

*Climate Change Impacts on the Transportation Sector: The Airlines' Climate Change Commitment*



Statement of John M. Meenan  
Executive Vice President and Chief Operating Officer  
Air Transport Association of America, Inc.  
before the  
Senate Committee on Commerce, Science, and Transportation

June 24, 2008



AIR TRANSPORT ASSOCIATION

Thank you, Mr. Chairman. Air Transport Association (ATA) airline members transport more than 90 percent of all U.S. airline passenger and cargo traffic.<sup>1</sup> Our airlines take their role in controlling emissions very seriously. Recently, there has been a great deal of focus in Congress on greenhouse gas (GHG) emissions in particular, and how this nation might achieve reductions in these emissions while maintaining economic stability and enhancing energy independence. Commercial aviation has a vital role to play in this regard. Also, as strong supporters of sound transportation planning, the airlines appreciate the committee's interest in the potential impacts on transportation that might result from changes in climate. Thank you for the opportunity to appear before you today to discuss these issues.

## INTRODUCTION AND OVERVIEW

For generations, flying has contributed to a better quality of life in America. Commercial aviation has been essential to the growth of our economy, yielded breakthrough technologies, brought people together and transported critical cargo – all while achieving an exceptional environmental track record. Today's airplanes are not just smarter – they are quieter, cleaner and use less fuel than ever before – but we also fly them smarter. That's why our industry represents just 2 percent of all GHG emissions in the United States while driving three times more economic activity. But we are not stopping there. The initiatives that we are undertaking to further address GHG emissions are designed to responsibly and effectively limit our fuel consumption, GHG contribution and potential climate change impacts while allowing commercial aviation to continue to serve as a key contributor to the U.S. economy. I want to emphasize three points that are essential to moving our emissions-reducing efforts forward within a framework of sound transportation planning, energy and climate change policy:

First, ***commercial airlines are and have long been extremely GHG efficient.*** For the past several decades, commercial airlines have dramatically improved GHG efficiency by investing billions in fuel-saving aircraft and engines and innovative technologies like winglets and cutting-edge route optimization software. Fuel is our largest cost center, which, long before the current fuel price crisis created the economic imperative that we continuously improve fuel and GHG efficiency. And while commercial aviation accounts for only 2 percent of domestic man-made GHG emissions, we shepherd this to good use, driving a far larger percentage of economic activity, not only directly, but also indirectly, as a necessary element in the airport and tourism sectors and in all business sectors that rely on the rapid delivery of goods and human resources.

Second, ***ATA airlines are proactively committed to further limiting their GHG footprint*** through a set of measures that will simultaneously address climate change and energy independence while preserving economic stability and the opportunity to grow. At the core of these measures is the ATA carriers' commitment to an additional 30 percent fuel efficiency improvement by 2025 – improvement that only comes from the airlines' investment in new aircraft, new aircraft engines, navigation aids and enhanced operational procedures. In addition, we are dedicating ourselves to developing commercially viable, environmentally friendly alternative jet fuel, which could be a game-changer in terms of aviation's output of GHGs. Moreover, we are central stakeholders in partnering efforts to modernize the outdated air traffic

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<sup>1</sup> ATA airline members include ABX Air, AirTran Airways, Alaska Airlines, American Airlines, ASTAR Air Cargo, Atlas Air, Continental Airlines, Delta Air Lines, Evergreen International Airlines, Federal Express Corporation, Hawaiian Airlines, JetBlue Airways, Midwest Airlines, Northwest Airlines, Southwest Airlines, United Airlines, UPS Airlines and US Airways. Associate members are: Air Canada, Air Jamaica Ltd. and Mexicana.

management (ATM) system and to reinvigorate research and development in aviation environmental technology, both of which can bring extensive additional emissions reductions.

Third, *there is a critical role for the federal government to play in energy, transportation planning and climate change policy* to complement the airlines' efforts. While the ATA airlines' 30 percent fuel efficiency improvement target will be met through the airlines' own investments and operating initiatives, the other measures in the package require a significant measure of congressional support. Also, sound transportation planning at all levels of government can help minimize the impacts on transportation from potential climate change effects.

Just as we ask Congress to continue to work with us, we also urge Congress to calibrate federal energy and transportation policy and any climate change-related legislation so they do not work against our efforts. Last week, ATA announced a revised 2008 forecast: the U.S. airlines expect to lose in the range of \$10 billion this year – a loss on par with the worst year in this industry's history. Soaring fuel prices are the sole reason. Congress must help get these prices under control. Moreover, while the Senate recently declined to go forward with the GHG cap-and-trade program proposed in the Lieberman-Warner Climate Security Act, which would have applied an additional fuel surcharge on airlines' jet fuel, we understand that many in Congress still are interested in applying such proposals to aviation. Not only is an additional "price signal" unnecessary for our industry, but recent events have shown the crippling effects that exorbitant fuel prices can have. We urge Congress to adopt sound energy, transportation planning and climate change policies that avoid counterproductive, punitive approaches that further siphon away funds that the airlines otherwise could use to invest in newer aircraft and other fuel- and GHG-saving measures.

