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The Environmentally Conscious Skies: Did the European Union's Game of Brinkmanship Lead to a Viable Global Plan for Emissions Trading in Aviation?

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THE ENVIRONMENTALLY CONSCIOUS SKIES: DID THE EUROPEAN UNION'S GAME OF BRINKSMANSHIP LEAD TO A VIABLE GLOBAL PLAN FOR EMISSIONS TRADING IN AVIATION?

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ABSTRACT

Effective January 1, 2012, the European Union (EU) instituted the first emissions trading scheme (ETS) for aviation, which affected the domestic and international commercial airlines flying into and out of the EU. The EU established the ETS to counter the global aviation sector's role in releasing greenhouse gas (GHG) emissions; however, such measures were met with heavy opposition by foreign countries, the International Civil Aviation Organization (ICAO), various commercial airlines and the Air Transport Association of America (ATA). This Article analyzes the legality of the EU's unilateral ETS approach with respect to the commercial airline industry, examines the subsequent development of the ICAO's global market based members (MBM) program, reviews strategic political strategies implemented by foreign nations to counter the EU's unilateral action, evaluates the ICAO's recent developments in instituting a global trading scheme to reduce GHG emissions, and analyzes policy issues with respect to the ICAO's MGM program as it applies to the EU ETS.

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TABLE OF CONTENTS

INTRODUCTION..... 2

I. APPLYING AN EMISSIONS TRADING PROGRAM TO GLOBAL AVIATION 6

 A. *The EU’s Decision to Take Unilateral Action*..... 6

 1. *Legal Challenges to the EU ETS*..... 8

 a. *The Courts* 9

 b. *Commentator Suggestions For Challenges and/or Resolutions*..... 12

 c. *A Challenge Based on the Treaty on the Functioning of the EU* 13

 d. *A Challenge Based on the Chicago Convention*..... 14

 e. *A Challenge Based on the World Trade Organization*..... 17

 (1)*GATT*..... 18

 (2)*GATS* 24

 f. *Incorporating a Bilateral or Multilateral Treaty* 25

 (1)*Political Responses* 27

 (a)*Equivalent Measures*..... 27

 (b)*Retaliatory Measures*..... 29

 B. *The ICAO’s Proposed Resolution and Fate of the EU’s ETS* ... 32

II. EVALUATING THE ICAO’S GLOBAL TRADING SCHEME..... 35

 A. *Technologies & Operational Initiatives* 35

 B. *Sustainable Alternative Fuels*..... 39

 C. *Overall Analysis* 45

CONCLUSION 46

INTRODUCTION

When environmental efforts to reduce aircraft emissions collide with aviation interests, tensions around the world escalate on countless fronts. Unlike other modes of transportation, the aviation sector brings together a unique mix of global parties including sovereign nations; a regional union of countries offering a singular marketplace through standardized laws; federal, state and local governments; and major corporations representing

national interests of airlines, manufacturers, and suppliers.¹ As such, regional or global efforts to bring forth meaningful changes to public policy addressing the aviation sector's role in releasing greenhouse gases (GHG) into the environment could stir controversy amongst the many stakeholders.²

Given that GHG emissions from the aviation industry account for about four percent of the total pollutants emitted globally, it is viewed as one of the fastest growing sources of emissions.³ The aviation industry is the only commercial trade industry that emits harmful emissions directly into the upper atmosphere⁴ and has thus become a high profile political target for environmental and other groups seeking to advance their sustainability agendas despite the industry's limited overall impact.⁵ As a result, the European Union (EU) adopted the first emissions trading scheme (ETS) for aviation on November 9, 2008, which included all aircraft, international and domestic, landing or departing within its jurisdiction regardless of the country in which each aircraft is registered.⁶

In taking this step, the EU set off a chain of events whereby numerous countries responded in opposition to the program and took offense to the regional regulatory body's bold directive, basing arguments on the premise that the ETS directly infringes on national sovereignty and corporate representatives, including air carriers.⁷ Twenty-six member

1. See generally Darren A. Prum and Sarah L. Catz, Greenhouse Gas Emission Targets and Mass Transit: Can The Government Successfully Accomplish Both Without a Conflict?, 51 SANTA CLARA L. REV. 935 (2011).

2. See generally Daniel B. Reagan, Note, Putting International Aviation into the European Union Emissions Trading Scheme: Can Europe Do It Flying Solo?, 33 B.C. ENVTL. AFF. L. REV. 349 (2008).

3. See Kathryn Kisska-Schulze & Gregory P. Tapis, *Projections For Reducing Aircraft Emissions*, 77 J. AIR L. & COM. 701, 706 (2012). Per the National Aeronautics and Space Administration (NASA), "aircraft produce up to 4[%] of the annual global CO₂ emissions from fossil fuels near the Earth's surface as well as at higher altitudes." Glenn Research Center: Fact Sheet, NASA, <http://www.nasa.gov/centers/glenn/about/fs10grc.html> (last visited Sept. 24, 2014); see also CONGRESSIONAL RESEARCH SERVICE, AVIATION AND THE EUROPEAN UNION'S EMISSION TRADING SCHEME 27 (2012) [hereinafter CRS Report].

4. Paul Stephen Dempsey, *Trade & Transport Policy in Inclement Skies—The Conflict Between Sustainable Air Transportation and Neo-Classical Economics*, 65 J. AIR L. & COM. 639, 643 (2000).

5. Brian F. Havel & Gabriel S. Sanchez, *Toward an International Aviation Emissions Agreement*, 36 HARV. ENVTL. L. REV. 351, 354 (2012).

6. Directive 2008/101, of the European Parliament and of the Council Amending Directive 2003/87/EC so as to Include Aviation Activities in the Scheme for Greenhouse Gas Emission Allowance Trading Within the Community, COM (2008) 818 final (Nov. 19, 2008), <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:008:0003:0021:en:PDF> [hereinafter 2008 EC Aviation Directive]. The implementation of aviation into the EU ETS did not take effect until January 1, 2012. *Id.*

7. See discussion *infra* Part I.A.

states of the International Civil Aviation Organization (ICAO) signed a joint agreement at the ICAO Council meeting on September 30, 2011, in New Delhi, India, affirming their opposition to the EU's decision to include aviation into its ETS,⁸ while several different carriers registered in the U.S. and the Air Transport Association of America (ATA) initiated legal action.⁹

The contentiousness and fear of retaliation by some governments upset with the ETS's application to its air carriers prompted some EU based airlines to delay requests for permission to expand service in those countries taking issue with the policy decision.¹⁰ Making an observation on the global dispute, the Chief Executive of Lufthansa stated that it appeared as if EU policymakers may have significantly misjudged other countries' reactions to this initiative, believing instead that advancing such an all-inclusive strategy would generate similar approaches around the world.¹¹

With such a high profile global dispute, many commentators evaluated and considered the numerous issues that continued to unfold as policymakers from around the world sought a resolution.¹² While some commentators focused on whether a country in opposition to the EU's ETS could mount a successful legal challenge,¹³ others advocated for an incremental approach with bilateral and multilateral agreements paving the way to a mutually beneficial resolution.¹⁴

8. INT'L CIVIL AVIATION ORG., Working Paper: Inclusion of International Civil Aviation in the European Union Emissions Trading Scheme and its Impact, ICAO Council, 194th Sess., App., ICAO Doc. C-WP/13790 (Oct. 17, 2011).

9. See generally Case C-366/10, Air Transp. Ass'n of Am. v. Sec'y of State for Energy & Climate Change, 2011 E.C.R. I-13755, available at http://curia.europa.eu/juris/document/document_print.jsf?doclang=EN&text=&part=1&docid=117193&cid=29777.

10. Daniel Michaels, *China Trips Up Major Airbus Deal*, WALL ST. J. (June 25, 2011), <http://online.wsj.com/news/articles/SB10001424052702304231204576405680519350192>

11. *Id.*

12. See, e.g., CRS Report, *supra* note 3; Reagan, *supra* note 2; see also Havel & Sanchez, *supra* note 5; Stephanie Switzer, *Aviation and Emissions Trading in the European Union: Pie in the Sky or Compatible with International Law?*, 39 ECOLOGY L. CURRENTS 1 (2012); Lorand Bartels, *The Inclusion of Aviation in the EU ETS: WTO Law Considerations*, ICTSD PROGRAMME ON TRADE AND ENV'T (Int'l Centre for Trade and Sustainable Dev. Issue Paper No. 6, Apr. 2012); Katelyn E. Ciolino, *Up In the Air: The Conflict Surrounding the European Union's Aviation Directive and the Implications of a Judicial Resolution*, 38 BROOK. J. OF INT'L L. 1151 (2013); Gabriel S. Sanchez, *In Defense of Incrementalism for International Aviation Emissions Regulation*, 53 VA. J. INT'L L. DIG. 1 (2012); Jol A. Silversmith, *The Long Arm of the DOT: The Regulation of Foreign Air Carriers Beyond US Borders*, 38 AIR & SPACE L. 173 (2013).

13. See, e.g., Switzer, *supra* note 12; see also Bartels, *supra* note 12; Ciolino, *supra* note 12; Silversmith, *supra* note 12.

14. See, e.g., Havel & Sanchez, *supra* note 5; see also Sanchez, *supra* note 12.

The EU's game of brinkmanship, however, became the catalyst for the ICAO to recently approve the development of its own global market based measures (MBM) program to quantify and reduce GHG emissions directly attributable to aviation, and forced the European Commission (EC) to recommend another postponement of its ETS as applied to foreign-flagged carriers.¹⁵ This Article seeks to address the legality associated with the unilateral approach undertaken by the EU to affect global public policy with regard to the GHG emissions derived from aviation and provides an analysis of whether the ICAO's response to such tactics will foster an MBM program which successfully reduces aircraft pollution at a global level.

Part I of this Article examines how the ICAO member nations decided to institute a global market based members (MBM) program for aviation emissions. It begins by explaining the underlying motivations of the EU to take the step to include all foreign carriers into its ETS. Part I then examines the aftermath of this step, involving a lawsuit filed in the English High Court as well as the possible challenges available under existing international agreements with dispute resolution mechanisms and the use of bilateral or multilateral treaty options to resolve the issue. Beyond challenging the legality of the ETS, Part I also reviews the strategy by some nations, which responded politically by attempting to develop jurisdictional programs to qualify under the "equivalent measures" exemption, or via obstinate actions, threats, or retaliation.

Part II evaluates the recent developments by the ICAO to institute a global trading scheme addressing GHG emissions from aviation in conjunction with evolving technology and whether such a program will resolve the dispute with the EU. This section further examines the current technologies available and the planned operational initiatives for aviation that may affect emissions based on their viability and relevance in offering a solution. In addition, we review the applicability of sustainable alternative fuels, which offer technological advancements that may directly reduce GHG emissions from aircraft. Finally, we consider the policy implications associated with the ICAO's MBM program as it applies to the EU's ETS in terms of the "equivalent measures" exception.

15. European Commission proposal for European Regional Airspace Approach for the EU Emission Trading for Aviation—Frequently asked questions, MEMO/13/905 (Oct. 16, 2013) (*available at* http://europa.eu/rapid/press-release_MEMO-13-905_en.htm) [hereinafter EC Memo for Regional ETS].

I. APPLYING AN EMISSIONS TRADING PROGRAM TO GLOBAL AVIATION

Following a two-decade endeavor to determine whether and how to abate aviation emissions to reduce climate change, the EU's Council and Parliament decided to incorporate GHG emissions from aviation sources as part of its larger ETS beginning on January 1, 2012.¹⁶ This action by the EU ignited an intense backlash from non-European flagged carriers and their governments.¹⁷ While initially taking measured steps, the ICAO finally responded with a unilateral plan, which offered MBMs for a more global solution to aviation emission controls; however, the EU approached the subject with a wait-and-see position.¹⁸ As such, the historical steps taken by the many stakeholders to get to this point in time, as well as the peripheral events and pressures, become relevant to understanding whether or not the ICAO's approach will ultimately succeed.

A. *The EU's Decision to Take Unilateral Action*

Unilaterally instituting an ETS, the EU based its course of action on its obligations under the 1992 United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol of 1997, in conjunction with the governments' frustrations over the lack of the ICAO's progress towards developing meaningful GHG emissions policies.¹⁹ Prior to taking this action, the EU contemplated a change in philosophy to a system predicated on allowing market conditions to allocate emissions rather than continuing its highly regulated approach

16. 2008 EC Aviation Directive, *supra* note 6. On December 21, 2011, the European Union Court of Justice upheld the validity of the ETS. This decision originated from a 2009 suit filed by the Air Transport Association of America (ATA) and three member carriers—American Airlines, Continental Airlines, and United Airlines—against the UK Secretary of State for Energy and Climate Change on the legality of the EU's plan to apply its ETS to non-EU airlines. *See Kisska-Schulze & Tapis, supra* note 3, at 729. *See also* Case C-366/10, *Air Transp. Ass'n of Am. v. Sec'y of State for Energy & Climate Change* 233, 240, 2011 E.C.R. I-13755 (opinion of the Advocate General Kokott), available at <http://curia.europa.eu/juris/document/document.jsf?jsessionid=9ea7d0f130d5730a46ec17a242f895bda608aa1802c3.e34KaxiLc3eQc40LaxqMbN4Oa3qLe0?text=&docid=110742&pageIndex=0&doclang=EN&mode=req&dir=&occ=first&part=1&cid=3591251>.

17. Andrew Galbraith, *China Bans Its Airlines From Paying EU Carbon Emissions Fees*, WALL ST. J. (Feb. 6, 2012), <http://online.wsj.com/news/articles/SB10001424052970204369404577206613592210638>.

18. *See* EC Memo for Regional ETS, *supra* note 15.

19. Commission Proposal for a Directive of the European Parliament and of the Council Amending Directive 2003/87/EC so as to Include Aviation Activities in the Scheme for Greenhouse Gas Emission Allowance Trading Within the Community, at 3, COM (2006) 818 final (Dec. 20, 2006) [hereinafter 2006 EC Aviation Directive].

coordinated by the various governments.²⁰ As the EU member nations weighed the philosophical change and acknowledged the successful implementation of market-based approaches in the U.S.,²¹ they gained confidence in formulating a policy of their own jurisdiction to address local environmental concerns.²²

To design its ETS program, the EU turned to the ICAO to develop a regulatory structure for GHG emissions reductions for domestic and international aviation sources.²³ While leaving the responsibility of regulating GHG emissions emanating out of domestic aviation to the signatory countries, the Kyoto Protocol deferred to the ICAO on situations when emissions releases occur during international flights.²⁴ This action essentially split the regulatory authority between the ICAO for international flights, while leaving it up to each country to determine an approach for domestic aviation.

