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Airline Carbon Costs Take Off As EU Emissions Regulations Reach For The Skies

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Table Of Contents

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Airlines worldwide are bracing themselves for the start, in 2012, of a new phase of Europe's greenhouse gas (GHG) emissions trading scheme (the EU ETS). Besides curbing the industry's projected growth in emissions, the scheme will likely increase costs. Furthermore, in Standard & Poor's Ratings Services opinion, these costs could, if not passed through to passengers or mitigated in other ways, impact the carriers' credit quality over time.

Emissions from airlines have been growing faster than those of any other industry, rising 98% between 1990 and 2006. What's more, they show no signs of abating: The United Nations Framework Convention on Climate Change (UNFCCC) predicts future emissions from airlines worldwide will grow by 63% by 2020 and by 88% by 2050--representing an increase of 290% and 667%, respectively, compared with 2006 levels. The International Air Transport Association (IATA), which represents major airlines worldwide, says it expects airline emissions to grow at a rate faster than the industry can improve fuel efficiency (estimated at about 2% per year in 2004), which means that airlines operating within European airspace will have to bear increasing financial liabilities associated with their carbon emissions. We estimate that in 2012-2013 alone--the first year of trading for airlines under the EU ETS--the industry will likely incur an additional cost of approximately €1.125 billion, based on the current carbon price of about €15 per tonne of carbon dioxide (€/tCO2).

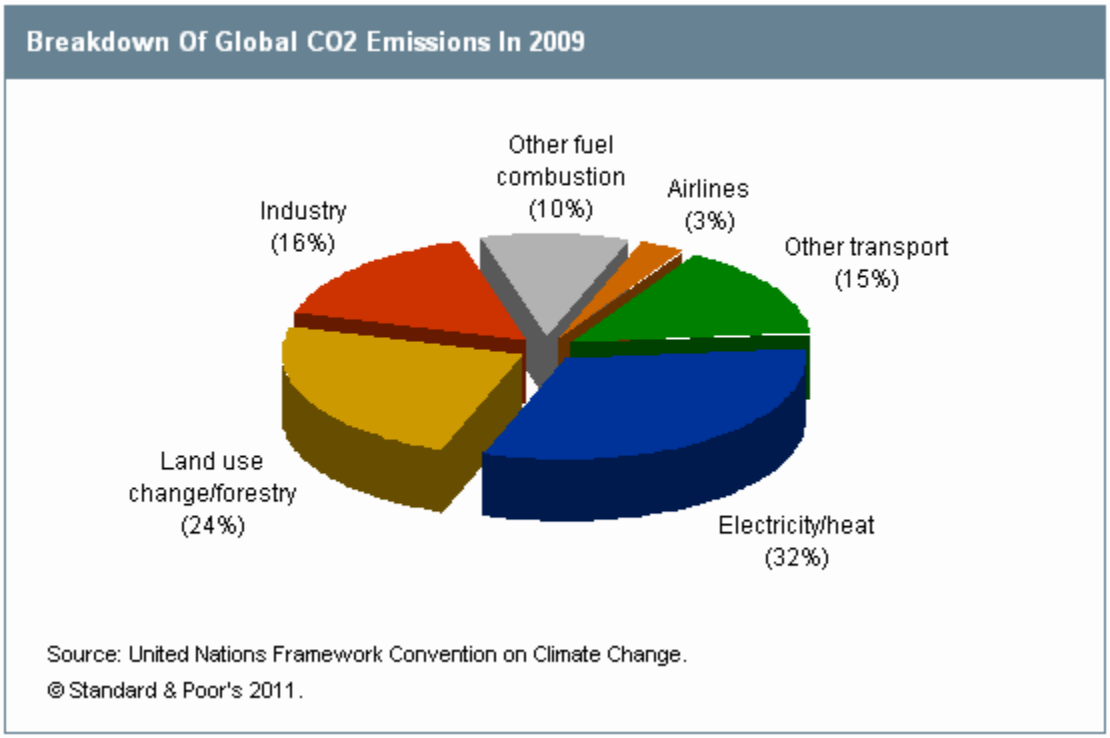
This additional cost burden on airlines is, at least initially, marginal in our view compared with existing fuel expenses and aircraft lease payments or depreciation charges. Nevertheless, it will add further cost pressure to a cyclical, capital-intensive, and highly competitive industry already subject to volatile fuel prices, and may further differentiate aircraft operators. Moreover, we believe that EU-based airlines may be more severely affected than non-EU based carriers, which could create a competitive mismatch and introduce the risk of carbon leakage (that is, the transfer of airline activities to non-EU operators or to routes not covered by the EU ETS).