### *Commercial Aviation Is Extremely GHG Efficient*

Commercial aviation in the United States has a decidedly strong track record that is often overlooked or misstated. U.S. commercial aviation contributes just 2 percent of domestic U.S. GHG emissions.<sup>2</sup> To put that into context, with passenger vehicles (cars and light duty trucks) alone accounting for over 17.5 percent,<sup>3</sup> as illustrated in Figure 1, road transport accounts for more than a quarter of U.S. GHG emissions and power plants account for over a third.<sup>4</sup> The picture is similar when viewed on a global basis. Worldwide commercial aviation contributes just 3 percent of man-made GHGs.<sup>5</sup> To put this into perspective, cattle and other livestock account for approximately 18 percent.<sup>6</sup>

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<sup>2</sup> The United States Environmental Protection Agency's (EPA's) most recent general inventory reports commercial aviation's contribution to the total GHG emissions in 2006 was 2.04 percent. EPA, *Inventory of Greenhouse Gas Emissions and Sinks: 1990 -2006* (April 15, 2008) (hereinafter *EPA GHG Inventory 1990-2006*) at pages ES-4 and 21 ("in 2006, total U.S. greenhouse gas emissions were 7,054.2" teragrams of carbon dioxide equivalent (Tg CO<sub>2</sub> Eq)) and Table 2-15 at pp. 2-22 & 2-23 ("Commercial Aircraft – Domestic" account for 143.6 Tg. CO<sub>2</sub> Eq.).

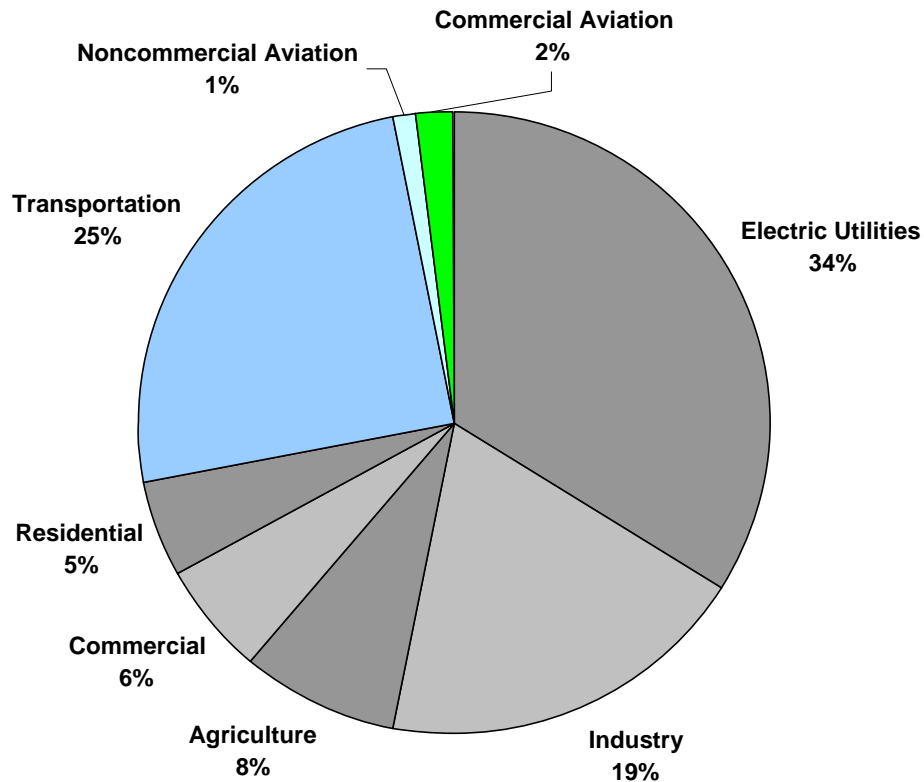
<sup>3</sup> *EPA GHG Inventory 1990-2006*, Table 2-15 at pp. 2-22 and 2-23.

<sup>4</sup> *EPA GHG Inventory 1990-2006*.

<sup>5</sup> It is estimated that on a worldwide basis, commercial aviation accounts for approximately 3 percent of total GHGs, while at the same time contributing over 8 percent of the world's economic activity. See International Air Transport Association, *Debunking Some Persistent Myths about Air Transport and the Environment*.

<sup>6</sup> United Nations, Livestock Environment and Development Initiative, *Livestock's Long Shadow – Environmental Issues and Options* (2006) at p. 271.