With the ICAO in the lead with respect to regulating GHG emissions in a broader international context, it turned to the UNFCCC to prepare and publish a report focusing aviation's effect on climate change, which later was included in the organization's Assembly Resolution A35-5 in 2004.²⁵ This resolution addressed the various tools available to those seeking to regulate the production of GHGs from aviation, such as voluntary efforts to promote reductions within member countries, the use of emissions

20. See Reagan, *supra* note 2, at 362.

21. *Id.*

22. *Id.*

23. Kyoto Protocol to the United Nations Framework on Climate Change art. 2.2, UN Doc FCCC/CP/1997/7/Add.1, Dec. 10, 1997, 37 I.L.M. 22 (1988) [hereinafter Kyoto Protocol]. The signatory nations of the Kyoto Protocol agreed upon such a role for the ICAO. During the policy discussion that occurred in the third conference of the parties of the United Nations Framework Convention on Climate Change in 1998, the countries in attendance discussed courses of action to address GHG emissions that threaten the entire planet, which eventually led to obligations from the signatory nations to attain quantifiable reductions in such releases. See 2008 EC Aviation Directive, *supra* note 6. For those industrialized countries that chose to join the Kyoto Protocol, they agreed to shrink their average GHG emissions to below 5% of their 1990 levels during the years of 2008 to 2012. *Id.* In June 2009, the EU Parliament and Council committed to further reduce GHG emissions to 30% below 1990 levels by the year 2020 in the event that it can come to a binding international agreement by 2015 with major emitting countries that would obligate them to make reductions by an effective date in 2020. *Id.*

24. *Id.* Article 2.2 states, "[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." *Id.*

25. INT'L CIVIL AVIATION ORG., *Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection*, Assemb. Res. A35-5 (2004), compiled in *Assembly Resolutions in Force*, at I-44, ICAO Doc. 9848 (Oct. 8, 2004) [hereinafter ICAO Assemb. Resolution A35-5].

based taxes and surcharges, and the employment of trading schemes.²⁶ The ICAO decided against the creation of a global ETS system for aviation.²⁷ Instead, the organization supported an approach that offered solutions through voluntary measures and by mutual agreement between member states.²⁸

Growing restless with the lack of action by the ICAO, the EC proposed the inclusion of the aviation industry into its GHG ETS in 2006 in an effort to help generate an international solution.²⁹ Undeterred by this intimidation tactic, the ICAO continued to support the bilateral agreement approach and urged against the implementation of a unilateral solution upon other member states;³⁰ however, the EU decided to incorporate aviation into its existing EU ETS by 2012 based on its frustration with the ICAO's lack of substantive progress.³¹ The EU later chose to temporarily suspend the application and enforcement of the program until 2014 in order to allow a forthcoming proposal on a comprehensive international market based measure at the October 2013 ICAO meeting.³²

1. *Legal Challenges to the EU ETS*

In response to the EU's decision to include foreign flagged carriers and its subsequent decision to adopt such a policy, many foreign governments reacted negatively.³³ Several governments, along with China, Russia, India, and the U.S., interpreted the EU's actions as violating international law.³⁴ While only one lawsuit ensued to determine the legality of the EU's

26. *Id.* at I-46 to I-48.

27. *Id.*

28. *Id.* at I-47.

29. See 2006 EC Aviation Directive, *supra* note 19.

30. INT'L CIVIL AVIATION ORG., *Consolidated Statement of Continuing ICAO Policies and Practices Related to Environmental Protection*, Assemb. Res. A36-22 (2007), compiled in *Assembly Resolutions in Force*, ICAO Doc. 9902 (Sept. 28, 2007).

31. See 2008 EC Aviation Directive, *supra* note 6. Following the EU's lead along with its own dissatisfaction with the ICAO's unresponsiveness, Australia and New Zealand proceeded to include the aviation industry into their own ETS while exempting international aviation fuels from each country's program. See CRS Report, *supra* note 3, at 3.

32. Council Decision No. 377/2013/EU, 2013 O.J. (L 113) 1 (Apr. 24, 2013).

33. Alessandro Torello, *EU Court Backs Carbon Trade for Airlines*, WALL ST. J. (Dec. 21, 2011), <http://online.wsj.com/news/articles/SB10001424052970204464404577112004147787954>.

34. *Id.* While the European Court of Justice considered the validity of the inclusion of foreign flagged carriers in the ETS program, U.S. Secretary of State Hillary Clinton along with Secretary of Transportation Raymond LaHood sent correspondence to several of the EU's commissioners in an attempt to encourage the suspension and enforcement of the rules and to engage in negotiations to develop a global solution for the emissions emanating from aviation. *Id.* The letters also notified the EU commissioners that a lack of willingness on their part to move towards a more amicable solution will compel the U.S. "to take appropriate action." *Id.* Likewise, the Chinese aviation administration

action, those parties wishing to strike down the ETS sought relief through other international organizations offering dispute resolution mechanisms within the EU's jurisdictional oversight. As such, the threat of utilizing alternative dispute resolution mechanisms provided insight into the complexity of including the aviation industry in the EU's ETS, as well as the different sources of pressure placed on all those involved seeking an amicable resolution.

a. The Courts

In late 2011, the ATA and several U.S. flagged airlines challenged the decision by the EU to include aviation in the ETS in the English High Court.³⁵ In bringing the lawsuit, the ATA sought injunctive relief against the measures taken by the United Kingdom to implement the EU's ETS.³⁶ The complaint contended that the extraterritorial nature of the directive by the EU was beyond its legal capacity, that the unilateral regulation ran contrary to the negotiated global approach agreed upon in the Kyoto Protocol, and that the ETS amounted to a tax on fuel consumption, which breaches the Chicago Convention on International Civil Aviation and the Open Skies Agreement (Chicago Convention).³⁷ While the English High Court could have decided the case on a national basis, it maintained the obligation to seek an advisory opinion from the European Court of Justice (ECJ) on the validity of certain aspects of the ETS directive.³⁸ In seeking the ECJ's opinion, the English High Court requested guidance on whether specific provisions contained in international agreements could serve as a basis for determining the validity of EU law, along with particular

forbid air carriers under its jurisdiction to participate in the EU's ETS program. *See Galbraith, supra* note 17.

35. *See generally* Case C-366/10, *supra* note 9.

36. *Id.*

37. *Id.* *See also* Kisska-Schulze & Tapis, *supra* note 3, at 729.

38. Consolidated Version of the Treaty on the Functioning of the European Union, art. 267, 2010 O.J. (C 83) 164, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:0047:0200:en:PDF> [hereinafter EU Art. 267]. Pursuant to the EU's precedent, the EU courts specifically reserve the right to determine the validity of an act of an EU institution; so a national court in a member state must refer the matter to the European Court of Justice. *See* Case 314/85 Foto-Frost v. Hauptzollamt Lübeck-Ost, 1987 E.C.R. 419, ¶¶ 15–19, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:61985CJ0314:EN:HTML>. However, Article 267 of the Treaty on the Functioning of the European Union provides for a national court of a member state to receive an advisory opinion from the European Court of Justice for constituent treaties or the “validity and interpretation of acts of the institutions” with the understanding that the “preliminary ruling” will provide a foundation for the underlying case. *See* EU Art. 267, *supra*.

principles of customary international law.³⁹ The court further sought clarification as to whether the asserted claims provided a foundation for invalidating or affecting the EU Directive that included aviation in the ETS program.⁴⁰

In responding to the first question, the ECJ grounded its opinion in the Treaty on the Functioning of the European Union Article 216(2) whereby the international agreements approved by the EU also apply to its institutions, which prevails when a conflict arises from an institution's action.⁴¹ The ECJ further explained that when evaluating the actions of an EU institution for conformance with the provisions contained in international legal agreements, three conditions must be satisfied: (1) the international rules must bind the EU, (2) "the nature and broad logic" of an applicable treaty cannot preclude scrutiny of its validity within the larger context of the EU's act, and (3) the applicable sections at issue must include a clear and precise obligation that prohibits any further steps from occurring towards implementation.⁴²

In applying these three criteria to the case at hand, the ECJ turned to evaluating the treaties included in the advisory opinion request.⁴³ The court explained that many of its member states are signatories to the Chicago Convention, but the EU is not a party to the agreement, which precludes the application of the provisions of that treaty.⁴⁴ Turning to the Kyoto Protocol and the language that calls for the reduction of GHG emissions in aviation through plans articulated by the ICAO, the ECJ recognized the EU's status as a party to the agreement, but determined that the provision lacked the unconditionality and sufficiency in precision necessary for a legal proceeding to use as a foundation to contest the authority of the directive to include aviation in the ETS.⁴⁵

39. See generally Case C-366/10, *Air Transp. Ass'n of Am. v. Sec'y of State for Energy & Climate Change*, Reference for a Preliminary Ruling from High Court of Justice Queen's Bench Division (July 22, 2010), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:260:0009:0010:EN:PDF>

40. *Id.*

41. Case C-366/10, *Air Transp. Ass'n of Am. v. Sec'y of State for Energy & Climate Change*, 2011 E.C.R. I-13755, ¶ 50, available at http://curia.europa.eu/juris/document/document_print.jsf?doclang=EN&text=&part=1&docid=117193&cid=29777 [hereinafter ECJ Final Judgment].

42. *Id.* ¶ 51–54.

43. *Id.* ¶ 56.

44. *Id.* ¶ 57–72. The court also explained that on certain subjects the EU chose to legislate, but the ECJ does not maintain jurisdiction in all areas covered by the Chicago Convention. *Id.* ¶ 69–70. For example, the French and Swedish governments chose to keep its powers to grant traffic rights, to determine the applicable airport charges, and to allocating restricted airspace within its jurisdiction. *Id.* ¶ 70.

45. *Id.* ¶ 73–78.

Finally, the ECJ evaluated the Open Skies Agreement, of which the EU is a party, and found nothing in the “broad logic” of the document to disqualify its use as a point of reference to attack the validity of the directive.⁴⁶ In tackling the secondary part of the analysis with respect to the Open Skies Agreement, the Court turned to the specific provisions.

Contained within Article 7, the applicable provision “. . . requires aircraft engaged in international navigation to comply with the laws and regulations of the European Union only when the aircraft enter or depart from the territory of the Member States . . .”⁴⁷ In evaluating this language, the court found that the aircraft only falls within the auspices of the ETS if the operator of a flight arrives or departs from a point within an EU member state, but is not subject to such treatment if the aircraft merely travels through EU airspace.⁴⁸ As a result, the applicable provisions of Article 7 do not prohibit flights terminating in EU member states from being included in the ETS. Therefore, no conflict with the directive exists based on this part of the agreement.⁴⁹

In considering the applicable language of Article 11, where an exemption exists for such items as aviation charges, taxes, levies, duties and fees on lubricants, fuel, and consumable supplies associated with the maintenance and operation of aircraft, the ECJ made a comparison to the underlying motivations for such actions.⁵⁰ The Court noted that the primary motivation for a tax or charge comes from an intention to generate revenue for the public good; but the decision to broaden the ETS to include aviation emissions emanated out of the desire to meet certain environmental objectives.⁵¹ With this in mind, the Court found that the ETS did not impose a tax or charge and did not provide a basis for inconsistency.⁵²

Turning to Article 15, the Court evaluated the applicable environmental standards.⁵³ According to the ECJ’s interpretation, this provision, read in

46. *Id.* ¶ 79–85.

47. *Id.* ¶ 131.

48. *Id.* ¶ 131–35.

49. *Id.*

50. *Id.* ¶ 136–47.

51. *Id.*

52. *Id.*

53. *Id.* ¶ 148–56. Article 15(3) reads “When environmental measures are established, the aviation environmental standards adopted by the International Civil Aviation Organization in Annexes to the Convention shall be followed except where differences have been filed. The Parties shall apply any environmental measures affecting air services under this Agreement in accordance with Article 2 and 3(4) of this Agreement.” See Air Transport Agreement of April 2007 between the European Community and its Member States, of the one part, and the United States of America, of the other part,

the context of the other referenced provisions, appeared to hold the EU accountable for ensuring that any environmental measures undertaken in the form of a charge that could limit the volume, regularity, or frequency of transatlantic air service not be higher than those payable by the airlines from an EU member state, and further must be compatible with applicable ICAO standards.⁵⁴ The Court detailed that neither the English High Court nor the ATA or other participants provided any material evidence that the inclusion of aviation within the ETS violated any ICAO environmental standard within the meaning of its interpretation of Article 15.⁵⁵

Moreover, the Court considered the EU's ETS program within the annex guiding principles for the design and implementation of market based measures as articulated in ICAO Resolution A37-19.⁵⁶ It held that the EU's ETS program did not infringe upon the standards adopted by the ICAO.⁵⁷ Accordingly, the Court found no conflict between the Open Skies Agreement and the EU's ETS program that would invalidate its implementation.⁵⁸

Thus, the ECJ advised the English High Court in its underlying case that the directive to include aviation within the larger ETS program was not preempted by previous international conventions and agreements like the Chicago Convention, the Kyoto Protocol, or the Open Skies Agreement.⁵⁹

b. Commentator Suggestions For Challenges and/or Resolutions

Upon observing the ECJ's decision to uphold the EU's ETS, and recognizing the size of the controversy, commentators from around the world evaluated various options for further challenges to the policy and offered proposals to bring forth a more mediated settlement.⁶⁰ While it appears that none of these proposals were executed, they offer a glimpse into the growing tension between the EU and those countries opposing the broad inclusion of aviation into the ETS program, as well as the remaining

April 2007, 2007 O.J. (L 134) 4, available at <http://www.state.gov/documents/organization/114872.pdf>.

54. Case C-366/10, *supra* note 39, ¶ 148–56.

55. *Id.* ¶ 149.

56. *Id.*

57. *Id.*

58. *Id.*

59. *Id.* ¶ 157.

60. *See infra* Part I.A.1.b–f.

weapons available for quashing the directive in the event a nation determines the need for such an action.

c. A Challenge Based on the Treaty on the Functioning of the EU

Before considering the options outside of the EU, Professor Stephanie Switzer⁶¹ pointed out the possibility of challenging the legality of the directive through Article 263 of the Treaty on the Functioning of the EU.⁶² Within the provisions of this article, “The Court of Justice of the European Union shall review the legality of legislative acts . . .” and allow “[a]ny natural or legal person . . . [to] institute proceedings against an act addressed to that person or which is of direct and individual concern to them, and against a regulatory act which is of direct concern to them and does not entail implementing measures.”⁶³

Under these provisions, Professor Switzer explained that a plaintiff must overcome a restrictive requirement for standing.⁶⁴ To gain standing in this type of situation, the plaintiff has two options:⁶⁵ the party asserting the claim must establish a “direct and individual concern” from the underlying act or must demonstrate that the measure itself has a direct effect outside of the implementation aspects.⁶⁶

In evaluating such a claim, Professor Switzer conceded that a plaintiff will face difficulties in meeting its obligations.⁶⁷ In particular, she held that the burden of proving an individual concern which establishes that an enactment by the EU singles out the plaintiff solely and does not also affect others is too difficult.⁶⁸ Hence, Professor Switzer found this challenge to be improbable if pursued.⁶⁹

61. Dr. Stephanie Switzer is a professor of law at the University of Strathclyde in the United Kingdom. Her main research interests include European law and environmental and economic development. She has published one book and seven articles in her areas of expertise, including *Aviation and Emissions Trading in the EI: A Flight of Fancy or Compatible With International Law?*, *supra* note 12, and, with Joseph McMahon, *EU Biofuels Policy—Raising the Question of WTO Compatibility*, 60 INT’L & COMP. L.Q. 713 (2011).

62. *See* Switzer, *supra* note 12, at 11.

63. Consolidated Version of the Treaty on the Functioning of the European Union, art. 263, 2010 O.J. (C 83) 164, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2010:083:0047:0200:en:PDF>.

64. *See* Switzer, *supra* note 12, at 11.