Policymakers Move To Curb Airline Emissions In Europe

In our view, the airline industry is an environmental policy target due to its increasing GHG emissions that policymakers argue contribute to man-made climate change. Although the airline sector is currently responsible for a relatively small (3%) share of total global emissions (see chart 1), this is set to rise as the sector experiences rapid growth. According to industry experts, the airlines' share of total emissions will increase to 5% by 2050.

Global emissions from aviation are currently about 700 million tonnes of CO2. The European Commission (EC) estimates that the EU ETS will lead to an annual reduction of about 20 million tonnes once the scheme comes into force in 2013. As a comparison, Western Europe's largest power station at Drax in Yorkshire, U.K., emits about 22 million tonnes of CO2 per year, so we consider the estimated savings from airlines through the scheme to be significant.

Chart 1



The EU ETS aims to offer an economically efficient method of constraining airlines' CO2 emissions while allowing them to grow within an overall emissions target (see box 1). With the industry continuing to grow at a rate faster than it can improve fuel efficiency, the result is that airlines will have to buy permits from other sectors to cover their emissions liabilities. Therefore, costs to the industry are in our view likely to increase in line with emissions growth and the price of carbon.

Box 1
EU Emissions Trading Scheme Sets The Standard

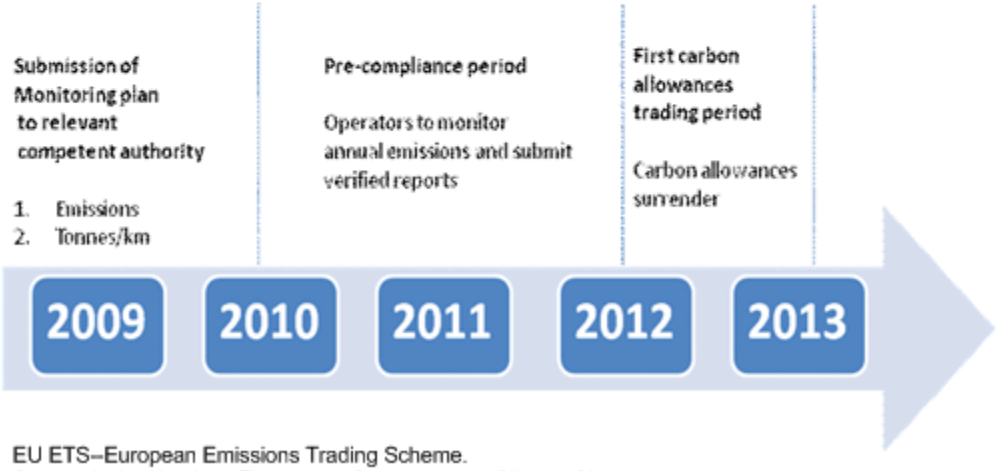
All flights arriving at or departing from EU airports are covered by the EU ETS, regardless of the nationality of the aircraft operator. EU member states will be responsible for ensuring compliance with the requirements of the legislation by those aircraft operators to which they issue an operating license and whose emissions in 2006 were mostly attributable to that member state.

Only commercial aircraft operators that fly fewer than 243 flights for three consecutive four-month periods, emit less than 10,000 tonnes of carbon dioxide (CO2) a year, or operate aircraft weighing less than 5,700 kilograms will be exempt from the scheme (source: European Commission). However, simplified monitoring, reporting, and verification procedures will still apply to small emitters (covering the first two categories). Total exemptions apply for state, military, training, test, and repositioning flights.

In practice, we understand that qualifying aircraft operators flying on routes covered by the EU ETS will need to submit sufficient allowances to cover the CO2 emissions generated on those routes. Allowance amounts will be based on emissions data provided by the operators in the pre-compliance period (see graphic below). Under the scheme, some of these allowances will be granted for free and the remainder will need to be purchased by the airlines.

The intention is for the EU ETS to serve as a model for other countries considering similar national or regional schemes, and to link these to the EU scheme over time. Therefore, we believe the EU ETS may form the basis for wider, global action.