Figure 1 – U.S. Aviation Greenhouse Gas Emissions  
2 Percent of the Inventory



Source: U.S. EPA Data 2005

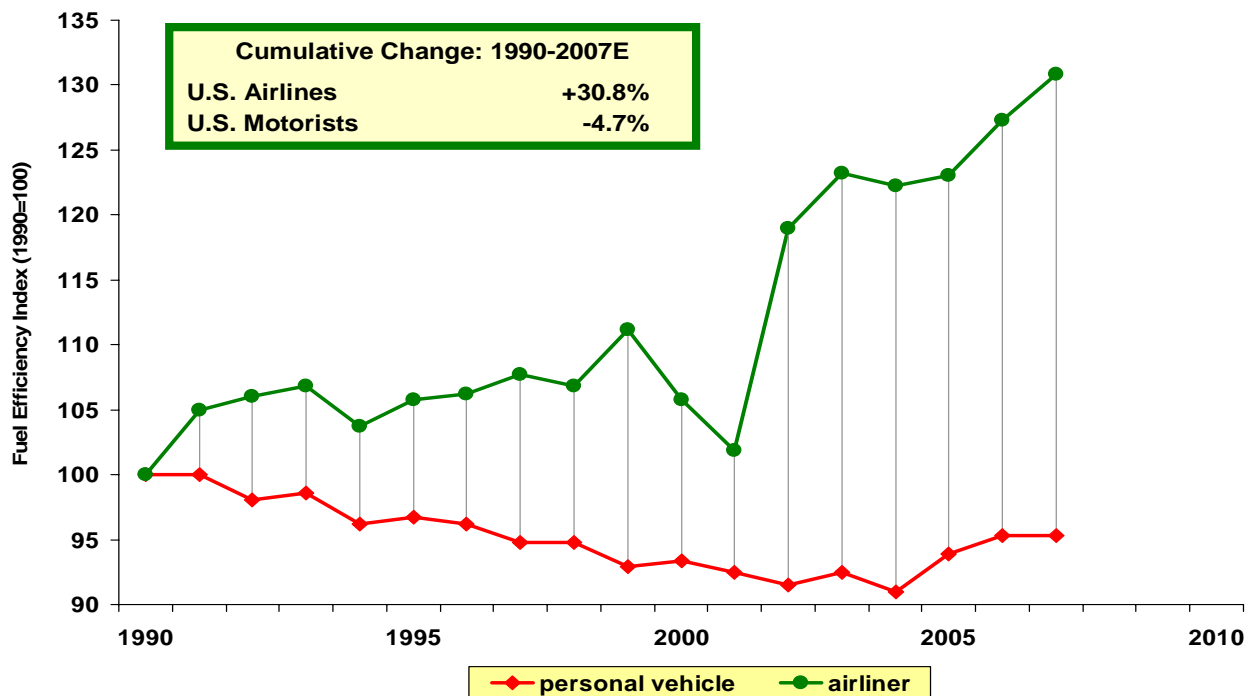
At the same time, commercial aviation is critically important to local, national and global economies, enabling a large percentage of U.S. economic output. A July 2007 study by the FAA found that the national economy is highly dependent on commercial aviation, which is directly or indirectly responsible for 5.2 percent of U.S. gross domestic product (GDP), \$1.1 trillion in U.S. economic activity (gross output), an estimated 9.5 million jobs, and \$322 billion in earnings.<sup>7</sup> Placing our economic output side-by-side with our GHG output, it is clear that commercial aviation is an extremely GHG-efficient economic engine, bringing good “bang” for our GHG “buck.”

We have been able to deliver such strong economic output while reducing our emissions by continually improving our fuel efficiency through reinvestment in technology and more fuel-efficient operations. In fact, U.S. commercial airlines (passenger and cargo combined) improved their fuel efficiency by 110 percent between 1978 and 2007, which (given the one-to-one relationship between fuel consumption and carbon dioxide (CO<sub>2</sub>)) has resulted in 2.5 billion metric tons of CO<sub>2</sub> savings – roughly equivalent to taking 18.7 million cars off the road each of those years. Further, Bureau of Transportation Statistics data confirm that U.S. carriers burned almost 3 percent less fuel in 2007 than they did in 2000, resulting in absolute reductions in GHG emissions, even though they carried 20 percent more passengers and cargo on a revenue ton miles basis.

<sup>7</sup> See FAA, *The Economic Impact of Civil Aviation on the U.S. Economy* (July 2007).

Commercial aviation's GHG efficiency compares very favorably to other modes and other sectors. While commercial aviation improved its per-passenger fuel efficiency from 1990, freight trucks showed the reverse trend, with GHG emissions growing faster than vehicle miles traveled.<sup>8</sup> EPA also has confirmed that passenger vehicles have lagged far behind aircraft in fuel and GHG efficiency.<sup>9</sup> (See Figure 2). Within the aviation sector, it is important to remember that different types of commercial aircraft have vastly different impacts on the environment. Commercial jets are five to six times more fuel efficient than corporate jets. The math is simple: carrying 200 people and cargo across the country in a single plane burns a lot less fuel than 33 separate corporate jets, each flying six people.

Figure 2 – In Contrast to Personal Vehicles, Airline Fuel Efficiency Has Improved Substantially Since 1990