65. *Id.*

66. *Id.*

67. *Id.*

68. *Id.*

69. *Id.*

d. A Challenge Based on the Chicago Convention

Outside of the EU courts, a challenge to the ETS program may occur based on the filing of a complaint with the ICAO under Article 84 of the Chicago Convention.⁷⁰ According to Professor Switzer, most parties to the Convention rarely turn to this option,⁷¹ but the U.S. government exercised this course of action in another instance when the EU attempted to impose its will with regard to aircraft registered outside its jurisdiction with loud engines.⁷²

In April 1998, the Commission of the EU submitted a proposed regulation⁷³ (hereinafter, the “Hushkit Regulation” or “Regulation”) to preclude certain aircraft from servicing EU Community airports.⁷⁴ The proposed Regulation, which set an effective date of April 1, 2002, targeted older model aircraft, which had been “recertificated” to comply with the noise standards of Annex 16 to the Chicago Convention, hushkit (or noise-muffled) aircraft and re-engined older aircraft.⁷⁵ The Regulation was adopted on April 29, 1999, but was allotted a one-year postponement so as to facilitate consultations with the U.S. on the issue.⁷⁶

The Regulation indicated that noise-modified aircraft registered in the U.S. and other countries outside of the EU could not operate in the EU

70. See Convention on Int'l Civ. Aviation at the Chicago Convention art 84, Dec. 7, 1944, 15 U.N.T.S. 295, available at http://www.icao.int/publications/Documents/7300_orig.pdf [hereinafter Chicago Convention]. The article reads, “[i]f any disagreement between two or more contracting States relating to the interpretation or application of this Convention and its Annexes cannot be settled by negotiation, it shall, on the application of any State concerned in the disagreement, be decided by the Council. No member of the Council shall vote in the consideration by the Council of any dispute to which it is a party. Any contracting State may, subject to Article 85, appeal from the decision of the Council to an ad hoc arbitral tribunal agreed upon with the other parties to the dispute or to the Permanent Court of International Justice. Any such appeal shall be notified to the Council within sixty days of receipt of notification of the decision of the Council.” *Id.*

71. See Switzer, *supra* note 12, at 11. In addition to Professor Switzer, the authors of a report to Congress from the Congressional Research Service also supplied this option, but they chose to focus on the procedural aspects of such a challenge rather than the precedent or the substance of such a claim. See CRS Report, *supra* note 3, at 27.

72. See *infra* text accompanying notes 68–89.

73. Corrigendum to Council Regulation (EC) No 925/1999 of 29 April 1999 on the Registration and Operation Within the Community of Certain Types of Civil Subsonic Jet Aeroplanes Which Have Been Modified and Recertificated as Meeting the Standards of Volume I, Part II, Chapter 3 of Annex 16 to the Convention on International Civil Aviation, 3d ed. (July 1993) 1999 O.J. (L 120) 46, Art. 2.2 [hereinafter “Regulation”].

74. Benedicte A. Claes, Comment: Aircraft Noise Regulation in the European Union: The Hushkit Problem, 65 J. AIR L. & COM. 329, 330 (2000).

75. *Id.* at 331. See also Andreas Knorr and Andreas Arndt, ‘Noise Wars’: The EU’s ‘Hushkit Regulation’ Environmental Protection or ‘Eco’-protectionism?, MATERIALIEN DES WESSENSCHAFATSSCHWERPUNKTES, GLOBALISIERUNG DER WELTWIRTSCHAFT, BD. 23, 5 (July 2002).

76. Claes, *supra* note 74, at 331.

after March 2002.⁷⁷ Furthermore, aircraft which were already registered in an EU member state or which were registered outside the EU by a foreign carrier but were operational in the EU, were “grandfathered” under the Regulation.⁷⁸

In instituting the Hushkit Regulation, the EU was steadfast in its concern that certain aircraft which were originally certified to meet the noise standards dictated by the ICAO⁷⁹ to improve noise certification levels not only caused more noise pollution, but also more gaseous emissions and consumed more fuel than modern aircraft originally certified to meet the Chicago Convention standards.⁸⁰

The U.S. vigorously opposed the Regulation, arguing that it was discriminatory against United States’ air carriers, U.S.–manufactured hushkits and aircraft engines,⁸¹ and was excessively costly to the U.S.⁸² Specifically, many U.S. airlines, including Northwest Airlines, had complied with the strict standards imposed by Annex 16 to the Chicago Convention by retrofitting aircraft engines with hushkits to dampen engine noise rather than purchasing newer aircraft.⁸³ The U.S. also maintained that hushkits used on aircraft flying into and out of the EU not only complied with the ICAO standards, but also adequately reduced noise emissions.⁸⁴ Most notably, it was argued that the Regulation failed to rely on performance standards, including regulating the volume of noise an aircraft actually makes as its basis for imposing its restrictions, but rather

77. See generally H.R. Rep. 106-334 (1999), available at <http://www.gpo.gov/fdsys/pkg/CRPT-106hrpt334/html/CRPT-106hrpt334-pt1.htm> (last visited Oct. 9, 2014).

78. *Id.* (“The regulation provides that . . . a recertified aircraft that was on the register of an EU member state before April 1, 1999 can be freely transferred to the registry of another EU Member State. Recertificated aircraft registered in non-EU States can not be operated in the EU after April 1, 2002, unless the operator can prove that these aircraft were both operated in the EU between April 1, 1995 and April 1, 1999, and have remained on the same register.”)

79. Chapter 3 of Volume 1 of Annex 16 to the Chicago Convention dictates noise allowances and requirements for subsonic jet aeroplanes, propeller-driven aeroplanes over 5,700 kg, and propeller-driven aeroplanes 8,618 kg.

80. Claes, *supra* note 74, at 332.

81. Specifically, the Regulation arguably targeted the older-model Boeing aircraft, including the Boeing 727 and DC-9, which had been fit with hushkit mufflers to meet the requirements of the ICAO noise standards. See *US Critical of EU Hush-Kit Ban*, BLOOMBERG NEWS (Dec. 11, 1998), <http://community.seattletimes.nwsourc.com/archive/?date=19981211&slug=2788480>.

82. Claes, *supra* note 74, at 332.

83. See Reagan, *supra* note 2, at 360, citing Paul Stephen Dempsey, *Flights of Fancy and Fights of Fury: Arbitration and Adjudication of Commercial and Political Disputes in International Aviation*, 32 GA. J. INT’L & COMP. L. 231, 279 (2004).

84. Claes, *supra* note 74, at 332.

imposed restrictions relying only on specified aircraft and engine technology and equipment with no regard to actual noise levels.⁸⁵

The U.S. was unsuccessful in preventing the Hushkits Regulation adoption in April 1999, or its subsequent implementation on the effective date.⁸⁶ There were several attempts to negotiate with the EU regarding the regulation to include U.S. Cabinet members and Ambassadors requesting that the EU not ratify the Regulation until further discussions took place.⁸⁷ Finally, on March 14, 2000, the U.S. initiated a dispute resolution proceeding before the ICAO Council.

EU member states responded by filing objections, specifically noting that the U.S.'s action was premature in that the parties failed to engage in sufficient negotiations; the U.S. failed to exhaust local remedies; and the U.S. requested relief exceeding the scope of the ICAO's authority.⁸⁸ The ICAO voted 26–0 in favor of the U.S. on the preliminary objections.⁸⁹ In October 2001, the U.S. and EU member states reached a preliminary agreement whereby the U.S. agreed to withdraw its ICAO complaint, and the EU would repeal the Hushkit Regulation.⁹⁰ Such dispute was finally settled on December 6, 2003.⁹¹

When considering the merits of a case under Article 84 for the ETS directives, the hushkit scenario seems very similar. The U.S. brought an Article 84 action against the EU member states in the hushkit dispute basing its argument on the fact that the institution of such unilateral regulation was in opposition to the Chicago Convention and the ICAO.⁹² Prior to bringing the action, Omega Air and other carriers had already filed suit in the English High Court and in the High Court of Ireland to prevent the enactment of the hushkit prohibition.⁹³ Preliminary rulings were referred to the Court of Justice of the European Union (CJEU) to elicit a

85. Sean D. Murphy, *Contemporary Practice of the United States Relating to International Law*, 95 A.J.I.L. 387, 410.

86. *Id.* at 411.

87. See Kriss E. Brown, *The International Civil Aviation Organization Is the Appropriate Jurisdiction To Settle Hushkit Dispute Between the United States and the European Union*, 20 PENN. ST. INT'L L. REV. 465, 477 (2002).

88. Murphy, *supra* note 85, at 410; see also Reagan, *supra* note 2, at 361, citing Paul Stephen Dempsey, *supra* note 83, at 282–83.

89. See Reagan, *supra* note 2, at 361 (citing Dempsey at 283).

90. *Id.*

91. *Id.* at 285.

92. See Jeffrey C. Bates & Susan M. Cooke, *Potential Challenge to the European Union Emissions Trading Scheme by International Airlines*, LEXOLOGY: ASSOCIATION OF CORPORATE COUNSEL (Apr. 5, 2012), <http://www.lexology.com/library/detail.aspx?g=f8260016-904e-40ee-803e-478c2a793fce>.

93. *Id.*

determination of whether the EU regulation was incompatible with the Chicago Convention and the ICAO.⁹⁴ Before the CJEU entered its decision, the ICAO adopted noise standards for aircraft engines, and the EU replaced its stringent hushkit prohibition in favor of adopting the lesser-stringent ICAO requirement.⁹⁵

In a similar environment, using the dispute resolution procedure under Article 84 of the Chicago Convention would parallel the tactic used by the U.S. in March 2000 to protest the EU's aircraft hushkit regulation, which the EU ultimately repealed: a maneuver which also led to the EU's adoption of the ICAO's lesser-stringent noise standard.⁹⁶ With regard to the institution of the ETS, it is not unforeseeable that in the wake of the negative reaction by foreign governments of the EU's unilateral approach to reduce aviation emissions followed by another Article 84 objection, the EU could be persuaded to consider adopting the ICAO's MBM program once it is fully developed.

e. A Challenge Based on the World Trade Organization

Providing another avenue to challenge the EU's inclusion of aviation into its ETS program, the World Trade Organization (WTO) maintains the authority to settle disputes over international agreements.⁹⁷ Through the use of a panel that determines whether a member nation's action with regard to trade conforms to the agreement under the jurisdiction of the WTO, an offending country may receive directives to bring its policies into compliance after failed attempts to negotiate a settlement and hearings occur.⁹⁸ Upon a determination that the policies of a member state fail to comply with the underlying agreement, the panel may order compliance;⁹⁹ however, should the offending country fail to bring its policies into

94. *Id.*

95. *Id.* Note that subsequently the CJEU approved the earlier EU hushkit regulation finding that under EU law, "no factor" had been disclosed with respect to the Chicago Convention which would affect the validity of that regulation.

96. See Bill Carey, *Industry Reps Urge ICAO Filing To Resolve Emissions Dispute*, *AINonline* (Apr. 2, 2012, 10:10AM), <http://www.ainonline.com/aviation-news/ain-air-transport-perspective/2012-04-02/industry-reps-urge-icao-filing-resolve-emissions-dispute>.

97. Understanding on Rules and Procedures Governing the Settlement of Disputes art. 1-19, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization Annex 2, 1869 U.N.T.S. 401. After attempting to negotiate an amicable resolution to a dispute, a member nation may request the WTO convene a panel to decide the matter. *Id.* art. 5-6.

98. *Id.*

99. *Id.* at Annex 2.

conformance, the WTO may allow retaliatory actions from those nations bringing the charges.¹⁰⁰

Given the power of the WTO to allow retaliatory measures against offending countries, some commentators turned to this option as a possible mechanism to resolve the conflict between the EU and other countries around the world and its decision to include aviation as part of its ETS program.¹⁰¹ In taking such action, other commentators consider possible actions brought under the General Agreement on Tariffs and Trade (GATT) and the General Agreement on Trade in Services (GATS) as applicable accords within the jurisdiction of the WTO.¹⁰²

(1) *GATT*

In evaluating GATT as the basis for a claim, Professor Lorand Bartels¹⁰³ assessed the most relevant language and precedent of the agreement to form an opinion on the merits of such an action.¹⁰⁴ Professor Bartels began by considering the legal makeup of the ETS to ascertain if it qualifies as a tax or charge based on paragraph 2 of Article III in GATT.¹⁰⁵ He concluded that the ETS did not qualify for treatment as a tax or charge within the meaning of GATT based on the opinion of the previously discussed ATA case,¹⁰⁶ where both the Advocate General and ECJ determined that the motivation to cap and trade aviation emissions originated out of environmental concerns and not out of a desire to generate revenue.¹⁰⁷

Given that the ETS is not deemed a tax or charge, Professor Bartels next considered whether it fits within the quantitative restrictions covered in paragraph 1 of Article XI.¹⁰⁸ In his analysis, Professor Bartels turned to the precedent laid forth by prior WTO panels that grappled with similar issues and found a broad interpretation of the term “other measures” within the larger framework where a country uses various methods to

100. *Id.* art. 22.

101. *See* Ciolino, *supra* note 12, at 1164–81; Bartels, *supra* note 12.

102. *See* Ciolino, *supra* note 12, at 1164–81; Bartels, *supra* note 12, at 8–26.

103. Dr. Lorand Bartels is a Senior Lecturer of Law and a Fellow of Trinity Hall at the University of Cambridge in the UK where he specializes in international law, WTO law and EU law. He has authored four books and 16 published articles. *See* Bartels, *supra* note 12.

104. *See* Bartels, *supra* note 12, at 8–21.

105. *Id.* at 8–9.

106. *See supra* text accompanying notes 34–56.

107. *See* Bartels, *supra* note 12, at 8–9.

108. *Id.* at 9–10.

restrain imports.¹⁰⁹ He explained that this approach by the WTO placed the entire emphasis on a nation's decision and the subsequent action to limit a product's importation over the rights to bring the good into the country.¹¹⁰ Applying these interpretations to products transported on international flights in the future, he drew parallels to prior decisions that found restrictive effects in violation of Article XI based on the likelihood that the ETS will increase transportation costs regardless of whether an airline carrying the goods meets the terms of the directive or chooses to suffer the consequences of noncompliance.¹¹¹

After considering the treatment of goods prior to import, Professor Bartels evaluated whether the ETS also discriminated against products upon arrival into the EU based on language in Article III, paragraph 4.¹¹² In this situation, he noted the lack of precedent and conflict of opinions on the subject matter but determined that this provision of GATT only covers flights moving products within the EU and therefore questioned whether it created anticompetitive conditions.¹¹³

Another commentator considering the same provision argued that the ETS program created a disparity because an imported product must travel farther and would require the purchase of more GHG emission allowances than a similarly transported domestic good.¹¹⁴ Professor Bartels acknowledged that aviation receives less favorable treatment than other modes of travel, but failed to see an internal disparity because many products arriving via aircraft will ultimately receive the same treatment during transit to their final destination, which makes Article III inapplicable to the ETS program.¹¹⁵

With an understanding as to the applicability of Articles XI and III, both commentators also evaluated paragraph 1 of Article I to determine whether the EU's ETS program conflicts with the requirements associated with Most Favored Nation (MFN) treatment.¹¹⁶ Under this requirement,

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.* at 10–12.

113. *Id.*

114. Ciolino, *supra* note 12, at 1168.

115. *See* Bartels, *supra* note 12, at 1112.

