



CHAIRMAN'S SUMMARY

GREEN GROWTH AND THE FUTURE OF AVIATION

27th Round Table on Sustainable Development
held at OECD Headquarters
23-24 January 2012

GREEN GROWTH AND THE FUTURE OF AVIATION

The following is a summary of the discussion on 24 January 2012, issued under the Chairman's authority. Please note that, in keeping with Round Table procedures, this summary in no way represents an agreed outcome.

The aviation industry is carbon-intensive and one of the fastest growing in terms of greenhouse gas emissions. Under business-as-usual, aviation is likely to generate a sharp increase in emissions and radiative forcing through 2050—its impact on global warming is likely to grow more swiftly than other sectors. In view of this there is a strong likelihood that governments will face pressure to take action to curb radiative forcing resulting from aircraft operations.

The current range of operational and technical options open to airlines to reduce greenhouse gas emissions will be overwhelmed if the enormous expected growth in airline travel eventuates. It appears that the only abatement opportunities available with the potential scale to address this may be extensive use of offsets and large-scale production and use of aviation biofuels.

To date, biofuels, mostly for road transport, have had had a mixed reception. Their production has been associated with subsidies, and the extent to which they are really carbon-neutral is the subject of considerable on-going debate. This raises the question of whether aviation biofuels represent a large potential green growth opportunity or whether the environmental, social and commercial challenges raised are too large.

The Round Table on Sustainable Development met to discuss the extent to which the predicted growth of aviation in a carbon-constrained world is possible. Three questions framed the discussion:

- Do the particularities of the aviation sector make it a 'special case' for policy makers?
- To what extent can biofuels provide the aviation sector with a sustainable way forward?
- What are the most important things governments can do to provide the aviation sector with a clear planning horizon?

Significant growth expected for the future...

Many participants emphasised the expected increase in demand for air travel over the coming decades. Growth will occur globally at an approximate rate of 4-5% per annum over the next 20 years. It was noted that this rate had been maintained even during the recent financial downturn, and that the trend is not predicted to change in the future. Moreover, increasing fuel prices have not reduced rising demand; the aviation market has shown the ability to absorb this cost.

Several participants highlighted that the bulk of this future growth will not occur in traditional markets, but rather in emerging economies like East Asia and South America.

Aviation as a 'special case'...

There was wide consensus that the industry must do its fair share to reduce greenhouse gas emissions, and did not deserve, as one participant described, "a get of jail free card". However, due to the

international nature of aviation,¹ many suggested that the industry requires special treatment with regard to policy. The International Civil Aviation Authority (ICAO) was identified as the appropriate forum for resolving the industry's contribution in terms of the Kyoto Protocol.

There are few alternatives to aviation for long haul travel. Thus, a uniquely high value is placed on flying. Aviation has become an integral part of social and economic progress and its contribution to GDP growth is significant.

Another participant defined aviation as a particularly special case due to the fact that, if left unabated, the emissions resulting from its expected growth would pose a grave challenge.

Package of abatement options...

The rising cost in fuel creates a natural incentive for the airline industry to reduce emissions. On the operational side, fuel is the industry's largest expenditure item. Airlines spent USD 140 billion in 2011 on fuel, a figure that is predicted to increase to USD 200 billion this year.

Operators are establishing a broad strategy by exploring all available abatement measures. In addition to aviation biofuels, options discussed include fleet renewal,² more fuel-efficient engines, improving air traffic management, market based measures (MBMs), and the possibility of constraining demand.

Improving air traffic management was a popular opportunity for emissions reductions among the group. Several estimated that improving the routing system and traffic regulation would save 10-12% of fuel usage in both Europe and the United States.³

Others emphasised that MBMs need to be part of the package of solutions. Offsets were deemed to be a critical and cost effective option. A global carbon price was also widely welcomed and it was suggested this could help incentivise new technology.

As expected, there was a raft of conflicting concerns regarding the aforementioned abatement options. For example, it was pointed out that new resources are required for fleet renewal, which raises the issue of sustainability. Fleet renewal is expensive. Further, there would be a political challenge if a global price on carbon increased ticket prices for consumers. Also, industry participants argued they would refuse to consider paying for emission reductions solely in other industries and not improving market incentives for reductions within their own sector. This appeared to be the case even if a pure offset strategy was the least costly means of abatement. The possibility of spurring market innovation seemed to provide justification for paying more for biofuels now than rely solely on offsets. Offsets were therefore seen as being only a part of an abatement strategy.

Biofuels...

The role of aviation biofuels was central to the Round Table discussion. Biofuels are favoured by the airline industry because of a belief that they hold significant abatement potential. This portion of the debate provided a critical look at some of the issues surrounding biofuels, including concerns about sustainability and several of the market barriers.

¹ Two thirds of aviation emissions take place internationally.

² Approximately 12,000 new aircrafts will be purchased between 2010-2020 – each generation of aircraft being 20% more efficient.

³ These measures include Continuous Descent Approach and Clean Airspeed Departure.

Some framed biofuels in the context of the ‘green race’. In order to compete with the United States and China, where subsidies exist for biofuels, Europe needed appropriate market incentives. Industry participants suggested the market in Europe was growing too slowly and must move faster, especially if it aims to be an exporter. This was viewed by some participants as a very large business opportunity.

Alongside this argument, concerns were raised about the environmental impacts of biofuels. Several participants expressed significant scepticism when discussing the issue of sustainability and insisted there must be more clarity about biofuels emissions. Comprehensive greenhouse gas accounting based on life-cycle analysis (LCA) must be included when making such assessments. A primary concern arose around land use change and indirect land use change (ILUC). It was suggested that biofuels do not reduce emissions directly, and are an offset at best. A true offset must be additional. It is critical not to double count carbon.

