blueskies PROJECT

Curbing Aviation Emissions 101

Everything You Need to Know About U.S. and EU Policies

By Rebecca Lefton and Samuel Grausz July 2012

Addressing the projected growth in greenhouse gas emissions from the aviation sector will be integral to solving climate change. Aviation accounts for 13 percent[1] of global transportation carbon dioxide emissions, and emissions from aviation are on track to quadruple by 2050 if left unchecked.[2]

The share of aviation's contributions to total global transportation emissions is even larger if non-carbon-dioxide emissions are included. In addition to carbon dioxide, aircraft emit other gases that lead to global warming—including water vapor, black carbon, nitrogen oxides (NOx), and sulfur oxides (SOx). The climate impact is potentially double, too, because airlines emit all of these greenhouse gases directly into the upper atmosphere.

Complicating the problem, the number of passengers on U.S. airlines is projected to double to 1 billion in the next 10 years, and the number of passengers globally will more than double to 6 billion by 2026.[3]

Sustainable growth of the airline industry—which already contributes $1.3 trillion to the domestic economy annually,[4] supports 10 million U.S. jobs and 15 million jobs worldwide, and sustains tens of millions more jobs for the tourism industry—is key to the health of our economy and our environment.[5]

So what is being done to cut greenhouse gas emissions in the aviation sector? How can public and private sectors ensure the growth of the airline industry without harming the climate?

This issue brief will examine these questions by looking at steps the United States and Europe are taking.

What the United States is doing to bring down aviation emissions

What is the United States doing to lower aviation emissions?

The United States does not regulate greenhouse gas emissions from aircraft. But the U.S. government is taking steps that could reduce emissions including developing a more modern and streamlined air traffic control system and producing advanced jet biofuels with the goal of creating a competitive national biofuels industry.

Next Generation Air Transport System, or NextGen, is a new satellite-based air traffic management system using GPS that if fully implemented aims to replace radars by 2025. NextGen is a win for passengers, airlines, the environment, and the economy.[6] The Federal Aviation Administration estimates that more direct routes—and planes circulating less overhead waiting for clearance to land—will result in 35 percent fewer delays and save 23 million through 2018.[7] What's more, improved route efficiency will save 1.4 billion gallons of jet fuel and reduce carbon dioxide emissions by 14 million tons in 2018.

Further, on August 16, 2011, the Obama administration announced a joint initiative with the Department of Agriculture, Department of Energy, and the Navy to increase the use of jet and marine advanced biofuels. The plan[8] is part of a broader goal to reduce dependence on foreign oil and improve energy security as laid out in a March presidential directive—"Blueprint for A Secure Energy Future," which

prioritized reducing oil imports by one-third by 2025. Increasing the use of biofuels is a key part of reaching that goal.[9]

What are potential U.S. policy responses to greenhouse emissions?

A 2009 Government Accountability Office, or GAO, report explored greenhouse gas emissions from the aviation sector and regulatory options for reduction.[10] Measures GAO considered included a carbon tax or cap-and-trade mechanism, performance or technology standards, and increasing government research and development for low-carbon technologies.

GAO preferred market-based measures such as cap and trade or a tax because of their greater economic efficiency. These measures can achieve emissions reductions by putting a price on emissions thereby allowing firms the flexibility to achieve reductions with the lowest cost.

The report found that standards for aircraft or engine emissions provide firms with less choice and increase costs, and also provide fewer incentives to reduce emissions beyond the set requirement.

R&D provides minimal incentives to reduce emissions but could provide breakthrough technologies and directly benefit from a market-based measure as revenues from the measure could be directed toward R&D investment.

How do market-based measures work?

Market-based measures put a price on emissions, creating an incentive to reduce them.

The price is usually accomplished by limiting overall emissions, allowing firms to trade the right to emit (cap and trade), or directly taxing their emissions.

Most economists believe that in many cases such programs reduce emissions at the lowest cost because they provide more flexibility for firms to decide how to reduce emissions. These programs also often generate revenue that can be used to invest in clean technologies, emissions mitigation, and adaptation to climate change.

