

EXPLANATORY MEMORANDUM TO
THE AVIATION GREENHOUSE GAS EMISSIONS TRADING SCHEME
REGULATIONS 2010

2010 No. 1996

1.1 This explanatory memorandum has been prepared by the Department of Energy and Climate Change and is laid before Parliament by Command of Her Majesty.

This memorandum contains information for the Joint Committee on Statutory Instruments.

2. Purpose of the instrument

2.1 These Regulations complete transposition of Directive 2008/101/EC of the European Parliament and of the Council ('the Aviation ETS Directive') by making provisions to include aircraft operators in an emissions allowance trading scheme.

2.2 The Regulations revoke the Aviation Greenhouse Gas Emissions Trading scheme Regulations 2009¹ ('the 2009 Regulations'), which will however continue to have effect for some purposes. These Regulations make provision for the free allocation of allowances; for the monitoring and reporting of emissions and the surrender of allowances equal to emissions; for the appointment of regulators in England, Wales, Scotland and Northern Ireland and for their powers and functions (including powers to recover costs); and for an effective, dissuasive and proportionate system of enforcement.

3. Matters of special interest to the Joint Committee on Statutory Instruments

3.1 The Regulations are made in exercise of the powers conferred by both section 2(2) of European Communities Act 1972 and section 2 of the Pollution Prevention and Control Act 1999. A combination of these powers is needed as section 2 of the Pollution Prevention and Control Act 1999 is the appropriate domestic power, but does not extend to Northern Ireland. In order to ensure aircraft operators covered by the EU ETS that are regulated by the United Kingdom, particularly aircraft operators based outside of the United Kingdom, are treated equally, it was decided the best approach would be to have one set of Regulations in force for the whole of the United Kingdom. It is therefore necessary to exercise the powers in section 2(2) of the European Communities Act 1972 as well as in section 2 of the Pollution Prevention and Control Act 1999.

4. Legislative Context

4.1 Directive 2003/87/EC of the European Parliament and of the Council ('the European Union Emissions Trading Scheme (EU ETS) Directive') established a system for greenhouse gas emission allowance trading within the European Community. In September 2005, the Commission adopted a Communication outlining plans to reduce the impact of aviation on climate change. The Communication recommended that aviation carbon emissions should be included in the EU ETS. This was part of a comprehensive

¹ S.I. 2009/2301, available at www.legislation.gov.uk/ukSI/2009/2301/made

approach which included research into cleaner air transport, better air traffic management and the removal of legal barriers to taxing aircraft fuel.

- 4.2 The Commission invited feedback from the other institutions and set up an aviation working group to consider the detailed design of the scheme. The Environment Council released supportive conclusions in December 2005 which also contained some preliminary guiding principles to be taken into account in the development of a Commission legislative proposal. In the European Council conclusions of 15/16 December, European heads of state and government also welcomed the Communication, recognised that the inclusion of the aviation sector in the EU Emissions Trading Scheme seemed to be the best way forward, and welcomed the intention of the Commission to bring forward a legislative proposal. The proposal was published in December 2006.
- 4.3 The proposal was the subject of Explanatory Memorandum 5154/07, sent to the Parliamentary Scrutiny Committees on 26 January 2007. The House of Lords Select Committee on the European Union referred the EM to Sub-Committee B. A supplementary Explanatory Memorandum was provided on 30 March 2007. The Lords Sub-Committee considered this in April 2007, and this was followed by additional correspondence between Government and the Committee before the Committee cleared the document in January 2008. The House of Commons European Scrutiny Committee considered the EM on 7 February 2007 and recommended that the proposal should be debated in European Standing Committee. The debate took place on 27 March 2007.
- 4.4 A UK Government consultation was held between March and June 2007 on the European Commission's proposal and on the Government's initial analysis of it. The proposal was amended through the EU legislative process, and a final agreement was reached between the Environment Council, the Commission and the European Parliamentary Environment Committee on its second reading on 26 June 2008. This was put before the European Parliament on 8 July and was supported by 640 votes to 30. The Aviation ETS Directive was adopted by the European Parliament and the Council of the European Union on 19 November 2008. The Aviation ETS Directive was published in the Official Journal of the European Union on 13 January 2009 and entered into force on 2 February 2009.
- 4.5 The Aviation ETS Directive amended the EU ETS Directive to include aviation activities in the EU ETS. Article 2(1) requires Member States to bring into force the laws, Regulations and administrative provisions necessary to comply with the Directive by 2 February 2010.
- 4.6 On 17 September 2009 the 2009 Regulations came into force, appointing regulators in England, Wales, Scotland and Northern Ireland and enabling aircraft operators to apply for a free allocation of allowances. The 2009 Regulations continue to have effect, for the purposes of such free allocation, for trading periods up to 2020. The present Regulations apply in the case of allocation for periods from 2020, and allocation from a special reserve for certain aircraft operators in 2015.
- 4.7 A Transposition Note has been prepared, and is attached as an Annex to this Memorandum.

5. Territorial Extent and Application

- 5.1 This instrument extends to England, Wales, Scotland and Northern Ireland.

6. European Convention on Human Rights

6.1 As the instrument is subject to negative resolution procedure and does not amend primary legislation, no statement is required.

7. Policy background

7.1 The EU ETS Directive established a system for greenhouse gas emission allowance trading within the European Community. The establishment of the EU ETS in 2005 was one of the key policies introduced by the European Union to help meet the EU's greenhouse gas emissions reduction target of 8% below 1990 levels under the Kyoto Protocol. It works on a 'Cap and Trade' basis, with Member States required to set an emissions cap for sectors covered by the EU ETS. The rationale behind emissions trading is that it enables emission reductions to take place where the cost of the reduction is lowest, thus lowering the overall costs of combating climate change. More abatement will be undertaken by operators with lower abatement costs, therefore reducing the overall costs of meeting the emissions target (cap) set by any trading scheme.

7.2 The EU ETS commenced in 2005 covering CO₂ emissions from heavy industry and energy intensive activities only. In recognition of the growing contribution of air transport to climate change the Government pressed for the inclusion of aviation in the EU ETS.

7.3 Starting from 2013, operators will be required to surrender one allowance for each tonne of CO₂ they emit during the reporting year (i.e. the preceding calendar year). If an operator does not have enough allowances to cover its annual CO₂ emissions it will need to purchase more. It can also sell any surplus if it has successfully applied for a free allocation of allowances. Failure to surrender enough allowances for each tonne of CO₂ emitted will result in a civil penalty for the operator and persistent offenders may be subject to detention and sale of assets or ultimately an operating ban as prescribed in Article 16 of the Aviation ETS Directive.

8. Consultation outcome

8.1 In conjunction with the Department for Transport and Devolved Administrations, the Department of Energy and Climate Change consulted on the draft 2009 Regulations from March 2009 to May 2009. On 11 December 2009 a second consultation on a draft of these Regulations was launched, focusing on aspects of the Aviation ETS Directive not transposed by the 2009 Regulations. It closed on 5 March 2010 and responses were received from 50 persons including aircraft operators, industry representatives, aerodrome operators and an NGO.

8.2 Responses were generally supportive of the inclusion of aviation in the EU ETS, although some responses were submitted under protest pending the outcome of a legal challenge to the 2009 Regulations (essentially a challenge to the legality of the Aviation ETS Directive itself) that has now been referred to the Court of Justice of the European Communities. Most aircraft operators who responded disagreed with proposals for the regulators to recover the costs of administering the scheme and cited Article 3d (4) of the Aviation ETS Directive stating auction revenues should be used to cover the cost of administering the scheme. Government's policy is to not earmark revenue from auctioning and we do not believe that charging is inconsistent with the requirements of the Directive. Article 3d (4) of the Aviation ETS Directive affords a discretion to Member States.

8.3 The UK Government took respondents' views into account when drafting these Regulations and published a summary report of consultation responses, and a Government Response document addressing points raised by respondents.

9. Guidance

9.1 The Department and regulators have so far as possible notified relevant stakeholders of the new procedures that will be introduced by these Regulations through email communication and updating respective websites where appropriate. Specific guidance on completing monitoring plans and the meaning of "UK operator", "aircraft operator" and "aviation activity" can be found on the Environment Agency's website.

10. Impact

10.1 The impact on business, charities and voluntary bodies is predominantly limited to aircraft operators and UK aerodromes on whom the Regulations place direct obligations. The costs are outlined in the accompanying Impact Assessment.

