



Annex 3

Summary report of facilitated events and aviation site visits



Introduction

This annex outlines the results of the SDC/IPPR stakeholder assessment events on 12th December, 30th January and 28th February, as well as case studies from the aviation visits. The first section provides a short summary of the main observations from the facilitated events and case studies, the rest of the report provides a summary of the transcripts. The full transcripts along with the attendee lists, independent evaluation report and other background information can be downloaded from the SDC website at: www.sd-commission.org.uk/pages/aviation.html

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Case Study

Bombardier – Shorts, Belfast

Bombardier-Shorts account for 10% of NI manufacturing output and have around 5,000 employees. They specialise in twin-propeller planes, which are more efficient than jets for shorter journeys, up to around 400 nautical miles. They also fly at a lower altitude so are less likely to cause contrails. Following the inclusion of the manufacturing facility in the EU ETS, they have reduced carbon emissions by 69.3%.

It appears that market dynamics in aviation have, and are, changing, mainly due to fuel price so that inefficient planes now have little value. There is huge demand for new efficient planes both from growing economies like India, but also from existing airlines replacing inefficient aeroplane models faster than usual due to the rising fuel prices.

Aircraft designers are now looking for a technology leap, rather than the optimisation of the last 20 years. Possibilities include:

- Engine technology - geared turbo fans, unducted fans or open rotors (possible noise issues)
- Air frame technology - wing morphing, lighter composite materials
- Fuel technology – including biofuels

Main observations

This section outlines the main observations from the three facilitated events and case studies.

12th December 2007

The first facilitated meeting was with 20 representatives from government departments, devolved governments and agencies working together to map out the benefits and challenges of aviation in relation to their organisation. Participants included individuals from the Scottish Government, Welsh Assembly Government and Northern Ireland Executive. From the exercise, we observed that all 20 participants could readily identify both benefits and challenges of aviation in relation to their departments. There was a large range of issues raised – from economics to climate change, health impacts of noise and pollution, provision of lifeline services to outlying areas, the effect on tranquillity, competition for land and aviation's role in supporting diverse communities.

In conclusion, it was felt that the participants raised issues around aviation that were felt broadly to reflect the feelings of the general population and their own conflicting views on aviation; from the desire for frequent low-cost travel, to concerns about the negative impacts of aviation.

30th January 2008

The second facilitated meeting was with 71 mixed stakeholders. At this event, participants focused on mapping areas of agreement and disagreement around aviation, and its contribution to sustainable development. During the day, stakeholders identified next steps and actions to be taken to reduce uncertainty over the future of aviation in the UK and support change towards more sustainable aviation.

Some main areas of disagreement included,

- The definition and measure of economic benefit from the aviation sector, is it overestimated?

- Is there a 'predict and provide' policy approach to aviation infrastructure and is that valid?
- Who flies, and why people fly. Can we distinguish between the need to travel and the desire to travel?
- What are the impacts of aviation in comparison with other industries and transport modes?

There was however much that was also easy to discuss and agree upon, but which was difficult to do. For example the plans for 'single European sky', was something that people supported, but agreed will be difficult to achieve. Other areas, such as efficiency of aircraft and airports, were considered to be easy to agree on and relatively easy to do, but were tied in with disagreement over the broader context of these actions.

Participants were not asked to resolve or defend their positions, but simply state them. This resulted in constructive discussions around why agreement might be difficult to reach and what might need to be in place to help achieve it. Often the answer lay in a lack of agreed research and measures. As a result, many of the discussions ended in a call for better evidence, and better understanding of how industry was currently reacting to environmental pressures. There was also interest in pragmatic and sellable solutions, and concern that any changes in aviation policy could meet with public opposition.

28th February 2008

At the third facilitated meeting there were 53 stakeholders. Participants were split into three broad groups according to sectoral interest, to create separate visions for sustainable transport and identify how they felt these visions might be achieved. When these three visions were brought together, it was found that the groups broadly identified the same five aspects of a sustainable transport vision:

- Integrated transport
- Climate change
- Non-climate impacts (noise, local air pollution)

- Skills and development, and
- Economics and fiscal measures.

Only the non-climate impacts of aviation were unique to the NGO and community interest group. There was also a large set of possible actions for achieving these.

People then worked in mixed stakeholder groups to identify the key actions and interventions that might best support this vision, and where there might be some consensus or collective interest between sectors. The small group size was felt to give people the opportunity to engage in some in-depth discussion of the issues. The combination of sectoral interests within the groups meant that participants had to work hard to reach agreement on actions that everyone could support.

Case studies

The SDC also arranged a number of site visits for participants in the dialogue. These visits were intended to complement the aviation dialogues with real-life case studies of aviation stakeholders and their attempts to reconcile their businesses with the challenges of sustainable development. The three visits included a demonstration of state-of-the-art telepresence facilities; a day visit to Belfast to explore aviation from the perspective of a devolved administration; and visit to the National Air Traffic Services (NATS) along with a presentation from the New Forest National Park Authority investigating issues around air space, aircraft routing and the potential carbon efficiency savings.

The visits were extremely informative and highlighted the multi-faceted and complex workings of the aviation industry, as well as some of the disagreements and competing needs within the aviation sector. A key issue discussed particularly in Belfast, was around the importance of aviation as a driver of economic growth, in particular to more peripheral areas of the UK, such as Northern Ireland.

During the site visits it became clear that the majority of stakeholders had high levels of awareness and concern about climate change. This concern, coupled with a high oil price, had

driven an impressive number of commitments to reduce environmental impacts within the aviation industry. These included improving efficiency within the operations of aviation industries, as well as integrating environmental concerns into future business strategy. There was also considerable optimism about the options available both to reduce the impact of aviation and potentially also reduce demand for aviation from business travel.

Case Study

Belfast Port

Belfast is a trust port on reclaimed land and manages over 12,000 ship movements a year, with 17m tonnes of goods and £20bn of goods and services in 2007. They account for 60% of Northern Ireland's sea imports and 20% of all Ireland. They are also the largest passenger port though, due to competition from the airport, sea passengers have declined from 2m to 1.27m over five years. There is no rail infrastructure available to transport goods from the port, so all is done via road.

Growth is around 3-3.5% pa. They are now estimating the need for an extra 120 acres by 2025. This will be further out of the city centre to cater for larger vessels that require bigger, deeper quays with 10-12 m depths. The expansion is expected to encroach on a special nature protection area.

The contribution from the industries located in Belfast Harbour (including port, airport and Bombardier-Shorts), was 26.8% of Northern Ireland workforce, and 30.7% of total economic value. Discussions centred around the projections for the port to 2025 and whether these projections would still hold in the face of concerted action on climate change and decoupling of the economy from increasing resource use.

12th December 2007

The first independently facilitated meeting of the dialogue was a half day meeting with government stakeholders facilitated by Dialogue by Design. The event focused on mapping issues around aviation as they related to individual departments and identifying further stakeholders to involve in the two events planned for the beginning of 2008. A matrix of department interests is available in the full transcripts. A plenary session then identified the following common benefits of aviation identified across departments, listed below.

Common benefits from aviation

A number of the benefits identified by participants were related to supporting economic growth through:

- Tax revenues raised from aviation industry
- Direct employment in airports and aeronautical industry
- Helping the operation of open markets and prompting competition
- Access to markets for, and in, developing countries (for high-value goods in particular).

There were also a number of **operational benefits** identified including:

- Allowing face-to-face meetings relatively quickly and cheaply
- Overseas recruitment and migration of skilled workers.

Social benefits around cohesion and engagement were also raised, including meeting the public demand for greater mobility and opportunities to travel. It was felt that ability to travel internationally facilitates openness, broadening horizons and minds.