Timetable For Implementation And Allocation Of Airline Sector Carbon Allowances



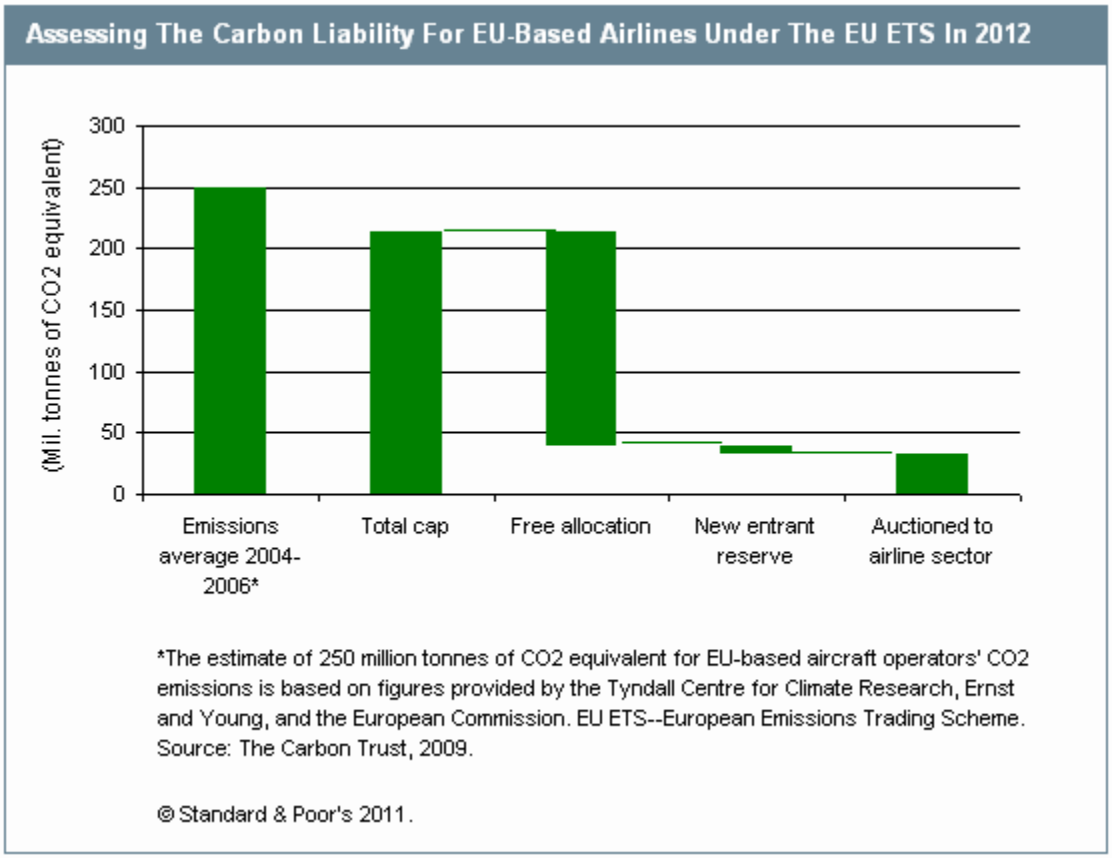
EU ETS--European Emissions Trading Scheme.
Source: United Nations Framework Convention on Climate Change.

How The EU's CO2 Cap Will Tighten Its Grip On The Airlines

For 2012, the EU will set a cap on airlines' emissions, measured in tonnes of CO2, set at 97% of the baseline level (the baseline being an average of annual emissions between 2004 and 2006; see chart 2). From 2013 to 2020, this cap will fall to 95% of the baseline. About 82% of the cap will be issued as free emission allowances in the form of EU Aviation Allowances (EUAAs--that is, EUAs issued to the aviation sector) and allocated to airlines free of charge. A further 15% of the cap will be in the form of allowances that are to be auctioned, while the remaining 3% will be held for new entrants. We understand that the EU will determine the final amount of each airline's free allocation by Sept. 30, 2011, and that this will be based on the airline's 2010 market share of routes covered by the EU ETS. The

allocations will be determined on the basis of reported revenue-tonne-kilometers (RTKs), which are a measure of the weight of freight, passengers, and baggage in tonnes, multiplied by the distance flown. Airlines are expected to have been monitoring and collating this data for the EU since the beginning of 2010.