10.2 The impact on the public sector is minimal with only relatively small costs relating to initial set-up of the specific administrative function and small ongoing enforcement and verification costs.

10.3 An Impact Assessment is attached to this Explanatory Memorandum and will be published alongside the Memorandum on www.legislation.gov.uk.

11. Regulating small business

11.1 The legislation applies to small businesses.

11.2 To minimise the impact of the requirements on small firms employing up to 20 people, the approach taken in the Aviation ETS Directive and therefore these Regulations provide for commercial aircraft operators with fewer than 243 flights per period for three consecutive four-month periods; or with total annual emissions lower than 10,000 tonnes CO₂ per year to be excluded from the scheme. Those operating aircraft with a certified maximum take-off weight of less than 5,700kg will also be exempt. Simplified monitoring and reporting procedures for small emitter operators are being implemented with the intention of reducing the administrative cost burden and ensuring proportionality.

11.3 The basis for the final decision on what action to take to assist small business was taken through consultation with small aircraft operators and aerodrome operators. The Aviation ETS Directive sets precise de minimis thresholds as set out in 11.2 and where regulatory costs are lower for smaller emitters, levels of cost recovery for subsistence are also reduced.

12. Monitoring & review

12.1 The Regulations will remain under review in response to amendments to the EU ETS resulting in particular from the procedure of review set out in Article 28(2) and Article 30(4) of the Aviation ETS Directive.

13. Contact

13.1 Chris Gormley at the Department of Energy and Climate Change Tel: 0300 068 5277 or email: chris.gormley@decc.gsi.gov.uk can answer any queries regarding the instrument.

ANNEX

DIRECTIVE 2008/101/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community²

TRANSPOSITION NOTE

FOR

**THE AVIATION GREENHOUSE GAS EMISSIONS TRADING SCHEME
REGULATIONS 2010**

Statement on over-implementation: These Regulations do no more than is necessary to implement the relevant requirements of the Directive.

Responsibility for implementation: These Regulations implement the Directive in respect of the United Kingdom. Functions under these Regulations will be exercisable (to the extent specified in the Regulations) by the Scottish Ministers, the Welsh Ministers, and the Northern Ireland Department of the Environment, as well as by the Secretary of State; and by the Scottish Environment Protection Agency and the chief inspector appointed under the Pollution Prevention and Control Regulations (Northern Ireland) 2003, as well as by the Environment Agency.

This Note also replaces the Transposition Note for the Aviation Greenhouse Gas Emissions Trading Scheme Regulations 2009, which are revoked by these Regulations but continue in effect for some purposes.

Department of Energy and Climate Change.

² OJ No L 8, 13.1.2009, p 3.

Article of Directive ³	Result to be achieved	Implementation by the Aviation Greenhouse Gas Emissions Trading Scheme Regulations 2009 ⁴ and 2010	Comments
1.3 (amends Art 3 of Directive 2003/87/EC (“ETS Directive”))	Inserts definitions for the purposes of the emission trading scheme as extended to aviation: in particular, definitions of “emissions”, “aircraft operator” and “administering Member State”.	2009/regs. 2 and 3; 2010/regs. 2 and 3: definitions of “aviation emissions”, “UK operator” and “aircraft operator”	
1.4 (inserts new Arts 3a to 3g)	<p><i>Art 3a:</i> defines scope of Chapter II, namely the allocation and issue of allowances in respect of aviation activities listed in Annex I.</p> <p><i>Art 3d(4):</i> Member States to determine the use to be made of revenues from auctioning of allowances and inform the Commission of action taken.</p> <p><i>Art 3e(1) and (2):</i> aircraft operators may apply to the competent authority for an allocation of free allowances; applications then to be submitted to the Commission.</p>	<p>2009/reg. 2; 2010/reg 2: definition of “aviation activity”</p> <p>Implemented by administrative means.</p> <p>2009/regs. 8 to13 (for trading periods 2010 and 2013 to 2020); 2010/regs. 8 to13 (for subsequent eight-year trading periods).</p>	See savings provisions of 2010/reg. 60(2)

³ Only those provisions that require implementation are listed.

⁴SI 2009/2301. The relevant provisions of the 2009 and 2010 Regulations are referred to in the form: “2009/reg. x” and “2010/reg. y”.

⁵ Commission Regulation (EC) No 994/2008 for a standardised and secured system of registries pursuant to Directive 2003/87/EC of the European Parliament and of the Council and Decision No 280/2004/EC of the European Parliament and of the Council (OJ L 271, 11.10.2008, p 3). From 1 January 2012, the Regulation will be replaced by a new Regulation that takes into account the inclusion of aviation activities in the scheme.

	<p><i>Art 3e(4):</i> Member States to publish details of allocations</p> <p><i>Art 3e(5):</i> Competent authority to issue allowances to aircraft operators by 28 February of each year from 2012</p> <p><i>Art 3f(2) to (4):</i> eligible operators may apply to competent authority for allocations from the special reserve; applications then to be submitted to the Commission.</p> <p><i>Art 3f(7):</i> Member States to publish details of allocations.</p> <p><i>Art 3f(8):</i> Any unallocated allowances in special reserve to be auctioned.</p> <p><i>Art 3g:</i> Member State to ensure that operators submit a monitoring plan to the competent authority; plans to be approved in accordance with Commission guidelines.</p>	<p>Implemented by administrative means.</p> <p>Dealt with under the Commission's Registries Regulation.⁵</p> <p>2010/regs. 14 to 17.</p> <p>Implemented by administrative means.</p> <p>Implemented by administrative means.</p> <p>2009/regs. 14 and 15; 2010/regs. 18 and 19.</p>	<p>Auctioning takes place under provisions made under section 16 of the Finance Act 2007 (c. 11).</p>
<p>1.8 (inserts Article 11a(1a))</p>	<p>Allows aircraft operators to use up to 15% CERs and ERUs to fulfil their obligation to surrender allowances.</p>	<p>2010/reg. 26(3).</p>	<p>CERs (certified emission reductions) and ERUs (emission reduction units) are Kyoto project-based mechanisms allowed by the amendments to the</p>

			ETS Directive made by Directive 2004/101/EC.
1.10 (amends Art 12)	Aircraft operators to surrender, by April 30th, allowances equal to total emissions for the preceding year. Surrendered allowances to be cancelled.	2010/regs. 26 and 27. Dealt with under the Registries Regulation.	By <i>Article 3c</i> , allowances are allocated to aircraft operators for emissions from 2012 onwards.
1.12 (amends Art 14)	From 1 January 2010, aircraft operators to report emissions during each calendar year in accordance with the Commission's monitoring and reporting guidelines based on Annex IV to the ETS Directive. (See under 1.22 below).	2009/reg. 16; 2010/regs. 20 and 21.	See also transitional provisions in 2010/reg. 60(9).
1.13 (substitutes new Art 15)	Those reports to be verified (by 31st March each year) in accordance with Annex V to the ETS Directive. If report is unsatisfactory, further transfers of allowances to be blocked.	2010/reg. 21 The blocking of accounts is dealt with under the Registries Regulation.	
1.14 (amends Art 16)	<i>Art. 16(1):</i> Member States to provide effective, proportionate and dissuasive penalties. <i>Art 16(2):</i> Member States to publish names of aircraft operators in breach of the requirement to surrender sufficient allowances.	2009/regs. 21-29 (civil penalties); 2010/regs. 30-41 (civil penalties) and 42-48 (detention and sale of aircraft). 2010/reg. 49.	See also 2010/reg. 60(11).

	<p><i>Art 16(3):</i> Such aircraft operators to be liable to an excess emissions penalty of EUR 100 per tonne of CO₂ equivalent.</p> <p><i>Art 16(5):</i> Where other enforcement measures fail, the administering Member State may request the Commission to impose an operating ban.</p> <p><i>Art 16(11):</i> Operating bans to be enforced within the territory of each Member State.</p>	<p>2010/reg. 38</p> <p>2010/reg. 50</p> <p>2010/reg. 51.</p>	<p>The inflation adjustment required from 2013 by Art 1.20 of Directive 2009/29/EC is included.</p>
1.15 (inserts new Arts 18a and 18b)	<p>Art 18a defines the “administering Member State” in relation to aircraft operators, which is reflected in a list published by the Commission.</p>	<p>2009/reg. 2; 2010/reg. 2: definition of “UK operator”.</p>	
1.22 (amends Annexes I, IV and V)	<p>Annex I defines the aviation activities to which the ETS Directive applies.</p> <p>Annex IV sets out principles for monitoring and reporting, and is supplemented by the monitoring and reporting guidelines of Decision 2007/589/EC, as amended by Decision 2009/339/EC.⁶</p> <p>Annex V sets out criteria for verification of emissions</p>	<p>2009/reg. 2; 2010/reg. 2: definition of “aviation activity”.</p> <p>2009/regs. 10 to 12; 2010/regs. 10 to 12 and 16.</p> <p>2009/reg. 12(b)(ii); 2010/regs. 12(b)(ii) and</p>	<p>But activities before 1 January 2012 are included (see below)</p>

⁶ Commission Decision 2009/339/EC amending Decision 2007/589/EC as regards the inclusion of monitoring and reporting guidelines for emissions and tonne-kilometre data from aviation activities (OJ No L 103, 23.4.2009, p. 10).