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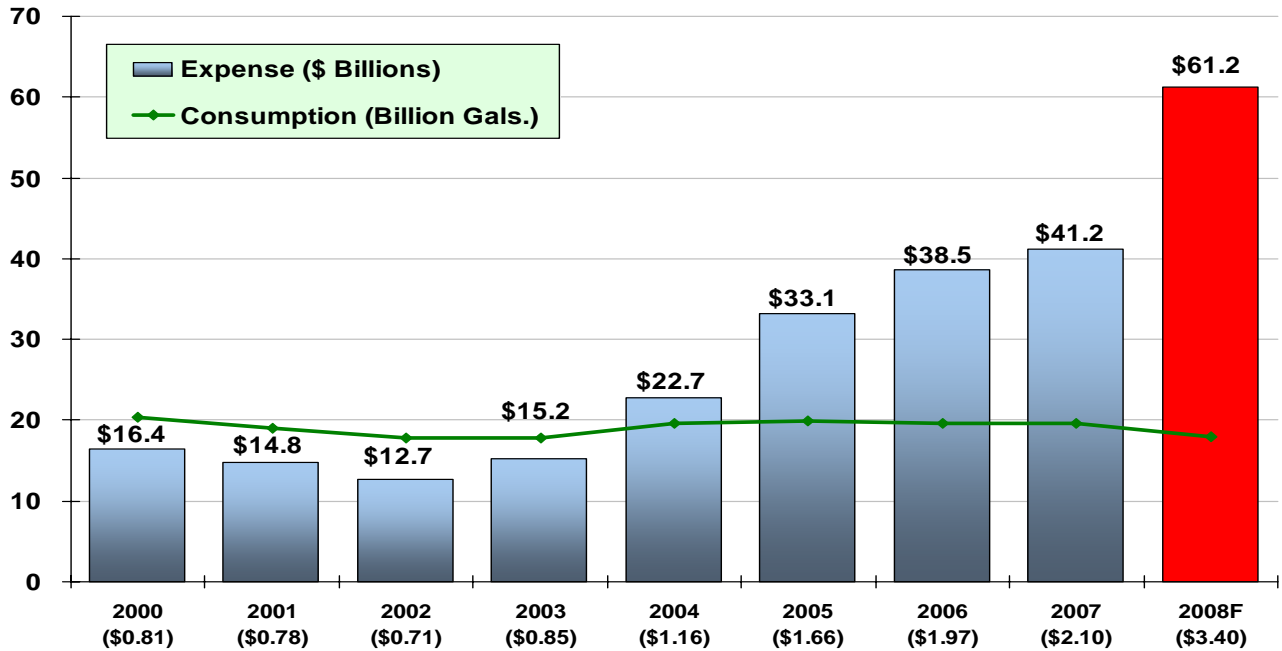
U.S. airlines are highly motivated to continue this trend. Fuel, long one of the two highest costs for airlines, is now our largest cost center, averaging between 30 and 50 percent of total operating expenses. In fact, jet fuel costs to the U.S. airlines in 2008 are projected to be \$62 billion or more, breaking the 2007 record of \$41.2 billion, resulting in what some analysts are likening to the economic effects of the 9/11 terrorist attacks.<sup>10</sup> As shown in Figure 3, the price change alone between 2004 and year-end 2008 is the equivalent of 267,000 airline jobs or the purchase price of 286 new narrow-body jets.

<sup>8</sup> EPA GHG Inventory 1990-2006 at 3-8.

<sup>9</sup> *Id.*

<sup>10</sup> See J.P. Morgan Securities North America Corporate Research (April 15, 2008).

**Figure 3 – 2008 Jet Fuel Expense Will Break 2007 Record**  
 Total Expense (Excluding Taxes and Into-Plane Fees) Will Exceed \$60 Billion



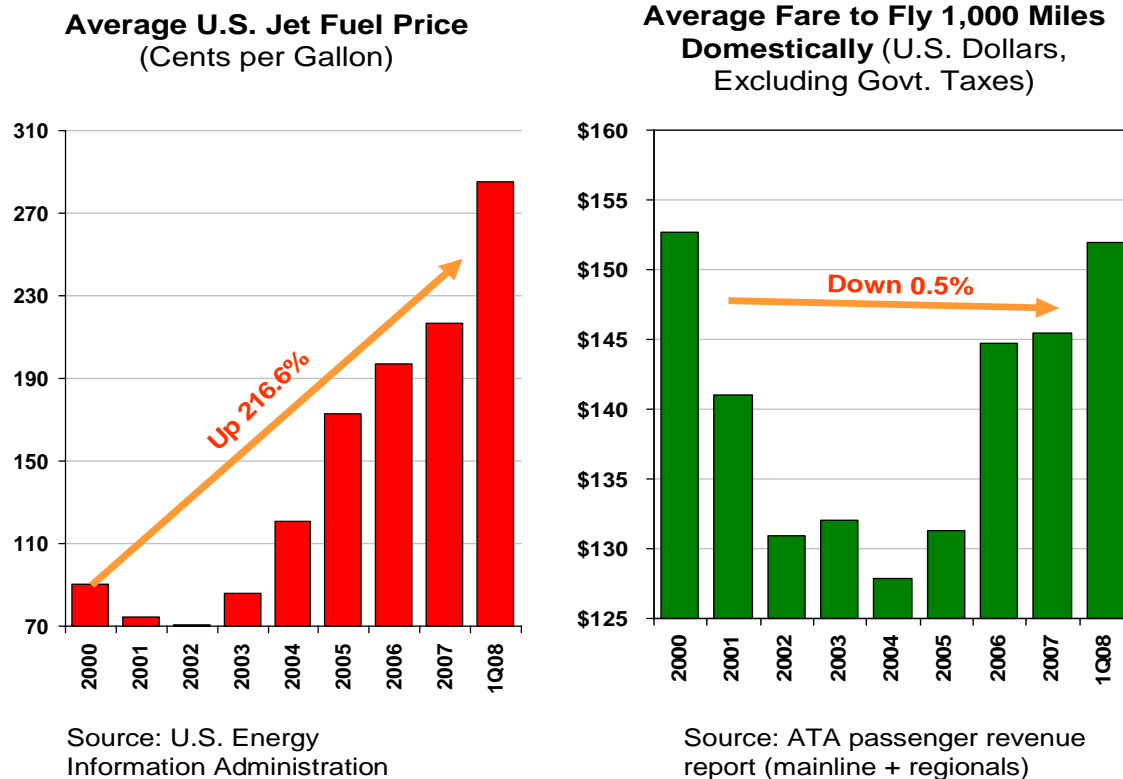
Note: Value in parentheses below year is average price paid excluding taxes, into-plane fees, pipeline tariffs and hedging costs

Sources: ATA, Energy Information Administration, Department of Transportation

And contrary to popular belief, the airlines cannot pass on significant portions of these costs. Indeed, as illustrated in Figure 4, today's U.S. domestic air fares remain below 2000 levels, although fuel prices have tripled. While a slightly more robust international aviation market has allowed today's systemwide fares to increase approximately 3 percent above 2000 levels, this hardly makes up for the three-fold increase in fuel prices over the same period. Thus, we have an unrelenting economic imperative to reduce fuel consumption.