Aviation was also seen to prompt **tourism** and the economic contribution from inward visitors, including foreign students.

There was particular note of the benefits for devolved administrations and outlying areas in the UK, which included:

- Lifeline services and access to markets for remote communities
- Operational and social benefits of short journey times for business and governments accessing London (particularly Northern Ireland)
- Good air-links facilitate inward direct investment from businesses in outlying areas.

Common challenges from aviation

There were also a large number of challenges identified. The issues raised fitted into two categories, those that exist due to aviation itself, and challenges with the perceived/expected solutions to tackling its climate impacts.

Aviation was felt to have a number of **negative local impacts** on:

- Noise (sleep disturbance, disruption of play)
- Air quality (in/around airports)
- Congestion (from other traffic modes around airports)
- Disruption of tranquillity and enjoyment of natural environment.

Opportunity costs from investment in aviation were identified, including the use of land against other competing uses such as home building, losing revenue from domestic tourists going overseas and investment lost in other transport infrastructure and alternative solutions to low-carbon mobility.

It was also noted that greater mobility also had **social costs**, in lack of cohesion in communities prompted by migration to work and live. It was noted that relationships (family and friends) maintained over long-distances could be to the detriment of local communities.

Aviation was also seen to be a threat to **controlling illegal activity**, such as drugs and illegal immigration into the UK. Other mentions were terrorist activities in the UK, as well as on board aircraft themselves.

A further issue with both benefits and challenges was increased competition from the global markets and potential threat to UK businesses

and jobs, particularly from low wage countries. Competition for university places from foreign students was also mentioned.

In the second category of challenges that may arise from the expected solutions to the industries contribution to **climate change**, and challenges from adjusting to the low carbon economy.

Challenges for government	Challenges for business (& aviation industry)	Challenges for the public
<ol style="list-style-type: none"> 1. Consistent messages and joined up government 2. Achieving balance between what is regulated and what is not 3. Balancing local needs and planning national transport infrastructure 4. Aviation inclusion in climate change bill & EUETS (potential for aviation using up bulk of credits) 5. Carbon footprint of government operations including demand for aviation 6. Achieving energy security for the UK 	<ol style="list-style-type: none"> 1. Making planes and flying more energy efficient 2. Sustainability implications of biofuels as alternative air-craft fuel 3. Developing viable low-carbon alternatives (technology) 4. Offsetting and its contribution 5. Aviation inclusion in EU ETS 	<ol style="list-style-type: none"> 1. Viability of maintaining physical links through aviation with work, family, friends over long distances/from remote locations 2. Expectation of convenience (regional airports) and local tranquillity 3. Expectation of cheap mobility

Case Study

Teliris Telepresence

Teliris Telepresence uses state-of-the-art audio and video technology to simulate real-time in-person meetings and conversations. The clever use of technology, along with detailed study of meeting etiquette, replicates meetings and the experience of sitting in the same room as people from across the globe, without the need for travel.

By using telepresence, one of Teliris's financial clients reported that it eliminated the need for approximately 200 transatlantic flights and 60 European flights through using the system for 158 meetings. This resulted in a reduction of more than 450 tonnes of CO₂ emissions. The firm estimated its savings at \$3,407,200, which included the cost of avoided flights and accommodation.

30th January 2008

The second event in the dialogue was held on 30th January with all stakeholders. There was a broad balance of attendees between industry, NGO and government.ⁱ The meeting aimed to map the main areas of agreement and disagreement around aviation and sustainable development. And, where possible, to explore the needs of future dialogue on aviation.

The participants were put into five cross-sectoral groups and asked to discuss the five broad areas of issues around aviation identified by the facilitation team in discussion with the core steering group.

1. Climate change
2. Community wellbeing
3. Economy
4. Freedom and mobility
5. Infrastructure

Participants were asked to consider what aspects of the issues were relatively easy to discuss, and on what aspects of the issues were opinions most polarised. Each group rotated around the five areas, adding to and commenting on previous groups' comments. The results listed were broadly agreed upon, but should not be taken as being absolute consensus.

Case Study

George Best City Airport

With Northern Ireland as island peripheral to a larger island, the George Best City Airport believe connectivity is vital to facilitating growth in exports and in foreign direct investment. The airport operates under a cap of 45,000 flight movements per year with a maximum of 1.5m seats. The Government's Air Transport White Paper predicts passenger numbers growing from the airport from 2.2 to 4m per annum and the airport are working to those projections. Currently, they are looking to increase the cap on seats and to increase the size of the runway to cater for more European destinations.

They are also working to reduce the impact of their operations. The airport have converted ground vehicles from diesel to electric, and reduced taxi-ing and holding aircraft time by 4% last year. Airport access remains a problem however. Only 7% of passengers arrive by public transport. Though the airport gets significant fees from car parking, they support any plans for light rail or rail access to the site.

ⁱ The attendee list is available to download with the full transcripts of the event.

Climate Change

Stakeholders discussing the topic of climate change reached broad acceptance of both:

- The science of climate change
- The need for action on climate change, by aviation, as well as other sectors.

People agreed that **decarbonisation and greater fuel and energy efficiency** of the operations of airports, the aviation industry and aircraft was a relatively easy starting point. Other ideas included:

- Using alternative transport modes where possible, i.e. train travel
- Increasing the numbers of people accessing airports by public transport
- Unlocking the potential of technology to replace some business travel
- Incentives to encourage airlines to replace aircraft more frequently.

People agreed that there was need for **more education about aviation and climate change** as there was nervousness about what people are told by media and others. There was agreement that better education first required more clarity and accuracy on the impact of aviation including the relationship between global, UK and individual carbon footprints from aviation.

There was also broad agreement about the **need for politically sustainable solutions** to climate change i.e. solutions that are long term, consistent, integrated across government and with cross-party support. In terms of policy frameworks, participants were able to agree:

- Emissions trading is part of the solution (but not whole solution)
- Solutions should include changes to the whole aviation system, not just flights
- They needed more clarity on long term policy, at UK and

European level, (and, ideally, at a global level)

- UK should push for more action at European level
- Aviation and maritime transport should be included in post-2012 global framework.

The groups also discussed areas where there were more polarised views, and where data was incomplete or difficult to agree on. One key area that needed agreement was a **standard metric to allow comparisons of environmental impacts** across transport modes. It was felt this metric was a vital starting point and precursor to all other discussions. Participants also discussed difficulties in the data and science of the non-CO₂ impacts of aviation, particularly on radiative forcing and contrails.

However, it was agreed that the need to agree a standard metric and develop better data and information, should not delay action. It was possible to decide on general direction and priorities, even with uncertainty.

This led to discussion about how **scientific uncertainty** needed to be treated in policy, and how it could be presented to lay people in ways they could understand, and act upon. How could government, or a trusted independent body, explain simply what different assumptions (e.g. about radiative forcing) can apply in different circumstances without undermining key messages?

There were felt to be **complex trade-offs and inter-dependencies** between some actions to address aviation's negative impacts; this meant there was difficulty in getting agreement on what approach was most valid or useful. Some of the areas where these complexities are impacting decisions were noted by the groups to be:

- Difficulties in prioritising targets for noise, CO₂, NO_x and local air pollution targets
- Whether money was best spent in sectors where reducing CO₂ was cheapest v. where CO₂ was projected to grow fastest (starting action at the 'easy wins' or strategic 'big hits')

- Should we be supporting the UK economy, or the economies of developing countries through trade and tourism
- Emissions reductions or offsetting. Was offsetting a sop or solution?

Other disagreements were over, **whose responsibility was it to pay for**, and start to address, aviation's climate impact? Once efficiencies have been improved, there would inevitably be more sharing of burden (& cost) from airlines to passengers through ticket prices.