		16(2)(b)(ii).	
2.1	Member States must transpose before 2 February 2010	2009/reg. 1 (17 September 2009); 2010/reg. 1 (31 August 2010).	The 2009 Regulations implemented the Directive in part on 17 September 2009, in order to expedite the allocation of allowances. Although the remainder of the Directive is implemented after the transposition date, these parts relate to obligations (such as the surrender of allowances) arising after 1 January 2012.
2.2	Implementing measures must contain or be accompanied by a reference to the Directive Texts of the main implementing provisions to be communicated to the Commission.	There are references in both the Explanatory Note and the Explanatory Memorandum Implemented by administrative means.	

Title: Impact Assessment of Second Stage Transposition of EU Legislation to include Aviation in the European Union Emissions Trading System (EU ETS) Lead department or agency: Department of Energy and Climate Change Other departments or agencies: Department for Transport	Impact Assessment (IA)
	IA No: DECC0002
	Date: 05/07/2010
	Stage: Final
	Source of intervention: EU
	Type of measure: Secondary legislation
Contact for enquiries: Chris Gormley tel: 0300 068 5277 e-mail: chris.gormley@decc.qsi.gov.uk	

Summary: Intervention and Options

What is the problem under consideration? Why is government intervention necessary?

The problem under consideration is the emission of greenhouse gases (GHGs) into the atmosphere, which leads to climate change. The global causes and consequences of climate change, coupled with the long term and persistent nature of the impacts, highlights the need for government intervention. Tackling climate change is therefore a key priority for the UK Government. The justification for government intervention is to comply with legal requirements by fully transposing Directive 2008/101/EC ('the Aviation ETS Directive'), and thereby to address a market failure in that the cost of aviation does not fully reflect the external costs of climate change imposed on others in society by the greenhouse gas emissions from this sector.

What are the policy objectives and the intended effects?

Including aviation in the EU Emissions Trading System is intended to achieve emissions reductions in a cost-effective and efficient manner. The inclusion of aviation in the EU ETS needs to be considered in the context of the EU's 2020 greenhouse gas reduction target, and the need for aviation to play its part in meeting this goal.

What policy options have been considered? Please justify preferred option (further details in Evidence Base)

The Government is committed to the aviation sector joining the EU Emissions Trading System from 2012, as required by Directive (2008/101/EC). The first set of Regulations that have transposed this into UK legislation have established a framework for operators to apply for a free allocation of allowances, and require operators to apply for an emissions plan and to monitor and report their emissions. This impact assessment and the Regulations that are the subject of this impact assessment relate to the second stage of the transposition, which will transpose the Aviation ETS Directive in full.

When will the policy be reviewed to establish its impact and the extent to which the policy objectives have been achieved?	It will be reviewed 2014
Are there arrangements in place that will allow a systematic collection of monitoring information for future policy review?	Yes

Ministerial Sign-off For final proposal stage Impact Assessments:

I have read the Impact Assessment and I am satisfied that (a) it represents a fair and reasonable view of the expected costs, benefits and impact of the policy, and (b) the benefits justify the costs.

Signed by the responsible Minister: Greg Barker

Date: 3rd August 2010

Summary: Analysis and Evidence

Policy Option 1

Description:

Second Stage Transposition of EU Legislation to include Aviation in the European Union Emissions Trading System (EU ETS).

Price Base Year 2009	PV Base Year 2009	Time Period Years 13	Net Benefit (Present Value (PV)) (£m)		
			Low: £1.3 Bn	High: £41.2 Bn	Best Estimate: £21.5 Bn

COSTS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Cost (Present Value)
Low	£0	£63 Million	£0.5 Bn
High	£0	£162 Million	£1.5 Bn
Best Estimate	£0	£63 Million	£0.5 Bn

Description and scale of key monetised costs by 'main affected groups'

The key costs to the EU are the additional abatement costs that will be incurred due to the increase in the level of emissions reductions required in the EU ETS. The direct costs to the EU between 2008 and 2020 have been estimated at £4.7 Billion (present value, PV). Depending on how these costs are apportioned to the UK, the direct costs to the UK have been estimated at between £0.5 to £1.5 billion (PV). The best estimate uses the lower end of this range (see para 91).

Aircraft operators will also incur costs in the form of an annual subsistence charge.

Other key non-monetised costs by 'main affected groups'

The aircraft operators that will be regulated by the UK will also incur additional administrative costs and fees as a result of membership of the EU ETS. These additional administrative costs and fees have been considered in the impact assessment for the first stage Regulations and in the Evidence Base below.

BENEFITS (£m)	Total Transition (Constant Price) Years	Average Annual (excl. Transition) (Constant Price)	Total Benefit (Present Value)
Low	£0	£180 Million	£1.8 Bn
High	£0	£4.2 Billion	£42.8 Bn
Best Estimate	£0	£2.2 Billion	£22.0 Bn

Description and scale of key monetised benefits by 'main affected groups'

Including aviation in the EU ETS has been estimated to deliver substantial CO2 emissions savings. The value of these emissions savings has been estimated at between £9.6 and £126.3 billion (PV) across the EU depending on whether a global deal to stabilise atmospheric concentrations of GHGs at 450 parts per million (ppm) will be reached without this policy. It is estimated that between £1.8 and £42.8 billion (PV) of this total benefit could be attributable to the UK. The best estimate assumes that a global deal to stabilise emissions at 450ppm will not happen without this policy (see para 149) and that the UK's share of EU benefits and costs are at the lower end of the range – i.e. on an all departing basis (para 91).

Other key non-monetised benefits by 'main affected groups'

The Regulations that are the subject of this impact assessment will help facilitate the efficient functioning of the EU ETS to ensure that emissions reductions are achieved cost-effectively. The above estimates do not include any benefits associated with potential reduction in the non-CO₂ emissions resulting from reduction in aviation emissions. These have an estimated value across the EU of £830m (Present Value).

Key assumptions/sensitivities/risks

Discount rate (%)

3.5%

1.) Several assumptions were made to apportion EU costs and benefits to the UK as sufficiently detailed information to identify precisely what proportion should be apportioned to the UK is not available. The costs and benefits to the UK are thus very uncertain. 2.) "UK benefits" should be interpreted as the UK's contribution to the global benefits of avoided climate change. 3.) The proportion of the estimated benefits that are wholly attributable to the Regulations is very uncertain. 4.) The value placed on the damage avoided by reducing emissions is subject to significant uncertainty. 5.) The estimated costs are sensitive to the assumptions made (e.g. aviation is not assumed to undertake abatement itself or face reduced demand). These assumptions have been made to be conservative; any abatement options that are taken up will result in lower overall costs. 6.) There are a number of other caveats and uncertainties.

Impact on admin burden (AB) (£m):			Impact on policy cost savings (£m):		In scope
New AB: N/A	AB savings: N/A	Net: N/A	Policy cost savings: N/A		No

Enforcement, Implementation and Wider Impacts

What is the geographic coverage of the policy/option?		United Kingdom			
From what date will the policy be implemented?		2010			
Which organisation(s) will enforce the policy?		Environment Agency, Scottish Environment Protection Agency, Chief Inspector			
What is the annual change in enforcement cost (£m)?		£ -			
Does enforcement comply with Hampton principles?		Yes			
Does implementation go beyond minimum EU requirements?		No			
What is the CO ₂ equivalent change in greenhouse gas emissions? (Million tonnes CO ₂ equivalent)		Traded: 90-174		Non-traded: 0	
Does the proposal have an impact on competition?		Yes			
What proportion (%) of Total PV costs/benefits is directly attributable to primary legislation, if applicable?		Costs: 0%		Benefits: 0%	
Annual cost (£m) per organisation (excl. Transition) (Constant Price)	Micro	< 20	Small	Medium	Large
Are any of these organisations exempt?	No	No	No	No	No

Specific Impact Tests: Checklist

Set out in the table below where information on any SITs undertaken as part of the analysis of the policy options can be found in the evidence base. For guidance on how to complete each test, double-click on the link for the guidance provided by the relevant department.