Figure 4 – As of Early 2008, Domestic Airfares Remain Below 2000 Levels While Jet Fuel Prices Have Tripled



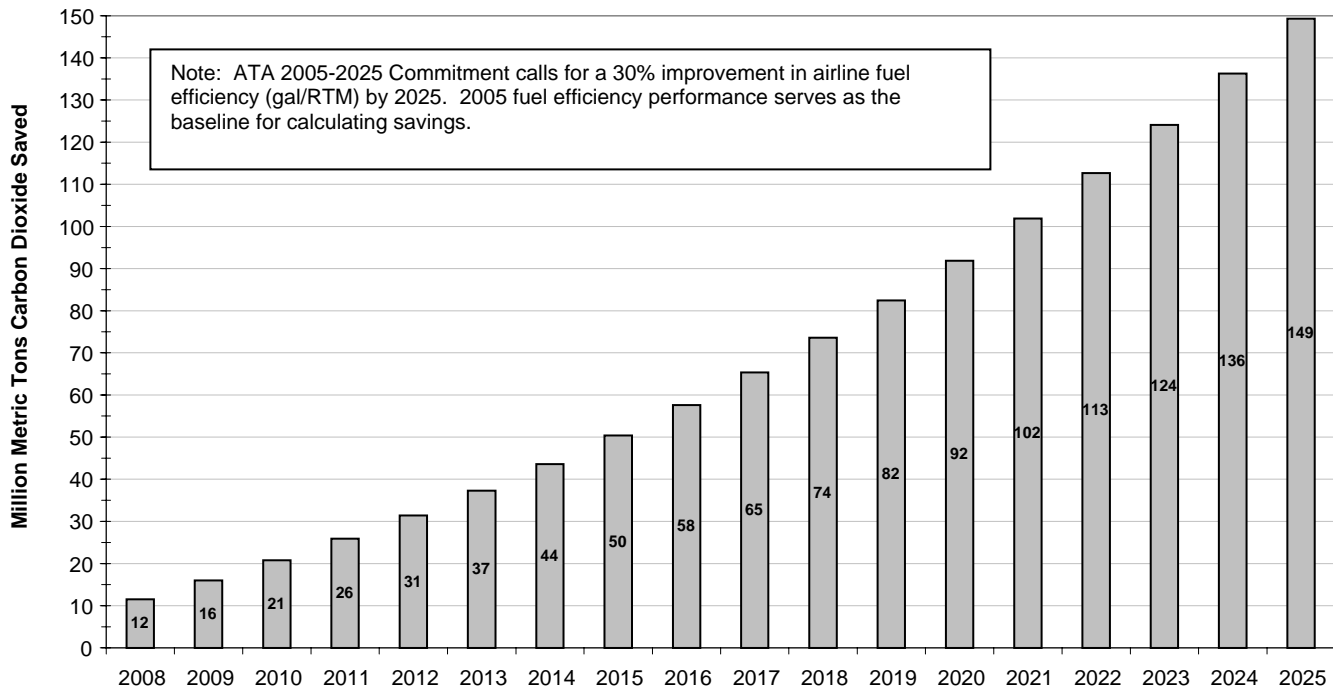
*ATA Airlines Are Proactively Committed to Further Limiting Their GHG Footprint*

In light of the current and sustained fuel price crisis, the U.S. airlines are being forced to put down capacity for air services. Should we be able to get fuel prices down to more reasonable levels and turn the economy around, we would hope to see a return to growth in U.S. air passenger and cargo services. Under such a scenario, some growth in aviation emissions is predicted. However, this growth must be kept in context. The Intergovernmental Panel on Climate Change (IPCC), which is considered the authority on this issue, has determined that under the most likely scenario, CO<sub>2</sub> from global aviation in 2050 will account for only about 3 percent of total man-made CO<sub>2</sub> emissions and that aviation’s overall GHG impact will be around 5 percent.<sup>11</sup> Yet even though those remain relatively small numbers, ATA carriers are relentlessly pursuing measures to further limit their emissions footprint.

<sup>11</sup> IPCC, *Aviation and the Global Atmosphere* (1999) at 8.