Should it be the responsibility of government to lead on aviation? Should the UK should lead in principle on tackling aviation's negative impacts, or only lead on 'easy wins' and prompt international action for more 'hair shirt' solutions where necessary.

This question about responsibility for emissions was related to discussions around the validity of, and policy instruments for, **demand management in aviation**. Did some flights have more legitimacy than others? Was it possible to identify the difference between necessity versus discretionary flights? Participants also questioned:

- Whether policies, taxes and charges ultimately changed behaviours. (what was the elasticity of demand for flights?)
- Was emissions trading credible? And would it actually reduce the impact of aviation?
- The extent to which any hypothecation of 'environmental' taxes was necessary or possible.

Another area of disagreement for stakeholders was the **legitimacy of differing policy approaches** taken by government, NGOs and industry. Often this depended on the use of projections versus the use of scenarios.

- **Scenarios** were based on aspirations, using long-term targets and then creating the conditions & policies to enable reaching those targets, for example the Stern Review

- **Projections** were based on forecasting, projecting out historical data, for example in the Air Transport White Paper, prompting policies to support the projections ultimately making them self-fulfilling.

Case Study

Flybe

Flybe has around 45% business customers and 70% of its flights are domestic. The overwhelming majority of routes are medium distance routes that take more than four hours by car, ferry or train. They are in direct competition with rail. For example, demand for flights to Paris from Southampton increased when Eurostar moved from Waterloo to St Pancras in late 2007.

Demand for their discretionary flights are also impacted by both interest rates and changes in Air Passenger Duty. Flybe are lobbying for the new aviation duty to be based on CO₂ emissions and related to load factors per plane, rather than the HM Treasury preference for maximum take-off weight, which they feel will have adverse consequences and will penalise UK regions.

Flybe perceive a levelling off in demand for flights in the UK and a shift away from congested centres like Heathrow, to smaller regional airports with direct flights across the Atlantic and to Europe.

Community Wellbeing

The general discussions surrounding the topic of community well-being started with questions over the definition and measurement of community and well-being.

- **How do we define the community?** Is it just geographically local to the airport? Or does it include international communities effected by climate change and reliant on international trade?
- **How do we measure community well being?** Are subjective surveys useful? Or should there be emphasis on objective 'quality of life' measures which require benchmarks such as noise parameters.

Another issue discussed was the best approach for government to take towards including communities within their decision making process. Should government aim for a **balance between local and national opinions and interests** – and was that balance correct at the moment?

- How much should communities (local and distant) be engaged and influence policy?
- Should community wellbeing should be prioritised, or just maximised within other parameters?

It was noted that **people often have conflicting interests** and therefore deal with trade-offs in their decisions every day. It was discussed that engagement could use this process to look at the conditionality in which people in communities make decisions. For example, there conditions under which they would accept more noise for better air quality?

Participants also mapped the different issues that arose in the discussion, and tried to identify which aspects were easier or harder to agree and discuss. Noise impacts were those that prompted most discussion, should airports be where people are, and cause noise disruption? Or should the impact be where people are not and disrupt tranquil areas?

Employment/local economy Direct employment (easier) Indirect employment (harder) Local economy & contribution of retail outlets (harder) Wellbeing in developing countries (harder)	Connectivity Provision of life-line services to remote locations (easier) Social cohesion/ community (harder)	Surface Access Improved public transport to airports (easier) Capacity constraints on integrating modes (harder)
Planning & airport locations Local noise mitigation measures (easier) Reducing carbon/sustainability impact of airport buildings (easier) Property prices and airport blight (harder) Land-take/use conflicts for habitats, green space and housing (harder) Who benefits, and who loses out from airport expansion? (harder)	Local environmental quality Air quality limits (easier) Air quality & what contributions come from private cars/aircraft/airport operations (harder) Water quality/ biodiversity/ nitrogen deposition (harder) Light pollution (harder) Safety (harder)	Noise Agreeing a measure for noise impacts (difficult) Technical improvements to aircraft to reduce noise (easier) Mitigating noise in local housing developments (easier) Frequency and timing of flights (harder) Noise in tranquil areas, levels of background noise (harder)
Health Pollution on respiratory diseases (easier – see air quality) Impact of daytime noise (harder)	Health (cont) Impact of night-time noise on wellbeing and the economy (harder) Spread of infectious diseases	

Economy

In the economy discussions, the participants found it difficult to see any of the aspects of the economy as easy or difficult. Rather all are difficult. As a result, the groups were asked to look at some of the areas of aviation's impact on the economy and considered how a productive conversation might start.

At the base of many of the discussions was the question, **what is the economic benefit of aviation?** The traditional measures of economic contribution were not felt to capture all of the underlying inequalities, disbenefits and opportunity costs. What were the benefits and disbenefits from aviation and who was affected by either? It was felt that a useful starting point would be to discuss and agree where we wanted to be: i.e. a definition and measure of economic success.

Participants discussed the intrinsic value to the economy of aviation in terms of **employment and mobility**, and that these benefits were supported by existing facts and figures. It was noted however that there was dispute over the existing data, and a conversation about aviation in isolation was impossible as it touched so many other parts of the economy. It was suggested that the group should look at what would best achieve our economic and social aims, and then decide the implications for aviation and its alternatives.

When discussing **the impact of aviation on UK regions** it was noted that some people's positives were other people's negatives and that 'benefit' was often a value judgment. In order to have a productive discussion there was first a need to gather agreed facts and figures, and agree key performance indicators.

It was also raised that **the technological innovation** from aviation could be good for the economy. Aviation is an industry with high skills and with high spill-over benefits to the rest of the economy. To have a discussion about this aspect there was a need to be able to both compare aviation with other industries that may have an

even greater economic spill over and get a better understanding about what the industry had committed to and the existing level of R&D. It was agreed that innovation was important to make aviation as environmentally efficient as possible, a caveat being that this should not be used to support the case for further growth.

It was also discussed whether **providing choice over mobility choices was good for the economy**, and that connectivity had clear value for fliers. The discussion first needed to centre around defining and measuring 'economy', a key issue being the international dimension of aviation and what that meant for the UK economy.

Another conversation was held around **aviation and trade**. It was noted that only 5% of trade came in by air, and that there were many different scenarios for freight (belly hold v. freight only flights), and all had different externalities. It was questioned whether the free movement of goods was always a good thing. A discussion around trade was seen as an opportunity to discuss the aero-political framework which, if reformed, could be used to make aviation more sustainable.

Further conversations were had around the demand side for aviation, and in particular, **how do we can we, pay for the environmental externalities of aviation?** Agreement on this issue was felt to require agreed evidence on:

- Defining the externalities – i.e. not just CO₂
- Metrics and comparison between externalities of aviation versus other forms of mobility
- A good understanding of how any income from taxes will be used (to avoid perverse effects)
- A better understanding of Air Passenger Duty (APD) and its replacement, in influencing demand for flights, and what other tools, trading, charges, regulation and rationing might achieve.

It was noted that airlines were starting to be more proactive about meeting the costs of **externalities** and communicating more with passengers and each other about best practice. Though it was also noted there were some issues that for reasons of competition, the industry are not allowed to discuss with each other. Concerns were also raised that knowing all the externalities, and potentially paying something for them, would not solve all the problems of aviation.

Participants also discussed **demand for flights and the continuing increase in air movements**. It was felt this could be further explored by working through peoples' internal divisions about flying, and using that to frame policy positions around the types of passenger demand for air travel, rather than just around the location of the airport or the aircraft. Other questions were raised around what investment might be needed to create a shift in demand, and how alternative modes could be compared.