Please note this checklist is not intended to list each and every statutory consideration that departments should take into account when deciding which policy option to follow. It is the responsibility of departments to make sure that their duties are complied with.

Does your policy option/proposal have an impact on...?	Impact	Page ref within IA
Statutory equality duties¹ Statutory Equality Duties Impact Test guidance	No	N/A
Economic impacts		
Competition Competition Assessment Impact Test guidance	Yes	40
Small firms Small Firms Impact Test guidance	Yes	40
Environmental impacts		
Greenhouse gas assessment Greenhouse Gas Assessment Impact Test guidance	Yes	38
Wider environmental issues Wider Environmental Issues Impact Test guidance	No	N/A
Social impacts		
Health and well-being Health and Well-being Impact Test guidance	No	N/A
Human rights Human Rights Impact Test guidance	Yes	41
Justice system Justice Impact Test guidance	No	N/A
Rural proofing Rural Proofing Impact Test guidance	No	N/A
Sustainable development Sustainable Development Impact Test guidance	No	N/A

¹ Race, disability and gender Impact assessments are statutory requirements for relevant policies. Equality statutory requirements will be expanded 2011, once the Equality Bill comes into force. Statutory equality duties part of the Equality Bill apply to GB only. The Toolkit provides advice on statutory equality duties for public authorities with a remit in Northern Ireland.

Evidence Base (for summary sheets) – Notes

Use this space to set out the relevant references, evidence, analysis and detailed narrative from which you have generated your policy options or proposal. Please fill in **References** section.

References

Include the links to relevant legislation and publications, such as public impact assessment of earlier stages (e.g. Consultation, Final, Enactment).

No.	Legislation or publication
•	DfT/ DECC (2009), Impact Assessment of First Stage Transposition of EU Legislation to Include Aviation in the European Union Emissions Trading System (EU ETS)
•	DECC (2009): Publication of final draft first stage Regulations transposing the EU Directive to include aviation in the EU Emissions Trading Scheme (ETS) into UK law
•	DfT/ DECC (2009); Impact Assessment of Second Stage Transposition of EU Legislation to include Aviation in the European Union Emissions Trading System (EU ETS)
•	Consultation on second stage transposition of EU Directive (2008/101/EC) to include aviation in the EU Emissions Trading System (EU ETS)

Annual profile costs and benefits - (£m) constant prices

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Transition costs													
Annual recurring cost	-23	-128	-173	-150	-133	145	166	192	178	181	204	191	164
Total annual costs	-23	-128	-173	-150	-133	145	166	192	178	181	204	191	164
Transition benefits													
Annual recurring benefits					2613	2765	2894	3007	3148	3238	3401	3500	3618
Total annual benefits					2613	2765	2894	3007	3148	3238	3401	3500	3618

Emission Changes

Version of GHG guidance used: e.g. June 2010

Sector		Emission Changes* (MtCO2e) - By Budget Period			Emission Changes (MtCO2e) - Annual Projections												
		CB I; 2008-2012	CB II; 2013-2017	CB III; 2018-2022	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Power sector	Traded	0	0	0													
	Non-traded	0	0	0													
Transport	Traded	6.2	47.1	36.2					6.2	7.9	8.8	9.4	10.3	10.6	11.7	12.0	12.5
	Non-traded	0	0	0													
Workplaces & Industry	Traded	0	0	0													
	Non-traded	0	0	0													
Homes	Traded	0	0	0													
	Non-traded	0	0	0													
Waste	Traded	0	0	0													
	Non-traded	0	0	0													
Agriculture	Traded	0	0	0													
	Non-traded	0	0	0													
Public	Traded	0	0	0													
	Non-traded	0	0	0													
Total	Traded	6.2	47.1	36.2	0	0	0	0	6.2	7.9	8.8	9.4	10.3	10.6	11.7	12.0	12.5
	Non-traded	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cost effectiveness	% of lifetime emissions below traded cost comparator	N/A															
	% of lifetime emissions below non-traded cost comparator	N/A															

CONTENTS

1.	INTRODUCTION	8
1.1	Background	8
1.2	Purpose of this Impact Assessment	8
1.3	Changes to the Impact Assessment since the Consultation stage	8
1.4	Rationale for Government Intervention	9
2.	GOVERNMENT & PUBLIC CONSULTATION	10
3.	REGULATIONS SUBJECT TO TRANSPOSITION	11
3.1	Allocation of Allowances	11
3.1.1	The Aviation Cap	11
3.1.2	Application for Free Allocation	12
3.1.3	Auctioning	12
3.1.4	The Special Reserve	12
3.2	Surrender of Allowances	14
3.2.1	The Use of Project Credits	15
3.3	Penalties and sanctions	15
3.3.1	Operating Ban	16
3.3.2	Penalty for Failing to Comply with Direction in Enforcement of an Operating Ban	16
3.3.3	Assistance of Aerodrome Operators	16
3.3.4	Appeals	16
3.4	Annual Subsistence Charge	17
3.5	Other Charges	18
4.	COSTS AND BENEFITS	18
4.1	Costs	20
4.1.1	Consistency with Previous Analysis of Abatement Costs	20
4.1.2	Approach to Estimating EU-wide Abatement Costs	21
4.1.3	Approach to Estimating the UK's Share of the EU-wide Abatement Costs	23
4.1.4	Costs to Participants	28
4.1.5	Costs to Government and Regulatory Bodies	32
4.1.6	Costs to Consumers	32
4.2	Benefits	35
4.2.1.	Approach to Estimating the EU-wide CO ₂ Emissions Savings	35
4.2.2.	Monetising the EU-wide CO ₂ Emissions Savings	36
4.2.3.	Approach to Estimating the UK's Share of the EU-wide Benefits	38
4.2.4.	Monetising the UK Emissions Savings	39
4.3	Overall Impact of the Aviation Sector Joining the EU ETS	39

5.	SPECIFIC IMPACT TESTS	40
5.1	Competition Impact Assessment	40
5.2	Small Firms Impact Test	40
5.3	Equality Impact Tests	41
5.4	Human Rights	41
	Annex 1: Post Implementation Review (PIR) Plan	43
	Annex 2: Competition Impact Assessment Results	45

1. **INTRODUCTION**

1.1 **Background**

1. The EU Emissions Trading System (EU ETS) was established under the European Directive 2003/87/EC which entered into force on 25 October 2003. The purpose of the EU ETS is to promote cost-effective reductions in greenhouse gas (GHG) emissions. It supports the EU's commitment to a global carbon market as a key instrument for tackling climate change, and will be central in enabling the EU to achieve its stated goal of reducing emissions by 20% in 2020 compared to 1990 levels and its commitment to increase the target to 30% as part of an international agreement. The adoption of the 30% reduction target is contingent on other developed countries committing themselves to comparable emissions reductions, and economically more advanced developing countries contributing adequately according to their responsibilities and respective capabilities.
2. The Stern Review (2006)² stated that carbon pricing was one of the three essential elements required to tackle climate change. The review highlighted the benefits of using emissions trading as the principal policy mechanism for mitigation, as it provides both certainty over emission reductions and economically efficient outcomes. The inclusion of aviation in the EU ETS is also supported by the UK Government, as it ensures that the aviation sector makes a cost-effective contribution towards tackling climate change.
3. In September 2005, the European Commission adopted a Communication³ which considered a variety of policies and instruments, and concluded that in view of the likely future growth in international air traffic, a new market-based instrument at Community level, such as emissions trading, was preferable to other financial measures. The European Commission published its legislative proposal in December 2006, and the UK subsequently consulted on this proposal in 2007.
4. The Directive to include aviation in the EU ETS (2008/101/EC)⁴ ("the Aviation ETS Directive") was adopted by the Council of the European Union on 24 October 2008. The Directive amends the existing EU ETS Directive (2003/87/EC) and entered into force on 2 February 2009.