Figure 5 – ATA’s 30 Percent Fuel Efficiency Goal Will Translate into CO<sub>2</sub> Savings

**Carbon Dioxide Savings:  
Value of ATA 2005-2025 Commitment**



At the core of our efforts, ATA carriers have made a commitment to achieve an additional 30 percent systemwide fuel efficiency improvement through 2025, on top of prior improvements. That equates to an additional 1.2 billion metric tons of CO<sub>2</sub> saved – roughly equivalent to taking over 13 million cars off the road each year. (See Figure 5). To accomplish this, our airlines plan to continue the tremendous investments in new equipment and in operational innovations that have allowed us to attain such great fuel efficiency improvements in the past. We are leaving no stone unturned. Some examples of our efforts include:

- **Upgrading Fleets.** Even in the highly constrained financial environment we have been in for some time, ATA airlines have been expending billions to upgrade their fleets through investments in new airframes and engines, removing less fuel-efficient aircraft from their fleets, installing winglets to reduce drag, altering fan blades and other measures aimed at improved aerodynamics. As a critical element of our commitment to achieve an additional 30 percent fuel efficiency improvement by 2025, Boeing estimates that the North American carriers will spend approximately \$730 billion on new aircraft through 2026.<sup>12</sup>
- **Introduction of Innovative, Cutting-Edge Technologies.** Our airlines also are investing millions of dollars in technologies to make existing airframes more efficient. For example, the airlines have undertaken equipage for Required Navigation Performance (RNP) approach procedures, which provide navigation capability to fly a more precise path into an airport.

<sup>12</sup> The Boeing Company (2008).



ATA airlines also have developed software to analyze flight paths and weather conditions, allowing aircraft to fly more direct, efficient routes (subject to air traffic approval).

- **Improved In-Flight Operations.** ATA airlines are doing all they can within the existing ATM system to utilize programs to optimize speed, flight path and altitude, which not only reduces fuel consumption and emissions in the air, but avoids wasting fuel waiting for a gate on the ground. In addition to pursuing the use of RNP approach procedures at additional locations, ATA carriers have worked with FAA to pioneer protocols for continuous descent approaches (CDAs), which reduce both emissions and noise, and we are doggedly pursuing implementation of CDAs where the existing ATM system allows.<sup>13</sup> Further, our carriers are implementing Automatic Dependent Surveillance Broadcast (ADS-B) satellite tracking technology, which avoids the circuitous routings that occur with today’s radar-based systems. Demonstrating that the efforts extend to the smallest details of airline operation, our members also have worked on redistribution of weight in the belly of aircraft to improve aerodynamics and have introduced life vests on certain domestic routes, allowing them to overfly water on a more direct route.
- **Improved Ground Operations.** ATA airlines also are introducing single-engine taxiing when conditions permit, redesigning hubs and schedules to alleviate congestion and converting to electric ground support equipment when feasible. Further, they are improving ground operations by plugging into electric gate power where available to avoid running auxiliary power units and using tugs to position aircraft where possible.
- **Reducing Onboard Weight.** ATA airlines continue to exhaustively review ways, large and small, to reduce aircraft weight – removing seat-back phones, excess galley equipment and magazines, introducing lighter seats and beverage carts, stripping primer and paint and a myriad of other detailed measures to improve fuel efficiency.

Second, recognizing that improving fuel efficiency with today’s carbon-based fuel supply can only take us so far, ATA and its airlines are making extensive resource commitments to stimulate the development of commercially viable, environmentally friendly alternative fuels. As a framework for doing this, we are a founding and principal member of the Commercial Aviation Alternative Fuels Initiative (CAAIFI), a consortium of airlines, government, manufacturers, fuel suppliers, universities, airports and other stakeholders who hold the various keys to research, development and responsible implementation of alternative jet fuels. Developing alternative jet fuels is a “higher hurdle” than developing alternative fuels for ground-based units, as jet fuel must meet rigorous FAA specifications, which include reliability and stability at altitude and in greatly varying temperature and pressure conditions to ensure safety. Thus, absent a cooperative initiative like CAAIFI, fuel providers almost certainly would not undertake the investments needed to clear this higher hurdle, opting instead for the surer payoff at ground level.

While each entity involved in CAAIFI has a role to play, our airlines understand that – as end users of the ultimate product – they must not only make clear their specifications for alternative jet fuels, but also signal the market that we will financially back fuels meeting those specifications. On Earth Day this year, the ATA Board of Directors took another significant step in this regard, issuing the “ATA Alternative Fuels Principles Document.” Among other things, that document stipulates that ATA carriers require that any future alternative jet fuel be more environmentally friendly, on a life-cycle basis, than the jet fuel