For these reasons, market-based measures for greenhouse gas emissions in the aviation and maritime sector have generated much attention—both as an environmental solution and as a revenue raiser for meeting climate goals. In the 2010 Conference

of the Parties for the U.N. Framework Convention on Climate Change in Cancun, Mexico, governments reaffirmed a goal to mobilize $100 billion annually by 2020 for adaptation and mitigation in developing countries from a mix of public and private sources. A mechanism to raise revenue from the aviation or shipping industry is among the U.N. Secretary General's High-Level Advisory Group on Climate Financing's recommendations for innovative and additional long-term sources of funding to support the needs of developing countries.[11]

What Europe and the rest of the world are doing

What is the International Civil Aviation Organization's role in reducing greenhouse gas emissions?

The 1997 Kyoto Protocol—the only existing international agreement on greenhouse gas emissions reductions—sets binding greenhouse gas emissions targets for participating developed countries to stabilize greenhouse gas concentrations in the atmosphere at a level to prevent disruptions to the climate (the United States did not ratify the Kyoto Protocol). Article 2 of the Kyoto Protocol requires parties to pursue limitations of greenhouse gas emissions from aviation working through the International Civil Aviation Organization, or ICAO—an agency of the United Nations.[12]

The International Civil Aviation Organization has been working on greenhouse gas standards for new airplanes and a potential market-based mechanism for existing airplanes for more than 15 years without adopting any binding policies. In the resolution on climate change adopted at its most recent assembly in October 2010 (37th Assembly of Resolution A37-19), the organization called for further work to explore the feasibility of a global market-based measure, noting that "a comprehensive approach, consisting of work on technology and standards, and on operational and market-based measures to reduce emissions is necessary" to promote sustainable growth of aviation. The resolution also recognized that states might take action to reduce emissions prior to 2020.[13]

The International Civil Aviation Organization failed to implement a market-based measure, so the European Union, or EU, moved forward with its own system noting the ICAO Assembly's endorsement in 2007 of the incorporation of international aviation into states' existing emissions trading systems.[14, 15] The EU aviation directive, however, also states, "The Community and its Member States

should continue to seek an agreement on global measures to reduce greenhouse gas emissions from aviation."[16]

Following the adoption of the EU Emissions Trading System aviation program, the International Civil Aviation Organization focused more on a market-based measure. An ICAO working group is considering options for a global market-based measure under the direction of the ICAO secretary general and plans to propose a set of policy options to the ICAO Council in the spring of 2013. This would apply to all airlines worldwide.

What is the EU Emissions Trading System aviation program?

The Aviation Emissions Trading Directive (Directive 2008/101/EC of the European Parliament and of the Council) introduced aviation to the Emissions Trading System in 2008.[17] The program covers all flights into, out of, or within Europe over their entire flight path and requires a 3 percent reduction in carbon dioxide emissions from the average level in 2004–2006 starting in 2012. The directive supports a comprehensive approach—including improvements in air traffic management under the Single European Sky—which will improve the efficiency and capacity of air traffic flows in Europe, and Single European Sky ATM Research—a research and development initiative in support of Single European Sky.[18]

It is a cap-and-trade program that sets an overall limit on the emissions by the aviation sector and allows airlines to trade the right to emit amongst each other—minimizing the overall cost of reducing emissions. The European Union issues permits to emit known as "allowances" and requires that airlines hold an allowance for each ton they emit.

The European Union gives away 85 percent of these allowances for free and auctions off the remaining 15 percent. Airlines that emit less greenhouse gases than their free allowance amount can sell their permits for a profit or "bank" them for future use or sale. Airlines planning to emit more greenhouse gases than their free allowance amount must purchase carbon credits at auctions from other entities in Europe, on the international markets, or reduce their emissions.

The European Union estimates that inclusion of aviation in the Emissions Trading System will reduce aviation emissions by more than 70 million tons of carbon dioxide equivalent annually from 2013 to 2020.[19]

Congress and the Obama administration are not supportive of the EU aviation emissions system. In fact, the House of Representatives passed the European Union Emissions Trading System Prohibition Act of 2011, which would prevent the United States from complying with the EU program.[20] The Senate held a hearing on a comparable measure in June 2012. The Obama administration supports the objective of the EU aviation program but opposes it on legal and policy grounds.[21]

The International Civil Aviation Organization adopted a working paper urging the European Union not to include non-EU carriers in the emissions trading system and recognizing the role of ICAO in addressing global aviation emissions on November 2, 2011.[22] The paper was presented by the United States and 25 other countries: Argentina, Brazil, Burkina Faso, Cameroon, China, Colombia, Cuba, Egypt, Guatemala, India, Japan, Malaysia, Mexico, Morocco, Nigeria, Paraguay, Peru, Republic of Korea, Russian Federation, Saudi Arabia, Singapore, South Africa, Swaziland, Uganda, and the United Arab Emirates.