1.2 **Purpose of this Impact Assessment**

5. The UK is transposing the Directive in two stages. On 4 March 2009, a 10-week consultation was launched to seek views on a draft Statutory Instrument to transpose the first stage elements of the Aviation ETS Directive. On 27 August 2009 the final impact assessment was published⁵ and the first stage transposing Regulations⁶ were laid before Parliament. They came into force on 17 September 2009.
6. The purpose of this impact assessment is to consider the costs and benefits of the UK's implementation of the remaining aspects of the Aviation ETS Directive. It therefore focuses only on those elements that are included in the second stage transposition - the key issues are summarised below.

² Stern Review on the Economics of Climate Change (October 2006), available at http://www.hm-treasury.gov.uk/sternreview_index.htm.

³ Document number COM(2005) 459 (2005), *Reducing the Climate Change Impact of Aviation*, available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52005DC0459:EN:NOT>.

⁴ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32008L0101:EN:NOT>.

⁵ Available at http://www.decc.gov.uk/en/content/cms/consultations/aviation_euets/aviation_euets.aspx.

⁶ The Aviation Greenhouse Gas Emissions Trading Scheme Regulations 2009, available at <http://www.legislation.gov.uk/ukSI/2009/2301/made>.

1.3 Changes to Impact Assessment since the Consultation Stage

7. Since the consultation-stage impact assessment, the following key changes have been made to the analysis. These include changes made in light of the opinion from the Regulatory Policy Committee⁷;
- Greater clarity is provided on the price of EU ETS allowances (the EUA price) with and without the inclusion of aviation in the EU ETS.
 - The impact of the inclusion of aviation in the EU ETS on the EUA price between 2008 and 2011 is now incorporated in the analysis and the estimated costs, reflecting the fact that the market is assumed to adjust to the inclusion of aviation when it receives this information, rather than the date at which aviation will enter the system.
 - The estimated costs are now in line with DECC's new estimated EUA prices.⁸ The updated EUA prices take into account the impact of the recession, changes to the scope of the EU ETS and new research on abatement options available in the EU industrial sectors. The reduction in the estimated EUA prices has lowered the estimated costs.
 - The reductions in the estimated level of Business As Usual (BAU) aviation emissions have also reduced the estimated costs of this policy, along with the estimated benefits.
 - The £/€ exchange rate has been adjusted in line with updated government guidance. This has resulted in all costs (which are originally estimated in €) increasing. The benefits are unchanged as the basis for their estimation is done in £.

1.4 Rationale for Government Intervention

8. The justification for government intervention is to address a market failure in that the cost of aviation does not fully reflect the external costs of climate change imposed on others in society by the GHG emissions from this sector.
9. Carbon dioxide (CO₂) is a key GHG, accounting for about 85% of the UK's domestic GHG emissions. In keeping with the global growth in demand for air travel, emissions of CO₂ from aviation have tended to grow strongly over recent decades and are forecast to continue growing. At the global level, international aviation (i.e. flights between countries) accounts for some 1.5% of total CO₂ emissions, and domestic aviation (i.e. flights within countries) a further 1.2%. At the UK level, the UK national atmospheric emissions inventory⁹ shows that emissions from domestic and international aviation assigned to the UK (on the basis of bunker fuel sales) accounted for some 5.5% of UK CO₂ emissions in 2008.
10. An emissions trading system (ETS), such as the EU ETS, ensures a specified environmental outcome by setting a cap on total emissions from participants within the scheme. Participants are allocated allowances that in total add up to the level of emissions permitted under the scheme, and any participants with emissions above their allocation must then purchase additional allowances. Participants who find it cheaper to reduce emissions than to purchase allowances can sell excess allowances to other participants in the scheme. In this way, emissions reductions to meet the cap are made wherever it is most cost-effective to do so.

⁷ Available at <http://regulatorypolicycommittee.independent.gov.uk/rpc/195>.

⁸ DECC (June 2010), *Valuation of energy use and greenhouse gas emissions for appraisal and evaluation*

⁹ Available through http://www.decc.gov.uk/en/content/cms/statistics/climate_change/data/data.aspx.

11. An ETS therefore introduces a direct cost, proportionate to the amount of CO₂ emitted. This encourages further efficiencies and incentivises participants to reduce emissions in the short-run. It also provides incentives to develop technologies to reduce emissions over time.

2. GOVERNMENT AND PUBLIC CONSULTATION

Consultation within Government

12. Development of policy has taken place through the involvement of government departments with an interest in this policy. The Devolved Administrations have also been fully consulted on the implementation of the policy.

Public consultation

13. A public consultation exercise was undertaken regarding the use of economic instruments to internalise the external costs of aviation in 2003. Representatives from industry, the expert community, environmental groups and public bodies were invited to comment through a series of workshops based upon the paper, *Aviation and the Environment: Using Economic Instruments* (2003)¹⁰.
14. Further meetings with stakeholder groups were held in advance of the UK presidency of the European Union in 2005 and informed the UK Government's response to the European Commission's consultation on reducing the climate change impact of aviation¹¹. In general, emissions trading was the preferred option of all groups for reducing emissions, with varying degrees of enthusiasm. Some respondents saw it as the best and only suitable option, whereas others regarded trading as one of a range of potential actions.
15. In addition to ongoing informal contact with the aviation industry and Non-Governmental Organisations (NGOs), we are continuing to engage with existing EU ETS sectors through the Emissions Trading Group and with trade unions through the Trade Union Sustainable Development Advisory Committee (TUSDAC). We have also had discussions with the Sustainability Alliance in order to include stakeholders from professional bodies.
16. At a European level, the results of the European Commission's consultation¹² exercise were broadly similar. The majority of respondents regarded emissions trading as the most attractive way to mitigate the climate change impact of aviation.
17. The UK consulted on the European Commission's proposal in March 2007. Copies of the consultation and associated Regulatory Impact Assessment were sent to key stakeholders including representatives of the airline industry, airports, NGOs, business associations and key industry representatives already participating in the EU ETS. The documents and summary of responses are available on the DfT website¹³.
18. Government ran a consultation between 4 March and 14 May 2009 on the draft Aviation Greenhouse Gas Emissions Trading Scheme Regulations 2009 – the first stage implementing Regulations which transposed key parts of the Aviation EU ETS Directive. The report summarising responses to the consultation and the Government response to

¹⁰ Available at http://www.hm-treasury.gov.uk/d/Aviation_Environment.pdf.

¹¹ For more details see: http://europa.eu.int/comm/environment/climat/aviation_en.htm.

¹² The Commission's report on public consultation can be found at http://europa.eu.int/comm/environment/climat/aviation_en.htm.

¹³ Available at <http://www.dft.gov.uk/consultations/archive/2007/aviationemissionstrading/>.

the consultation can be found at the DECC website¹⁴. Government consulted on its second set of Regulations from 11 December 2009 to 5 March 2010. This consultation built on the first stage consultation and focused on the transposition of the remaining parts of the Directive that were not covered in the first stage Regulations. The consultation document and consultation-stage impact assessment can be found on the DECC consultation website¹⁵.

3. REGULATIONS

19. This impact assessment considers the impact of the second set of Regulations to facilitate the inclusion of aviation within the EU ETS. The first set of Regulations will be repealed in part and replaced by the second set of Regulations.

3.1 Allocation of Allowances

3.1.1. The Aviation Cap

20. Emissions trading delivers a market price for carbon by capping total emissions to a fixed limit, providing certainty over the total quantity of emissions. The environmental effect of an emissions trading system is directly dependent on the cap, since this corresponds to the number of allowances available and therefore the total amount of emissions that participants are allowed to emit. For a given cap, the GHG reductions that can be expected depend on what would have happened if the cap had not been introduced; this is known as business-as-usual (BAU) emissions. The emissions savings from the scheme are the difference between the ETS cap and BAU emissions.
21. The cap to be applied to the aviation sector within the ETS in 2012 will be **97% of average annual aviation CO₂ emissions in 2004, 2005 and 2006, and from 2013 onwards the cap is set at 95% of average emissions over these years**. The 95% may be reviewed as part of the general review of the Aviation ETS Directive in 2014.
22. An open system, with the aviation sector integrated into the EU ETS and able to trade with other sectors within it, will allow emissions reductions to take place where the cost of reduction is lowest. A stand-alone aviation ETS would not be able to achieve the same environmental benefits without extremely high costs to the aviation industry.
23. Aviation allowances equivalent to the aviation cap are created upon aviation's inclusion in the EU ETS and added to the carbon market's volume of allowances. Initially 15% of these will be allocated to aircraft operators through an auction process, 3% will be set aside for the Special Reserve (provided for new and fast-growing aircraft operators) and the remainder will be allocated free of charge using a benchmarking methodology.
24. Aircraft operators covered by the aviation EU ETS must surrender allowances equal to their CO₂ emissions on all flights falling within the scheme departing from or arriving at EU airports (one allowance being equivalent to one tonne of CO₂). There are various means by which an aircraft operator¹⁶ may accumulate its required volume of allowances for the purposes of compliance. Aircraft operators may apply for a free allocation of aviation allowances. Where they decide not to apply or where they do not receive enough free allowances to cover their emissions, aircraft operators will be required to purchase sufficient EU allowances or project credits on the open market.