116. Ciolino, *supra* note 12, at 1166–68; Bartels, *supra* note 12, at 12–13. With respect to Professor Bartels' analysis, he qualified it on the basis that no guidance exists on whether GATT applies to the international transportation of goods. *See* Bartels, *supra* note 12, at 12. He further explains that a narrow reading of the applicable provisions could apply only to the "act" of importing and not the transportation aspects, which could lead to discriminating between the different modes; but he also raises the counterpoint used for a broad interpretation as applied to Article XI discussed in the text of endnotes 80 to 83. *Id.* at 13, 40 nn.80–83.

panel precedent dictates that the ETS program must not give an “advantage” to “like products originating” from different WTO member countries; therefore, a member nation could not cause the price associated with an imported good to rise solely due to the mode and distance it traveled.¹¹⁷

Based on this precedent, both commentators agreed that the EU’s ETS program does not equally give a uniform “advantage” to all goods emanating from WTO member countries and violates Article I, paragraph 1.¹¹⁸ Furthermore, if the EU chose to exempt another nation based on the “equivalent measures” provision of the ETS program, an advantage will develop which fails to apply equally amongst WTO member states.¹¹⁹

Continuing his evaluation of the “transportation of goods” precedent as applied to the ETS, Professor Bartels also considered Article V, which covers the freedom of transit.¹²⁰ The main question under this article is whether the ETS represents an “unnecessary restriction” or “unreasonable regulation.”¹²¹ Supporters of the program will argue that the ETS is essential and not excessive because the polluters are covering the costs of their environmental contamination.¹²² He considered this viewpoint in light of paragraph 4 of Article III to settle on a belief that no violation existed because it allows variances among the internal transportation charges based on real economic costs.¹²³

Professor Bartels did suggest that a violation may occur when considering goods that transit through other countries for import into the EU.¹²⁴ In such a situation, paragraph 6 of Article V would require equivalent treatment; however, no violation would occur when imported goods make intermediate stops in other WTO member countries.¹²⁵

Finally, both commentators evaluated the justification of the EU’s actions based on Article XX’s ten categories that allow social and

117. Ciolino, *supra* note 12, at 1166; Bartels, *supra* note 12, at 12.

118. Ciolino, *supra* note 12, at 1166–67; Bartels, *supra* note 12, at 13.

119. *Id.*

120. Bartels, *supra* note 12, at 13. Before conducting his analysis, Professor Bartels clarifies that even though Article V, paragraph 7 creates an exemption for the operation of aircraft in transit the provision specifically includes the transportation of goods via aviation. *Id.*

121. *Id.* at 14.

122. *Id.*

123. *Id.*

124. *Id.*

125. *Id.* Professor Bartels explains that a product’s origin could originate in country A and end up in an EU member nation B. *Id.* If the product traveled directly from A to B, the ETS would apply to the entire trip. However, if the good stopped in Country C along the way, only the portion from C to B would fall within the emissions program. *Id.*

environmental exceptions.¹²⁶ To assert this defense, a two-tier analysis applies whereby the defending WTO member country must show that the policy fits within one of the exceptions, and which satisfies the requirement of the preamble (referred to as the Chapeau of Article XX).¹²⁷

In addressing the first tier, both commentators addressed the applicability of Articles XX(g) and XX(b).¹²⁸ Article XX(g) allows policies in “relation to the conservation of exhaustible natural resources” that are “made effective in conjunction with restrictions on domestic production or consumption[.]”¹²⁹ In spite of the fact that the WTO maintains no precedent on the issue relating to whether climate change mitigation is equivalent to the conservation of natural resources, both commentators pointed out that a prior appellate panel determined that clean air is an exhaustible resource, which provides sufficient guidance; and the EU’s ETS plan applies equally to foreign and domestic production. Consequently, both commentators made a preliminary conclusion that the EU’s ETS policy qualified under the first tier for an exemption under Article XX(g).¹³⁰

Article XX(b) states that an applicable policy may be excused if it is “necessary to protect human, animal or plant life or health[.]”¹³¹ Both commentators evaluated whether the ETS program will immediately or timely deliver a safeguard towards human, animal, or plant life or health.¹³² Commentator Katelyn Ciolino expressed that the revenue from the sale of the emission permits would ultimately translate into environmental efforts to reduce emissions by creating a financial disincentive for those using aircraft that pollute through higher prices for allowances.¹³³ Professor Bartels found enough WTO precedent to conclude that such a material influence would occur.¹³⁴

126. See Ciolino, *supra* note 12, at 1168–81; Bartels, *supra* note 12, at 14–21.

127. Appellate Body Report, *United States—Standards for Reformulated and Conventional Gasoline*, 22–23 WT/DS2/AB/R (Apr. 29, 1996). More specifically, under a preamble analysis, it must be determined that the policy in dispute would not apply in a manner that establishes “a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail,” and is not “a disguised restriction on international trade.” *Id.* at 38. See GATT, *infra* note 100, ¶ 1.

128. See Ciolino, *supra* note 12, at 1169–72; Bartels, *supra* note 12, at 14–16.

129. General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 194, art. XX [hereinafter GATT 1947]; General Agreement on Tariffs and Trade, Apr. 15, 1994, 1867 U.N.T.S. 187 [hereinafter GATT 1994].

130. See Ciolino, *supra* note 12, at 1169–71; Bartels, *supra* note 12, at 14–15.

131. GATT 1947, *supra* note 119, art. XX(b).

132. Ciolino, *supra* note 12, at 1171–12; Bartels, *supra* note 12, at 15–16.

133. Ciolino, *supra* note 12, at 1171.

134. Bartels, *supra* note 12, at 15–16.

Moreover, the commentators inquired as to whether a different approach might reasonably yield a less trade-restrictive option in accordance with the Article XX(b) analysis.¹³⁵ While Ms. Ciolino drew attention to the lack of a counterproposal to the EU ETS program,¹³⁶ Professor Bartels explained the extreme difficulty in conducting a meaningful analysis on the subject and that to exclude non-EU aviation would run counter to the stated objectives.¹³⁷ As such, both commentators determined that the ETS program could survive the initial review for Article XX(b) applicability.¹³⁸

Turning to the second tier of the Article XX inquiry, the preamble requires that the policy under review needs to receive an evaluation so as to not create a situation of “arbitrary or unjustifiable discrimination” or a “disguised restriction on international trade[.]”¹³⁹ Should any of the three situations arise, the challenged policy will fail to gain protection under Article XX.¹⁴⁰

When evaluating each of the situations separately, both commentators turned to the applicable precedent from WTO cases and applied it to the EU’s ETS program.¹⁴¹ While Professor Bartels quickly dismissed the ETS as being motivated by a protectionist agenda to restrict trade, Ms. Ciolino withheld judgment pending an analysis.¹⁴² She evaluated the underlying criteria of the policy’s adoption to determine that the EU did not take such unacceptable steps because it publicly announced its intentions, which does not violate the preamble of Article XX.¹⁴³

135. Appellate Body Report, *Korea—Measures Affecting Imports of Fresh Chilled and Frozen Beef*, ¶ 161, WT/DS161/AB/R, WT/DS169/AB/R (Dec. 11, 2000).

136. Ciolino, *supra* note 12, at 1171.

137. Bartels, *supra* note 12, at 16.

138. Ciolino, *supra* note 12, at 1172; Bartels, *supra* note 12, at 16.

139. Appellate Body Report, *United States—Standards for Reformulated and Conventional Gasoline*, *supra* note 126, at 23.

140. Appellate Body Report, *United States—Import Prohibition of Certain Shrimp Products*, ¶ 184, WT/DS58/AB/R (Oct. 12, 1998). When this type of analysis occurs, prior precedent explains that the WTO member nation seeking to utilize an Article XX exception bears the burden of proof that the policy it is seeking to protect does not violate any of the three situations so “as to frustrate or defeat the legal obligations of the holder of the right[.]” See Appellate Body Report *United States—Standards for Reformulated and Conventional Gasoline*, *supra* note 126, at 22. Because this rigorous approach creates such a daunting task, one commentator likened this impediment to threading a needle in which only a few environmental policies will survive. Sanford Gaines, *The WTO’s Reading of the GATT Article XX Chapeau: A Disguised Restriction on Environmental Measures*, 22 U. PA. J. INT’L ECON. L. 739, 741–43 (2001).

141. Ciolino, *supra* note 12, at 1179–80; Bartels, *supra* note 12, at 16–19.

142. Ciolino, *supra* note 12, at 1179–80; Bartels, *supra* note 12, at 16.

143. Ciolino, *supra* note 12, at 1179–80.

When addressing the discrimination situations, both commentators focused their analysis on two different scenarios where the ETS could create biases.¹⁴⁴ They pointed out that the ETS will treat two aircraft that travel the same distance with goods differently if one stops along the way, which demonstrates a lack of nexus between the policy's objectives and implementation.¹⁴⁵ This also translates into an inconsistency with respect toward the overall efficiency and application of the policy because a transported good with a very low carbon footprint may travel much farther than a good that causes greater pollution but moves a shorter distance.¹⁴⁶

Ms. Ciolino also noted that other elements of the ETS survive the analysis required for both discriminations.¹⁴⁷ She explained that the participatory nature of the ETS program removes the due process and procedural hurdles associated with this language, and the fact that the EU takes on a leading role with the negotiations occurring at the ICAO and UNFCCC demonstrates movement toward a multilateral agreement.¹⁴⁸ As such, she believes that an unaltered ETS will not withstand a WTO inquiry as an exemptions under Article XX.¹⁴⁹

In contrast, Professor Bartels' analysis finds justification behind the discriminatory policies.¹⁵⁰ He based his opinion on the fact that the EU made a conscious decision to exclude portions of a flight that do not terminate in its jurisdiction. He also believes that the EU can alleviate the discrimination issues by changing its definition to include all flights around the word.¹⁵¹ Moreover, he explains that the EU could also substantiate its policy due to an inability to acquire pertinent data on the appropriate flights unless a "terminal point" occurs in the EU.¹⁵² Thus, he concludes that an Article XX analysis will permit the EU's ETS to continue under GATT.¹⁵³

144. Ciolino, *supra* note 12, at 1176–17; Bartels, *supra* note 12, at 20–11.

145. *Id.* Ms. Ciolino also points out that this disparity provides an incentive to make stops at airports just outside EU airspace to reduce the calculated charges under the ETS program and may actually lead to more pollution rather than less. Ciolino, *supra* note 12, at 1177.

146. Ciolino, *supra* note 12, at 1176–77; Bartels, *supra* note 12, at 20–21.

147. Ciolino, *supra* note 12, at 1177–80.

148. *Id.*

149. *Id.* at 1180–81.

150. Bartels, *supra* note 12, at 20–21.

151. *Id.* Professor Bartels' opinion is based on the flexibility of the EU's ETS and the applicable precedent of prior WTO decisions and the language used by the ECJ in its opinion in the ATA case.

152. *Id.*

153. *Id.*

(2) GATS

Paralleling GATT, GATS offers another avenue for a WTO member nation to contest the EU's ETS. While GATT covers tangible property, GATS involves trade in relation to services such as tourism. In conjunction with his analysis of GATT, Professor Bartels also evaluated the feasibility of using GATS as a basis for a claim against the ETS.¹⁵⁴ He commenced this analysis by considering the applicability of the GATS Annex on air transport, which seemingly excludes air transport services from the agreement's ETS coverage.¹⁵⁵

When evaluating the scope of the Annex and the language contained in paragraph 2, Professor Bartels found a broad and inclusive definition that embraced the extent and manner of services offered by foreign providers in conjunction with the underlying regulatory environment while determining that the exemption for policies that affect trade in air transport services does not apply to the facts pertaining to the ETS;¹⁵⁶ however, his inquiry into whether the WTO maintained sufficient jurisdiction pursuant to paragraph 4 concluded that a panel overseeing such a claim would need to yield its authority until the termination of all ICAO remedies prior to proceeding with its duties under GATS.¹⁵⁷

While maintaining jurisdiction poses a large obstacle to proceeding within the WTO's purview, Professor Bartels continued his analysis by considering whether the Most Favored Nation (MFN) obligation under GATS also came into play under paragraph 1 of Article II.¹⁵⁸ While GATS allows a more direct evaluation than under GATT, he quickly determined that the ETS would most certainly affect consumers that travel outside of the EU and in a disproportionate manner.¹⁵⁹ As a result, he concluded that the ETS would fail to grant the same advantage to all "like services" and "service suppliers" under GATS.¹⁶⁰

Further, Professor Bartels contemplated the use of other sources for a claim, but noted that GATS is only relevant to the degree that a WTO member commits to specific services.¹⁶¹ In this area, the EU took such an

154. *Id.* at 22-26.

155. *Id.* at 22.

156. *Id.* at 22-23.

157. *Id.* at 23-24.

158. *Id.* at 24.

159. *Id.* He explained that geographical factors will play a big role in these types of situations.

160. *Id.* at 24 (internal quotation marks omitted). In addition, Professor Bartels clarified that the previous analysis under GATT was if the EU approves "equivalent measures" exceptions to a limited number of countries, a similar violation would occur within GATS. *Id.*

161. *Id.*

action with respect to tourism and recreational services abroad; however, the analysis by Professor Bartels in relation to the different provisions of GATS with respect to the ETS found no basis for discrimination due to the national origin of the service or provider.¹⁶²

Finally, GATS provides similar exceptions as discussed earlier with respect to GATT, but the agreement only contains Article XIV(b), which provides similar language to Article XX(b) of GATT.¹⁶³

Professor Bartels determined the analysis for GATS would mirror that used for GATT and would generally make the ETS justifiable for aviation.¹⁶⁴ He concluded that in the event the ETS overcame the obstacles of jurisdiction and fit within the meaning of GATS, the WTO would likely find it justifiable so long as a reasonable alternative fails to materialize and also meets the EU's objectives in a less trade restrictive manner.¹⁶⁵

f. Incorporating a Bilateral or Multilateral Treaty

Offering another solution in an attempt to find a middle ground to resolve the various climate change issues emanating from international civil aviation, Professors Havel¹⁶⁶ and Sanchez¹⁶⁷ proposed drafting a treaty to address such concerns.¹⁶⁸ They considered applicable international legislative directives and controls for aircraft emissions, as well as an evaluation of whether a global approach would offer a reasonable solution.¹⁶⁹ In completing their analysis, both commentators negated the idea that all of the sovereign global nations could come to an agreement, due in large part to the significant disparity of interests.¹⁷⁰ As such, they determined that a broad accord would produce a more desirable outcome through a bilateral or multilateral approach.¹⁷¹

162. *Id.* at 24–25.

163. Compare GATT 1994, *supra* note 128, art. XX(b) with General Agreement on Trade in Services, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1B, art. XIV(b), 33 I.L.M. 1125, 1167 (1994).

164. *Id.*

165. *Id.* at 26.

166. Professor Brian F. Havel is the Director of International Affairs, Director of the International Aviation Law Institute, and a Distinguished Research Professor of Law at DePaul University.

167. Professor Gabriel Sanchez is a Senior Research Fellow and Adjunct Professor at the International Aviation Law Institute at DePaul University.

168. See Havel & Sanchez, *supra* note 5, at 351.

169. See *id.* at 357–75.

170. *Id.* at 353, 372–75. Professors Havel and Sanchez also discussed whether a global solution could overcome the concept of International Parentalism, which they explain as “all state parties must believe themselves better off by their lights [sic] as a result of the . . . treaty.” *Id.* at 372 (quoting ERIC A. POSNER & DAVID WEISBACH, CLIMATE CHANGE JUSTICE 6 (2010)).