Further issues raised in this section but not discussed in detail were:

- Are the economic benefits unique to aviation?
- What are the alternatives to air freight e.g. road/sea
- Did aviation facilitate inward investment?
- The net economic impact of outbound tourism and inbound tourism
- Perceived subsidy of aviation over other forms of transport
- What was/would be the impact of climate change on the economy
- Long term policy issues that relate to migration etc, and impact that aviation has on this policy area.

Case Study

National Air-Traffic Services (NATS) – Swanwick

Some facts about NATS and Air Traffic Control (ATC):

- Owned 49% by Government, 41.8% airline group and 4% BAA
- Covers around 2.5 million flights per year
- ATC regulations require a minimum separation of five nautical miles (nm) nose to tail and 1,000ft above and below
- Flights above 19,500ft require ATC, NATS usually deals with aircraft above 10,000ft
- 29-41,000ft is the altitude range for normal cruising for civil passenger aircraft. 31-37,000ft is approximate optimum efficiency (varies according to plane)
- Stacking levels for London start at 7,000ft and go up to 13-14,000ft
- ATC now try to hold planes as high as possible in stacks to minimise fuel burn
- NATS internal operations are aiming to be carbon neutral by 2011.

The Intergovernmental Panel on Climate Change (IPCC) suggests that 6-12% of CO₂ emissions from aircraft comes from air traffic management. ACAREⁱ targets include an agreement to reduce CO₂ emissions per flight by 10% through ATC improvements.

Levers for change in efficiency of ATC.

- Departure – including Collaborative Decision Making which shares information on delays
- More efficient and direct flight paths
 - Single European Skies (SESAR) project is expected to save 12MtCO₂
 - Airspace design (requires public consultation)
 - Precision Radar Navigation (PRNAV) – improve efficiency of flight paths
- Use of in-flight management systems on optimum speed & efficiency
- Approach & landing - Continuous Descent Approach (CDA) (already in use for over 90% of flights coming into London airports), steeper approach angles, low power & low drag landings.

Freedom and mobility

The carousel station around freedom and mobility addressed the difficult political, philosophical and ethical issues that underlie aviation. This focused around the aspiration and need for, greater mobility, and how, or whether, the government should be looking to influence our choices and freedom to travel.

Areas that were relatively easy to discuss and agree amongst stakeholders were:

- There is an **aspiration to mobility**: but mobility is not an end in itself - mobility enables people to do and see different things when they arrive at their destinations
- Mobility has to be discussed in wider context of quality of life, and over the short and long terms
- **People should pay for their externalities** however they travel and whatever they do
- We in the present have a responsibility for the welfare of people in the future
- Government policy needs take account of the **international context**, the international nature and impacts of most air travel means that it cannot be discussed purely in the context of a single nation's actions
- **People should be informed and steered by government to make good choices about mobility**
- Technology can substitute for some business and other travel, potentially up to 20-25%
- Employers can encourage more sustainable travel choices. For example, allowing extra holiday time for staff to travel more sustainably.

There was also discussion about where opinion was currently most polarized. The area of most controversy was around the 'legitimacy',ⁱⁱ 'right' and 'need' to fly, as well as the economic need

ⁱⁱ The word 'legitimate' was controversial for some participants because of its overtone of 'legal'. 'Moral' or 'ethical' was suggested as a possible alternative.

for mobility and social and cultural benefits of aviation.

One question was **what constitutes the 'need to fly'**? Do we have the ability, through data gathering, to distinguish between 'need' and 'want'? It was discussed that the distinction would be influenced by:

- The strength of cultural, family and economic links to countries around the world
- Availability of alternatives, i.e. the legitimacy of domestic air travel when there are alternatives.

There was also the issue of the **right balance between freedom to fly and freedom from** its impacts?

The other area of controversy, was around what is the proper role of government in terms of influencing choices about mobility? Should government:

- Manage the transport network overall
- influence behavioral choices indirectly through pricing and availability.
- How much should government intervene in the free market to influence aviation – if at all?

The final issue was around externalities, whether they could be priced, and how could all modes of mobility pay them (not singling out aviation)

Case Study

Aviation – the perspective of the Northern Ireland Executive

The Executive outlined ambitious plans to boost the economy of Northern Ireland to match mainland UK levels. They see connectivity through aviation as key to plans to attract both greater numbers of short-break tourists, as well as inward investment from finance and business services industries which are both low-carbon and high-value economic sectors.

Infrastructure

There was a lot of discussion about the planned growth in aviation infrastructure and capacity, including how much is enough, and where and for what purpose? It was noted several times that aviation infrastructure needed to be compared fairly with all transport modes and alternatives in order to have a valid debate.

It was also noted that because of huge costs and lead times for transport infrastructure, policies need to be very long-term and holistic. The areas that were easier to discuss around aviation infrastructure were:

- The need for airports and UK's role as an international hub/in global economy
- That **aviation needed to be part of integrated transport system**, with better public transport access
- Better utilization of existing transport infrastructure, around the UK – all modes
- Investigation of alternatives to travel and how these might relate to infrastructure demand and capacity in the future
- Heating, power and sustainability of terminal passenger facilities and other airport facilities
- **Future proofing existing system:** security of supply for aviation fuel, potential for decarbonisation
- Importance of better air traffic management across Europe (noted that it was easy to discuss but politically difficult to achieve)
- Essential services to remote communities (which may not be justified by market alone)

Opinion was polarized around the issue of **growth in aviation and resulting need for increase in airport and aviation infrastructure**. This included the 'chicken and egg' discussion around aviation demand and aviation infrastructure. Does increasing capacity increase demand? Would constraining capacity effectively cap aviation growth? Or would constraining capacity lead to less climate-friendly solutions. One approach to resolving the issue was to model

the different constraints on aviation in the future, such as carbon limits and fuel price, and then measure how these impacted on infrastructure needs.

Participants also questioned where the increased demand for aviation and associated extra infrastructure was coming from. Was it private aviation, business travel, transit passengers or leisure. Or was demand increasing for all modes of transport simply due to the population's growing aspiration to travel.

There was discussion on the planning and provision of aviation and transport infrastructure nationally, and how these might vary for different needs. Freight/passenger, urban/non-urban, Regional/central, is hub and spoke aviation better than direct routing of flights, and what does that mean for regional v. national aviation capacity. It was agreed that decisions would require a long-term **national vision and aspiration for integrated transport system** that took into account the full environmental impact and social justice issues related to airport growth, and the socio-economic benefits and disbenefits from aviation.

Further discussions continued around **pricing mechanisms to control demand for aviation** and new aviation infrastructure. Can policies be put in place to make it cheaper for people to take other modes of transport where alternatives exist? There was some debate again about comparing aviation to other modes of transport, in particular the **relative value of transport infrastructure**, its land take, and whether there should be investigation into how transport infrastructure is provided, upgraded and controlled. It was noted that some transport modes and systems were in public ownership, but others, including aviation, were private. There was also a need for more clarity on direct and indirect subsidies for aviation and other modes, and how that impacted relative pricing of the services.

Next steps for the assessment

After a full morning in carousel sessions, the participants returned to their original tables and were asked to comment individually, and as table groups, to a plenary session.

In reviewing results from the carousel session, it was noted that overall, people agreed that:

- Climate change is a key issue and action was necessary
- Aviation should not be singled out – but should pay its way
- People and industry had responsibility for their externalities.

People then, individually and in groups, suggested areas where further dialogue might start around the future of aviation. Participants were also asked to consider information needs. It was reiterated that there was a need to know what contribution aviation makes compared to other sectors, and standard indicators should be agreed in order for there to be determined. A better understanding of the constraints that industry operated under was needed, as well as greater understanding of the dilemmas and tensions regarding the need for aviation.