¹⁴ Available at http://www.decc.gov.uk/en/content/cms/consultations/aviation_euets/aviation_euets.aspx.

¹⁵ Available at <http://decc.gov.uk/en/content/cms/consultations/consultations.aspx>.

¹⁶ Note that the second stage Regulations update the definition of aircraft operator to place obligations on the owner of the aircraft where the operator is unknown or not identified by the owner.

3.1.2. Application for Free Allocation

25. A proportion of aviation allowances will be allocated free of charge¹⁷. The allocation process will be carried out using a benchmarking methodology that allocates allowances in line with the proportion of each operator's share of the activity (total tonne-kilometres) of all aircraft operators in the EU ETS during the 'benchmarking' year. This will be based on "benchmark" data submitted to the regulators prior to the trading phase.

3.1.3. Auctioning

26. For the period 1 January 2012 to 31 December 2012, allowances equivalent to 15% of the cap on aviation emissions will be auctioned. From January 2013, 15% of the cap on aviation emissions will again be auctioned, although this may be increased as part of the general review of the Aviation ETS Directive in 2014. The number of allowances to be auctioned in each period by the UK will be proportionate to its share of the total attributed aviation emissions for all Member States for the reference year¹⁸.
27. Provisions for auctioning are not included within the Regulations that are the subject of this impact assessment. An auctioning Regulation containing detailed provisions for the auctioning of allowances by Member States will be adopted by the European Commission in due course.

3.1.4. The Special Reserve

28. A Special Reserve amounting to 3% of the aviation cap will be set aside. This will provide access to free allowances for new entrant aircraft operators and to assist aircraft operators that sharply increase the number of tonne-kilometres they perform. The competition implications of the Special Reserve are set out further in the Competition Assessment at Annex 2. The Reserve is in part intended to avoid creating a barrier to entry for new entrants who would not otherwise receive a free allocation from a system of allocation based on benchmarking.
29. To be eligible for allowances from the Special Reserve for the trading period 2013 to 2020 (the same process is repeated in subsequent trading periods), aircraft operators must:
- (a) have commenced operations falling within scope of the scheme after the monitoring year of 2010; or
 - (b) increased their tonne-kilometres by an average of more than 18% annually between 2010 (the monitoring year) and 2014.
30. For either of the above cases, an aircraft operator is not eligible if the aviation activity listed above was in whole or in part a continuation of an aviation activity previously performed by another aircraft operator.
31. Aircraft operators coming within either of the above two categories must make an application for Special Reserve allowances to their regulator by 30 June 2015. The following section provides examples to illustrate how an aircraft operator might apply to the Special Reserve under both case (a) and (b).

¹⁷ The regulations regarding application for free allocation were covered in the first stage of transposition and can be viewed at: <http://www.legislation.gov.uk/ukxi/2009/2301/made>. This can also be accessed at http://www.decc.gov.uk/en/content/cms/what_we_do/change_energy/tackling_clima/emissions/eu_ets/aviation/aviation.aspx.

¹⁸ For the purpose of auctioning, attributable emissions will be those associated with all flights departing the UK and all flights arriving into the UK from outside the EU. This is a different definition as is used to attribute emissions to the UK elsewhere in this document.

(a) Where a person becomes an aircraft operator for the first time between 2011 and 2014.

32. If a person becomes an aircraft operator for the first time between 1 January 2011 and 31 December 2014, they may apply to the Special Reserve for a free allocation. The application must contain:

- evidence of their eligibility;
- verified tonne-kilometre data from their aviation activity in 2014; and
- a fee of £1,120.

33. Following submission of an application, the following process applies:

- The regulator will assess the report and, if satisfied with it, send it to the Secretary of State (SoS) by 31 October 2015.
- The SoS will forward the application to the Commission by 31 December 2015.
- The Commission is under an obligation to decide on the benchmark to be used to allocate allowances under the Special Reserve by 30 June 2016.
- Member States must calculate and publish the entitlements of those operators subject to their regulation within three months from the date on which the Commission publishes its decision on the benchmark (by 30 September 2016 at the latest).

Successful applicants will then receive an annual free allocation from 2017-2020. If an operator in this category does not apply in accordance with the above procedure then they will not receive any free allocation.

(b) Where an aircraft operator's tonne-kilometres increases by an average annual rate of more than 18%¹⁹ between 2010 and 2014

34. An aircraft operator in this category may or may not have received a free allocation through the 2010 benchmarking system. An aircraft operator in this category must have performed aviation activity in 2010; if it did not then it would apply under category (a).

35. The application of an eligible aircraft operator under this scenario must:

- contain evidence of their eligibility;
- contain verified tonne-kilometre data of their aviation activity in 2014;
- state the actual increase in tonne-kilometres from 2010 to 2014;
- state the percentage increase in tonne-kilometres from 2010 to 2014;
- state the amount in tonne-kilometres by which the aircraft operator exceeds 93.9% between 2010 and 2014; and
- contain a fee of £1,120.

36. An aircraft operator must show that the percentage increase in tonne-kilometres from 2010 to 2014 exceeds 93.9%, which is equivalent to a compound average annual rate of 18%. As an illustrative example, an aircraft operator performing tonne-kilometres (TKs) of 100,000 in 2010 would be required to perform more than 193,900 tonne-kilometres in 2014 in order to be eligible to apply to the Special Reserve under case (b). The formula to calculate the compound average annual growth rate is as follows:

¹⁹ The Regulations specify that an aircraft operator is eligible to apply to the Special Reserve if their tonne-kilometre data in 2014 is over 93.9% more than its tonne-kilometre data in 2010 (this is equivalent to 18% compound average annual rate).

$$\text{Compound average annual growth rate} = \left(\frac{TK_{2014}}{TK_{2010}} \right)^{1/4} - 1$$

37. Table 1 below provides an illustrative example of the methodology required to calculate the compound annual average growth in tonne-kilometres in order to apply to the Special Reserve under case (b).

Table 1: Illustrative example of an application to the Special Reserve on growth basis

	Benchmark TKs ('000s)	Actual TKs ('000s)	Annual growth rate
2010	100		
2011		150	50.0%
2012		170	13.3%
2013		185	8.8%
2014		194	4.8%
Compound average annual growth rate = 18.02%			

38. Although the growth rate in each individual year is not always above 18%, the compound average annual growth rate calculated using the formula above is (at least) 18%, so the aircraft operator is entitled to apply to the Special Reserve. Successful applicants will receive an annual free allocation from 2017-2020. The Aviation ETS Directive states that an allocation to a successful applicant under case (b) cannot exceed 1 million allowances.
39. Where a person becomes an aircraft operator before 1 January 2011, the main route for free allocation is through the benchmarking allocation procedure, which was set out in the first set of Regulations²⁰ and described above. Where a person becomes an aircraft operator for the first time on or after 1 January 2015, they do not qualify for any free allocation for the first two trading periods. They may, however, qualify for the next trading period (2021 to 2028).

3.2 Surrendering Allowances

40. By 30 April each year, aircraft operators must surrender allowances equivalent to their total reportable aviation CO₂ emissions during the preceding calendar year. Operators may surrender different types of allowances and project credits in order to cover their respective emissions. These include:
- (i) *Aviation Allowances* (or EUAAs – the allowances available that make up the aviation cap) – 15% of allowances will be allocated through an auctioning process; 3% will be free and set aside in the Special Reserve; and the remainder are allocated free of charge through the benchmarking process. Aviation allowances may only be surrendered by aircraft operators and cannot be surrendered by other sectors in the EU ETS.
 - (ii) *EU Allowances (EUAs)* – these will be available for aircraft operators to purchase on the open market from other sectors in the EU ETS.

²⁰ Available at <http://www.legislation.gov.uk/ukxi/2009/2301/made>. This can also be accessed at http://www.decc.gov.uk/en/content/cms/what_we_do/change_energy/tackling_clima/emissions/eu_ets/aviation/aviation.aspx.