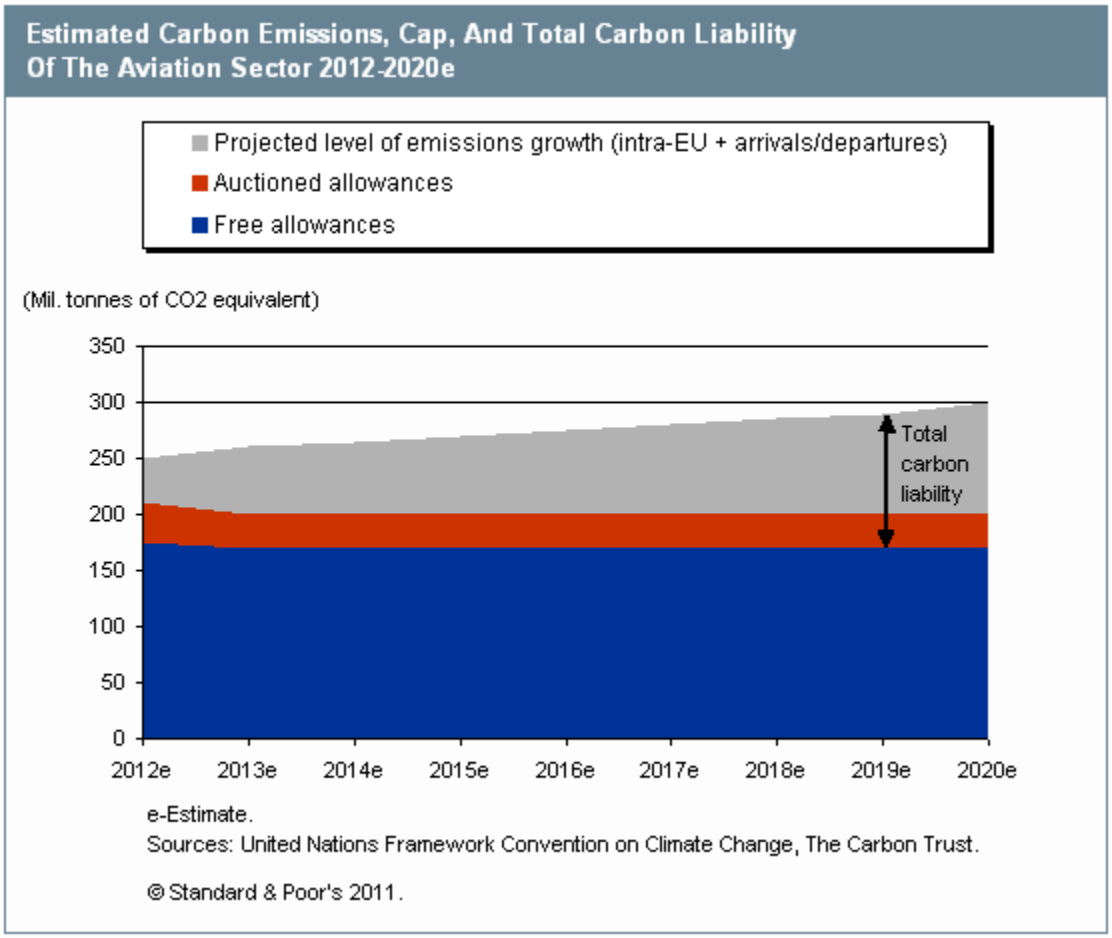
Chart 2



We think the airline industry will likely therefore need to purchase surplus allowances covering a minimum 20.5% of its average 2004-2006 emissions (the calculation being 100 less [0.82 x 0.97]), plus actual emission growth on European routes since the 2004-2006 baseline average. Under current proposals, the amount of free allowances will not change during the trading period that spans 2013-2020. Therefore, we understand that any increase in emissions from the airline industry after allocation will increase the amount of carbon allowances that will have to be purchased (see chart 3).

For any shortfall (that is, an airline's total carbon liability), aircraft operators will have to buy allowances at market prices--currently about €15 per tonne of CO2.

Chart 3



To comply with the scheme and offset its emissions, an airline covered by the EU ETS will also be permitted to substitute nonaviation EUAs for EUAAs on an unlimited basis. In addition, airlines will have a limited time in which they may also submit Certified Emission Reduction units (CERs) and Emission Reduction Units (ERUs) for up to 15% of their overall emissions. These allowances, created under the Kyoto Protocol by projects in developing and transition economy countries, would be most likely purchased on the open market. While we believe that airlines are likely to seize the opportunity to substitute CERs and ERUs because these allowances tend to be cheaper than EUAs, we think the airlines would likely purchase offsets through intermediaries rather than invest directly in eligible projects. Furthermore, from 2013 CERs and ERUs can only be used by an airline to the extent that it has unused CER and ERU capacity left over from 2012. Once this capacity is used up the airlines will not be able to use CERs and ERUs.

