scheme by undertaking further studies on the technical aspects, environmental benefits, economic impacts, and the modalities of such a scheme, also for consideration by the 38th Assembly in 2013.[94]

The aspirational targets and guiding principles above are the result of over a decade of work by ICAO on the regulation of aviation GHG emissions. A previous ICAO High-level Group stated that its action so far was no more than a *"first step to address greenhouse gas emissions from international aviation."*[95] The question is whether the new High-level Group can introduce a step change in the pace of progress in time for the 38th Assembly?

In March 2012, the Ad-hoc Working Group on Market-based Measures presented four options for a global MBM scheme for international aviation, as well as the evaluation criteria underpinned by the fifteen guiding principles adopted by the 37th Session of the Assembly (C-WP/13828). The Council requested the continuation of further work on the evaluation of options and on the development of a

framework for MBMs.[96] In June 2012, a Working Paper on MBMs was presented. It reported progress on the evaluation of options for a global MBM scheme and narrowed the options from four down to three (Option 1, global mandatory offsetting of emissions; Option 2, global mandatory offsetting with some revenue-generating mechanism; and Option 3, global emissions trading (cap-and-trade system)) and presented a concept document describing an ICAO framework for MBMs.[97]

Subsequently, the new High-level Group (HGCC) was announced by the Council in November 2012. The group met three times, most recently in March 2013, with no announced plans to meet again. Indications are that little substantive progress has been made to resolve major political questions. Furthermore, there are significant divergent views on issues such as whether the framework would obviate the need for individual mutual agreement; whether it should be based on departing flights, on all flights of operators registered in a state, or on all flights within a state's national airspace or Flight Information Region; how to incorporate CBDRRC; who the participants should be; and whether a global MBM should generate revenue, and if so who should use it.[98,99] No further work has been done to narrow down the options for a global MBM. Nevertheless, some optimism remains. At the recent 4th ICAO Symposium on Aviation and Climate Change, there were divergent views. Some speakers were optimistic that some form of agreement could be reached by the ICAO Assembly this coming autumn, with further progress towards a global scheme being achieved by 2016.[100]

HGCC comments on a draft 2013 Assembly resolution on ICAO's basket of measures (including technical and operational measures, development of aviation biofuels, and a CO2 standard for new aircraft); on a Singapore text on the framework for MBMs; and on a UK text for a global MBM roadmap will now be considered at ICAO's June Council meeting.[101] The future of the HGCC is uncertain and will depend on guidance from the ICAO Council President and the views of the Council itself.[102]

Obstacles to the Progress of ICAO

Certain factors hindered ICAO's adoption of an international agreement regulating aviation emissions.[103]

After the failure of the UNFCCC to include international aviation emissions in the Kyoto Protocol, there was a general political reluctance to negotiate an agreement under ICAO.[104] Commentators questioned, for instance, whether ICAO's mandate to promote the growth of the aviation industry was compatible with the mitigation of emissions from international aviation.[105] This emphasis on growth is demonstrated in Resolution A36/22, which urges Member States to *"refrain from environmental measures that would adversely affect the orderly and sustainable development of international civil aviation."*[106] Indeed, ICAO has been accused of serving *"as much, if not more, as a forum for championing causes to preclude the sector from mandatory measures aimed at reducing [greenhouse gas] emissions as it has for developing such measures."*[107]

A second major obstacle has been a political debate about differentiation. This debate has been framed in terms of an alleged conflict between the principle of CBDRRC, reflected in the UNFCCC and the Kyoto Protocol, and the principle of non-discrimination contained in the Chicago Convention,[108] discussed further below. On the one hand, developed countries argue that the ICAO *modus operandi* is one of absolute non-discrimination and thus there is no room for aviation climate action based on the CBDRRC principle.[109] An underlying consideration is that application of the CBDRRC principle would provide unfair competitive advantages to developing countries. Developing countries, however, take the view that non-differentiated climate change action contradicts the provisions of the UNFCCC. Accordingly, the non-discrimination principle would effectively be qualified or set aside by the CBDRRC principle. These debates in ICAO clearly reflect the dynamics of the international climate change negotiations, where disagreement on CBDRRC has been a major obstacle to the implementation and operationalisation of the

UNFCCC. It is within the context of this impasse in negotiations conducted through ICAO to date that the EU acted unilaterally.[110]

ICAO Working Paper and Resolution

In response to the EU actions, an ICAO working paper adopted on 2 November 2011 invited the ICAO Council to urge the EU and its Member States to refrain from including flights by non-EU carriers to and from airports located in the territory of EU Member States in the ETS.[111] The paper was backed by twenty-six of the thirty-six Member States on the ICAO Council – including China, Japan, Russia and the United States. Eight EU Member States opposed the adoption, while Australia and Canada were absent at the vote. Although the paper is not legally binding for the Council or any ICAO member, it reflects the strong opposition to the inclusion of aviation in the ETS by the majority of ICAO member countries.[112]

The ICAO working paper claims that the unilateral measure of including civil aviation in the EU ETS contravenes international law – and the implementation of the EU ETS without ICAO's concurrence – would undermine ICAO's leading role in matters related to aviation and environment. In particular, it would pre-empt and negate ICAO Assembly Resolution A37-19,[113] which was also supported by EU Member States. As described above, this Resolution calls on the Council to develop a framework for MBMs for consideration at the 38th ICAO Assembly in 2013.[114] It also reaffirms the declaration that ICAO is the most appropriate forum for future discussions on solutions to international aviation emissions, including marked-based mechanisms.[115]

2. POLITICAL DRIVERS AND ALTERNATIVES

Of course the drivers of deadlock will not disappear overnight, and they are very similar to the obstacles for progress in global climate negotiations. In particular, there is an argument based on historical contributions to the problem of climate change which states that developing countries have a right to increase their GHG emissions while requesting stronger reductions by developed countries. In accordance with the principle of CBDRRC, there are further arguments that support this concern.[116] CBDRRC, as codified in the UNFCCC, *"recognises that developed countries are principally historically responsible for the current high levels of greenhouse gas emissions in the atmosphere."*[117] Consequently, the burden for reducing GHG emissions is to be placed primarily on developed nations. At the same time, the principle of non-discrimination under the Chicago Convention states that all regulations, standards and rules are to apply equally to aircraft of all countries, without distinction as to nationality.[118] Developing countries therefore seek some form of lesser obligation, following CBDRRC, while developed countries insist on equality. The EU argues that the principle of CBDR in any case only applies to countries, not to international airlines operating in the EU market.