- (iii) *Emission Reduction Units (ERUs)* – available through Joint Implementation (JI) projects between countries that have targets to reach under the Kyoto Protocol.
- (iv) *Certified Emission Reductions (CERs)* – available through Clean Development Mechanism (CDM) projects which involve investment in emission reduction or sequestration projects in developing countries without emission targets.

3.2.1. The Use of Project Credits

- 41. Allowing for the use of Kyoto project credits (ERUs and CERs) provides operators with the flexibility to undertake emission abatement where it is cheapest to do so. These projects also provide a source of finance to help developing countries become low carbon economies by supporting investment in emission reduction projects. However, allowing unlimited access to project credits could reduce the amount of domestic abatement and possibly discourage operators within the scheme from investing in low-carbon technologies.
- 42. The Aviation ETS Directive limits the extent to which aircraft operators can surrender project credits within EU ETS. For the trading period 2012, an aircraft operator must not surrender project credits amounting to more than 15% of the total amount of allowances they are required to surrender to account for their emissions. For the period 2013 – 2020, the percentage of project credits that the aviation sector will have access to will not be set below 1.5% of verified emissions²¹. However, it is expected this level will be reviewed through comitology in 2010.

3.3 Penalties and sanctions

- 43. Failure to comply with the Regulations can result in operators facing financial penalties; many of these were set out in the first stage Regulations²².
- 44. The second stage Regulations that are the subject of this impact assessment also set out a new civil penalty of £1,000 for making a false or misleading statement in an application to the regulator in relation to applying to the Special Reserve. In addition there is a new penalty for an operator that fails to comply with conditions in its emissions plan. For failure before 1 January 2012 the penalty is £500 and £50 for each day the aircraft operator fails to comply up to a maximum for £4,500. For failure from 2012 onwards the penalty is £1,500 and £150 each day up to a maximum of £13,500.
- 45. In the case where an operator does not surrender sufficient allowances to the registry by 30 April 2013 (and every year thereafter) to cover its reportable emissions during the preceding calendar year, the following penalty, as prescribed by the Aviation ETS Directive, will apply:

€100 for each tonne of CO₂ emitted for which the aircraft operator has not surrendered allowances.²³ Payment of the excess emissions penalty shall not release the operator or aircraft operator from the obligation to surrender an amount of allowances equal to those excess emissions when surrendering allowances in relation to the following calendar year.

²¹ This provision is set out in the amending Directive 2009/29/EC to improve and extend the greenhouse gas emission allowance trading scheme, available at:

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:140:0063:0087:EN:PDF>

²² The First Stage Regulations can be found at <http://www.legislation.gov.uk/ukxi/2009/2301/made>.

²³ The excess emissions penalty relating to allowances issued from 1 January 2013 onwards will increase in accordance with the European index of consumer prices.

The Aviation ETS Directive requires Member States to ensure publication of the names of aircraft operators who are in breach of requirements to surrender sufficient allowances. The regulator will publish on its website a list of operators that were liable to this civil penalty in the previous year.

3.3.1 Operating ban

46. The Aviation ETS Directive sets out that in the event that an aircraft operator fails to comply with the requirements of the Directive and where other enforcement measures have failed to ensure compliance, its administering Member State may request the Commission to decide on the imposition of an operating ban on that aircraft operator. Where the Secretary of State intends to apply to the European Commission to impose an operating ban on an aircraft operator, certain procedures will apply as set out in the Regulations at Regulation 50 (1).
47. Following the application, the Commission may adopt a decision to impose an operating ban on the aircraft operator concerned. Each Member State must then enforce any operating ban within its territory, and inform the Commission of any measures taken to implement the ban.
48. In the event of an operating ban being in force, the Regulations set out that the regulator must take all reasonable steps to ensure a banned operator does not operate a flight to or from the UK. To do this the regulator would be able to issue a direction (after receiving approval from the authority²⁴ and, if necessary, approval from the authority in the relevant part of the United Kingdom) to an aerodrome operator or any other person that the regulator deems necessary to enforce the ban. The regulator would also be able to detain any aircraft operated by the banned operator, and with leave of the court sell the aircraft to recover regulator expenses if the operating ban was not lifted within 56 days of the start of the detention²⁵.

3.3.2. Penalty for Failing to Comply with Direction in Enforcement of an Operating Ban

49. The Regulations set out a civil penalty of £50,000 for any person not complying with any direction issued by the regulator in the enforcement of an operating ban.

3.3.3. Assistance of Aerodrome Operators

50. As set out in the first stage Regulations, in extreme cases of non-payment of civil penalties incurred for non-compliance, the regulator may detain any aircraft operated by the operator in default in order to recover the debt.
51. The second stage Regulations provide that aerodrome operators have a duty to provide reasonable advice and assistance to the regulator in connection with any of the regulator's functions relating to the detention and sale of aircraft. The Regulations set out a civil penalty of £50,000 where an aerodrome operator fails to provide assistance and advice.

3.3.4. Appeals

52. Provision for an appeals process was consulted on for the first set of transposing Regulations. However, the second stage Regulations provide for an appeals process for:

²⁴ See the accompanying Regulations for the definition of 'authority'.

²⁵ The same provisions relating to detention and sale of an aircraft apply as those set out in Part 10 of the accompanying Regulations. These provisions were included in the first stage implementing Regulations.

- an operator where a decision has been made by the regulator not to submit to the Secretary of State the operator's application to the Special Reserve;
- an aerodrome operator who has been served a notice in relation to a civil penalty for failing to provide reasonable advice and assistance to the regulator with regard to the duty in connection with any of the regulator's functions relating to the detention and sale of aircraft;
- a person who has been served a notice in relation to a civil penalty for failing to submit or re-submit an application for an emissions plan;
- persons not complying with a direction relating to an operating ban; and
- persons making a false or misleading statement in a benchmarking report.

3.4 **Annual Subsistence Charge**

53. In the existing EU ETS, there is an annual subsistence charge which recovers the regulator's costs not otherwise recovered under specific fees. A similar approach will be applicable in the aviation EU ETS. A summary of how these annual charges will apply is set out below.

Table 2 – Annual subsistence charges

Operator's estimated annual emissions	Base charge (£)	Variable charge (£)
Less than 50,000 tonnes	£1,920	£630
50,000 – 500,000 tonnes	£2,490	£830
More than 500,000 tonnes	£3,060	£1,020

54. In the first year a person becomes an aircraft operator, the variable element of the subsistence charge (25% of the subsistence charge) will be pro-rated from the date its plan is first issued, to reflect the fact that the regulators costs will be proportionately less where an operator is to be regulated for less than 12 months. However, the base charge (75% of the subsistence charge) will be payable by all operators, no matter at which point they join the System, reflecting the fact that the regulators incur 75% of the annual costs associated with regulating an operator, regardless of whether they are to be regulated for 12 months or less.
55. Amendments may be made to the Regulations at a future date to allow the regulator to make its own charging scheme. The powers relied upon to make a scheme to impose charges are contained within the Environment Act 1995 and in the case of Northern Ireland the Environment (Northern Ireland) Order 2002. As each makes reference to the Commission Regulation on Registries which is not yet in force, provisions cannot be included in the Aviation Greenhouse Gas Emissions Trading Scheme Regulations 2010.
56. The charges in the Regulations are based on the cost estimates of the Environment Agency (which will regulate the majority of aircraft operators, with input from the other regulators). In setting charges, the Environment Agency has made estimates of the number of operators subject to regulation, and estimates of the costs of its regulatory effort.

57. The charges set out in the Regulations will be comprehensively reviewed by the regulators in 2011, following experience of a full compliance year of the scheme. Time recording information will be used and calculations will be based on the exact number of aircraft operators regulated under the scheme.
58. The subsistence charge is banded by reference to the aircraft operator's estimated annual emissions²⁶. This is because the regulators will incur greater costs in regulating large emitters. The Environment Agency identified several work areas where the level of effort, and the resulting input cost, varied for different sized operators. The Environment Agency has estimated this cost differential between each band of operator to arrive at the charges shown above.

3.5 Other Charges

59. The Regulations also set out two further charges. In certain circumstances, an aircraft operator should apply to the regulator to vary their emissions plan. If the aircraft operator fails to do so, the regulator will amend the emissions plan. A charge of £430 is payable for varying an emissions plan (whether the variation is applied for by the aircraft operator or made by the regulator).
60. In the event that the regulator is required to determine emissions on behalf of an aircraft operator, an hourly charge of £115 per hour will be charged.