The most popular choice, from nine tables, was the creation of **future scenarios for aviation and transport** in the UK, including exploring where we were now, where we want to get to, and where aviation in the future relates to other modes, in a low carbon economy / scenario and in our existing transport network.

Sellable solutions, incentives, levers and motivators for change were chosen by three tables. The emphasis was on solutions to encourage sustainability (including demand management/behaviour change) that were practical, immediate and acceptable to industry, government and the consumer.

It was felt further agreement about incentives to change required:

- Data on the cost of carbon abatement in different transport modes
- Better profiling of customers travel needs and freight (e.g. price elasticity), and

- More investigation on pros / cons of various incentives / instruments.

Three tables also wanted further investigations into the measure of economic benefit, for example how it could be done better and what it might include.

Any further dialogue was felt to require a better understanding of:

- Existing fiscal measures, taxes, regulation on aviation and what they achieve
- UK, European, International externalities from aviation and how these translate to national policy
- Holistic understanding of the aviation industry including its operations and constraints
- Understanding peoples' internal dilemmas / tensions regarding aviation
- Future carbon emissions profile of aviation and transport.

Engagement was also discussed. In particular, how did government engage with communities around environmental impacts? How were those conversations with communities translated into national policy decisions.

Case Study

Friends of the Earth Northern Ireland

Friends of the Earth believe that the future demand for aviation will look very different by 2030. There will be carbon constraints, high oil prices and aviation paying its full externalities.

If the UK is struggling to meet its carbon reduction targets, as Friends of the Earth predict, then the Northern Ireland argument about a 'special case' is not going to be persuasive. They believe Northern Ireland should be preparing its economy and way of life to be less carbon intensive by investing in a low carbon economy including transport alternatives to aviation, such as rail and ferry.

28th February 2008

The final event in the dialogue was another full day workshop with all stakeholders on 28th February. The purpose of the day was:

- To create shared and contrasting visions of aviation within a low-carbon sustainable society.
- To generate ideas and materials to inform the advice SDC IPPR offers to government.
- To clarify next steps, including potential for ongoing dialogue.

Participants were put into broad 'sector' interest for the morning to identify shared and contrasting vision for aviation in a low carbon, sustainable society. They were asked to create 'mind maps' from different points of view and then in smaller groups create 'leaves' that will enable those key elements. The three groups were:

- A – Broader economic interest
- B – Aviation industry
- C – Environment and Community

Broader economic interest

Group A represented the broader economic interest and those participants agreed that the following points in bold were key elements of sustainable aviation. Underneath each element, the outlined what policy actions could start to move industry, government and the public towards that vision.

Sustainable aviation would:

1. **Be safe, secure and responsive to consumer preferences, as part of the transport communication system.** This would require:

Decent consumer market research is done to inform development of integrated transport
Stronger staff training / support – both regarding aviation and other modes
Provision of transport capacity / pricing to meet consumer demands

2. **Be efficient, integrated and provide viable alternatives, both in forms of transport and other means of communication (in low carbon context).** This would require:

Integrating transport service provision within airport and other transport (for staff and passengers)
Pricing and taxation that reflects external costs and the more sustainable options (both transport and communication)
Developing a national policy framework for all transport (that takes account of communications) within a spatial context
International development funding for airports is connected to provision of integrated transport
Limiting car park facilities at airports to encourage use of alternatives (ascendant package)
Having a number of alternatives to take passengers to transport nodes (including airports)
Alternatives to flying are efficient and convenient and customer-focused
A European-wide transport policy
Incorporating (and advocating) Telepresence and other cutting edge communication technologies as part of transport nodes and town centres (especially rural / remote communities)

3. **Be enabling equality of access.** This would require

Protecting regional slots through statute or incentive

- Customising government policy – including life-line service exemptions etc
- Considering the continuation of de-regulated competitive markets
- Fair fiscal treatment
- Emissions trading

Supporting development of regional airports

Considering implementation of a progressive taxation regime

Making it as easy, or as difficult for everyone to fly (a level playing field)

4. **Have the full range of employment opportunities.** This would require:

Illuminating inter-connectivity from aviation to the related employment sectors

Aviation providing improved skills that are transferable to other sectors and relevant to the wider community

Support for integrated communities and interaction between different communities

Encouraging and supporting innovation – in systems, technology and transferable skills

5. **Positive economic outcome.** This would require:

Not creating reliance on one dominant industry sector (overheated economies not stable)

Investment that benefits the whole UK

Equality of investment in all transport modes (UK and EU-wide)

Investment in research and development in UK companies and UK universities etc

Enabling UK to compete in global economy, nationally and regionally

Fully valuing economic costs from aviation

Providing support for community schemes:

- Mitigation of negative impacts from aviation
- Community improvements
- Improving local environment.

Capitalising on innovation in the pioneering aerospace sector

Achieving local and regional prosperity:

- Research and development for new materials, methods for sustainable aviation
- Assessment of wide community needs.

6. **Be subject to fair fiscal treatment.** This would require:

Having a fully international emissions trading scheme

Bringing aviation fuel into a taxation regime and applying this along global lines

7. **Aviation will have minimal environmental impacts by 2050.** This would require:

Airports being sited to have no negative impact on surrounding communities and to be linked by top class connections

More efficient air traffic control / planning

Internalising environmental costs – to act as a market incentive

Binding emissions performance targets for aviation sector

Investment in research and development to encourage technological advance

Removal of institutional barriers to fuel taxation

Resolving market inequalities on environmental lines

Airports served by effective, efficient public transport

Aviation industry

Group B represented the Aviation industry. Participants agreed that the following points in bold were key elements of sustainable aviation. Underneath each element, the outlined what policy actions could start to move industry, government and the public towards that vision.

Sustainable aviation would:

1. **Be meeting Society's transport needs for the future.** This would require:

Flying to destinations that meet customer needs for business, education, tourism, leisure, social interaction
Working within a liberalised market allowing efficient choices
Working within a multi-modal system of efficient alternative modes including airport access
Being a safe and secure form of transport (and time, cost and comfort)
Using aircraft and routes to best effect to maximise transport provision while minimising associated emissions – i.e. Route capacity, load factors and efficient routes
Meeting consumer demand by elective choice within a carbon restricted society
Facilitating movement of goods within world economy
Using aircraft efficiently
Anticipating society's future transport needs and developing the required capability / infrastructure sustainably
Providing a role in emergency rescue, defence, humanitarian aid
Reducing delays, providing an on-time service!

2. **Be helping develop the world and national and regional economies.** This would require:

Communicating the benefits as well as the costs
Liberalising the marketplace (aviation market or whole market?)
Growing developing economies: <ul style="list-style-type: none"> • Helping industrialisation • Economic development from tourism • Helping agriculture
Developing a global environmental approach to aviation via UN (United Nations), EC (European Commission), ICAO (International Civil Aviation Organisation)
<ul style="list-style-type: none"> • Contributing to economic growth • Creating jobs • Lessening poverty
Not distorting transport market by licensing systems or restricting airport development.