Aviation is of high political importance. In an increasingly globalised world, new middle classes in Asia, Africa and Latin America are demanding increased international travel, while travel continues to grow in developed countries as well. The importance of India, a country at the forefront of opposition to the EU measures, cannot be underestimated. The numbers are impressive: *"In 2006-2007 the Indian civil aviation sector experienced a phenomenal growth rate of about 40%. Considering that less than 1% of the population in India boards a plane during the year, the future growth potential seems massive. Leading aircraft manufacturer Airbus expects the Indian domestic aviation to be the strongest growing market for the next two decades worldwide."*[119]

Some countries are afraid that the EU ETS will suppress aviation growth.[120] Moreover, they regard the actions by the EU as being distinctly to the EU's advantage as it *"is the global leader in aviation emission reduction technologies. The collection of carbon tax is useful to drive the demand of countries for green and low-carbon materials and relevant products, thus the EU can foster new economic growth point by exporting its green technology and equipment."*[121]

There is also a real concern on the part of the rising powers that the establishment of an ETS for aviation can be regarded as a trial run. If successful, extension to further sectors that are seen to export carbon emissions could follow. This might explain the near-fanatical opposition. Such an expansion could potentially be comparatively more damaging for countries such as China and India which rely on heavy and production industry. In the view of those with these concerns, technological solutions are preferable.

In contrast, the majority of least-developed countries (LDCs) have tended to support market-based mechanisms and climate finance measures such as the Clean Development Mechanism (CDM). Although they did not benefit much from these mechanisms after they were established, LDCs were rarely among the countries that objected to their existence or to the connection with the EU ETS. Moreover, LDCs' support for market-based mechanisms is likely to increase as a result of the EU's decision to limit the projects for Certified Emission Reductions to LDCs from 2013.[122] This exclusion of non-LDCs has led certain developing countries to withdraw their support for the ETS, as they are now concerned about the economic consequences of their exclusion from the CDM. South Africa, for example, is opposed to the EU ETS for purely economic reasons, as the decision of the EU to limit the entry of carbon credits from outside the EU to the LDCs will seriously affect the South African economy.[123]

At the same time, developing countries in which tourism is the major industry fear that any plans to curb emissions from aviation, for which the costs will most likely be added to ticket prices, will affect their national tourism sector as well as their development goals.[124] Since tourism is a major industry in many developing countries, civil aviation is therefore essential for their development. The emerging infrastructure of carriers and feeder plants around airports also contributes to the economic development of a country. Fast connections are essential for the export of perishable goods, which constitute a large part of many developing countries' economies, in contrast to the more service-based economies in industrialised countries. On the other hand, they reinforce reliance on fossil fuels and possibly carbon-intensive tourism.[125] It is necessary to develop approaches that are truly comprehensive and take into account all these intrinsic and interwoven aspects.

The aviation industry, as represented by the International Air Traffic Association (IATA), although preferring a multilateral approach, nonetheless has viewed the EU as *"pushing for environmental mitigation and making it a primary concern for the aviation industry."* However, it is opposed to co-existing competing regional solutions which would force airlines to pay several times for the same emissions. It hopes that the next Assembly meeting of ICAO in September/October 2013 could lead to a global solution.[126] Nevertheless, there are nuances within the community of aviation companies. State-owned companies obviously reflect their government's stance, whereas other airlines may be more likely to accept any form of regulation. However, the IATA Director General recently told delegates at a conference that the EU ETS had been a roadblock to establishing a global approach to MBMs. *"With that roadblock removed, we are well positioned for a breakthrough on MBMs,"* he said. *"Governments are fully focused on ICAO to agree a global solution at their upcoming Assembly. And the industry is united and working hard to support that by finding an equitable way to share the burden of achieving carbon-neutral growth (CNG) from 2020."* He said that the question of how the burden of *CNG* from 2020 should be shared between airlines had been discussed by the governing board of IATA in order to provide governments with a unified industry position. *"The implications will be very different for airlines in a high growth phase than for those in more mature markets,"* he told delegates.

"There is no perfect solution to level the burden. But an agreed industry position would aim to spread the burden as fairly as possible. And that is likely to be more palatable to airlines than a scheme exclusively designed by governments in the absence of airline expertise and experience. The incredibly complicated and burdensome monitoring, reporting and verification (MRV) requirements of the EU ETS proposals are a clear example of how things can go horribly wrong when we leave it to governments to decide how we should run our business."

Of the three global MBM options under consideration at ICAO, he said a carbon offsetting scheme would be the simplest to implement. He made it clear that MBMs would be a *"temporary, gap-filling measure until the full impact of new technologies and sustainable biofuels could be realised. We fully expect that technology, operations and infrastructure measures alone will provide the long-term solution for aviation's sustainable growth."*[127]

Some airlines such as Qantas already have their own – albeit voluntary – carbon offsetting mechanisms in place, and generally there seems to be an increasing knowledge, awareness and acceptance in the public opinion towards possibilities and mechanisms to offset carbon footprints.[128] However, the public opinion also seems to favour a global and comprehensive solution.

In this context, it should be acknowledged that the European Union did consult with other governments, international organizations, and players throughout the development of the ETS inclusion of aviation, as the first part of a broader objective to include the international transport sector in the ETS.[129] Also, as mentioned

above, several non-EU countries have or are considering adopting national legislation associated with the EU ETS.

2.1 Alternatives

Overall, the political alternatives states may adopt can be broken down into the following options:

- Refraining from further action to reduce emissions from aviation through regulation
- Accepting that a weak multilateral outcome is preferable to regional/unilateral action
- Pushing hard for agreement on a strong multilateral outcome, including the developing countries that can be seen as rising powers
- Pursuing unilateral action while slowly convincing aviation partners to address climate change and aviation within or outside of ICAO

At the moment, we are at a cusp in the international negotiations where negotiations (and some countries and politicians) seem to favour the business-as-usual scenario for aviation and climate change. There are several risks involved in this first option: the biggest risk involves the exponential growth of GHG emissions with the related climate risks involved. The second, perhaps less obvious, risk is that, just like big tobacco, aviation might lose or endanger its 'social licence' to exist once climate concern and demand for action grows. It is also legally doubtful as a strategy, given that hardly any nation doubts the validity of the UNFCCC mandate to combat climate change.

The second option seems to have been chosen by the EU on behalf of its Member States. The EU has sacrificed the immediate implementation of its EU ETS to the hope of some international agreement. This is not without risks because even the suspension of the ETS application to international aviation carries the risk that the entire ETS might be undermined. The EU legislator has clearly decided to uphold the application of the ETS to intra-EU flight activities (also for non-EU airlines). This creates great legal uncertainties and focuses all the attention on ICAO, which has not shown itself to be very creative when addressing aviation and climate change. The second option is also attractive to those states willing to give a minimum amount in order to forestall the unilateral resumption of the EU ETS to international aviation. The risk to such states is whether that minimum will be considered sufficient from the EU's point of view. Equally however, the question whether the EU will be able politically to resurrect the ETS for international flights after the potential failure of a sufficient agreement in ICAO is a real one. In a note to the EU Council from March 2013, the European Commission considered that agreement on guidelines for the administration of national or regional MBM systems to be a realistically achievable option and invited industry and civil society representatives to make presentations on MBM options and expectations.[130]

The third option, though politically not very likely, is not to be discounted. The outcome and follow up of the ICAO HGCC could lay the foundations for phased agreement on important measures at the international level. It would be a major breakthrough in ICAO if it was able to convince aviation partners to take steps towards adopting a global MBM to address aviation and climate change. Even preparatory steps such as establishing registration for GHG emissions and a timetable would be hugely significant. The rising powers would need to be convinced. There is also the possibility that countries with very small national carriers (which are exempted from the ETS application) would support the EU in its drive for a global standard.[131]

The fourth option was, in many ways, what the EU intended all along, as in all communications and in the Aviation ETS Directive, the EU clearly favoured international action. There is interesting precedent in the area of noise. As discussed in detail below, the EU first adopted standards unilaterally and then backed down in ICAO. However, ICAO eventually adopted the stricter noise standard.