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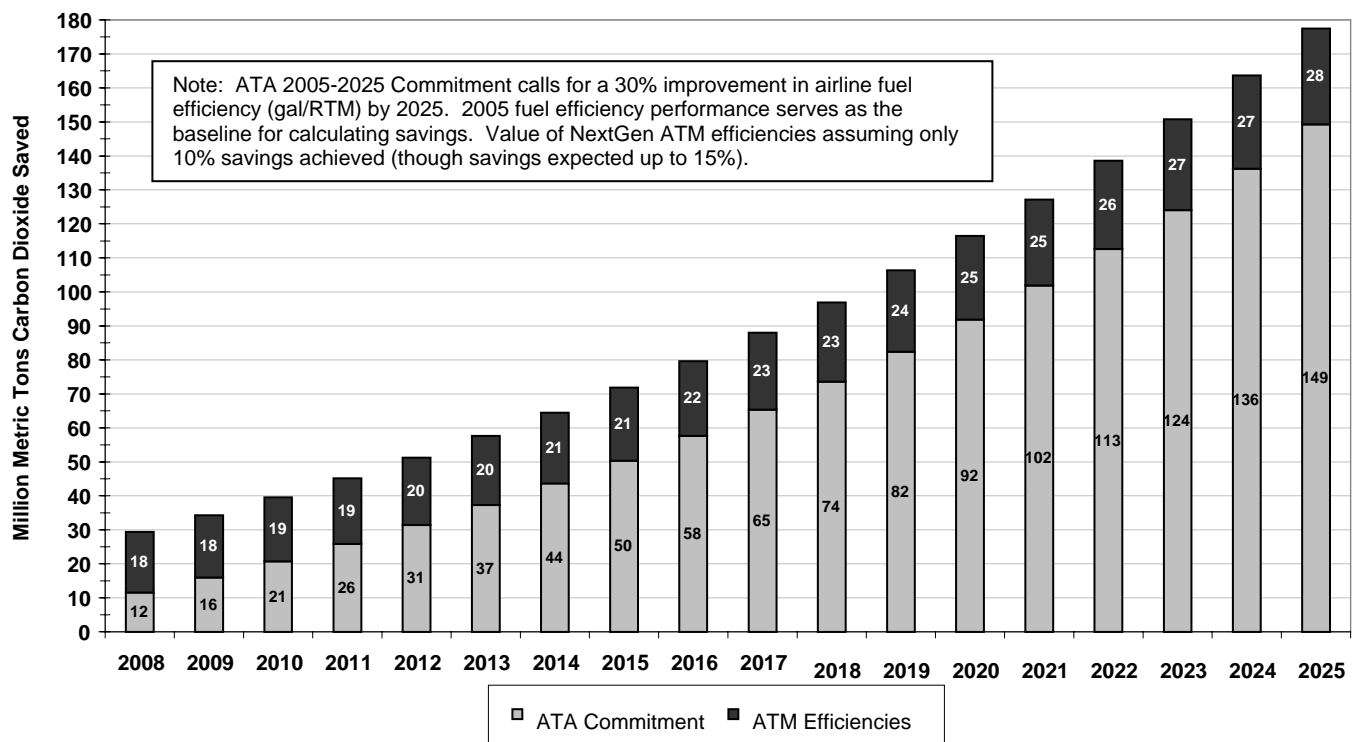
<sup>13</sup> For example, one ATA carrier is achieving an average savings of 1,300 pounds of CO<sub>2</sub> savings per flight for approaches into the Atlanta airport.

available today. Through CAAFI and other partnerships, we are undertaking the work to be sure that tomorrow’s alternative jet fuel meets that criterion. And accomplishing that will ensure the full decoupling of growth in aviation demand from growth in GHG emissions.

Third, while ATA airlines are doing all that they can to promote efficiencies within the current ATM system, the limitations of that system account for 10-15 percent of unnecessary fuel burn and resulting emissions. To address this, and to achieve much-needed modernization of our outdated ATM system, ATA and its carriers are working with FAA and other agencies on a fundamental redesign of the system through the Next Generation Air Transportation System (NextGen) project and on various regional airspace design initiatives. ATA is supporting this modernization initiative through our “Smart Skies” program.<sup>14</sup> However, congressional approval, including fair and equitable distribution of costs among all system users, is needed before significant progress can be made in implementing this system. Congressional authorization and implementation of this initiative will bring 10-15 percent additional savings on top of the ATA 30 percent commitment. (See Figure 6).

Figure 6 – CO<sub>2</sub> Saved Under ATA and NextGen Initiatives  
(As if NextGen Implemented in a Given Year)

**Carbon Dioxide Savings:  
Value of ATA 2005-2025 Commitment and Next-Generation ATM Efficiencies**



<sup>14</sup> “Smart Skies” is a national campaign led by ATA airlines, which advocates modernization of the U.S. ATM system and its funding mechanisms. For more on this initiative, see the Smart Skies Web site, at <http://www.smartskies.org>.

Fourth, at the same time ATA and its members are pushing the envelope with existing technology, we continue to contribute to work that will advance new technology. For example, ATA participates in key, joint government/stakeholder initiatives, including the Steering Committee of the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) and the Environment and Energy Subcommittee of the FAA Research Engineering and Development Advisory Committee. While additional evolutionary environmental improvements are in the pipeline as a result of such initiatives, revolutionary environmental breakthroughs can only come about through the reinstatement of significant federal investments in basic aeronautics research and development programs at NASA and FAA. Indeed, Pratt & Whitney's new geared turbofan engine, which offers both noise and emissions benefits, as well as many features of Boeing's more environmentally efficient 787 were spawned through such programs. As we have noted in other contexts, however, congressional funding to NASA and FAA for aeronautics research and development – specifically including for environmental projects – has been cut significantly (by about 50 percent) in the past 8-10 years, compromising the public-private partnership for exploring and bringing to market products with significantly improved environmental performance.<sup>15</sup> Thus, we continue to urge Congress to provide this needed funding, which also is critical to preserving America's competitiveness in aeronautics.

*Congress Should Complement the Airlines' Initiatives, Through Sound Energy, Transportation Planning and Climate Change Policies*

We are confident that the measures ATA is undertaking and supporting will continue to limit and reduce aviation's emissions footprint, such that commercial aviation will remain a very small source of GHG and other emissions. However, Congress has a key role to play. First, as noted, congressional approval for implementation of a modernized ATM system is critical, as is reinstatement of funding for research and development programs to foster aviation environmental technology breakthroughs. Further, while Congress generally is supporting several alternative fuel research programs, specific support and funding should be provided for the development of environmentally friendly alternative jet fuels. Thus, while a central focus of today's hearing is on how climate change may impact transportation and transportation infrastructure, we must also remain focused on how improving air transportation infrastructure can help minimize the very GHGs of concern.