3. **Be developing and using the best skills and technologies for their own industry and others (e.g. clean energy generation).** This would require:

Government support for targeted and innovative research and technology
Information sharing (internationally / cross-sectorally, etc.)
Hypothecation of environmental taxes to develop solutions
Industry combining resources to drive technology development
Synergistic developments

4. **Be contributing towards a globally safer society.** This would require:

Facilitation, face-to-face communication (improved understanding of other cultures and needs)
A global network - "The Global Village"
<ul style="list-style-type: none"> • Aid programmes • Search and rescue • Safe travel
Being open to alternative views / cultures, and having respect for other cultures
Operating a safe and secure mode of transport
Enhancing economic development of less developed countries

5. **Be a healthy industry and commercially viable.** This would require:

Aviation not being taxed excessively as this would be counter-productive and remove funds for research and development and improvement
<ul style="list-style-type: none"> • Eliminating national intervention in aviation • Sensible global leadership but no 'hair shirt' solutions
The aviation industry earning appropriate returns
Hypothecation of aviation environmental taxes to invest in solutions

6. **Be meeting its full external costs in the most effective way.** This would require:

Using most effective and efficient least-cost mechanisms
Ongoing research to agree external costs
Participate in EU carbon & emissions trading by 2012 – and international cap and trade system
Credible voluntary off-setting
Technological development
Balancing trade-offs between 1. Noise, 2. Local air quality 3. Tranquillity / visual impacts
Other appropriate economic instruments as required (e.g. charges for noise)

7. **Be playing its role in avoiding / stabilising emissions to avoid dangerous climate change.** This would require:

Developing a better understanding of non-CO ₂ emissions / effects
Basing research and development technology on sound science (including on new fuels)
Making research and development funding available
Developing skills to provide solutions to climate change both within aviation – but also to use these capabilities in other sectors e.g. renewables, lower carbon technologies
<ul style="list-style-type: none"> • Emissions trading – to be effective and world-wide • Workable / sustainable carbon offsetting
Not taking money out of industry through taxation. Industry needs to be in a position to undertake substantial research and development and acquire a new generation of planes / or hypothecation of environmental taxes back into industry for research and development
Society to decide where to spend its carbon budget
Efficient operations including air traffic control aircraft and load factors
Meeting the ACARE targets by 2020
<ul style="list-style-type: none"> • 50% in CO₂ / passenger km • 50% in noise • 80% in NO_x
Action on aviation regarding climate change to be proportionate and science-based with agreed metrics

Having a joined-up industry-wide approach (e.g. sustainable aviation) for aligned strategies and knowledge transfer
Developing a suite of measures to minimise net climate impact of aviation
The industry developing a strategy to manage the uncertainty of non-CO ₂ emissions – which is partly minimising fuel burn
Meet SESAR (air traffic management) targets 10% emissions improvement (CO ₂) by 2020

8. **Be operating on a clean power source.** This would require:

Carbon neutral airports by 2015 (Manchester Airport Group target) – Airports working together to agree scope of carbon footprint and carbon neutrality
Developing: <ul style="list-style-type: none"> • 1st – cleaner fuels and more efficient engines and airframes • 2nd – alternatives to Kerosene and current engine designs
Full assessment of life-cycle costs of biofuels and identification of where to use them most cost-effectively (i.e. which sectors), including assessing: <ul style="list-style-type: none"> • Security of supply issues • Balance of payment benefits for some countries
Investing in skills and technology development to improve our current practice
Pushing for sustainable alternative fuels. Potential benefits for the 3 rd world as a source of fuel

9. **Be responding to society’s view on climate change.** This would require:

Informing consumers of the facts related to aviation and climate change
Developing consumer awareness through eco-labelling
Ensuring consumers views are heard and evaluated
A response based on sound science – but managing uncertainty <ul style="list-style-type: none"> • Research and development • Developing the technology • More efficient operations
Listening to concerns and understanding
Be part of the broader solution e.g. applying skills to other sectors, e.g. renewables
Active engagement communication – public and government at all levels via AOA/BATA/ACI
Understanding drivers – why people fly?
Understanding where / how people want to spend society’s (and individual’s) carbon budget

Environment and Community

Group C represented the participants interested in environment and community. Participants agreed that the following points in bold were key elements of sustainable aviation. Underneath each element, the outlined what policy actions could start to move industry, government and the public towards that vision.

Sustainable aviation would:

1. **Be integrated with other modes of transport that have a lower carbon impact.** This would require:

More government policy focus on a wider range of demand management measures – take what works and replicate elsewhere e.g. better planning, car-sharing and cycle routes
Reducing fuel wastage
New fuels (compressed air, solar, wind) not agro-biofuels
More efficient engines
Addressing the relative costs and time (actual) of different modes of transport
Imposing VAT on mainland domestic flights and eventually aviation fuel tax EU-wide to encourage rail (no excuses!)
Reducing flights to those places (e.g. Paris) which are easily accessible from the UK – though this must be linked to improved UK rail system
Promoting holidays that don't involve flying

2. **Be serving a lower level of demand for travel.** This would require:

Determining the costs of aviation to meet environmental limits
Education at schools about the UK – its geography, scenery, even weather (not all bad): kids currently know more about Ibiza than Bournemouth
Ensuring everyone aware of the full impacts of flying
A more balanced rural development globally – more employment, food etc. available locally and less need to import food or travel abroad to find work
Fewer wars over oil > fewer refugees > fewer split families > fewer international love-miles
People working less so having less need to 'get away from it all!'
Planning our cities, towns and countryside so that people work and relax close to home
Encouraging more UK-based tourism (Government aid for UK tourist board) but understanding impacts on local communities through increase in visitors
More higher quality video conferencing, less need to travel to meetings
"Telepresence ports" to replace airports

3. **Serve only the needs no other form of transport can.** This would require:

Restricting aviation where other forms of transport are feasible
Promoting, improving (and subsidising) other forms of transport
Focus on connectivity not mobility – virtual meetings instead of business travel
Having minimum flight distance / time
Making other transport more affordable
Pricing aviation higher
Agreement reached re. 'reasonable' need to travel and 'legitimate' travel

4. **Be serving a lower level of demand.** This would require:

Lower house prices > less need to move abroad to get affordable homes!
Avoiding travel – dependent development patterns
Being aware of restricted value of domestic aviation – poor tourism access to many desirable areas (you can fly to Newquay only – but this denies smaller resorts of tourism benefits)
Encourage EU to impose incremental EU-wide aviation fuel tax (been talking for years!) – as EU ETS is too weak
Developing business practice / organisation that focuses on local staff doing local work (Less CEO travel)
Survey of reasons for flying
Greater promotion and ease of access to information and pricing of high speed rail to Europe. Learn from Ryanair...

5. **Allow for economic benefits to the developing world.** This would require:

The tourism sector to work towards economic model which doesn't require growth but quality
Using some of the UK emissions allocation to provide development benefits. e.g. 0.1% of UK GHG emissions support 1 million African livelihoods
Developing local markets for their produce – which guarantees equal prices / returns
Allowing developing countries space to use their 'emissions allocation' to develop their industries and bring products to market (including UK)
Helping to invest in lower-carbon industries to supplement GDP

6. **Take account of the inequalities of airport impacts.** This would require:

Minimising the need for increased air traffic, e.g. by integrated transport system to reduce traffic and congestion
Reduce and minimise negative impacts at airports: <ul style="list-style-type: none">• Air quality• Noise• Congestion
Respecting the planning process and consultation with public
Compensation of those affected by those who fly / buy flown goods

7. **Minimise and reverse landscape and wildlife impacts.** This would require:

Minimising the need for aircraft by having better integrated transport and no expansion
Improving non-concrete space to attract wildlife
Green airports as much as possible – e.g. green roofs
Ensuring flight paths respect sensitive landscapes – especially on higher ground
Airport managed in order to reduce footprint – water runoff etc.
Airships – which don't require runways

8. **Be within health and eco system based air quality limits.** This would require:

Better technology
Policing of air quality limits – quick resolutions, meaningful fines etc.
ICAO (International Civil Aviation Organisation) setting more demanding limits or develop different monitoring body

9. Make no noise outside the airport boundary.

Silent aircraft initiative e.g. stealth bombers
Imposing limits on flight numbers until planes are silent
Solutions to noise avoid negative carbon impacts
<ul style="list-style-type: none">• More gliding?• Steeper take-offs?• Embankments to absorb noise?
Planning and infrastructure needs