2.2 An Adjacent Perspective – Aviation Noise Pollution[132]

A recent dispute between the US and the EU concerning the noise pollution generated by certain aircraft provides a useful case analysis of how regulation at the European level fares on the international stage. At the heart of the matter was an EU Regulation addressing environmental concerns on international air transport which was adopted outside, and in opposition to, the cooperative framework of ICAO. This Regulation sought to address the growing concern surrounding the noise pollution created by civil aircraft around the airports of EU Member States. In the period between the proposal and its adoption, several rounds of negotiations between the US and the EU took place in an attempt to placate the US's reservations concerning what it regarded as a *"purely protectionist"*[133] measure which had a *"disparate impact on US interests."*[134]

The EU stated that it was adopting this measure because the US had deviated *"from the internationally agreed upon ICAO Chapter 2 phase-out schedule."*[135] Each Chapter indicated an ever-decreasing limit on the noise that registered aircraft were permitted to make. The US had progressed on this phase-out faster than agreed upon, and there were worries from both the EU aviation market and the noise-abatement lobbyists that this would encourage US owners and operators to move their Chapter 2 aircraft into the territory of the Community. The method of hushkitting (i.e. installing mufflers to reduce noise) such Chapter 2 aircraft to comply with the standards under Chapter 3 of Annex 16 – thereby facilitating their operational use within the EU – was therefore countered by the EU with the promulgation of this Regulation. Although *"hushkitted aircraft meet Chapter 3 standards … their performance is near the bottom of the acceptable noise range allowed by [that] Chapter."*[136] Therefore, according to the EU, while these aircraft technically complied with the Chapter 3 requirements, this did not mean that they were required *"to accept them as Chapter 3 aircraft."*[137]

A number of policy and economic arguments against this EU Regulation were articulated by the US. More important for this paper, however, were the purely legal objections. What limit did the US allege the EU had transgressed in adopting this Regulation? Principally, their concern was that both the design and effect of the measure were discriminatory. For instance, the measure appeared to advantage European States over non-European ones, regarding the use of the aircraft in question. Importantly, the measure was also alleged to be discriminatory in that it distinguished between Chapter-3-compliant aircraft which had been recertified and Chapter-3-compliant aircraft which had always held this certification. As such, the Regulation also violated Article 33 of the Chicago Convention, which requires all states to recognize the validity of airworthiness certificates issued by any other contracting State. As the US had technically complied with those standards, the EU's decision not to recognize those certificates violated Article 33.

However, before the matter reached a formal court, the ICAO Council adopted Chapter 4 on noise standards within Annex 16 in June 2001. These standards offered *"member-states a great deal more flexibility in the definition and enforcement of their national and local noise abatement policies"* than the previous set of standards did.[138] As a consequence, the EU Council, in mid-October 2001, officially recognized the *"prospect of repealing the 'hushkits' Regulation in the near future."*[139] It finally took those steps in late March 2002, adopting Directive 30/2002 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at Community airports. Article 15 of this Directive explicitly repealed the hushkit Regulation. The Directive avoided stipulating design methods to carriers seeking to comply with the Directive and effectively diffused the dispute between the US and the EU.

This brief case analysis provides useful lessons for states seeking to understand the limits and

opportunities within international aviation law for taking initiatives in the environmental sphere. First, it indicates, as noted above, that Article 33 of the Chicago Convention presents a sticking point for states seeking to take unilateral action. Second, it is clear that any measures must not be seen by another state as discriminating against them, either legally or regarding their air transport economy. However, these aspects of the case do not ultimately rule out unilateral action aimed at international air transport. Indeed, an equally important lesson to be taken from this case is that the EU ultimately achieved its desired goal of quieter planes by establishing Chapter 4 on noise standards within the ICAO framework. States must therefore be aware of the restrictions in place, while also being alive to the fact that global standards can be achieved from initially unilateral beginnings.

3. BREAKING THE DEADLOCK

3.1 A Principled Approach[140]

It is proposed that any solution should follow a principled approach, whereby fundamental principles of sustainable development are observed in the negotiation and conclusion of a comprehensive solution.

These fundamental principles include the principle of sustainable development as objective, the principle of precaution, the principle of inter-generational equity, the principle of CBDRRC, the principle of integration, and the principle of the sustainable use of natural resources.

Sustainable development as objective

Sustainable development requires that environmental, economic, and social dimensions be balanced with each other. For aviation, this means that climate concerns, the economic growth of the industry, and the social dimension of airline travel need to be balanced in a way that does not completely ignore any one of these dimensions.

Precaution, inter-generational equity and common but differentiated responsibilities and respective capacities

Precaution is a key factor not only in climate change and environmental law in general but also for future approaches to aviation and climate change. A precautionary approach would suggest analyzing the risk involved in not acting or not acting decisively. If GHG emissions from aviation increase by 176 per cent over the next decades (EU estimates) – and might quadruple by 2050[141] – inaction or maintaining the status quo are no longer options.[142] The emergence of the precautionary principle in international environmental law[143] thus suggests taking measures as soon as possible. This would also correspond to demands regarding inter-generational equity.

However, especially in developing countries, resistance to any serious regulations are often based on arguments of CBDRRC. As most of the CO2 has been produced by developed, industrialised countries, there is a feeling of injustice in developing countries which believe that they now have the right to exploit their natural resources accordingly. It has been pointed out by economists that an MBM, and an ETS in particular, would be superbly placed to realise the necessary differentiation in a politically attractive way, through the allocation and administration of allowances.[144] From the starting point of a cap and allocations on a business-as-usual basis, the stringency of the regime can be increased. At the same time, differentiation of the burdens among state participants can also be increased by means of differentiation in the allocation and administration of allowances, including for example the granting of increased auction rights to some states rather than others. Ellerman calls this *"inconspicuous differentiation."* For this to work, formulae for allocation would have to be subject to multilateral decision-making, but the potential for inconspicuous differentiation to address CBDRRC requirements in this way is certainly a valid point that several countries criticizing the MBM option do not seem to have considered fully.

More recently, the International Maritime Emission Reduction Scheme (IMERS) set out detailed proposals for dealing with CBDRRC concerns overtly in both the international maritime and aviation transport sectors. The IMERS proposals seek to use carbon pricing of international transport as a mechanism to increase mitigation and financing ambitions for climate change action, while at the same time delivering on equity.[145]

IMERS calculations show the international aviation carbon footprint being concentrated in the north, and the potential burden of aviation carbon pricing – as a percentage of GDP – being largest in the south, impacting most on less developed countries, as they often disproportionately rely on international transport. IMERS sees the question as

"not whether, but how" when it comes to relating differentiated climate principles and provisions to uniform carbon pricing for international aviation.