171. *Id.* at 375–76. The commentators based their decision on the fact that the 2007 Agreement

In settling on an underlying mechanism to bring forth meaningful reductions in GHGs emanating from aviation sources, Professors Havel and Sanchez considered various options to include grounding those aircraft which emit the greatest volume of emissions, limiting “high-volume routes” to only the most “fuel efficient aircraft,” and placing quotas similar to the days prior to deregulation in the U.S.¹⁷² They ultimately selected MBMs as the preferred method because such an approach allows greater flexibility within a less burdensome framework than the other alternatives, and MBMs are endorsed by the ICAO and various air carriers as the preferred solution.¹⁷³

In addressing the enforcement aspects of their proposal, the commentators analyzed the 2007 U.S.-EU Air Transport Agreement (2007 Agreement) as a template for their accord.¹⁷⁴ They found that the language and approach fit within the existing framework of international law and suggested that each party to the agreement maintain its own responsibility for imposing and enforcing a common emissions tax or trading system upon those carriers within its jurisdiction.¹⁷⁵ Professors Havel and Sanchez further borrowed a provision from the 2007 Agreement, which allows any party to the accord to voluntarily relinquish oversight of the emissions emanating from aircraft within its jurisdiction to another agreement participant or a joint regulatory body.¹⁷⁶

While Professors Havel and Sanchez acknowledged that issues such as fragmentation may also exist, they viewed this proposal as an incremental step towards responsible actions taken by those countries interested in lowering their environmental impact with respect to aviation.¹⁷⁷ To this end, no global regime currently upholds the uniformity in environmental

demonstrated large amounts of political desire towards aviation solutions and cooperation between two major geographic markets, which could serve as the foundation for a broader treaty to address GHG emissions. *Id.* They pointed out that sixty percent of the global air traffic movements occur within the airspace of the U.S. and EU, which could have a formidable affect on such an endeavor. *Id.* at 380. While this geographic footprint would still leave some major air transportation hubs outside the reach of the agreement, the commentators envisioned their approach as a way to entice other nations to join the accord by offering such widespread access with liberal air services trade relations that those countries outside of the treaty could not receive otherwise. *Id.* at 381.

172. *Id.* at 376.

173. *Id.* at 376–77.

174. *Id.* at 379–80.

175. *Id.*

176. *Id.* at 380. This idea comes from the 2007 Agreement where the parties mulled over the ramifications of merging the regulatory approaches to security, safety, competition, and environmental issues while also demonstrating an inclination to establish a joint committee to address such issues moving forward. *Id.*

177. *Id.* at 383–85.

norms and enforces the commitments agreed to by participants.¹⁷⁸ The proposal from these commentators ultimately balances the need for GHG emission reductions without causing economic harm to the aviation industry, while also moving towards a larger, global framework.¹⁷⁹

Accordingly, outside of a complaint filed with the ICAO based on the Chicago Convention, the commentators conclude that a challenge invalidating the EU's ETS will likely fail based on the various forums available for redress.¹⁸⁰ Meanwhile, U.S. and foreign governments have voiced displeasure at the EU's unilateral approach to reduce GHG emissions, while simultaneously expressing the need for a more "consensus-based" solution.¹⁸¹ The multilateral treaty agreement offers a passive approach towards resolving global negativity of the EU's implantation of the ETS.

(1) Political Responses

Outside of mounting a challenge or negotiating a treaty, many nations have considered alternative strategies in response to the EU's policy. China turned to the "equivalent measures" language of the EU's directive as an avenue to resolve the dispute followed by warnings of negative consequences should it find its proposals rejected.¹⁸² In contrast, India, Russia, and the U.S. considered options within their own jurisdictional powers that directly challenged the EU's ETS or threatened to do so should the program proceed.¹⁸³ Ultimately, these political alternatives produce benefits and penalties, which impose pressure on each nation involved in the dispute to seek an amicable resolution.

(a) Equivalent Measures

In an attempt to resolve the issues with the ETS using a bilateral approach, China turned to the "equivalent measures" language contained in the EU's directive as a means for negotiating an exemption.¹⁸⁴ The

178. *Id.*

179. *Id.* at 385.

180. *See Switzer, supra* note 12, at 11; *Bartels, supra* note 12, at 20–21, 26.

181. *Cf. FAA Modernization and Reform Act of 2012, Pub. L. No. 112-95, § 509, 126 Stat. 11 (2012).*

182. *See CRS Report, supra* note 3, at 28.

183. *See infra* text accompanying notes 173–92.

184. *See CRS Report, supra* note 3, at 28. The applicable provision states

[i]f a third country adopts measures, which have an environmental effect at least equivalent to that of this Directive, to reduce the climate impact of flights to the Community, the

Chinese strategy emerged when the Civil Aviation Administration of China (CAAC) unveiled its master plan in April 2011 to deal with aircraft GHG emissions.¹⁸⁵

While the unveiling of this plan coincided with the conspicuous absence of mandatory ETS data reporting by Chinese airlines for the EU's May 2011 deadline,¹⁸⁶ the CAAC's proposal called for three phases.¹⁸⁷ Using 2005 as a baseline, the goal was to reduce aircraft emissions by eleven percent during phase one (2011 to 2012), fifteen percent in phase two (2013 to 2015), and twenty-two percent in the phase three (2015 to 2020).¹⁸⁸ The CAAC expected to see these efficiencies come about through the encouragement and use of alternative fuels, as well as the integration of new generation engines by its domestic airlines.¹⁸⁹

In response, the EU announced that it would study the plan put forward by China to determine if it met the requirements associated with "equivalent measures."¹⁹⁰ The Chinese made the point that they should fall

Commission should consider the options available in order to provide for optimal interaction between the Community scheme and that country's measures, after consulting with that country. Emissions trading schemes being developed in third countries are beginning to provide for optimal interaction with the Community scheme in relation to their coverage of aviation. Bilateral arrangements on linking the Community scheme with other trading schemes to form a common scheme or taking account of equivalent measures to avoid double regulation could constitute a step towards global agreement. Where such bilateral arrangements are made, the Commission may amend the types of aviation activities included in the Community scheme, including consequential adjustments to the total quantity of allowances to be issued to aircraft operators.

See 2008 EC Aviation Directive, *supra* note 6, § 17.

185. P.R.C., CHINA'S ACTION PLAN TO LIMIT AND REDUCE CO₂ EMISSIONS FROM INTERNATIONAL AVIATION, 11 (2012), available at http://www.icao.int/environmental-protection/Documents/ActionPlan/China_en.pdf. In particular, the government of China argues that it will be adversely affected by the EU's ETS, since its geographic location forces the covered aircraft to follow longer flight paths that will eventually translate into higher fees. See Hart, *infra* note 191. The government also recognizes that the fees will increase significantly because China's civil aviation industry continues to expand. *Id.*

186. Elena Ares, House of Commons, EU ETS and Aviation, SN/SC/5533, 11 (May 23, 2012), available at <http://www.parliament.uk/briefing-papers/sn05533.pdf>. Following this noticeable reporting absence, the government of China confirmed its directive to forbid its air carriers from participating in the ETS program in February 2012. Chris Buckley, *China bans airlines from joining EU emissions scheme*, Reuters (Feb. 6, 2012), available at <http://www.reuters.com/article/2012/02/06/us-china-eu-emissions-idUSTRE81500V20120206>.

187. P.R.C., CHINA'S ACTION PLAN TO LIMIT AND REDUCE CO₂ EMISSIONS FROM INTERNATIONAL AVIATION, 11 (2012), available at http://www.icao.int/environmental-protection/Documents/ActionPlan/China_en.pdf.

188. *Supra* note 187.

189. Civ. Aviation Admin. Of China, 12th Five-Year Plan of China Aviation Development (Apr. 2, 2011).

190. Saqib Rahim, *U.S.-E.U. Showdown Over Airline Emissions Begins Today*, NY TIMES (July 5, 2011), available at <http://www.nytimes.com/cwire/2011/07/05/05climawire-us-eu-showdown-over-airline-emissions-begins-88684.html?pagewanted=all>. While not committing to approving the Chinese

under a different standard due to their status as a developing nation, and any attempt to treat them differently would violate the UNFCCC guiding principle of “common but differentiated responsibilities.”¹⁹¹ One commentator drew attention to the fact that the plan put forward by China offered improvements in efficiency rather than a curb in the output of GHGs, and, therefore, the plan would face obstacles for approval as an “equivalent measure.”¹⁹²

Further clarifying its plan in an attempt to satisfy the EU and gain approval as an “equivalent measure,” the Chinese government offered to institute a passenger tax on international flights in April 2012.¹⁹³ The government further explained that the collected revenue would go towards the reduction of emissions generated from aviation, security upgrades, and research and development in the newly established Civil Aviation Development Foundation.¹⁹⁴ Accordingly, the EU’s delegation evaluating China’s earlier proposal received direction to include this new provision in its scope of work to determine whether it should conduct bilateral negotiations for an “equivalent measures” exemption.¹⁹⁵

(b) Retaliatory Measures

Taking a more adversarial approach, India, Russia, and the U.S. either took direct action against the EU’s ETS or threatened to take retaliatory measures while China issued similar warnings and directives in

plan as an “equivalent measure,” the EC Director General for Climate Change explained that the commission “did not set any kind of standard as to what can be considered an equivalent measure because we do not want to restrict the range of possibilities.” (See Hart, *infra* note 179 (citing translation from *Ou meng yuan tan tao huo mian* (European Union Wants to Talk About Exemption)), 21 *shi ji jing ji bao dao* (21 Century Economic Report) (July 19, 2011), available at <http://stock.jrj.com.cn/2011/07/19034010476743.shtml>).

191. Melanie Hart, *Europe Moves to Limit Aviation Emissions, China Follows: EU and China to Begin Limiting Flight Emissions While U.S. Airlines Fight Regulations*, CTR. FOR AM. PROGRESS (Aug. 1, 2011), available at <http://www.americanprogress.org/issues/green/news/2011/08/01/10195/europe-moves-to-limit-aviation-emissions-china-follows/>. The Chinese perspective of the UNFCCC principle asserts a viewpoint that holds their nation accountable for lower contributions towards the reduction of GHGs because of its lower historical emissions and its present need for ongoing advancements as a developing country. *Id.*

192. *Id.*

193. Barbara Lewis, *EU climate boss: studying China’s airline CO2 plan*, Reuters (Apr. 19, 2012), available at <http://www.reuters.com/article/2012/04/19/uk-eu-china-airlines-idUSLNE83100S20120419>.

194. Barbara Lewis, *EU climate chief: looking at China’s airline carbon plan*, Reuters (Apr. 19, 2012), available at <http://www.reuters.com/article/2012/04/19/us-eu-china-airlines-idUSBRE83109120120419>.

195. *Id.*

combination with its “equivalent measures” proposal.¹⁹⁶ China’s threats included a trade war and the cancellation of all contracts for the delivery of Airbus-manufactured aircraft if the plan to qualify Chinese air carriers under the “equivalent measures” provisions failed.¹⁹⁷ Russia continued to enforce its overflight charges for Siberia upon EU carriers irrespective of its agreement to allow passage free of charge for all new rights issued after January 2012 and to eliminate those still in effect after January 2014.¹⁹⁸

Both India and China directed their air carriers flying to EU member countries to disregard any compliance requirements emanating from the ETS.¹⁹⁹ Such action led to a visible absence in the 2011 emissions reports of ten airlines registered in India and China, which the EU Commission published in May 2012.²⁰⁰

Likewise, the U.S. Congress disapproved of the EU’s unilateral directive and noted such dissatisfaction in the FAA Modernization and Reform Act of 2012.²⁰¹ In this legislation, Congress expressed its opinion that the unilateral action by the EU to broaden its ETS to include aircraft regulated by foreign jurisdictions ran contrary to the Chicago Convention, and other relevant air service agreements. The Act emphasized the need to bring together a coalition to address climate change policy on a global basis.²⁰² Congress also urged the EU to take an alternative course of action

196. See Sanchez, *supra* note 12, at 2.

197. See Hart, *supra* note 191.

198. Cathy Buyck, *EU, Russia Resume Talks On Siberian Overflight Fees*, AVIATION WEEK, Mar. 21, 2013, available at http://www.aviationweek.com/Article.aspx?id=/article-xml/awx_03_21_2013_p0-561623.xml. Many countries charge an overflight fee to the operators of a flight that flies through its airspace without landing or taking-off in its jurisdiction. See e.g., Fed. Aviation Admin., *Overflight Fees: Fees in U.S.-Controlled Airspace*, available at http://www.faa.gov/about/office_org/headquarters_offices/aba/overflight_fees/ (last visited Nov. 22, 2013).

199. See Ares, *supra* note 186, at 9.

200. *Id.* at 11.

201. See Pub. L. 112-95, § 509 (2012).

202. See *Id.* § 509(1). The decision by Congress to show its displeasure with the unilateral approach by the EU brings to the forefront a hypocritical policy position by the U.S. government with respect to extraterritorial requirements in aviation. See Silversmith, *supra* note 12. For example, Congress prohibited inflight gambling for all carriers on international routes to and from the U.S. regardless of the country of registration in the Federal Aviation Authorization Act of 1994, 49 U.S.C. § 41311(a) (2000). This unilateral action by the U.S. government to regulate another nation’s aircraft outside its own territorial airspace sparked outrage and protests by numerous foreign governments and similar threats of retaliation by those nations affected by the prohibition. See Darren A. Prum, *Flight Check: Are Air Carriers Any Closer to Providing Gambling on International Flights that Land or Depart from the United States?*, 74 J. AIR L. & COM. 71, 72 (2009). This hypocritical position with respect to gambling and other areas would allow the EU the opportunity to assert a defense under the Doctrine of Unclean Hands and could ultimately pose an obstacle to any attempt to seek relief through a court using equitable remedies under common law principles. However, Mr. Silversmith points out that the more troubling predicament that comes from these types of policies where one country imposes its will on another’s sovereignty through aviation is the diminishment of the US government’s

and to work collegially with other ICAO member nations to develop a consensus-based solution to address GHG emissions.²⁰³ Finally, Congress directed all officials with authority relating to aviation to “use all political, diplomatic, and legal tools” within their powers to ensure that the EU’s ETS does not pertain to aircraft under the U.S. Government’s jurisdiction.²⁰⁴

To this end, Professor Sanchez predicted the possibility of an unrestrained aviation trade war that unfairly punishes and effects innocent parties including airlines, airports, aircraft manufactures and the public at large should both sides continue to hold their respective positions.²⁰⁵ He recalled that these kinds of tensions historically exist in the highly competitive environment surrounding the sales and subsidies associated with new aircraft as seen between the U.S.-based *Boeing Company* and its EU competitor, *Airbus*.²⁰⁶ As such, the underlying tensions that already exist may resurface, and the lack of a strong working relationship between the EU and U.S. due to a trade war emanating out of the applicability of the ETS, could serve as a major obstacle to the larger goal of addressing GHG emissions and climate change.²⁰⁷

Moreover, Professor Sanchez called attention to the fact that a trade war will also damage other international efforts.²⁰⁸ Because of the EU’s geographic location, the ETS will affect the high volume routes associated with Asia and the transpacific as well as the sparsely regulated emerging market surrounding the Persian Gulf.²⁰⁹ A trade war caused by the EU will erode their leadership position in the world on the issue of climate change as it relates to aviation and will minimize support from other nations in affecting meaningful change to GHG emissions from aircraft.²¹⁰

In addition, a trade war between the U.S. and the EU will hinder other endeavors to reduce GHG emissions from aviation, including any ongoing projects to enhance the existing air traffic management systems.²¹¹ Absent

ability to claim the moral “high ground” because of its previous actions, which will ultimately affect its leverage in future negotiations to resolve the ETS situation. *See Silversmith, supra* note 12, at 174–75.