As this committee is aware, in March 2008 the Transportation Research Board issued a special report on the "Potential Impacts of Climate Change on U.S. Transportation." That report identified threats that aviation (as well as other modes of transport) may face under certain climate change scenarios. Many of the recommendations called for further coordination among federal, state and local agencies in conducting research and transportation planning to mitigate climate change impacts. ATA strongly supports data-driven, coordinated transportation planning, which can help ensure cost-effective deployment of

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<sup>15</sup> While later funding cuts were even more drastic, a 2002 study by the National Academy of Sciences observed:

In constant year dollars, NASA funding for aeronautics research was cut by about one-third between 1998 and 2000, reducing the breadth of ongoing research and prompting NASA to establish research programs with reduced goals, particularly with regard to TRL (technology readiness level). This significantly reduces the likelihood that the results of NASA research will find their way into the marketplace in a timely manner, if at all. The ultimate consequence is that the federal expenditures are inconsistent with the long-term goal of support for an aviation enterprise compatible with national goals for environmental stewardship.

See National Academy of Sciences, Committee on Aeronautics Research and Technology for Environmental Compatibility, *For Greener Skies: Reducing Environmental Impacts of Aviation* at 44 (2002).

resources. To this end, we work closely with FAA, state governments, the airports and local communities in aviation-related transportation research and planning. Congress should continue to support FAA's role in such planning initiatives.

Just as we ask Congress to work to complement airline GHG initiatives, we also urge Congress to calibrate federal energy policy and any climate change-related legislation so they do not work against our efforts. As noted, ATA's recently revised 2008 forecast shows that the country's airlines are likely to lose in the range of \$10 billion this year – a loss on par with the worst year in this industry's history, with soaring fuel prices as the sole reason. Congress must help get these prices under control. The \$62 billion (plus) that the airlines will spend on fuel this year is at least \$20 billion more than last year and slightly more than our combined fuel bill for the first four years of this decade. Sadly, 2008 could turn out to be the worst year in the industry's history. Unlike the temporary revenue hits from SARS, 9/11 and other one-time demand shocks, the airlines now are facing a massive structural increase – with no end in sight – in a virtually uncontrollable cost. Moreover, there is little low-hanging fruit left to harvest. Unfortunately, not even Chapter 11 can lower the price of fuel.

To many members of Congress, \$10 billion is not a lot of money. Let me add some context. More than 14,000 airline jobs have been cut so far this year, and that is just the tip of the iceberg. By cutting capacity, scores of communities stand to lose all commercial air service by early next year. Orders for new planes have been slashed and hundreds of older, less efficient planes have been taken out of service. We are burning through cash at unprecedented rates, barely surviving from month to month. The nation's airlines will never fully recover from this economic blow, and more airlines – in addition to the nine that already have filed for bankruptcy or stopped operating – may simply shut down. That means even more job losses and untold harm to families and the economy.

Committee members and Congress, for that matter, may ask why the country should care that its airlines are on the brink of financial disaster and – some would say – about to implode. The answer is simple: this nation's economy is inextricably linked to the viability of its air transportation system. If the airlines continue to spiral downward, so will the economy. Aviation contributes \$690 billion to the U.S. GDP – that's equal to heating oil costs for 376 million households for one winter, 24 million new cars and 10 million new jobs.

If Congress does not turn things around very soon, the impact on the country's economy will be even worse. Analysts are predicting that a 20 percent reduction in capacity may not be enough to save the industry. Based on the communities that stand to lose service, airline hubs will be decimated, tens of thousands more jobs will be eliminated and tourist destinations will be devastated by huge cuts in the number of flights. Realistically, rural areas will be hit the hardest by the cuts, leaving thousands of square miles without air service.

Not only must Congress act with sound energy policy, but it also must forbear from adopting climate change policies that would further exacerbate the fuel price crisis. While the Senate recently declined to go forward with the GHG cap-and-trade program proposed in the Lieberman-Warner Climate Security Act, which would have applied an additional fuel surcharge on airlines' jet fuel, we understand that many in Congress still are interested in applying such proposals to aviation. Not only is an additional "price signal" unnecessary for our industry, but recent events have shown the crippling effects that exorbitant fuel prices can have. We urge Congress to avoid counterproductive, punitive approaches that further siphon away funds that the airlines otherwise could use to invest in newer aircraft and other fuel- and GHG-savings measures.

## CONCLUSION

I close by asking you to note the achievements that commercial airlines have made in reducing fuel burn and GHGs, particularly when compared to other industries, and the actions that we are taking to continue our progress in this regard. While we are fully committed to working with Congress and are asking for congressional leadership and support in each of the areas I have described, we are not asking you to work for us, we're asking you to work with us in addressing these environmental, energy and transportation concerns. We also are urging you to refrain from adopting policies that would work against our efforts. A vibrant, competitive and growing aviation sector is a key part of the solution, not an impediment to ensuring a future where a strong economy, freedom from foreign oil and cleaner air are the order of the day.