Airlines that fail to surrender sufficient allowances after the end of each reporting year face a double compliance penalty: First, they must pay €100 per tonne of excess CO2 emitted; and second, they will be required to make up the shortfall in the following trading year.

Assessing The Cost Of ETS Compliance

Although we believe the cost of complying with EU ETS will initially be marginal compared with jet fuel expense and lease payments, we think it is likely to have more of an impact on financially weak airlines.

According to a study published in December 2009 by The Carbon Trust in the U.K. (see footnote 1 at the end of this article), airlines are likely to be net buyers of carbon allowances in the EU ETS, potentially purchasing €23 billion-€35 billion of allowances over 2012-2020, assuming a carbon price of €25/tCO2. In our view, and before taking into account any cost pass-through, the scheme's first trading year of 2012-2013 is likely to cost the industry in the area of €1.125 billion at a carbon price of €15/tCO2, reflecting more closely where carbon prices are today.

According to The Carbon Trust study, the EU ETS could become an increasingly significant cost burden for the industry in the future, regardless of an individual airline's size. The Trust says that the ultimate impact of a cap-and-trade scheme on an individual airline's performance is determined by:

- The prevailing cost of carbon. Although carbon price scenarios range widely, the general trend is upward, subject to policymakers' emissions-reduction ambitions and underlying carbon-reduction regulations. With current carbon prices at about €15/tCO2, we consider the cost impact as relatively low compared with volatile fuel costs. However, over the longer term we think this could potentially be a significant variable.
- The number of carbon allowances allocated for free to airlines. The level of carbon allowances/EUAAs being auctioned could have a noticeable effect on airlines' operating profits. In our opinion, the substantial amount of freely allocated carbon allowances available under the scheme will mitigate to a large degree any immediate costs to the airlines, compared with other industries. That said, the projected growth in airline emission levels could erode this protection over time.

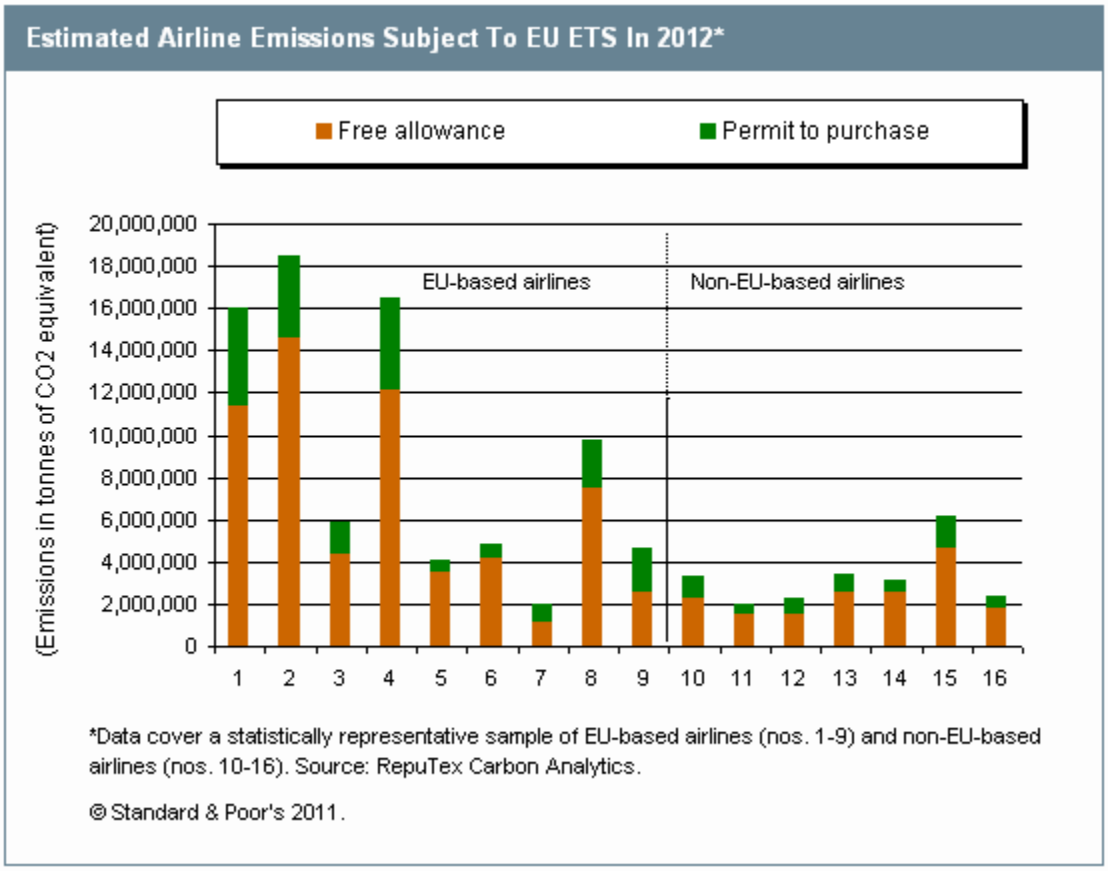
In practice, individual airlines' free allowance allocations in 2012 will be based on their level of activity relative to total aviation activity in the EU ETS, measured in tonne-kilometers, in the 2010 monitoring year. They would then be required to purchase allowances for emissions that exceed their free allocations in 2012.