203. *See id.* § 509(2).

204. *See id.* § 509(3).

205. *See Sanchez, supra* note 12, at 3.

206. *Id.* at 5.

207. *Id.*

208. *Id.*

209. *Id.* at 4–5.

210. *Id.* at 5.

211. *Id.* These improvements reduce delay at airports and more direct routing by providing more efficiency with the airspace, which ultimately decreases the unnecessary burning of fuel. *Id.*

a strong relationship between the U.S. and the EU with regard to aviation, the commitment of both parties to complete the project with a seamless interface across jurisdictions will be jeopardized, and the GHG benefits associated with it will be lost.²¹² Thus, Professor Sanchez recognized that the fallout from a trade war emerging out of retaliatory actions will cause immediate negative economic effects. The real harm, however, will be the effect on the overall goal of achieving a mutually agreeable resolution addressing GHG emissions from aviation from a group of willing stakeholders.²¹³

B. The ICAO's Proposed Resolution and Fate of the EU's ETS

Initially, the ICAO's response to the dispute between the EU and other member nations regarding the ETS was to approve a resolution that accelerated its work in developing a comprehensive framework to address MBMs for emissions emanating from international aviation.²¹⁴ Resolution A37-19 called for member nations to collectively improve fuel efficiency by two percent annually until 2020, and then set an aspirational goal to reduce the same percentage each year from 2021 to 2050.²¹⁵ It also invited member states to prepare and submit action plans on how they expected to achieve the fuel efficiency reduction objectives and aspirational goals by June 2012.²¹⁶ Finally, the ICAO advocated for member states to devise their own MBM for international aviation, to "engage in constructive bilateral and/or multilateral consultations and negotiations with other States to reach an agreement," and to allow an exemption to a program for those aircraft under the jurisdiction of a developing country.²¹⁷

Before the next meeting of the ICAO Assembly, the UNFCCC requested an update on the efforts to address climate change in aviation, from which the ICAO noted progress on the action items emanating out of Resolution A37-19.²¹⁸ In its report, the ICAO explained that the provision

212. *Id.*

213. *Id.*

214. INT'L CIVIL AVIATION ORG., Consolidated statement of continuing ICAO policies and practices related to environmental protection—Climate change, Assemb. Res. A37-19 (2010), compiled in Assembly Resolutions in Force, at I-67-74, ICAO Doc. 9958 (Oct. 8, 2010).

215. *Id.* at I-71.

216. *Id.*

217. *Id.* at I-71. Given the flexibility of this statement and the ability to derive multiple interpretations, Professor Bartels explained that the EU nations took the position that it implicitly endorsed the unilateral measures they already began to implement. Bartels, *supra* note 12, at 6.

218. U.N. Framework Convention on Climate Change, 35th Sess., *Information relevant to emissions from fuel used for international aviation and maritime transport*, Agenda Item 9(a), at 4, U.N. Doc. FCCC/SBSTA/2011/MISC.9 (2011).

calling for action plans by member nations allowed the organization to make a noteworthy shift from a “[s]tandards and policies setting” approach to one that emphasizes the “implementation” aspects.²¹⁹ Recognizing the joint agreement that affirmed the opposition of twenty six countries to the EU’s decision to include aviation in its ETS at the ICAO Council Meeting in New Delhi, India two months earlier, the report concluded that development on a worldwide solution to tackle GHG emissions from aviation continued to move forward.²²⁰

On July 11, 2012, the ICAO’s Committee on Aviation Environmental Protection (CAEP) announced that the organization attained a unanimous agreement on a system to measure carbon-dioxide emissions in aviation.²²¹ Under this newly approved approach, the CAEP attempted to develop a flexible system to appropriately convey benefits to those employing and advancing the latest technologies in their aircraft that positively correlated with the goal of reducing emissions while recognizing the full spectrum of technologies employed by different manufacturers.²²² Following this initial step, the CAEP revealed on February 14, 2013 that another agreement for the procedures used to certify aircraft with respect to the emissions measurement standards had been developed.²²³

Given these movements towards laying the foundation for a global MBM system and the growing possibility of a looming trade war, the ICAO Assembly moved forward with its own worldwide program at its Thirty-Eighth Session that ended in October 2013.²²⁴ In this landmark resolution, the ICAO agreed to bring forward in three years a specific plan

219. *Id.* at 3.

220. *Id.* at 6. Of note, the ICAO specifically clarified its point of view with regard to MBMs and the EU’s unilateral approach when it stated, “It is of utmost importance that the design and implementation of market-based measures for international aviation be treated as an element of ICAO’s comprehensive mitigation strategy to achieve the global aspirational goals, as part of global solutions for the sustainable development of international aviation, and not in isolation.” *Id.*

221. INT’L CIVIL AVIATION ORG., *ICAO Fact Sheet, Aircraft CO₂ Emissions Standard Metric System*, AN 1/17, 1 (2012), available at http://www.icao.int/Newsroom/Documents/CO2%20Metric%20System%20-%20Information%20Sheet_FINAL.PDF. This agreed upon approach takes measurements of the fuel burn performance of a given aircraft to supply a level of CO₂ emissions

222. *Id.* The CAEP recognized that the system needed to provide meaningful emissions results over a diverse set of aircraft categories that maintained different purposes and capabilities. *Id.* It hoped that its plan would inspire and promote “the integration of fuel efficient technologies into aircraft design and development.” *Id.*

223. INT’L CIVIL AVIATION ORG., *ICAO Environmental Protection Committee Delivers Progress on New Aircraft CO₂ and Noise Standards*, COM 4/13 (2013), available at <http://www.icao.int/Newsroom/News%20Doc%202013/COM.4.13.EN.pdf>

224. INT’L CIVIL AVIATION ORG., Consolidated statement of continuing ICAO policies and practices related to environmental protection—Climate change, Assemb. Res. A38-18 (2010), compiled in Resolutions Adopted by the Assembly, at 95, Provisional Ed. (Nov. 2013) [hereinafter ICAO Assemb. Resolution A38-18].

detailing a global MBM for curbing aircraft emissions by 2020.²²⁵ The resolution included language mirroring its predecessor, A37-19, which addressed sovereign rights and called for exemptions on aircraft under the jurisdiction of developing nations and the need to “engage in constructive bilateral and/or multilateral consultations and negotiations with other States to reach an agreement.”²²⁶ Much to the chagrin of the member nations from Europe, the ICAO’s actions temporarily superseded the EU’s ETS, being applicable to international aviation until the global MBM is approved.²²⁷

In response to the new direction taken by the ICAO, the EC evaluated its alternatives and responses to Resolution A38-18.²²⁸ While the EC expressed its intention to submit formal reservations on those parts of the Resolution, which it disagreed with, the EC also recognized that there was significant progress and momentum towards a global MBM program.²²⁹ It also acknowledged that prior actions by the EU suspended the ETS program for aviation in order to promote progress towards a global solution through the ICAO.²³⁰ Based on these premises, the EC recommended amendments to the EU’s ETS as it applies to aviation.²³¹

Under its formal proposal to the EU, the EC recommended that the ETS remain in place for all flights between airports within its jurisdiction;²³² however, the EC also recommended emissions exemptions in two other situations.²³³ First, the EC recommended a partial emissions exemption from 2014 to 2020 on the portion of those flights between the EU and countries outside its jurisdiction until the global MBM becomes

225. *Id.* The Resolution specifically calls for an all inclusive and broad based approach to incorporate “technologies, operational improvements and sustainable alternative fuels to achieve ICAO’s global aspirational goals.” *Id.*

226. *Id.* At the request of Russia along with Brazil, China, India, and South Africa, The ICAO approved this language on a vote of 97–39 for its inclusion in Resolution A38-13 over the opposition of the EU member nations and other major aviation nations. *See* EC Memo for Regional ETS, *supra* note 15, at 2.

227. Ewa Krukowska, Global Emissions Plan for Airlines Gets First UN Approval, BLOOMBERG, Oct. 4, 2013, available at <http://www.bloomberg.com/news/2013-10-04/carbon-cuts-loom-for-airlines-as-icao-eyes-global-market.html>.

228. *See* EC Memo for Regional ETS, *supra* note 15.

229. *Id.* at 2–3.

230. *Id.* at 3.

231. *Id.*

232. European Commission, Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in view of the implementation by 2020 of an international agreement applying a single global market-based measure to international aviation emissions, COD 2013/0344 final (Oct. 16, 2013), available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2013:0722:FIN:EN:PDF>.

233. *Id.* ¶ 2.

available and implemented.²³⁴ Second, the EC proposed a full exemption for flights traveling between the EU and countries outside its jurisdiction which qualify as developing nations and which contribute to less than one percent of the total global aviation emissions.²³⁵

Thus, the EU's game of brinkmanship continues to force the issue of creating a global MBM plan through the auspice of the ICAO, while simultaneously advancing its own agenda of bringing forth meaningful change to public policy on a regional and global level addressing aviation GHG emissions.

II. EVALUATING THE ICAO'S GLOBAL TRADING SCHEME

The cornerstone of the ICAO's decision to develop and implement a global MBM program focuses on broad based applications of "technologies, operational improvements and sustainable alternative fuels to achieve ICAO's global aspirational goals."²³⁶ Many of these applications are in early developmental stages, yet the ICAO looks towards advances in these areas to achieve its ultimate goal of reducing GHGs from aviation by two percent each year until 2020. Accordingly, an evaluation of these initiatives and their ability to reduce aviation GHG emissions is apropos in determining whether the ICAO's global MBM program can succeed.

A. *Technologies & Operational Initiatives*

In the U.S., an ongoing advancement in the aviation industry is the Federal Aviation Administration (FAA)'s initiative to implement a satellite-based radar system utilizing GPS technology to accurately pinpoint an aircraft's position in National Air Space (NAS) at all times.²³⁷ In a steadfast effort to minimize commercial aircraft emissions and flight congestion in the U.S., the FAA developed The Next Generation Air Transportation System (NextGen). NextGen is a U.S. Congressional initiative²³⁸ with the ultimate goal of modernizing NAS by guiding and

234. *Id.* ¶ 3.

235. *Id.* ¶ 10.

236. See ICAO Assemb. Resolution A38-18, *supra* note 203, at 95.

237. Geneva Williams, *GPS For The Sky: A Survey of Automatic Dependent Surveillance-Broadcast (ADS-B) and Its Implementation in the United States*, 74 J. AIR. L. & COM. 473, 482 (2009).

238. Justin T. Barkowski, *Managing Air Traffic Congestion Through the Next Generation Air Transportation System: Satellite-Based Technology, Trajectories, and—Privatization?*, 37 PEPP. L. REV. 247, 269 (2010).

tracking air traffic precisely and efficiently with the ultimate goal of minimizing air congestion while simultaneously saving fuel, diminishing aircraft noise, and reducing pollution.²³⁹

NextGen was created to replace the U.S.'s current air traffic system, which utilizes an Air Traffic Control Radar Beacon System (ATCRBS)²⁴⁰ with modern GPS.²⁴¹ The ATCRBS is extraordinarily limited with its need for air traffic controllers to physically monitor radar screens and relay verbal instructions to pilots,²⁴² suffering through eleven second blip delays alerting controllers to only periodic coordinates of flying aircraft,²⁴³ and is unavailable in various global areas where radar beacon system coverage does not exist.²⁴⁴

The FAA anticipates that several long-term NextGen initiatives will be met by the year 2025,²⁴⁵ to include the reduction of airline delays (both in the air and during taxi) by thirty eight percent by 2020²⁴⁶ and the implementation of new technologies to include the Automatic Dependent Surveillance-Broadcast (ADS-B), Data Communications (Data Comm)

239. *Why NextGen Matters*, FAA, http://www.faa.gov/nextgen/why_nextgen_matters/ (last visited Aug. 8, 2012).

240. See FAA, Order JO 6360.12—*Air Traffic Control Radar Beacon System (ATCRBS) Performance Handbook* (Nov. 23, 1977).

241. Ashley Halsey III, *Modernization of Air Traffic Control May Be Delayed*, WASH. POST, July 4, 2011, available at, <http://english.hku.cn/washington%20post/2011/07/04/Ax01.pdf>.

242. Consider the Comair Flight 5191 flight which crashed during takeoff in Lexington, KY on August 27, 2006 killing all 47 passengers, crew and the pilot. The pilot of the Bombardier aircraft attempted a takeoff from the wrong runway. The National Transportation Safety Board (“NTSB”) determined that the probable cause of this accident was the flight crewmembers’ failure to use available cues and aids to identify the airplane’s location on the airport surface during taxi and their failure to cross-check and verify that the airplane was on the correct runway before takeoff. Contributing to the accident was the flight crew’s nonpertinent conversation during taxi, which resulted in a loss of positional awareness, and the Federal Aviation Administration’s (FAA) failure to require that all runway crossings be authorized only by specific air traffic control (ATC) clearances. Of the four safety issues discussed in the NTSB’s accident report, one recommended the implementation of cockpit moving map displays or cockpit runway alerting systems. For more information regarding the Flight 5191 crash, see *Attempted Takeoff From Wrong Runway Comair Flight 5191 Bombardier CL-600-2B19, N431CA Lexington, Kentucky August 27, 2006, Accident Report*, NTSB/AAR-07/05 PB2007-910406, National Transportation Safety Board, <http://www.ntsb.gov/doclib/reports/2007/AAR0705.pdf>.

243. The FAA currently requires a minimum of 1,000 feet vertical separation between aircraft. See 14 C.F.R. § 91 Appendix G, Section 1.

244. Halsey, *supra* note 241, at 7–8.

245. *NextGen Implementation Plan*, FAA, http://www.faa.gov/nextgen/implementation/media/NextGen_Implementation_Plan_2012.pdf (Mar. 2012) at 5. The 2025 deadline is called: *Destination 2025*. For more information on this initiative, see *Federal Aviation Administration, Destination 2025*, FAA, http://www.faa.gov/about/plans_reports/media/Destination2025.pdf (last visited Aug. 8, 2012).

246. *NextGen Implementation Plan*, *supra* note 245, at 5. Note that in meeting this target, the FAA predicts the reduction of 14 million metric tons of cumulative carbon dioxide emissions and 1.4 billion gallons in cumulative reductions of jet fuel.

and Performance Based Navigation (PBN) in an attempt to increase safety, save time and fuel, and decrease aircraft exhaust emissions.²⁴⁷

ADS-B, a satellite-based successor to ATCRBS, more precisely and efficiently tracks air traffic. It offers increased situational awareness by providing free in-cockpit traffic and weather information.²⁴⁸ ADS-B offers significant improvement to the archaic air traffic system for a number of reasons: it broadcasts immediate aircraft “location several times per second,”²⁴⁹ offers a quality signal which does not break down as does radar signal,²⁵⁰ and offers air traffic controllers identifiable information regarding specific aircraft.²⁵¹ Further, ADS-B not only obtains an aircraft’s position utilizing GPS signals which broadcast information to air traffic control facilities and other aircraft, it also allows pilots to visualize the location of other air traffic within the system.²⁵² As of 2011, over three hundred ADS-B ground stations were deemed operational, providing satellite-based surveillance coverage of numerous U.S. regions, including the East, West and Gulf coast areas as well as the majority of the U.S./Canadian border.²⁵³ By 2014, it is expected that seven hundred radio stations will be in working order.²⁵⁴

Data Comm, another component of NextGen, enables two-way information exchange between air traffic controllers and flight crew.²⁵⁵ It provides for pre-departure clearances allowing for last-minute flight plan amendments. It also offers improved ground situational awareness for pilots via flight-deck displays, which portray aircraft movement and positioning on a moving map.²⁵⁶ Moreover, improved tower displays allow controllers to better manage taxiways and runways via surface-movement

247. *Id.*

248. *Id.* at 12.