Their proposed scheme focuses on the inclusion of a Rebate Mechanism (RM). The RM could apply to any revenue raising MBM such as a levy/charge or ETS. Under the scheme, all planes would pay for their emissions. Developing countries could[146] obtain rebates of the cost burden incurred by participating in the MBM to ensure they are at least not worse off.[147] The remaining revenue (net revenue) dedicated for climate action would therefore only come from consumers in developing countries, complying with the UNFCCC principles. It would be disbursed by an agreed entity or entities (e.g. GCF, ICAO). The most vulnerable countries (SIDS, LDCs, African countries) would benefit through the relevant rules and provisions, and the aviation sector would also benefit, potentially through a new global Aviation Technology Fund or similar. Rebates to developing countries could amount to a third of revenue raised; the remaining two thirds would be a predictable and affordable source of climate change financing and R&D for clean international transport.

In line with the principles of precaution, inter-generational equity, and CBDRRC, the further development of technological improvements is important and must be pursued as part of the solution.[148]

Integration

Integration suggests that, in the upcoming negotiations, social and environmental aspects have to be considered on an equal footing to economic considerations. Thus, any solution that ignores the different pillars of sustainable development should be rejected on principle.

Sustainable use of natural resources

Especially in the aviation industry, it is of key importance to observe the principle that natural resources should be used sustainably. While ever lighter airplanes are constructed using less metal and more carbon-based materials, the use of fossil fuels in aviation must be discussed seriously.

In this context, one might be tempted to question the manner in which biofuel is treated in the EU ETS scheme.[149] Whereas, on the one hand, it is commendable that industries including the aviation sector become more and more independent of non-renewable resources, on the other hand, the *carte blanche* given to airlines regarding their allowance quota raises several problems. First of all, it compromises the urge and pressure on airlines to develop more fuel-efficient systems and mechanisms that might be more expensive than the additional costs for biofuel. On a larger scale, it opens up an accumulation of other factors linked to biofuels. The farming of monocultures (the common method for the production of biofuel) not only has detrimental repercussions for the environment, but has also been linked to price increases for wheat and other grains on the stock-markets, and resulting food shortages and even famine around the world. The blanket exemption of all biofuels therefore does not appear to be compatible with an overall objective of sustainable development. In order to implement the principle of sustainable use of natural resources, it would be appropriate to also include fuel quality standards for airplane biofuels. This would require an amendment of the current ETS. An airplane flying with biofuel should be completely exempted (depending on certain biofuel standards, i.e. second or third generation biofuels), which would allow operators to actually reduce their emissions and not be trapped in the ETS with no possible reduction of GHG from their activities.

3.2 Identifying Legally, Politically and Economically Feasible Solutions

Many airlines and initiatives from the private sector already allow for the offset of one's carbon footprint. Rather than disregarding these initiatives and focusing only on state-centric mechanisms, the international community should include such initiatives in the wider framework for mitigation efforts against climate change. Whereas it appears preferable to regulate the ETS market in an

intergovernmental and inter-organizational setting, complete carbon offsetting and climate change mitigation and adaptation efforts can be better addressed on the basis of a comprehensive approach which includes as many different actors as possible.

One possibility is to combine carbon offsetting with wildlife, deforestation and nature conservation projects, e.g. the Kibira National Park project in Burundi.[150] Such combined inter-disciplinary measures have the potential to address several economic and development issues simultaneously by providing jobs for the local population, increasing living standards, decreasing the destruction of forests due to illegal agriculture, and minimizing the number of animals killed by poachers, while mitigating climate change at the same time.

Comprehensive approaches such as this one are also more likely to gain governmental and public support. Therefore, any politically and economically feasible solutions for the offsetting of carbon imprints by civil aviation should be implemented in the wider context of development and economics. Broadening the network of involved actors would also diminish the burden for developing countries that might partially lack the capacity to implement these programmes independently. This would also be in line with CBDRRC. It is, however, essential, that these programmes also fulfil the criteria of good governance.

3.3 Actors, Process and Institutions

Who should decide?

One of the most important questions for the future is who should decide. There is little question that a multilateral solution is favoured on all sides. The Joint Declarations of countries opposed to the EU measures call for the international community to work collaboratively to address aviation emissions[151] and strongly urge a multilateral approach.[152] Multilateralism has the highest priority on the European foreign policy agenda and constitutes one of the founding principles of the EU's integration process.[153] Other important actors, including the IATA, favour a multilateral solution.

Who should negotiate?

The list of possible actors is long: states, airlines, international organizations, representatives of airplane manufacturers, and representatives of industries relying heavily on air transport, as well as climate groups, CDM project sponsors, and those affected by climate change. In the state-centred world of international law, it is clear that an agreement must be reached first and foremost by and among states. In some ways, the EU ETS can be viewed as a good example because, in its design, establishment and implementation, all of the above-mentioned stakeholders were in fact consulted. Perhaps a similarly forward-looking, creative negotiation process could be adopted.

What institutional framework is necessary?

There are considerable limitations for the negotiations in both the UNFCCC (which has until this point continuously tasked ICAO and the International Marine Organisation (IMO) with addressing climate change) and ICAO. The EU is not a member of ICAO, and the mandate of the latter is perhaps not comprehensive enough to include all possible solutions, due to the fairly rigid rules of the Chicago Convention and the political frailty of ICAO. It is nevertheless clear why the EU is placing the combined weight of its Member States behind a possible ICAO initiative. Even if ICAO were merely to adopt guidelines for the administration of national or regional MBM systems, it would be interpreted by the EU as an endorsement of its own initiative, which would probably require only minor adjustments. If, on the other hand, ICAO were to fail to get out of the deadlock, the EU would potentially feel emboldened in its own approach to aviation and climate change.

Although there have been suggestions that ICAO Member States are confined to ICAO for negotiating an agreement on aviation emissions, such suggestions have little legal ground. Despite the primacy accorded to ICAO by the

Kyoto Protocol, the international law of civil aviation provides regulatory space for a global approach to reducing aviation emissions. States have exclusive sovereignty over their territory and general authority over their nationals.[154] The submission to the disciplines of the world trade system implicates the right of every state to regulate its economy, and the actors within that economy,[155] by freely accepting restraints on its commercial sovereignty. In other words, even the existence of ICAO as an international regime cannot prevent the EU from adopting laws within its jurisdiction. While ICAO is endowed under the Chicago Convention and UNFCCC with certain powers of oversight regarding aviation emissions, it does not, unlike the WTO in relation to trade, have exclusive stewardship; states remain free to work within or outside ICAO to develop a consensual treaty-based approach to carbon emissions reduction.