Disruptions And Rising Demand Could Cost The Industry Dear

Disruptive events can in our view add carbon liability risk for the airlines. The eruption of the Eyjafjallajökull volcano in southern Iceland in April 2010 and its resultant ash cloud, which led to a hiatus in air travel across northern and western Europe, will likely prove expensive for some airlines, in our opinion. The reduction in travel in April 2010 means that some airlines saw their normal RTK proportion reduced in relation to their competitors, so they will be allocated fewer allowances for free. However, not only will they have to buy those that they "lost," but also their competitors may be allocated more free allowances as a result.

Airlines that see significant growth in demand on EU ETS-covered routes between 2010 and 2012 are also likely to face a relatively higher total carbon liability. This is because free allowances will represent a smaller percentage of their total emissions, compared with airlines with lower growth or declining demand. RepuTex, (HK) Ltd., a Hong Kong-based carbon data and risk analytics company, forecasts that from its sample of EU-based airlines, some may be required to purchase up to 45% of their total emissions on EU ETS-covered routes in 2012 (see chart 4).

Chart 4



Potential Impact On Revenues And EBITDA Should Be Slight — For Now

While the medium- and longer-term price of carbon is uncertain, we do not think that the EU ETS will have a significant impact on rated European airlines such as British Airways PLC (BB-/Stable/--), Deutsche Lufthansa AG (BBB-/Stable/A-3), and SAS AB (B-/Negative/--) in the short term. CO2 emissions are directly related to fuel efficiency, and airlines already have an incentive to improve fuel efficiency because fuel costs represent as much as 40% of their total costs.

Moreover, the level of free carbon allowances is fairly high and current carbon costs are relatively low compared with fuel prices, particularly compared with historic jet fuel price volatility. As of Jan. 21, 2011, the weekly average jet fuel price was about $890 per metric ton. With 1 tonne of jet fuel generating 3.15 tonnes of CO2 and a current carbon price of about €15/tCO2, we calculate that the additional carbon cost would be the equivalent of adding about €47 (about $64), or about 7%, to the cost of a tonne of jet fuel. This is before taking into account any free carbon allowances, which should mitigate some of this cost, and before considering any cost pass-through to the customer.

In the longer term, we think an aircraft operator's ability to pass on the additional carbon cost will be a key differentiator, one that is likely to vary from operator to operator. The degree to which an individual airline is able to pass on this cost will in our view be influenced by the efficiency of its route network, its market pricing point, and