249. See Williams, *supra* note 237, at 482 (citing generally Chris Kjelgaard, *Fantastic Flight Decks to Fly You Safely*, AVIATION (June 14, 2007), <http://www.aviation.com/safety/070614flightdecktech2.html>).

250. *Id.*

251. *Id.*

252. Justin Barkowski, *Managing Air Traffic Congestion Through the Next Generation Air Transportation System: Satellite-Based Technology, Trajectories,—and Privatization?*, 37 PEPP. L. REV. 247, 271 (2010) (citing Michael J. Harrison, *ADS-X The Next Gen Approach for the Next Generation Air Transportation System 3C1-1* (2006)).

253. See *NextGen Implementation Plan*, *supra* note 245, at 5.

254. *Id.*

255. *Id.* at 36.

256. *Id.* at 23.

displays.²⁵⁷ The use of Data Comm during aircraft departure will result in fewer departure delays, reduced fuel consumption, and lower emissions.²⁵⁸

PBN allows for more direct, fuel efficient routes while providing alternate routes around NAS disruptions, such as bad weather or unexpected congestion.²⁵⁹ Since being implemented, PBN procedures have allowed for the construction of specified flight paths without the limitation of requisite ground navigation aids. As of 2011, the FAA published forty-nine Area Navigation (RNAV) routes, fifty-five RNAV arrival and departure procedures, and fifty-one Required Navigation Performance (RNP) Authorization Required approach procedures.²⁶⁰

The implementation of NextGen is a major breakthrough in environmentally responsible advances in aviation in the U.S.; however, delays in instituting this program were announced in 2012, which could affect the FAA's target implementation goals. Such delays are due to new and expanded runways at various national airports, a softer economy, airline schedule cuts, and budget pressures.²⁶¹ Still, the FAA has a viable interest in developing long-term resolutions in commercial air travel to reduce emissions and flight congestion in the U.S. NextGen will not only provide certainty in the market, but flexibility in dealing with the increasing capacity of aircraft in our skies along with a reduction of emissions emanating from air traffic.²⁶²

Outside the U.S., the use of GPS systems in aviation is limited to a small number of airports in Europe.²⁶³ Still, several global projects are under development to increase the utilization of such systems in aviation, including Zurich Airport, which is building a new GPS approach for one of its runways.²⁶⁴

257. *Id.*

258. *Id.* at 24.

259. *Id.* at 7.

260. *Id.* at 12.

261. See Adrian Shofield, *NextGen Breakeven Shifts to 2020, FAA Says*, AVIATION WEEK (Mar. 26, 2012), http://www.aviationweek.com/aw/generic/story_generic.jsp?channel=comm&id=news/awx/2012/03/22/awx_03_22_2012_p0-439330.xml&headline=NextGen%20Breakeven%20Shifts%20To%202020,%20FAA%20Says.

262. See J. David Grizzle, Amanda K. Bruchs, Robert A. Hawks & Lisa A. Holden, *Navigating the Turbulence of Competing Interests: Principles and Practice of the Federal Aviation Administration*, 75 J. AIR L. & COM. 777, 804 (2010).

263. See Adam Twidell, *The Use of GPS in Aviation*, PRIVATEFLY (Feb. 29, 2012), <http://blog.privatefly.com/gps-in-private-aviation>.

264. *Id.*

B. Sustainable Alternative Fuels

Another global approach to reduce aviation emissions comes in the form of sustainable alternative biofuels.²⁶⁵ The debate is open as to whether the use of biofuels is a responsible advancement in combating global climate change.²⁶⁶ A biofuel is a fuel made from biomass material.²⁶⁷ “Biomass refers to energy production through the use of biological material, either living or recently living.”²⁶⁸ Unlike other renewable energy sources, biomass can be converted directly into liquid fuels (or biofuels) to help meet transportation fuel needs.²⁶⁹ The two most common types of biofuels used today are ethanol²⁷⁰ and biodiesel.²⁷¹

As global economies struggle to wean themselves off fossil fuels, one of the most overwhelming challenges is finding an environmentally

265. See 2014 Environment Report, BOEING, available at http://www.boeing.com/aboutus/environment/environment_report_14/4.2_engaging_the_industry.html (last visited Sept. 29, 2014).

266. See, e.g., Justice Rick Strange, *Weaving A Tangled Web: The Intersection of Energy Policy and Broader Governmental Policies*, 5 TEX. J. OIL GAS & ENERGY L. 1, 23 (2009) (Noting the warnings that ethanol production is generating global food insecurity at unprecedented scales); Timothy A. Slating and Kay P. Kesan, *The Renewable Fuel Standard 3.0?: Moving Forward With the Federal Biofuel Mandate*, 20 N.Y.U. ENVTL. L.J. 374, 398 (2014) (documenting that the U.S. First Renewable Fuel Standard (RFS1) was supported due to the fact that biofuels can potentially have a significant role in reducing greenhouse gas emissions from the transportation sector); David B. Hunter, *The Confluence of Human Rights and the Environment: Human Rights Implications for Climate Change Negotiations*, 11 OR. REV. INT’L 331, 355 (2009) (presenting that increasing biofuel production to a level that can significantly impact total greenhouse gas concentrations will have significant implications for the availability and price of food); Howard A. Latin, *A New Direction in Climate Change Policy?: Keynote Speaker: Climate Change Mitigation and Decarbonization*, 25 VILL. ENVTL. L.J. 1, 67–68 (2014) (discussing the environmental dangers associated with biofuels, to include their negative impact on food supplies, prices and security, as well as concerns that the production of biofuels actually releases green house gases into the air, thereby potentially counterbalancing the positive effect of their use on the environment).

267. Brett Buchheit, *The Economics of Alternative Energy: Decisions Following the IPCC’s Report on Climate Change*, 38 TEX. ENVTL. L.J. 73, 82 (2008) (citing *Biomass FAQs*, U.S. DEP’T OF ENERGY, BIOMASS PROGRAM, http://www1.eere.energy.gov/biomass/biomass_basics_faqs.html (last visited June 13, 2012)).

268. *Id.* at 80.

269. *Biofuels Basics*, NATIONAL RENEWABLE ENERGY LABORATORY, http://www.nrel.gov/learning/re_biofuels.html (last visited June 13, 2012).

270. Ethanol is an alcohol biofuel made from starches and sugars (the same used in beer and wine) made either by fermenting a biomass high in carbohydrates, or through a process known as gasification which uses high temperatures and a low-oxygen environment to convert biomass into synthesis gas, a mixture of hydrogen and carbon monoxide. Ethanol is generally used as a blending agent with gasoline to increase octane and cut down on carbon monoxide and smog-causing emissions. See *id.*

271. Biodiesel is made by combining alcohol with vegetable oil, animal fat, or recycled cooking grease. See *id.*

trustworthy replacement for the liquid fuels that power aircraft.²⁷² The global aviation industry uses an enormous amount of jet fuel.²⁷³ The U.S. commercial airline industry burns about forty eight million gallons of jet fuel every day, which accounts for thirty five percent of the industry's total operating costs.²⁷⁴ As such, biofuels are the leading contenders in the effort to find a more renewable energy source within the aviation industry.²⁷⁵

On February 24, 2008, Virgin Atlantic Airways (Virgin Atlantic) joined forces with Boeing and General Electric Aviation (GE) to become the first airline to fly a commercial aircraft using a biofuel mixture.²⁷⁶ The one hour and twenty minute flight of Virgin Atlantic's Boeing 747-400 utilized a blend of twenty percent biofuel (a mixture of coconut and babassu oil) and eighty percent conventional jet fuel.²⁷⁷

While Virgin Atlantic may have been the first, it is not the only commercial airliner to test and utilize biofuel blends in the aviation industry. On November 23, 2008 KLM Royal Dutch Airlines (KLM) operated a Boeing 747 carrying the first passenger-load using a biofuel mix.²⁷⁸ Almost three years later, KLM launched another commercial flight from Amsterdam to Paris using biokerosene made from recycled cooking oil.²⁷⁹ In October 2011 British-based Thomson Airways flew a commercial flight fueled by a mixture of waste fat and A-1 jet fuel.²⁸⁰ The flight of the Boeing 757-200 was the first of its kind in the UK to fly passengers using a biofuel mix.

272. David Biello, *For Greening Aviation, Are Biofuels the Right Stuff?*, YALE ENVIRONMENT 360 (June 11, 2009), http://e360.yale.edu/feature/for_greening_aviation__are_biofuels_the_right_stuff/2160/.

273. Aviation jet fuel, or kerosene, is frequently referred to as Jet A or JP-8. See *Kerosene/Jet Fuel Category Assessment Document*, THE AM. PETROLEUM INST. PETROLEUM HPV TESTING GRP. at 6 (Sept. 21, 2010), available at <http://www.epa.gov/hpv/pubs/summaries/kerjetfc/c15020ad2.pdf>

274. Mary Beth Quirk, *FAA: There Are Less Flights To Be Had & They're Getting More Expensive*, THE CONSUMERIST (Mar. 9, 2012, 10:00 AM), <http://consumerist.com/2012/03/faa-there-are-less-flights-to-be-had-theyre-getting-more-expensive.html>.

275. See Biello, *supra* note 272.

276. See BBC NEWS, *Airline In First Biofuel Flight* (Feb. 24, 2008, 15:32), available at <http://news.bbc.co.uk/2/hi/7261214.stm>.

277. News Release, Boeing, Virgin Atlantic and GE Aviation To Fly First Commercial Jet on Biofuel (Feb. 24, 2008) (on file with author), available at <http://boeing.mediaroom.com/2008-02-24-Boeing-Virgin-Atlantic-and-GE-Aviation-to-Fly-First-Commercial-Jet-on-Biofuel?printable>.

278. *Sustainable Biofuels*, ROYAL DUTCH AIRLINES ("KLM"), <http://www.klm.com/csr/en/climate/footprint/biofuels/index.html> (last visited June 14, 2012). The flight operated using one of the four Boeing 747 engines using a mixture of 50% biofuel made from camelina.

279. *Id.*

280. See *Britain's First Biofuel Passenger Flight Touches Down Amid Worries from Environmentalists*, MAIL ONLINE (Oct. 7, 2011, 11:02 EST), <http://www.dailymail.co.uk/travel/article-2046460/Thomson-Airways-biofuel-flight-touches-down.html>.

German-carrier Lufthansa launched the first regular biofuel-powered commercial flight on July 15, 2011. The six-month trial²⁸¹ using an Airbus A321, flew the Hamburg-Frankfurt-Hamburg path four times a day over the trial phase.²⁸² For the duration of the testing period, one of the A321's twin-engines ran on a fifty-fifty mixture "of regular jet fuel and biosynthetic kerosene"²⁸³ consisting of jatropha,²⁸⁴ camelina,²⁸⁵ and animal fats.²⁸⁶ In April 2012, Australian-based Qantas flew an A330 powered by a fifty-fifty blend of conventional jet fuel and biofuel derived from cooking oil.²⁸⁷

United Airlines was the first U.S. commercial carrier to operate an aircraft using a biofuel blend in November 2011.²⁸⁸ Following the Boeing 737-800 flight from Houston to Chicago, United-Continental announced it signed a letter of intent with Solazyme²⁸⁹ to negotiate the purchase of twenty million gallons of jet fuel per year, derived exclusively from algae oil for delivery as early as 2014.²⁹⁰ That same month, Alaska Airlines and its sister-carrier Horizon Air operated the first of seventy-five passenger flights using a twenty percent biofuel blend made from cooking oil.²⁹¹

281. The Lufthansa biofuel trial ended on January 12, 2012 due to its running out of the biofuel mix with no other viable supplies available. However, during the trial period Lufthansa operated 1,187 biofuel flights with initial calculations showing carbon dioxide emissions were reduced by 1,471 tons. See *Lufthansa Ends Biofuel Trial with U.S. Flight*, REUTERS (Jan. 9, 2012, 12:13PM EST), <http://www.reuters.com/article/2012/01/09/uk-lufthansa-biofuels-idUSLNE80802I20120109>.

282. Press Release, Lufthansa, Lufthansa Launches First Scheduled Flights Using Biofuel (July 15, 2011) (on file with author), available at [http://www.lufthansagroup.com/index.php?id=322&tx_ttnews\[tt_news\]=1980&L=1&print=1&no_cache=1](http://www.lufthansagroup.com/index.php?id=322&tx_ttnews[tt_news]=1980&L=1&print=1&no_cache=1).

283. *Id.* The biofuel mixture was produced by Nestle Oil.

284. *Id.* See also Kamrun Nahar and Monica Ozores-Hampton, *Jatropha: An Alternative Substitute to Fossil Fuel*, IFAS Extension University of Florida, Publication # HS1193, at 5, available at <http://edis.ifas.ufl.edu/hs1193> (last visited Oct. 21, 2014) (discussing that Jatropha is a plant which produces seeds that, when crushed, can be used in the production of biodiesel).

285. See *Lufthansa launches first scheduled flights using biofuel*, *supra* note 268. See also *Camelina Information*, Sustainable Oils, available at <http://www.susoiils.com/camelina/> (last visited Oct. 21, 2014) (providing that Camelina, which is derived from the mustard family, contains oils used in biofuel production).

286. Press Release, Lufthansa *supra* note 267.

287. *Qantas Spruiks Biofuels With A330 Flight*, AUSTRALIAN AVIATION (Apr. 13, 2012, 2:20 PM) <http://australianaviation.com.au/2012/04/qantas-spruiks-biofuels-with-a330-flight/>.

288. The fuel-mix, produced by Solazyme, is a 40/60 blend of sustainable biofuel derived from algae and traditional petroleum-derived jet fuel. See Press Release, United Airlines Flies First U.S. Commercial Advanced Biofuel Flight (Nov. 7, 2011) (on file with author), available at <http://ir.unitedcontinentalholdings.com/phoenix.zhtml?c=83680&p=irol-newsArticle&ID=1627061>

289. Solazyme Inc., headquartered in San Francisco, California, is an alternative energy company specializing in the production of algae fuel. See SOLAZYME, <http://solazyme.com/> (last visited Oct. 16, 2012).