Observers have characterised ICAO resolutions as *"soft law,"* notwithstanding ICAO's central role, under the Kyoto Protocol, in regulating international civil aviation.[156] Its resolutions do not specify whether ICAO's members imagine a global treaty imposing an MBM regime or rather foresee a purely non-binding framework.[157] Moreover, Resolution A37-19 can be read as suggesting that its Member States no longer see ICAO as the sole or exclusive agency for international aviation emissions control, given the inclusion of guiding principles proposed for the design of either bilateral or multilateral MBMs.[158] The use of the term *"guiding principles"* suggests that Member States chose not to attribute exclusive jurisdiction over the regulation of global emissions from aviation to ICAO, notwithstanding Article 2(2) of the Kyoto Protocol. Presumably, so long as the Protocol's Parties do not venture beyond ICAO's mandates as listed in the Chicago Convention and expressed through Assembly Resolutions, there would be no conflict if two states, certain clusters of states, or even all of ICAO Member States were to negotiate an emissions reduction treaty outside ICAO.

There is a persuasive legal case not to address the issue of climate change and aviation in ICAO, based on the founding principles of ICAO and its focus on non-discrimination. This focus makes it difficult to allow for the levels of differentiation called for by some states. Any global solution to the aviation and climate change challenge cannot be based on strict non-discrimination, but rather will require preferential treatment of some kind.

An interesting institutional approach could be the amendment of existing bilateral agreements, such as Open Skies. While a global or at least multilateral solution (such as a long-term amendment of the Chicago Convention itself) is clearly preferable, there is potential for innovation in these bilateral flight arrangements. This method would further be enhanced if a minimum consensus could be reached in ICAO, because it would allow for enhanced measures agreed on a bilateral basis.

It is proposed that there is perhaps space for a middle way between bilateral and multilateral arrangements. As in IMO decision-making, there could be an agreement among the countries with the largest airlines, for whom the Open Skies agreements are also economically and politically most important. It would not be purely bilateral (or in the case of the EU, regional with a partner country) but rather constitute a plurilateral agreement to address climate change and aviation.

4. VIABILITY OF VARIOUS PROPOSALS

4.1 Moscow Bloc Proposals

Following the decision of the CJEU upholding the validity of the inclusion of civil aviation in the EU ETS, opponents issued the Moscow Declaration,[159] Annex A of which contains a basket of nine potential actions/measures in response to the EU ETS. Similar to the EU ETS, these actions appear to raise serious questions regarding their compatibility with international law.

The first action point envisaged is the filing of an application under the dispute settlement mechanism of ICAO. In contrast to the WTO, the EU is not a member of ICAO but acts there through its Member States. Article 54 of the Chicago Convention and the rules for the settlement of disputes (Article 1 (1) (a) ICAO DS Rules) define dispute as *"any disagreement between two or more contracting States."* It is therefore already questionable whether such a claim made directly against the EU would be justiciable.[160] Furthermore, Article 2 (g) ICAO DS Rules presupposes previous unsuccessful negotiations between the parties to the conflict. As negotiations are still ongoing, it is therefore unlikely that any such claim would be successful.[161]

Should advocates of the Moscow Joint Declaration prohibit overflight over their territorial sea, such a measure would be in violation of Article 39 of the United Nations Convention on the Law of the Sea (UNCLOS), which regulates the overflight of aircraft over the territorial waters of states. Furthermore, any further rules directly applicable to carriers refer to the Chicago Convention on the basis of Article 39(3)(a) UNCLOS.

Compatibility issues regarding these countermeasures especially arise within the framework of the GATT and WTO law. Mandating EU carriers to submit flight details and other data and imposing additional levies/charges on EU carriers/ aircraft operators as a form of countermeasure, as foreseen in action points 4 and 8, is in violation of the most-favoured nation clause in Article II of GATS. As the measures would apply to EU carriers uniquely, they cannot be justified under Article XIV or Article *XIVbis*. Equally possible is a violation of Articles XVI and XVII GATS and Article XI GATT regarding the imposition of additional levies/charges on EU carriers creating additional transportation costs for airline operators. There is no overarching exemption in WTO law for countermeasures, since all trade sanctions have to be adopted within the existing legal framework.

4.2 EU Proposals

The EU continues to promote its idea of a global cap-and-trade system for aviation and climate change. However, the feasibility of such a system before a comprehensive new agreement has been reached in the UNFCCC in 2015 may not be seen as very realistic.

The EU has stopped the clock specifically to allow ICAO to reach further clarity on guidance for MBMs and other measures to address climate change and aviation. While we have questioned the rationale for relying on ICAO, it seems certain that the EU has no interest in starting a full-fledged trade conflict over the issue of aviation and climate change. On the other hand, the EU's resolve to address climate change should also not be questioned. Since the Treaty of Lisbon, addressing climate change has become a constitutional objective (Art. 21 TEU and 191 TFEU) that the EU cannot legally ignore in favour of a business-as-usual approach. When assessing the EU's proposals, it should be understood that, despite political differences, this view of the EU position could in extreme cases be justiciable with the CJEU showing that it is prepared to uphold a constitutional objective even in the face of political will to the contrary.[162]

The EU currently has high hopes that ICAO will issue guidelines on MBMs at the regional and national levels and thus legalise its own ETS (or an amended version thereof). Reporting on the work of the HGCC, Australia's representative on the Council and Chair of the Council's Air

Transport Committee recently commented that the geographic scope of MBMs is the area with the least agreement. In her opinion, applying the departing flights option – favoured by the EU – in which flights are administered by the state of departure, was preferable as it provided the maximum global coverage in terms of capturing emissions, treated all operators equally on a given route, was less administratively complex and was consistent with UNFCCC reporting of international aviation emissions. An alternative suggestion is the national airspace option in which states administered only for flights in their own airspace. This appeased concerns over sovereignty, but coverage of emissions was far from complete – even if all states participated it would still only cover about 20 per cent of emissions – and there could also be market distortions and leakages, plus administrative complications where operators need to report to a number of states on a given route. She reported that there were pros and cons to both approaches, and that, while consensus was building around the airspace option in the Council in order to avoid the sovereignty issue, at least as a starting point, the debate had not yet finished.[163]

In response, the Head of the Aviation and Maritime Unit, International Carbon Markets at the European Commission commented:

"A discussion around a framework that is not very meaningful from an environmental integrity point of view is not what we expected when we stopped the EU ETS clock. We expected this was going to be a serious conversation about a political commitment by our partners to work towards a solution. If we talk about a national airspace approach, that is already provided for in the Chicago Convention. We do not need a discussion on this as it's pretty much redundant."

On the EU's expectations for the 2013 Assembly she said:

"Our stopping of the clock on the EU ETS is a temporary one-year measure. It is crafted in a way that anticipates a more permanent amendment in the event of a meaningful outcome. The parameters of success are something on which that the EU co-legislators – the Council and the Parliament – have already expressed their views. We would need something meaningful under the framework and we would need, which I believe is within reach, a realistic timetable on a global MBM, and we would also need to see ambition on the other basket of measures."