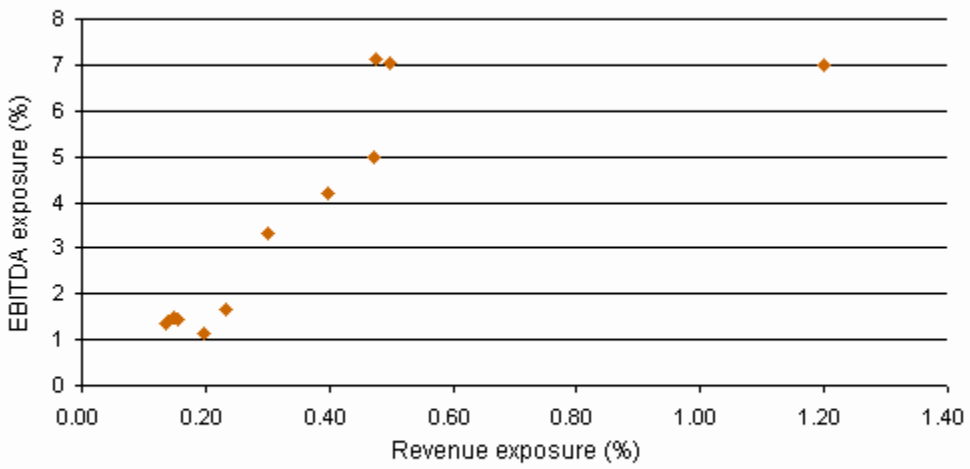
market dynamics. Given that a significant proportion of fuel is burned on take-off, we believe that non-stop, long-haul routes are relatively more fuel-efficient than the same mileage covered by the same aircraft and payload on two or more short-haul routes. Furthermore, we think those airlines with a higher proportion of premium revenues may find it easier to pass on carbon costs to passengers because these costs will be a proportionately lower percentage of the ticket price than for low-cost and economy passengers.

Overall, we think that the global network carriers are best-placed to cope with the introduction of the EU ETS. Conversely, we think that low-cost and short-haul airlines that have lower premium revenues, and particularly those with older aircraft fleets, may be somewhat more adversely affected.

According to RepuTex, the potential effect of the EU ETS on airline industry revenues and EBITDA in 2012 could, before cost pass-through, be up to 1.2% and 7%, respectively (see chart 5). All other things being equal, these percentages would likely rise in 2013 as the emissions cap (and therefore the amount of free allowances) is tightened.

Chart 5

Financial Impact Of EU ETS On Airline Revenues And EBITDA In 2012*



*Before any consideration of cost pass-through to customers.
EU ETS--European EmissionsTrading Scheme. Source: RepuTex Carbon Analytics.

Our €1.125 billion estimate of total carbon cost for the airline industry for the first EU ETS trading year of 2012 (see table) is calculated as:

Total carbon liability in tCO2 (therefore allowances required to be purchased) equals the short position (that is, total emissions less the allocation of free allowances).

This figure assumes that the airlines do not pass on carbon costs to their customers in the first year of the scheme. However, based on our observations of how the industry has managed fuel price spikes and volatility historically, we anticipate that a significant proportion of this cost will be passed on from the outset.

Calculating The Estimated Cost Of The EU ETS For The Global Airline Industry In 2012

Total emissions level (tonnes of CO2)	Free allocation (units)	Reserve for new entrants (units)	Auctioned to airlines (units)	Emissions cap (tonnes of CO2)	Short position (no. of carbon credits to purchase)	Likely cost to the industry (bil. €)*
250	175	6.4	32	213.4	43	1.125

*Assuming a carbon price of €15 per tonne of CO2. EU ETS--European Emissions Trading Scheme. Sources: European Commission, The Carbon Trust, and Standard & Poor's.

Additional factors that are likely to impact airlines' performance under the EU ETS are:

- The rate of price pass-through of carbon costs by airlines to their customers. According to an EC Staff Working Document (see footnote 2), airlines are expected to be able to pass on to a large extent the cost of participating in the scheme to their customers. Fully passing on this cost would mean that by 2020, airline tickets for a return journey could increase by between €4.6 and €39.6, depending on the length of the journey. This assumes coverage of all departing and arriving flights and a high allowance price of €30.
- The resulting change in demand due to the increased ticket price and the airlines' ability to manage their cost structures in response. We believe this factor has a long-term implication for the industry as a whole and is closely connected to the concept of carbon leakage (see section below headed "Carbon Leakage Could Impact Carriers' Profitability").

The portion of additional allowances required by an airline would likely increase in line with its growth, in our opinion. To illustrate the additional costs the airline sector may face in the near future, take as an example a mid-size airline "X" with 1.5 million tonnes of annual emissions in 2010 and a hypothetical annual growth of 2%. To cover emissions growth, the cost of carbon liabilities (including estimated additional allowances required) would increase from approximately €6 million in 2012 to €13 million in 2020. This assumes a carbon price of €15/tCO2 in 2012, and €25/tCO2 in 2020. (The increase takes into account annual energy efficiency improvements of 1% per year and does not envisage any potential switch toward more biofuels). Over the trading period 2012-2020, we calculate a carbon cost for airline X of about €82.5 million.