290. *Id.*

291. *Race for Scale: United, Alaska Airlines Launch Commercial Aviation Biofuels Flights*, BIOFUELS DIGEST (Nov. 7, 2011), <http://www.biofuelsdigest.com/bdigest/2011/11/07/race-for-scale->

Due to the global effort to reduce GHG emissions, there is little surprise that the aviation industry is testing biofuel blends for commercial flights. The increasing price of jet fuel is a rising challenge in an industry desperate to maintain profits. While the cost of jet fuel in the second quarter of 2012 went down,²⁹² it was the airline industry's largest expense in 2011 representing thirty-five percent of total costs and reaching a record high of \$3.00 per gallon that year.²⁹³ In March of 2012, the price of jet fuel reached \$3.20 per gallon before siphoning off. Due to the high cost of fuel in 2011, U.S. airlines spent about \$50.5 billion on fuel, up from \$38.8 billion in 2010, and were forced to raise ticket prices nine times in 2011 in order to make a profit.²⁹⁴ The FAA anticipates the cost of oil to reach \$138 per barrel by 2032.²⁹⁵

Further, the use of biofuels in lieu of jet fuel is another testament to the global aviation industry's interest in reducing its carbon footprint. Energy for transportation consumes sixty-three percent of all oil used in the U.S., and foreign oil accounts for more than half of all oil used in the U.S.²⁹⁶ The fact that oil is nonrenewable and that the U.S. is highly dependent on foreign sources for energy are tremendous incentives for developing renewable energy sources.²⁹⁷ As a major consumer of non-renewable energy resources, including fossil fuels, transportation is deemed the largest end-use source of carbon dioxide.²⁹⁸

united-alaska-airlines-launch-commercial-aviation-biofuels-flights/.

292. Trefis Team, *Delta Is Right In Hedging Jet-Fuel Prices*, Trefis (Aug. 21, 2012), <http://www.trefis.com/stock/dal/articles/139697/delta-is-right-in-hedging-jet-fuel-price/2012-08-21> (noting that during the second quarter of 2012, the price of jet-fuel declined)

293. Candice Leigh Helfand, *High Gas Prices Raising Airline Ticket Costs*, CBS DC (Mar. 1, 2012, 11:33 AM), <http://washington.cbslocal.com/2012/03/01/high-gas-prices-raising-airline-ticket-costs-curbing-holiday-travel/>.

294. Bart Jansen, *Fares Expected to Soar Through Summer; Blame Jet Fuel Costs*, USA TODAY (Mar. 14, 2012, 1:16 PM), <http://travel.usatoday.com/flights/story/2012-03-13/Fares-expected-to-soar-through-summer-blame-jet-fuel-costs/53515892/1>.

295. See FED. AVIATION ADMIN., FAA AEROSPACE FORECAST, FISCAL YEARS 2012—2032, HQ-121545 at 35, available at http://www.faa.gov/about/office_org/headquarters_offices/apl/aviation_forecasts/aerospace_forecasts/2012-2032/media/2012%20FAA%20Aerospace%20Forecast.pdf. The FAA's prediction is derived from IHS Global Insight, as measured by the Refiner's Acquisition Cost. Specifically, the price of oil is predicted to reach \$100 per barrel in 2012, \$115 per barrel by 2015, increase to \$118 per barrel by 2025 and hit a high of \$138 by 2032, all the while increasing at a faster rate than inflation. *Id.*

296. Dinesh Mohan, Charles U. Pittman, Jr., Philip H. Steele, *Pyrolysis of Wood/Biomass for Bio-oil: A Critical Review*, ENERGY AND FUELS, 20, 848 (2006).

297. *Id.*

298. See *Transportation and Climate*, UNITED STATES ENVIRONMENTAL PROTECTION AGENCY ("EPA") (last updated Feb. 8, 2012), <http://www.epa.gov/otaq/climate/basicinfo.htm> (indicates that CO₂ is the most prevalent greenhouse gas.).

The road to successfully incorporating biofuels into the global commercial aviation sector is long, since the use of biofuels as a renewable energy resource has been met with some skepticism. Notwithstanding the fact that the high cost of jet fuel is a rising concern within the industry, the cost of biofuels is also troublesome. In New York, Bloomberg New Energy Finance (“BNEF”) projects jatropha-based jet fuel (currently the most affordable category of aviation biofuels) to cost about \$3.25 per gallon by 2018, followed by fuel made from woody biomass (the next most affordable category)²⁹⁹ at \$3.40 per gallon by 2018.³⁰⁰ Critics of the United Airlines commercial biofuel flight in November 2011 noted that the airline paid six times the cost of regular fuel for the biofuel used in the demonstration.³⁰¹ Further, Alaska Airlines paid \$16.00 per gallon for the biofuel used during its flights as compared to the \$3.15 it would have cost to use Jet-A fuel.³⁰²

Consider further Virgin Atlantic’s inaugural biofuel flight. Critics alleged that Virgin Atlantic was not testing biofuels for the purpose of ultimately reducing GHGs, but to promote the flight for marketing purposes.³⁰³ Perhaps a valid argument, considering that Imperium Renewables, the biofuel developers for the flight, maintain that the blend used during the test flight is not a realistic substitute for the eighty seven billion gallons of fuel needed each year to fly the world’s airline fleets.³⁰⁴ Advocacy groups further attack biofuel use for their negative impacts on the environment, including water shortages due to the huge volume of

299. The pyrolysis of woody biomass refers to a process converting biomass to liquid fuels. Pyrolysis converts organics to solid, liquid, and gas by heating in the absence of oxygen. Further, the wood preservative industry utilizes this means to find a low-cost and environmentally friendly means to dispose of treated wood products. See Mohan et al., *supra* note 282, at 849. See also zhoyle, *Biomass Energy from Southern Forests*, CompassLive (Dec. 31, 2013), <http://www.srs.fs.usda.gov/compass/2013/12/31/biomass-energy-from-southern-forests/> (noting that Biochemical and thermochemical technologies used to produce liquid fuel from woody biomass are not yet commercially viable).

300. *The Future of Aviation Biofuels*, BIOFUELS DIGEST (Feb. 20, 2012) <http://oilprice.com/Alternative-Energy/Biofuels/The-Future-of-Aviation-Biofuels.html>.

301. Melody M. Bombgardner, *Flying the Green Skies with Biofuel*, CHEMICAL AND ENGINEERING NEWS, VOL. 90, ISSUE 24, pp. 18–24 (June 11, 2012), <http://cen.acs.org/articles/90/i24/Flying-Green-Skies-Biofuels.html>.

302. Jason Paur, *High Cost Makes Aviation Biofuel Slow To Take Off*, AUTOPIA (Nov. 10, 2011 6:55PM), <http://www.wired.com/autopia/2011/11/aviation-biofuel/>.

303. Avi Brisman, *It Takes Green to Be Green: Environmental Elitism, “Ritual Displays,” and Conspicuous Non-Consumption*, 85 N. D. L. REV. 329, 339 (2009).

304. Jennifer Conlin, *Trying to Lighten That Carbon Footprint*, N.Y. TIMES (May 4, 2008), <http://travel.nytimes.com/2008/05/04/travel/04green.html>. In her article, Conlin notes that Friends of the Earth, an international environmental network, criticized Virgin Atlantic’s flight promotion as a trendy public relations stunt, reiterating that carbon savings from biofuels are negligible and that growing crops for alternative fuels cuts into land used to grow food as well as drives deforestation. *Id.*

biofuels needed to process grains or sugar into ethanol, expanded acreage requiring extensive fertilization, the addition of nitrogen and phosphorus to local watersheds which starve water bodies of the oxygen needed to support aquatic life, and the vast crop acreage needed to feed biofuel feedstock.³⁰⁵

Although the EU unilaterally increased the global pressure to lower aviation emissions, biofuel blends are not currently the most cost-effective approach to meeting the ETS standards. Factually, biofuel costs are almost double that which airlines pay for kerosene;³⁰⁶ however, in March 2012, Boeing, Airbus and Embraer signed a Memorandum of Understanding (MOU) in an effort to promote the development of affordable aviation biofuels.³⁰⁷ These three leading aircraft manufacturers agreed to collaborate in speaking to governments, biofuel producers and key stakeholders “to support, promote and accelerate the availability of sustainable jet fuel sources.”³⁰⁸ Also, in March 2012, the White House promised up to thirty-five million dollars over three years to support research and development in advancing biofuels, bioenergy, and biobased products.³⁰⁹ The projects, to be funded through the Biomass Research and Development Initiative (BRDI)—a joint program through the U.S. Department of Agriculture (USDA) and the U.S. Energy Department (USED)—aim to help “develop economically and environmentally sustainable sources of renewable biomass and increase the availability of renewable fuels” to help replace the need for gasoline and diesel.³¹⁰

One promising development is the use of the previously noted jatropha plant.³¹¹ Jatropha is an opportunistic choice for biofuel use as it can be

305. C. Ford Runge, *The Case Against Biofuels: Probing Ethanol's Hidden Costs*, YALE ENV'T 360 (Mar. 11, 2010), http://e360.yale.edu/feature/the_case_against_biofuels_probing_ethanols_hidden_costs/2251/. A 2007 study in *Science* noted that to replace just 10% of the gasoline in the U.S. with ethanol and biodiesel would require 43% of current U.S. cropland for biofuel feedstocks. The EU would need to commit 38% of its cropland base. Otherwise, new lands will need to be brought into cultivation, drawn disproportionately from those more vulnerable to environmental damage, such as forests.

306. Robert Wall, *Concerns About Biofuels, ETS Gain Strength*, AVIATION WEEK & SPACE TECH. (Oct. 24, 2011), http://www.aviationweek.com/Article.aspx?id=/article-xml/AW_10_24_2011_p28-384460.xml.

307. Press Release, *Airbus, Boeing, Embraer Collaborate on Aviation Biofuel Commercialisation* (Mar. 22, 2012) (on file with author), available at <http://www.airbus.com/presscentre/pressreleases/press-release-detail/detail/airbus-boeing-embraer-collaborate-on-aviation-biofuel-commercialisation/>.

308. *Id.*

309. *Obama Administration To Fund Next Generation Biofuels Research*, US DEP'T OF ENERGY (Mar. 22, 2012), http://apps1.eere.energy.gov/news/daily.cfm/hp_news_id=345.

310. *Id.*

311. Jatropha is a drought-resistant plant, which grows well in marginal or poor soil, producing seeds with an oil content which can be combusted as fuel without being refined. For more information

grown virtually anywhere in the world without requiring substantial water or fertilizer, and is estimated to cost half of the price of fuels produced from corn.³¹² Recently, BNEF concluded that if production efficiency continues to improve, the cost of certain biofuels, including jatropha, could be competitive with the cost of fossil-based jet fuel by 2018.³¹³ Such competitive pricing is necessary to keep the commercial aviation industry running, as it is entirely dependent on petroleum-based jet fuel, regardless of the source, price, or ultimate environmental concerns.³¹⁴ And as the IATA has called for six percent of jet fuel demand to be met by biofuels by 2020, finding a realistic option, which will keep fuel prices reasonably competitive and environmentally friendly is key to finding a trustworthy biofuel solution.

As the quest to implement biofuels into the aviation sector continues, advocates aggressively work to find viable options to reduce the use of pure kerosene jet fuel in commercial aviation. While critics allude to certain negative impacts that biofuels have on the environment, research indicates that the development of alternative sustainable biofuels that are both cost-effective and environmentally friendly is on the horizon. In the wake of the EU's implementation of the ETS, and to further meet the ICAO's MGM future goals, developing a more environmentally sustainable and cost-effective aviation fuel in the form of biofuel blends may be the wave of the future.

C. Overall Analysis

As the ICAO's MBM program continues to develop, the organization will further articulate a policy direction and determine which plans qualify based on a globally agreed upon criteria.³¹⁵ To this extent, the annual GHG reduction goals by 2020 along with the aspirational objectives for the ensuing years thereafter will serve as the overarching benchmark, while

on the jatropha plant, *See About Jatropha Plant*, JATROPHA WORLD, <http://www.jatrophabiodiesel.org/aboutJatrophaPlant.php> (last visited July 17, 2012).

312. Zachary M. Wallen, Note, *Far From a Can of Corn: A Case for Reforming Ethanol Policy*, 52 ARIZ. L. REV. 129, 151 (2010).

313. *Jatropha Oil-Based Aviation Biofuels Cost-Competitive By 2018, Finds Bloomberg Study*, JATRO BIOJET FUEL (Feb. 15, 2012), <http://www.jatrofuels.com/835-0-Jatropha+oil-based+aviation+biofuels+cost-competitive+by+2018+finds+Bloomberg+study.html>. Note, the Bloomberg Study projects that Jatropha can produce jet fuel at \$0.86 a litre (\$3.25 per gallon) by 2018, making it a front-runner in the world of biofuel production for both cost and environmental friendliness.

314. *See Agriculture and Aviation: Partners in Prosperity*, USDA (Jan. 2012) at 9, available at <http://www.usda.gov/documents/usda-farm-to-fly-report-jan-2012.pdf>.

315. *See ICAO Assemb. Resolution A38-18, supra note 224.*

the subsequent agreement on a system for measurement will provide the initial means for assessment.³¹⁶

In time, the ICAO will need to make the important decision as to whether to allow a qualifying plan from a participating country to satisfy the stated goals solely through the reductions in GHGs produced, based on improvements in efficiency, or a combination of the two. In essence, the ICAO's role in reducing GHG now becomes that of an arbitrator as well because its MBM program will set the global policies while allowing flexibility amongst its members to determine its own jurisdictional approach within those constructs.

With the ICAO following such a course, the EU may find it necessary to modify its current noncommittal position that seeks GHG output reductions in lieu of improvements to efficiency.³¹⁷ The language of the EU's ETS allows for an exemption on the basis of "equivalent measures," which provides a convenient opportunity for it to point to its continued leadership on the GHG issues while retaining a stance that it did not cave to international pressures.³¹⁸

Accordingly, the ICAO's MBM solution appears to offer a middle ground for the many nations involved in addressing and implementing an approach to reducing GHG emissions that emanate from aviation sources while providing suitable opportunities to incorporate technological advances into the solution. Thus, the ICAO's MBM addresses the main concerns that motivated the EU's ETS while including many of the approaches considered important by other nations, offering a solution that addresses aviation GHGs in order to bring forth meaningful reductions over time.

CONCLUSION

The EU continues to expand upon its reputation for bringing international stakeholders to the negotiating table on subjects they would not ordinarily agree to discuss.³¹⁹

The ICAO appeared trapped in endless studies to determine a course of action with regard to addressing GHG emissions from aviation when the EU's patience waned, so it decided to leverage its unique position in the

316. *Id.*

317. *See generally* Hart, *supra* note 191 (citing translation from *Ou meng yuan tan tao huo mian* (European Union Wants to Talk About Exemption)), 21 *SHI JI JING JI BAO DAO* (21 Century Economic Report) (July 19, 2011), *available at* <http://stock.jrj.com.cn/2011/07/19034010476743.shtml>.

318. *Id.*

319. *See* Katelyn E. Ciolino, *supra* note 12, at 1186.

market to pressure other nations into tackling this difficult issue and to become a major policy topic.

The pressure from numerous member countries that opposed the EU's plan to include foreign flagged carriers, along with losses in the courts and unpalatable options for a challenge through other conventions and treaties, provided enough momentum within the ICAO to develop a global and comprehensive solution to GHG emissions in aviation. While the ICAO's MBM program continues to emerge from its nascent stages, it offers enough substance to delay implementation of the EU's ETS for foreign flagged carriers and deliver a comprehensive global solution rather than a unilateral one imposed by a block of nations upon the world.

The EU's game of brinksmanship forced conflicting parties to address GHG emissions within the realm of aviation. As no other countries or member nations had previously placed a high value on achieving a global objective to reduce GHG emissions emanating from aircraft, the EU's unilateral movement ultimately compelled the ICAO to undertake its role of assessing the appropriate global methods for reducing GHG emissions within the aviation sector. Such undertaking was a necessary response to help reduce a rising global conflict, which seemed to be moving towards unacceptable levels among EU member nations.