Scale was another key topic discussed. Many pointed out that scalability may be more limited than has been claimed due to land constraints. How can the necessary volumes be created? Some attempted to refute the issue of scale, suggesting that not all biofuels are crop based (i.e. industry waste products). Further, technology is improving and different types of fuel may become available in the next 10+ years. Hydrogen may be possible to deploy by mid-century. Algal oil was another popular subject of debate with some seeing algae as the holy grail of biofuels, although the requirement for large amounts of water to produce it was identified as a potential limiting factor.

Investor concerns and road transport...

Several concerns arose during the biofuels discussion concerning investment security.

Ambiguity with regard to biofuels’ sustainability has created a lack of investor confidence. ILUC, for example, has become a significant source of investor uncertainty. Investors are also concerned about price volatility and access to feedstocks given potential demand from road transport. Simply put, should priority be given to aviation or road transport?

If priority goes to road transport, the concern is that there will be less incentive to advance the innovation curve for aviation biofuels. This could at the same time discourage investment in aviation biofuels, and distract the road industry from pursuing electrification. However, the point was made that current technology is limited. For heavy-duty vehicles, an electric battery is the same size of the truck itself. Further, vegetable oil for diesel has also been very limited for road transport. Demand will not be met for road transport if all biofuel is put into jet. The road transport industry would also like to advance from first generation fuels, and seeks an alternative to fossil diesel.

A more subtle consideration was addressed regarding the infrastructure of emerging economies. These countries are likely to invest significantly more in aviation compared to road transport, and will ultimately use a different business model compared to Europe and the United States.

Where public-private partnerships can be effective...

Governments must understand that airlines are prepared to use biofuels in the new era. Currently, governments are slow to move on biofuel policy until sustainability is fully understood. Once governments clarify the environmental impacts, they can help facilitate biofuels through public-private partnerships. This will help to send loud and unambiguous price signals to the market.

One caveat must be re-visited. Like the private sector, governments also see biofuels as limited resources and currently favour them for the road sector. It was suggested that it would be most sensible to prioritise the use of biofuels where there are no alternatives – aviation and heavy goods vehicles, for

example. Support could be implemented to overcome costs, provide access to capital, and provide guarantees to feedstocks. Ultimately, private-public efforts are very effective at de-risking investments.

It was also suggested that a mandate could create the desired price signal. As was the case with road transport, a mandate served to help biodiesel scale. However, there was disagreement about whether such a mandate should be enforced for aviation biofuels.

The majority emphasised that certain standards need to be established. For example, what qualifies as degraded land needs to be defined. This would provide better clarity regarding environmental impacts and allow biofuel producers to establish better relationship with suppliers.

There was much emphasis on the ability governments have to improve air traffic management. Direct investment in such infrastructure could potentially reduce emissions by 12%. Many favoured putting more pressure on governments to respond to this particular issue. One participant noted that, in many instances, radio beacons that were set up on the ground from the 1940s and 1950s are still being used. Governments recognised the potential for improvement, but commented that the Chicago Convention was the culprit for slow progress. The Chicago Convention must be updated and streamlined with other regimes.

Finally, governments could have significant impact if they regulated the voluntary commitments made by the industry, such as stabilising CO₂ post 2020. Most important, there was wide consensus that because aviation is international, policy must be recognised and applied so there is a global level playing field. Tinkering at the national and regional level may be viewed as aggressive unilateralism. It was stressed that the next ICAO meeting in 2012 would be critical for the negotiation process. In light of ICAO's struggle to produce legally binding resolutions, governments may ultimately have to provide such enforcement.

Comprehensive government policy and global population challenges

Like most global negotiations regarding climate change, complications arise between the interests of developed and developing countries. Typically, developing countries oppose global sector approaches, but in this instance many agree aviation needs one.

Naturally, the issue of Common but Differentiated Responsibility (CBDR) arises. For example, it was suggested that there should be equitable treatment for operators, but that revenues should be common but differentiated. It was also suggested that there be no net incidence for developing countries and that revenues should be recycled to ensure that. It appeared that a number of participants were open to a fresh debate about where ETS revenues should go and that a portion should be used to help airlines in poorer countries.

More broadly, many emphasised that governments need to ensure that climate, energy, transport, and especially agriculture policies have better linkages. An agriculture policy linked to aviation policy could solve many current issues including problems related to feedstocks. Integrating agricultural policy with climate policy serves multiple benefits in addition to spurring growth in the biofuel market. With a further two billion people joining the human population in the next forty years, improving food production will be essential.

It is estimated, there will be 9 to 10 billion people in 2050 and 85% of the world will be living in developing countries. Addressing poverty and hunger will be the top priority. Africa's population will increase from 800 million to 2.5 billion and will have to increase yields by 300% just to remain as hungry as it is today. We must think more radically than simply addressing the business-as-usual scenarios. It was noted that in the short and medium-term cultivating biofuels on degraded land could alleviate poverty for

some landowners.⁴ However, biofuels are time limited and energy will become a second priority compared to feeding the poor. Degraded land will ultimately be used for food crops.

Closing remarks...

In closing, the Chairman stressed the need for action sooner than later. The OECD's forthcoming *Environmental Outlook to 2050* emphasises the need for emissions to peak by 2020 to avoid the costs of adjustment becoming prohibitive. On the other hand, he noted that after 2030, demographic change will see pressure on agricultural land reduce in some parts of the world. The Chairman thanked participants for what had been a vigorous discussion and noted that there were significant uncertainties that should be the subject of further scrutiny by government and industry.

⁴ As seen with *Jatropha* production in Mexico.