Carbon Leakage Could Affect Carriers' Profitability

One possible consequence of this additional cost is so-called carbon leakage. In general, the concept of carbon leakage covers two scenarios--either supply or demand driven. In the manufacturing sector, supply driven carbon leakage is initiated by a company moving its activities outside the area affected by carbon regulation to avoid the compliance cost. In such cases, the affected corporate is likely to maintain its profitability. Demand-driven carbon leakage--which is most likely to affect airlines--occurs when a corporate loses its market share and/or competitiveness due to the high cost of compliance and the resultant demand then shifts to a non-EU manufacturer. In this instance, the profitability of the EU-based corporate is likely to be adversely affected.

In contrast to ground-based industrial activities, carbon leakage for airlines is linked neither to a product nor to a place of production. It's better defined as the risk of traffic being diverted from EU operators to the benefit of non-EU operators. While this is not an option for EU-based or bound passengers, European airport hubs may become somewhat less competitive for passengers coming from outside the EU and transiting through to an end destination outside Europe. Therefore, we think European hubs may increasingly be bypassed by these passengers. Instead, they will connect through other global airports, primarily those in the Middle East.

In the worst case of a high carbon price and low cost pass-through scenario, we believe carriers might abandon some routes, with further economic and social consequences on regional connectivity and local employment. More price-sensitive and competitive routes (short-haul leisure, for example) may be the most exposed. Less price-sensitive routes (long-haul business) are less exposed, in our view, and could even gain profitability in the short term due to the allocation of free allowances. Overall, we believe the EU ETS will have a more pronounced impact on short-haul flights and airlines with lower load factors and older, inefficient aircraft.

Regulation May Not Stop At CO2 Emissions

Although not currently captured under the EU ETS, non-CO2 GHG emissions from aircraft (see box 2) are considered by some scientists to be significant and could cause as much as four times the damage of CO2. Depending on how the technology and science evolves to more accurately understand the potential impact of other non-CO2 aircraft emissions, we believe that these other GHGs could be incorporated into a regime designed to deal with airline emissions. In our opinion, this could potentially have a more significant impact on the airline industry than the current anticipated EU ETS. But for now, such a development remains hypothetical.

Box 2
The Science Behind Airline Emissions

Airlines' greenhouse gas (GHG) emissions come from the combustion of jet fuel. Emissions from aircraft operations are broken down as follows: carbon dioxide (CO2) 70%, water (H2O) about 29%, and the remainder comprising nitrogen oxide (NOX), carbon monoxide (CO), sulfur dioxide (SO2), and particulates. One kilogram of jet fuel produces 3.15 kilograms of CO2. Generally, about 10% of emissions occur during landing and take-off (LTO) and 90% when cruising at altitude. The exception is hydrocarbons and CO, where emissions are closer to 30% for LTO and 70% during cruising (source: Air Transport Association [IATA]). CO2 has the same climatic effects at all altitudes, but because it is emitted at high altitudes it does not get captured and broken down by natural means such as trees.

CO2 emissions from the airline industry are directly proportional to the amount of fuel burnt and fuel is a significant proportion of operating costs. Consequently, airlines, and aircraft manufacturers, are continually striving to increase fuel efficiency through retrofits such as winglets, weight reduction, improved aerodynamics, and engine upgrades. Therefore, we believe the EU ETS may prompt the switch toward bio fuels.

The effect of policymakers' desire to allocate permits (thereby charging for emissions) to the airline sector via mileage conversion is similar to imposing a tax, because it's not possible to "abate" mileage. Allowance costs are directly proportional to the fuel burnt, the penalties for noncompliance are high, and the incentive for technological developments such as engine technology and bio fuels are still weak, but will eventually strengthen as kerosene prices rise.

Nevertheless, IATA has set a goal for its member airlines to use 10% "alternative" fuels by 2017. In the long term, IATA aims to achieve carbon-neutral growth from 2020 and to halve its members' net carbon emissions 50% by 2050.

Notes

1. Fasten your seatbelt: Airlines and cap-and-trade (CTC764). For more information, contact The Carbon Trust, http://www.carbontrust.co.uk

2. Summary of the Impact Assessment: Inclusion of Aviation in the EU Greenhouse Gas Emissions Trading Scheme (EU ETS). For more information, contact the European Commission, http://europa.eu

The authors would like to acknowledge the contribution of RepuTex (HK) Ltd. in providing some of the background data for this article.

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