She added: *"The EU has engaged quite intensely in the run-up to the third high-level group meeting. It has been an effort but not a good enough effort so far and much more needs to be done. The industry has provided a positive injection into the process – it can definitely add a dynamic in encouraging governments to take on the leadership to deliver in this window of opportunity."*[164]

As stated in the recitals to the legislation providing for the EU ETS suspension, *"the EU suspended EU ETS to international flights in order to facilitate an agreement at the 38th ICAO General Assembly on a realistic timetable for the development of a global MBM beyond the 38th Session, and on a framework for facilitating the comprehensive application of national and regional MBMs to international aviation, pending the application of the global MBM."*[165]

4.3 ICAO Options for Discussion

An ICAO Council Working Paper issued as a response to the inclusion of civil aviation in the ETS examined and analyzed four options for MBMs to deal with carbon emission by airlines.[166] Of these, three options remain under consideration.[167]

- Option 1 – global mandatory offsetting of emissions. Participants (either states or operators) acquire *"emissions units"*[168] (meeting an agreed set of eligibility criteria) to offset emissions from international aviation above an agreed baseline. Participants would acquire the emission units beyond the agreed baseline from the existing carbon market system. The advantage of this solution is that it would

not be necessary to create a new market system.

- Option 2 – global mandatory offsetting with some revenue-generating mechanisms. The revenue could be used for broader (sustainable) development goals and is therefore very attractive in a broader development agenda.

- Option 3 – global emissions trading (cap-and-trade system). In contrast to options 1 and 2, the limit is defined by a cap rather than by a baseline, and a new aviation allowance market would have to be created. Participants must have bought enough emission units until the end of each compliance period. If the aviation allowances were to be auctioned, additional revenue would be created which could be used for climate mitigation/adaptation purposes.

Taking into account broader development goals and obligations for states under international law, it seems preferable to address the system to states, and to include a revenue-gathering, mechanism which would directly create income to be spent on broader development and climate financing goals.[169]

Obstacles, challenges and other difficulties

Given the lack of progress in international climate negotiations, the more ambitious options do not seem politically feasible. On the other hand, the domestically confirmed legality of the EU unilateral scheme does seem to have added new dynamism to the discussion in ICAO, which in itself is an interesting development and shows that entrenched scepticism about the organization may not be entirely warranted.

A practical obstacle is the fact that any baseline for a global MBM would have to be adjusted regularly as new and more energy-efficient aircraft are added. A trading cap would also have to take the increases in air traffic into account. In other words, there would have to be a constant board reviewing the MBM at the ICAO level, which would probably have more work than the CDM board currently at the UNFCCC.

Another problem is how to calculate whether an operator has surpassed the baseline. Would the baseline be country-based or nationality-based? Would it cover all flights, an average number of flights, or flights grouped per region/country? In this context, the first alternative would be simpler.

It is clear that any global agreement will need to make space for the continuation of at least the domestic part of the EU ETS, as it applies to aviation. In this respect, there is interesting precedent dating from the introduction of the EU ETS as a whole. The UK and Denmark had emission trading schemes for aviation that were not initially compatible with the new ETS approach. The EU Commission took a pragmatic approach and, while both schemes were phased out, their allowances were not entirely lost but rather counted for the first period.

The EU ETS would be more sophisticated than any potential global scheme but, as the EU has arguably shown with its linking directives, it is feasible to provide for a smooth co-existence of different systems.

4.4 Amendments to the EU ETS

One of the more creative proposals, besides the many proposals advocating abolishing the EU ETS for international flights, was made by Scott and Rajamani, who proposed that revenue raised should not just be dedicated to address climate change but rather should be transferred to a global climate fund and earmarked for action in developing countries: *"We consider that it would be appropriate for the revenues raised as a result of the inclusion of developing country flights in the ETS to be committed to a global climate fund, and for these revenues to be used to finance climate mitigation and adaptation activities in developing countries."*[170] Such an amendment could go some way to satisfying certain EU ETS opponents, in particular those with CBDRRC concerns. The idea could prove constructive more generally, though it should be pointed out that Japan categorically stated in Doha that it will under no circumstances agree to share revenue from a domestic or regional ETS. Some

EU countries are also opposed to earmarking revenue regardless of the issue. Alternatively, perhaps the EU could address critics of the EU ETS by taking the bold step of integrating something along the lines of the IMERS proposals into the EU ETS, including an RM.

5. ALTERNATIVES TO ECONOMIC INSTRUMENTS

While much attention has been paid to discussions about MBMs, we should also briefly consider the available alternatives. Indeed the view is increasingly being expressed that any MBM solution is to be seen as a stop-gap pending the development of other solutions.[171]

5.1 Mandate Strict Emissions Information Requirements

While there are still no global standards on the GHG emissions per 100km for cars, all manufacturers have to provide this information prominently and many schemes, from insurance to the London Congestion Charge, rely on this information. It is therefore realistic to require similar information from aircraft manufacturers and to consider charging different airplanes differently, based on GHG emissions information provided by their manufacturer. This technique has, as discussed, been used successfully for noise pollution and there does not seem to be anything inherent in GHG emissions which would not allow countries or bilateral groups of countries to make such distinctions. The US-EU Open Skies Agreement of March 2007 provides an example of such an accord. Article 15(2) states: *"When a party is considering proposed environmental measures, it should evaluate possible adverse effects on the exercise of rights contained in this Agreement, and, if such measures are adopted, it should take appropriate steps to mitigate any such adverse effects."* In other words, cost-neutral environmental measures are allowed and expected under certain conditions.

5.2 Require Fuel Switching

There is the possibility of requiring different fuels. While it would be problematic to allow all forms of biofuels, particularly first generation fuels, reliance on second or third generation biofuels may provide a real alternative to an MBM. It is notable that the EU Fuel Quality Directive[172] prohibits certain biofuels for compliance purposes. The main reason is that first generation biofuels especially can actually generate higher carbon emissions than certain fossil fuels when compared from a carbon cycle point of view. This is the point the EU Fuel Quality Directive (which incidentally has also been criticized for potentially overreaching the jurisdiction of the EU) tries to address. It does not blindly favour biofuels but tries to ensure that GHG emissions from the fuel production do not render the biofuel a negative proposition, potentially endangering food supply.

5.3 Set Efficiency Standards, Thresholds and Incentives

While improved aircraft design is favoured as a solution by many countries, as well as industry, it may not deliver major reductions in GHG emissions. Nonetheless, it could be an alternative. There could be a developed/developing country scheme which would work similarly to the cash-for-clunkers legislation in several countries.[173] This would provide for replacement of old airplanes from developing countries using extra funds provided for the purchase of newer airplanes, which would in turn benefit the industry in the EU and elsewhere.