What are the economic impacts of the EU aviation law?

The EU aviation law was designed to minimize costs for airlines in the early years of the policy. The consensus of economic studies shows that, as a result, airlines will likely make a significant profit from the policy from now until 2020. The first report of the Center for American Progress's new Blue Skies project—"Is the Sky Falling for Airline Profits in the European Union?"—found that airlines will gain between $380 million and $570 million per year in additional profits, or a 20 percent to 30 percent increase in profits on covered flights.[23]

The fact that airlines could profit off the EU aviation law is confusing at first glance. When a company faces new costs, it attempts to pass on those costs to consumers. Whether the company can pass on those costs is a function of the elasticity of supply and demand for their services. In the case of airlines, there are few good alternatives to flying; in general, economists have found that airlines can pass on most of their costs.

The EU aviation law imposes costs on airlines by requiring them to hold allowances to cover their emissions. The program gives away 85 percent of the allowances for free, however, and the airlines receive these allowances regardless of whether they passed on costs to consumers. Thus, the airlines will rationally pass

on the full emissions costs and keep the profits from the free emissions permits the European Union provides. Airlines given the most allocations—those that flew the most in the past—will make the most money.

These additional profits do not necessarily imply that the opposition of the airlines to the EU policy is irrational. As with the European power sector—which received many free allowances when they were similarly regulated in the mid-2000s and also gained so-called "windfall profits" —the European Union will eventually stop giving out the free allowances to the airlines. At that point the EU law will switch from a net gain to a net loss for the airlines. The profits do, however, provide the airlines with an infusion of much-needed capital that would enable them to invest in a modern, fuel-efficient fleet and minimize their costs in the long-term once the free allowances go away.

Are any flights exempt from the program?

A *de minimis* provision applies to airlines with two flights or fewer a day or less than 10,000 tons of carbon emissions annually. Small aircraft (defined as less than 5,700 kg) and state, military, rescue, emergency, VFR (visual flight rules), and training flights are also exempt.

Notably, the EU system also includes a clause that waives the compliance of flights from countries with an "equivalent measure."

Is the EU program legal?

The legality of the program remains quite controversial. Several major U.S. airlines and their trade association A4A (formerly the Air Transport Association) brought a lawsuit challenging the directive in the European courts in 2009. On December 21, 2011, however, the highest court in Europe (the EU Court of Justice or ECJ) validated the EU aviation directive.[24]

What alternatives exist for the United States?

The United States has a number of policy options to resolve the conflict with the European Union over following its aviation emissions program.

First, the United States could continue to pressure the European Union to back down from its policy, though this seems unlikely to succeed given the resolve of the Europeans, and it would not solve the ongoing challenge of aviation emissions.

Second, the United States could craft its own aviation emissions regulations and thereby exempt itself from the EU aviation law. The Blue Skies Project examines this option in our new report, "A Domestic Alternative for Aviation Carbon," which finds that there is sufficient authority under the Clean Air Act to craft such a regulation while minimizing costs for airlines.[25]

Third, the United States could help draft a global market-based mechanism in the International Civil Aviation Organization. If the ICAO policy is as stringent as the EU aviation law, then the Europeans would roll back their law and the world could operate under a single, unified emissions regime. Moreover, the administration could likely use the same Clean Air Act authority to implement the ICAO regulations—potentially without needing to go back to Congress.

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Read more about what the United States can do to reduce aviation emissions:

- Domestic Action on Aviation Carbon by Nathan Richardson and Samuel Grausz, available at http://www.americanprogress.org/issues/2012/07/pdf/aviation_carbon_execsumm.pdf.

- Is the Sky Falling for Airline Profits in the European Union? by Samuel Grausz, Nigel Purvis, and Rebecca Lefton, available at http://www.americanprogress.org/issues/2012/02/sky_falling.html.

Endnotes

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