10. Internalise its environmental costs. This would require:

A trading scheme – though this will only cover some environmental costs
Fuel taxation
Compensation for environmental impacts such as air, noise, light pollution and land-take
Agreed assessment and valuation of damage caused

11. Bring sustainable economic benefits. This would require:

Improved logistics
<ul style="list-style-type: none">• Less just-in-time flying of goods• Internalising air costs (airmail) etc?
Managing consumer expectations
Researching 'what are the economic benefits'
Encouraging UK 'eco-tourism'
Understanding impacts of reducing incoming tourism and increasing domestic tourism
A better understanding of people's motivations to travel
Improve perception of 'holidaying in the UK'

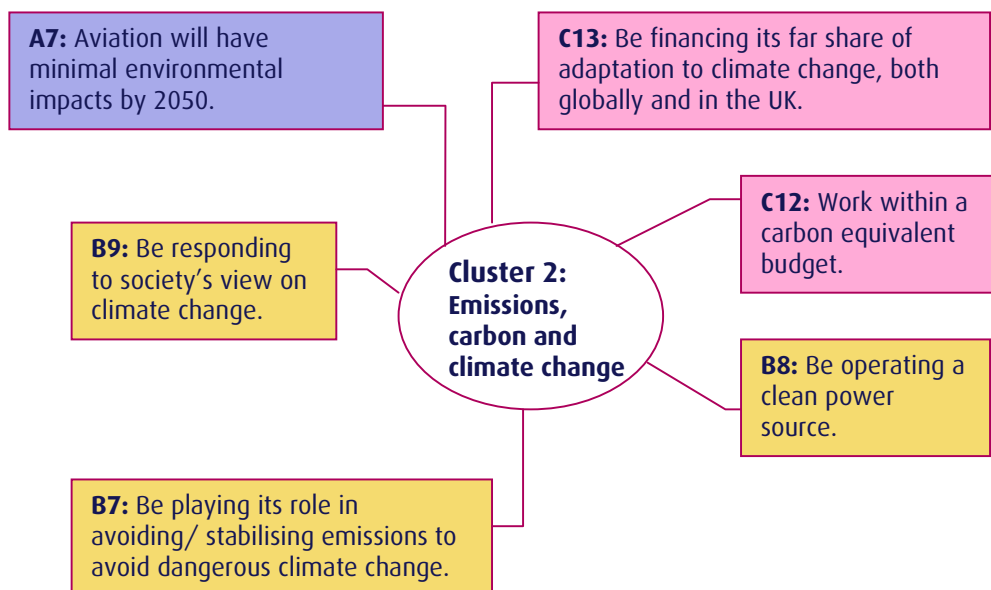
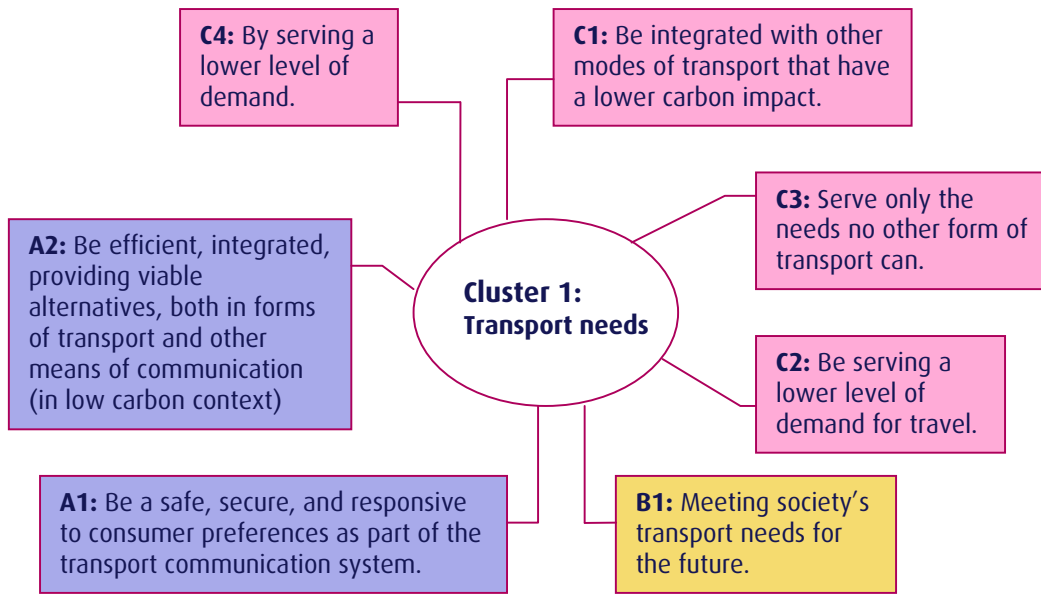
12. Work within a carbon equivalent budget. This would require:

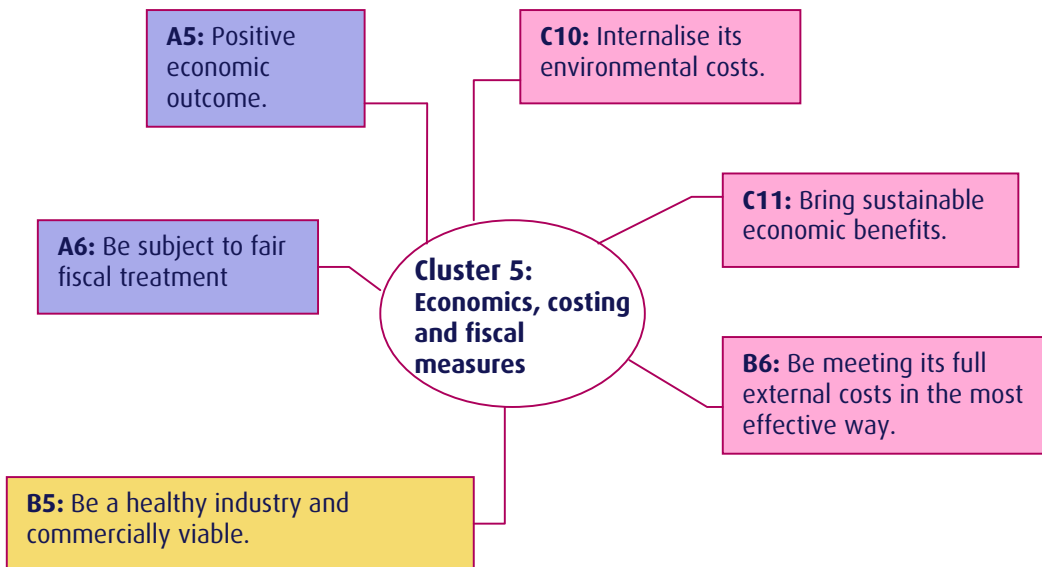
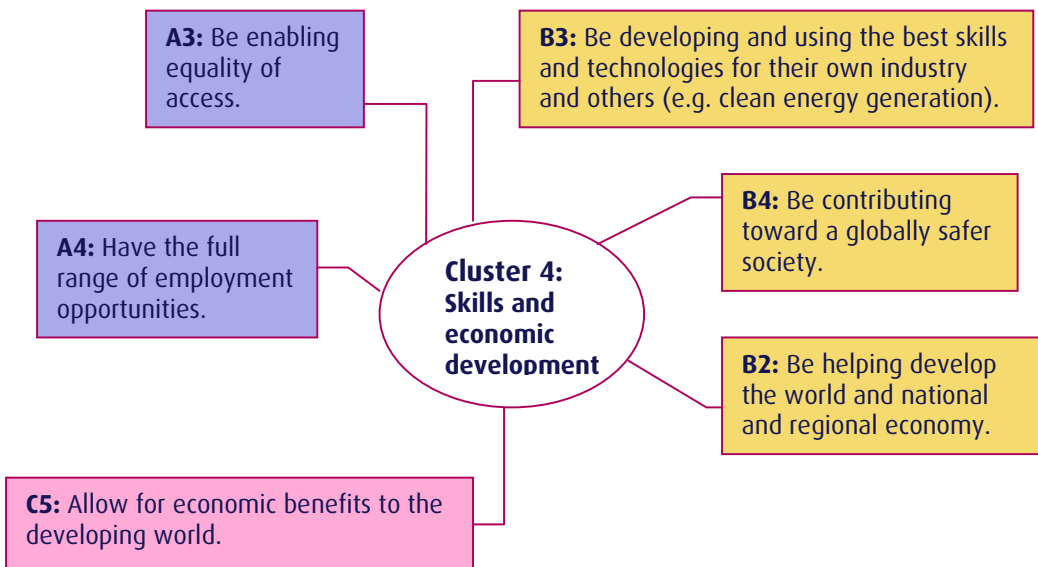
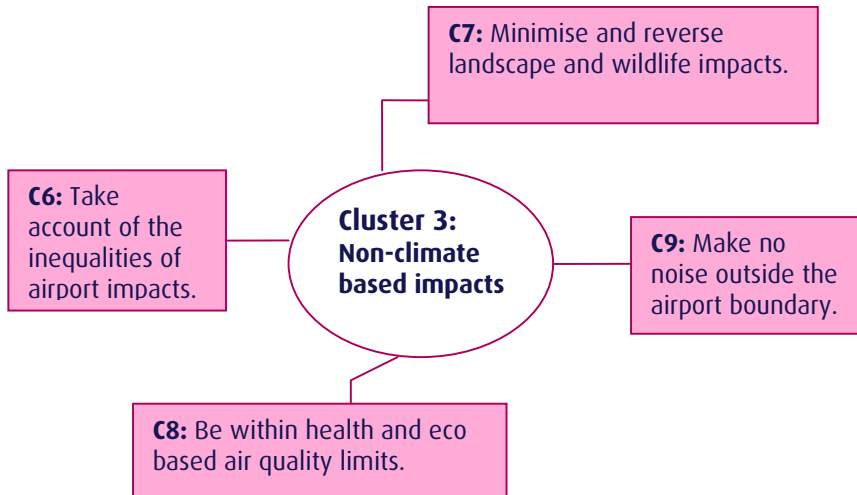
Setting radical national, EU and global targets with milestones along the way
Effective, enforced carbon trading system for all sectors
A pre-global trading agreement, with additional precautionary regulation for aviation
Defined carbon pathway for aviation
Incorporating solutions for dealing with non-CO ₂ emissions. E.g. optimising altitude to reduce contrail formation
Radically accelerate technological innovation through e.g. regulation. Technology needs a step change, not just incremental improvements
3rd generation biofuels or other alternative fuels