The ICAO Annexes contain Standards and Recommended Practices (SARPs) that, though without the force of an international treaty, entail legal obligations for the contracting States to the Chicago Convention. Such states have *"accepted an explicit legal undertaking to collaborate in securing the highest practicable degree of uniformity in regulations, standards, procedures and organization in relation to [air navigation]."*[174]

The ICAO SARPs are the current multilateral mechanism used to govern or guide the consequential national regulations concerning air transport on an international level. Compliance with these standards is of the highest concern for most states. Without this compliance, cooperation and faith in international air transport would be jeopardized. Article 33 of the Chicago Convention seeks to ensure compliance by ensuring SARPs are recognized, on a reciprocal

basis, by every contracting State.[175] This means that certificates of airworthiness, certificates of competency and licences *"issued or rendered valid by the contracting State in which the aircraft is registered, shall be recognized as valid by the other contracting States, provided that the requirements under which such certificates or licences were issued or rendered valid are equal to or above the minimum standards which may be established from time to time."* Article 33 therefore dictates that one state may not reject or discriminate against the aircraft of another state, if that aircraft complies with the standards annexed to the Chicago Convention. States must therefore ensure that any initiatives put in place do not have the effect of invalidating another state's Annex-compliant air transport framework.

A CO2 standard for new aircraft is part of the basket of measures expected to be put forward at the 38th ICAO General Assembly.[176,177]

5.4 Carbon Accounting

Carbon accounting, especially now that there is a globally agreed metric system to measure CO2 emissions, should be done as a matter of course or even as an obligation under the UNFCCC. While measuring carbon emissions from aviation may might seem like a very low-level commitment, it would constitute a major step forward, and we have seen in other areas (such as toxic release inventories) that public pressure and consumer choice are powerful drivers for sustainable development in this field.

5.5 Flight Management

US airlines repeatedly argued that more carbon could be saved if the EU harmonised flight management in Europe, or even established one central flight control in the EU. This ought to be taken on board, as in other areas such as road traffic significant CO2 reductions have been achieved through smart traffic management. A UK Sustainable Aviation review concluded: *"Improved air traffic control resulting in more direct routes and reduced delays could reduce overall fuel burn by 6-12%.*[178]

NATS[179] *has, independently, set a stretching target to cut the CO2 emissions of aircraft under its control by an average of 10% per flight by 2020 against a 2006 baseline, which is currently being established."*[180] In July 2010, the Perfect Flight live trial demonstrated a reduction in CO2 emissions of some 11per cent on a flight from Heathrow to Edinburgh, through the use of an optimal flight profile and the minimization of delay at all stages of the flight.[181]

6. SKETCHING POSSIBLE OPTIONS FORWARD

6.1 A Roadmap Forward

A multilateral solution to the climate and aviation problem is favoured for political, economic, social, and environmental reasons, and preferable from a legal point of view. It is however not the only solution that is feasible. A plurilateral approach is legally possible and perhaps politically more realistic.

6.2 Actors

While a certain state-centred approach in this field can probably not be avoided given the clear decisions in international law stating that states have full sovereignty over their national air space,[182] other actors also need a voice in this upcoming process. The international community could learn from the EU process on how to involve international stakeholders. There is also a legal requirement to assess and consult on the environmental impacts.

6.3 New International Agreement

A new standalone multilateral or plurilateral agreement, potentially linked with the 2020 (entry into force) comprehensive, legally binding outcome of the UNFCCC negotiations, is favoured. Such an agreement should be based on fundamental principles, such as the objective of sustainable development, the precautionary principle, inter-generational equity, CBDRRC, the integration of social, economic and environmental issues and the sustainable use of natural resources. The current ICAO structures do not allow the EU to participate, which, given the competence structures in the EU, is a significant obstacle, and Member States of the EU do not adequately represent the Union as a whole. The UNFCCC has a historic opportunity to embark on comprehensive new negotiations, and the failed Kyoto attempt to task ICAO and IMO could be corrected.

The ICAO has an important technical role to play; however, due to its reliance on the Chicago Convention which does not provide for adequate sustainable development objectives (unlike the WTO and the GATT 1994), it is not the best forum for global compromise.

While unilateralism should be avoided, this paper does not recommend abandoning all unilateral initiatives. Especially in a global industry such as aviation, there will always be the avant-garde and it is important to safeguard that regulatory space.

6.4 Substantive and Institutional Elements of a Regulatory and Political Solution

In terms of substance, this paper has collected several elements that can be included in an agreement to address emissions from aviation.

Carbon offsetting schemes could be expanded and they could be combined with wildlife, deforestation and nature conservation projects. Until a global cap-and-trade system for aviation is feasible, guidelines on MBMs and the linking of schemes can improve coherence.

Some alternatives to economic instruments are efficiency standards, the use of second and third generation biofuels, carbon accounting and improved flight management.

If a new standalone treaty were to be formed, there would be several institutional possibilities, and it would not be advisable to create a new international institution. The agreement could be administered by the ICAO or the UNFCCC secretariat. The International Renewable Energy Agency (IRENA) might also be a possible administrator.

This treaty administration should also act as a focal point for catalyzing technological advances and sharing information and best practices in the field. An institutional link with the World Bank has been beneficial for institutions set up as accountability mechanisms, such as EITI. This could also be beneficial – at least initially – for the accounting of global GHG emissions (and the World Bank has sufficient institutional know-how with the prototype carbon fund).

ENDNOTES

1 See "Aircraft Engine Emissions," www.icao.int/icao/en/env/aee.htm. For the full report, see J. E. Penner et al., "Aviation and the Global Atmosphere," Intergovernmental Panel on Climate Change, http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/aviation/index.htm.

2 RCN Wit et al. "Giving Wings to Emissions Trading: Inclusion of Aviation under the European Emissions Trading System (ETS): Design and Impacts," Report for the European Commission (Delft: Director General of the Environment, 2005), available at http://www.asser.nl/upload/eel-webroot/www/documents/aviation_et_study.pdf.

3 Executive Summary, "Aviation and the Global Atmosphere," J. E. Penner et al. (Eds.), (Cambridge: Cambridge University Press).

4 Centre for Clean Air Policy (2004).

5 EU DG Climate Action, http://ec.europa.eu/clima/policies/transport/aviation/index_en.htm.

6 Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008, amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (OJ 2009 L 8, p. 3), recital 11.

7 Article 2(2) of the Protocol provides that *"[t]he Parties included in Annex I shall pursue limitation or reduction of emissions of greenhouse gases not controlled by the Montreal Protocol from aviation and marine bunker fuels, working through the International Civil Aviation Organization and the International Maritime Organization, respectively."*

8 ICAO,http://www.icao.int/Newsroom/Documents/CO2%20Metric%20System%20-%20Information%20Sheet_FINAL.PDF.

9 The 37th Session of the ICAO Assembly in 2010 instructed the UN aviation body to prepare and deliver both the MBM Framework and Feasibility Report for consideration by its next triennial Assembly in October 2013. ICAO Press Release, COM 20/12 http://www.icao.int/Newsroom/Pages/new-ICAO-council-high-level-group-to-focus-on-environmental-policy-challenges.aspx.

10 EU DG Climate Action, http://ec.europa.eu/clima/policies/transport/aviation/index_en.htm.

11 Concrete threats by the Indian WTO Panel representative at the ICTSD Trade and Climate Symposium, Durban 2011, see also ICTSD, "Opponents of EU Aviation Carbon Law Agree on Possible Countermeasures" *Bridges Weekly* 20 Feb 2012, http://ictsd.org/i/news/bridgesweekly/126278/.

12 This part shares thoughts with the author's case note "Air Transport Association of America v. Energy Secretary: Clarifying Direct Effect and Providing Guidance for Future Instrument Design for a Green Economy in the European Union," *Review of European Community & International Environmental Law,* no. 21 (2) (2012): 149 *ff.*

13 See Articles 21(1)(f) TEU and 192(1) TFEU respectively.

14 For an economic analysis, see for example, "Towards a Green Economy in Canada – Sustainable Prosperity White Paper Final Draft (June 2012), http://www.sustainableprosperity.ca/dl864&display.

15 Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (OJ 2003 L 275, p. 32).

16 Article 1, Subject matter.

17 EU press release, "Climate change: European Union notifies EU emission reduction targets following Copenhagen Accord," http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/97.

18 See footnote 5 above.

19 Recitals 10 and 11.

20 J. Scott and L. Rajaman, "EU Climate Change Unilateralism: International Aviation in the European Emissions Trading Scheme," *European Journal of International Law*, Vol. 23, No. 2, (2012): 475.

21 It is difficult to summarize the reactions within the EU. The lobbying at Union level was intense and the EU airline industry sent letters to EU leaders, including Chancellor Merkel and Prime Minster Cameron, warning of severe economic consequences if the inclusion of aviation was maintained. Given the suspension of the inclusion, it can only be assumed that this lobbying at the highest level was successful. The problem that, if ETS participation is restricted to the EU industry, this would not increase the competitiveness of that industry can be forgotten in the debate. Peter Marsh et al., Financial Times, 11 March 2012, http://www.ft.com/cms/s/0/3362d176-6b9c-11e1-8337-00144feab49a.html#axzz2CWgAcuP6. The signatories, which included Airbus, Lufthansa, Swiss, Iberia, British Airways and Virgin Atlantic among others, argued that the pollution levy threatens 2,000 jobs as well as trade. They were concerned about trade-related retaliation by countries not complying with the Emissions Trading Scheme (ETS). The industry executives also said they expect *"suspensions, cancellations and punitive actions" by other countries to grow "as other important markets continue to oppose the extension of ETS"*, according to the FT article which cited the letter. See also S. Mangan, "Aviation calls on EU leaders to fix carbon tax: FT", Reuters, 11 March 2012, http://www.reuters.com/article/2012/03/12/us-aviation-tax-eu-idUSBRE82B01020120312.

22 Case C-366/10 *Air Transport Association of America, American Airlines Inc., Continental Airlines Inc., United Airlines Inc. v Secretary of State for Energy and Climate Change* [2011] OJ C 260/9 . The principal EU institutions, together with interveners, including the UK and ten other EU Member States, as well as Iceland and Norway as ETS non-EU participants, defended the legality of the measure.

23 A convention that is solely concluded by the Member States, such as the Chicago Convention, binds the EU only if all powers previously exercised by the Member States have been transferred, which was not the case here.

24 Case C-366/10, Opinion of Advocate General Kokott, delivered on 6 October 2011.

25 Para. 147.

26 Para. 148.

27 Compare para. 154.

28 *Ahlstrom Osakeyhtio and Others v Commission*, paras 15-18.

29 Case C-188/07 *Commune de Mesquer* [2008] ECR I-4501, paras 60-62.

30 Para. 129.

31 Scott and Rajamani, supra at pp 475-6 and fn 36, point out: *"The territorial connecting factor to which the EU attaches importance is market access, be it for departing or landing flights. Only flights that depart from or land at an EU airport will be covered by the emissions trading scheme. The Aviation Directive may be extraterritorial when viewed through the lens of a productionbased system boundary. However, it is merely differently territorial when it is viewed through a system boundary that posits market access (place of arrival or departure) as the key ... Neither Kokott AG nor the ECJ accepted that the EU measure is extraterritorial … The ECJ observed at para. 125 that the Aviation Directive does not infringe the principle of territoriality because the aircraft covered are physically present in the territory of one of the EU Member States. It also stressed (para. 129) that the EU can take steps to regulate within its territory even where the activity causing effects within its territory originates in an event that occurs partly outside. This is a crucial point. It reminds us that from the perspective of the EU, the fact that a flight lands in or takes off from an EU airport is relevant not only from the point of view of its enforcement jurisdiction, but from the point of view of its legislative or prescriptive jurisdiction as well."*

32 Para. 24.

33 Case C-346/97 Braathens [1999] ECR I-3419.

34 Case C-127/07 *Arcelor Atlantique et Lorraine and Others* [2008] ECR I-9895.

35 Para. 140.

36 Para. 143.

37 See also Tunteng, Verki et al., "Legal Analysis on the Inclusion of Civil Aviation on the European Union Emissions Trading System," CISDL Legal Brief (2012), www.cisdl.org.

38 L. Bartels, "The Inclusion of Aviation in the EU ETS: WTO Law Considerations," *ICTSD Trade and Sustainable Energy Series*, no. 6 (2011). See also L. Bartels, '"The WTO Legality of the Application of the EU's Emission Trading System to Aviation," *European Journal of International Law,* no. 23 (2012): 429-67.

39 Bringing the matter before the WTO would involve risks on all sides. N. Purvis and S. Grausz, "Air Supremacy: The Surprisingly Important Dogfight over Climate Pollution from International Aviation," GMF Policy Brief (2012).

40 Scott and Rajamani, supra.

41 In EU discussions on this issue, some policy-makers have suggested that, when applying this principle in the EU ETS, smaller airlines with less than a couple of flights per week should be excluded, as an alternative to a blanket exception for large developing country carriers that are actively competing on lucrative routes. Compare Directive 2008/101/EC, para. 18.

42 Case C-366/10, Written Observations of the International Air Transport Association and the National Airlines Council of Canada, para 7.

43 This argument may seem somewhat bizarre given that many of the airlines included as claimants in this case originate from non-Kyoto Protocol countries – something that Advocate General Kokott pointed out.

44 This means that the Directive will not be enforced and payment will not be required by EU regulatory authorities in respect of extra-EU flights by airlines which exceed their emissions limit and are unable to buy additional allowances. Clyde & Co Aviation December 2012 Update, http://clydeco.com/uploads/Files/CC002382_Aviation_Legal_Update_7_12_12.pdf. The scheme still applies to intra-EU flights.

45 "Stopping the clocks of ETS and aviation emissions following last week's International Civil Aviation Organisation (ICAO) Council," European Commission MEMO/12/854, 12 November 2012, http://europa.eu/rapid/press-release_MEMO-12-854_en.htm.

46 *Ibid.*

47 It is however unclear how this will work in practice. Clyde & Co Aviation December 2012 Update, http://clydeco.com/uploads/Files/CC002382_Aviation_Legal_Update_7_12_12.pdf.

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