13. Be financing its fair share of adaptation to climate change, both globally and in the UK. This would require:

Calculating the costs of adaptation globally and apportioning a share based on emissions contributions to aviation
Carbon offset schemes being available only if genuine
Using the VAT tax take towards UK sea level rise problem (East Coast - managed retreat!)
Nurturing and investing in lower carbon industries in developing countries that provide genuine increasing economic benefits
Diverting long-haul aviation fuel tax globally to UK overseas aid programme

The groups then worked together to cluster the issues identified in the visions. These were:





In the final session on 28th February, facilitators asked the participants to work in pre-assigned groups to define what actions or interventions, and by whom, would do most to support the elements of the visions – and what might be SDC and IPPR’s role going forward. Though the groups discussed particular ideas, due to significant overlaps, these have been grouped into demand side and supply side initiatives for this report. A full report of the ideas from the tables can be found in the full transcript.

Suggested demand-side policy initiatives and actions

- Internalise external environmental costs of different transport modes (Increase cost of flying for passengers, new APD and personal carbon quotas)
- Provide improved and fully integrated public transport (inc. to airports) with coordination of timetables
- Ensure there are viable alternatives to aviation (for example, government to invest in rail system that complement aviation and/or replaces domestic aviation).
- Reduce need for travel through planning of communities and promoting technological alternatives
- Encourage UK based tourism (government) and contribute to vibrant rural economy
- Education - Carbon issues across whole economy in the school curriculum
- Allowing limited hypothecation to create political space for new transport policies.

Information needs would include:

- Accurate and agreed metrics to allow comparison of costs/benefits and impact of each mode of transport
- Research into why people travel. Reasons for transport behaviour and modal choice
- Research and modelling of demand aggregation (to ensure higher aircraft load factors) e.g. as with car pooling.
- Investigate price elasticities and the social class/income of those who fly.

Some suggested supply-side policy initiatives and actions

- Negotiate international (EU first?) agreement on treatment of aviation emissions
- Agreement on separate inclusion of non-CO₂ impacts
- Re-negotiate Chicago Convention and associated bilateral agreements to allow for fuel taxation.

Encourage and further incentivise aircraft and airline efficiency. Ideas included:

- Code sharing/derogation to influence competition to ensure planes fly full
- CO₂ or carbon quotas for each flight/new aircraft by 2020
- APD being changed into a tax per aircraft and based on carbon emissions
- Reduction of excess weight on planes
- Carbon label for each passenger ticket enforced by trading standards and ASA, or agreed methodology for carbon labelling and enforcement (trading standards)
- Operational measures to reduce noise e.g. continuous descent approaches.

Increase in research and development into new aviation technology

- Higher innovation funding from government (lower fuel burn, quieter engines)
- Directly fund innovation for alternative aviation fuels. E.g. biofuel incentives (with regard to sustainable biofuels)
- Partial hypothecation of aviation taxation to support RD&D.

Improve low carbon skills

- More education to develop the skills required for low carbon technologies (including aviation)
- Facilitate knowledge transfer from universities and international cooperation on aviation research.

Information needs would include:

- Research into impact on local economic development of regional airports
- Clear, independent, trusted data on aviation’s impact on climate

- Further research into radiative forcing and effect of changing altitude of aircraft to reduce contrails
- Assessment of trade offs between engine technologies to reduce impacts (noise, NO_x, CO₂)
- Research on noise impact metrics including subjective human perception of noise
- Research into improved monetarisation of noise impact of aviation and transport noise (house prices, sleep deprivation, stress).

Finally, the groups were asked to suggested **next steps and further actions for SDC / IPPR** to help resolve some of the issues identified. The suggestions included:

1. Convene smaller groups of relevant experts to brainstorm problems or issues at greater level of detail
2. Name and shame worst market failures in carbon terms
3. Facilitate debate about demand management – include information about public attitudes to policy and fiscal intervention.
4. Promote public education on carbon literacy – e.g. education on transport choices
5. Continue dialogue between sectors of debate - act as diplomats / facilitators / honest brokers
6. Facilitate and disseminate agreed research on contentious issues
7. Investigate a true comparison of transport's effect on the climate by mode.

Case Study

New Forest National Park – the impact of aviation

The New Forest National Park is facing number of pressures on its landscape from transport including main roads (M27), and over-flown areas, as well as being in close proximity to both Bournemouth and Southampton Airports.

- Airspace extension - In 2007 NATS consulted on an extension of airspace that would impact on more areas of the national park. They raised questions about whether the airspace extension would be environmentally beneficial in terms of lost delays – as claimed
- Airport expansion – as well as increased aircraft movements, there were concerns about traffic impacts on the parks roads from the projected rise in passenger numbers.

They believe there is a failure to give sufficient weight to the protection afforded to nationally important landscapes in aviation decision making, particularly the impact on tranquillity.