4. COSTS AND BENEFITS

61. This section sets out the estimated costs and benefits of the Regulations that are the subject of this impact assessment and are summarised above. It has not always been possible to place a monetary value on some of the costs and benefits; where this is the case a full qualitative description has been provided.
62. The approach taken to estimate the value of the costs and benefits to the UK is consistent with the methodology that was used for the UK impact assessment of the EU 2020 Climate and Energy Package²⁷ and all modelling analysis is consistent with DECC's latest estimated EUA prices²⁸ to be used for appraisal purposes.

Limitations of the Analysis

63. It is important to recognise the following limitations of the analysis when interpreting the estimates of costs and benefits for the UK.
 - Definitional issues and data limitations prevent us from accurately estimating the proportion of EU costs and benefits that should be attributed to the UK (see paragraph 86). Two illustrative methodologies have therefore been used for the purposes of this impact assessment. In line with the way international aviation emissions are reported as a memo²⁹ item to the United Nations (based on bunker fuel sales), the central estimates use an 'all departing flights' scenario (i.e. flights departing from UK airports). However, there a number of reasons why this scenario

²⁶ The Regulations define estimated aviation emissions as a reasonable estimate by the regulator of the aviation emissions of an aircraft operator for the following year.

²⁷ DECC (April 2009), *Impact Assessment of the EU Climate and Energy package, the revised EU Emissions Trading System Directive and meeting the UK non-traded target through UK carbon budgets*. Available through http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_budgets/carbon_budgets.aspx.

²⁸ DECC (June 2010), *Valuation of energy use and greenhouse gas emissions for appraisal and evaluation*

²⁹ International aviation and shipping are excluded from the national total, but are reported as memo items.

may not be an accurate reflection of costs and benefits to the UK. A sensitivity is therefore presented using an 'all departing and arriving flights' scenario (i.e. flights departing from or arriving at UK airports) – this scenario also has a number of limitations. In particular, the 'all departing and arriving flights' scenario could be considered to overestimate the volume of emissions associated with the 'UK aviation sector' because it has not been able to strip out the emissions from flights to and from other EU countries. It should be noted that these illustrative scenarios do not prejudge a view on the apportioning of emissions to the UK in the event of an international deal. In addition, it should also be noted that the total CO₂ emissions under these scenarios are highly unlikely to correspond to the total aviation CO₂ emissions from aircraft operators that have been assigned for regulation by the UK.

- The value placed on the damage avoided by reducing CO₂ emissions is subject to significant uncertainty and dependent on whether action in the EU is pivotal in inducing global action on climate change. The results of two scenarios have therefore been shown to illustrate the potential range under different assumptions. In line with the UK's impact assessment of the EU 2020 Climate and Energy Package, the central scenario assumes that the Aviation ETS Directive alongside the EU 2020 package is pivotal to inducing global action to move the world to a 450ppm stabilisation trajectory.
- The "UK benefits" identified in this impact assessment should be interpreted as the UK's contribution to the global benefits of avoided climate change. They do not reflect specific estimates of climate change damage avoided in the UK.
- The proportion of the estimated benefits that are wholly attributable to the Regulations is very uncertain, because of the difficulties with estimating the level of emissions without these Regulations and the extent that these Regulations contribute to the world moving to a 450ppm emissions trajectory.
- The estimation of the costs and benefits from aviation joining the EU ETS are heavily dependent on estimates of Business As Usual (BAU) emissions from EU and 'UK' aviation. As with any forecasts, they are subject to uncertainty.
- The estimated costs are sensitive to the assumptions that have been made for the purposes of this impact assessment. For example, aviation is not assumed to undertake abatement itself.
- The DECC modelling framework is not able to account for any feedback effect on the demand for air transportation (which comprises both air passenger and air freight demand). It is expected that the aviation sector will pass on at least some of the cost of abatement, and purchasing allowances and credits, to consumers in the form of higher prices (e.g. air fares and air freight rates). This change in the price of air transportation would be expected to dampen the demand for air transportation, but this reduction is not picked up by the DECC Carbon Price model. Should the demand for air transportation be reduced to the extent that the number of flights is reduced, as a source of additional potential abatement, this would lower the level of aviation emissions, and hence the additional effort required to achieve a given cap on aviation emissions. The overall impact of this is unclear – by not taking account of the impact on the demand for air transportation, the estimates below could overstate the total costs of meeting the cap. However, this feedback effect on the demand for air transportation would itself impose a cost. Section 4.1.6 outlines the likely size of demand reduction and potential impact on EUA prices.
- The analytical methodology that has been used to estimate the costs and benefits in this impact assessment is consistent with the UK modelling of the impacts of the EU Climate and Energy package, as presented in the UK's impact assessment of the package³⁰. However, it should be noted that the estimates of the costs presented in this impact assessment were estimated using a more recent version of DECC's

³⁰ DECC (April 2009), *Impact Assessment of the EU Climate and Energy package, the revised EU Emissions Trading System Directive and meeting the UK non-traded target through UK carbon budgets*. Available through http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_budgets/carbon_budgets.aspx.

Carbon Price model. This takes into account the impact of the recession at EU level, changes to the scope of the EU ETS and new research on the abatement options that are available in the EU industrial sectors.

4.1 **Costs**

4.1.1 **Consistency with previous analysis of abatement costs**

64. The approach that has been used to estimate the costs is consistent with the consultation stage impact assessment and the UK's impact assessment for the EU Climate and Energy Package. However, there have been some updates to the modelling framework which mean that the underlying modelling inputs are not fully consistent. In particular:

- the fossil fuel price assumptions have been updated to reflect the latest Government projections³¹;
- the industrial sector is now modelled using a more recent marginal abatement cost curve;
- the estimated level of BAU emissions (at the EU level) for both the aviation and non-aviation sectors in the EU ETS have been reduced to reflect the impact of the recent economic downturn;
- the estimated EUA prices implicit in this analysis account for aviation (**at the EU level**) being included in the EU ETS on an 'all departing and arriving flights' basis, rather than the previously used estimates which assumed an 'all departing flights' only basis. This is consistent with the design of the EU ETS, which will capture flights departing from and arriving at EU airports.

4.1.2 **Approach to estimating EU-wide abatement costs**

65. The starting point for analysis of the costs to the EU is to establish the EU counterfactual level of emissions (i.e. what would happen otherwise in the absence of aviation joining the EU ETS). This can then be compared to the 'policy case' in which aviation is included in the EU ETS from 2012, and the additional costs associated with meeting the new cap can be estimated.

66. The counterfactual assumes that emissions from non-aviation sectors already covered by the EU ETS are capped in line with the EU Climate and Energy package. As the cap is set below the estimated BAU level of emissions, carbon abatement actions must be undertaken. Project credits – emissions reductions purchased through the Clean Development Mechanism (CDM) and Joint Implementation mechanism (JI) – are included within the modelling of potential carbon abatement actions. The total cost to the economy is the sum of the cost of individual abatement actions required to ensure that the cap is met.

67. The 'policy case' has aviation included in the EU ETS from 2012. This increases the level of BAU emissions covered by the system and the overall cap. As above, the cap applied to the EU aviation sector in 2012 will be 97% of the average annual EU aviation CO₂ emissions in 2004, 2005 and 2006, and from 2013 onwards the cap will be set at 95% of the average emissions over these three years.

68. It should be noted that as the Aviation ETS Directive was adopted by the Council of the European Union on 24 October 2008, the carbon market is likely to have anticipated the inclusion of aviation in the EU ETS and adjusted accordingly prior to aviation's inclusion in the EU ETS in 2012. As aviation is expected to be a net buyer of EUAs, DECC estimate

³¹ Available at <http://www.decc.gov.uk/en/content/cms/statistics/projections/projections.aspx>.

that the anticipated inclusion of aviation in the EU ETS will result in more abatement prior to 2012 and thereby increase the EUA prices in 2008-2011.

69. For the consultation stage impact assessment, forecasts of CO₂ emissions from flights arriving at and departing from EU airports were taken from the European Commission's Impact Assessment³². This suggested that BAU aviation emissions are higher than the cap in each year and leads to an increase in the 'effort' (the level of abatement relative to BAU) required in the EU ETS. In light of the economic downturn and the latest evidence, DECC believe that these forecasts now represent significant over-estimates of BAU aviation emissions. This final stage impact assessment uses a new forecast of emissions, which is presented below. This new forecast is estimated assuming growth in line with Eurocontrol's forecasts of air traffic growth³³ and assuming that the emission intensity of flights remains unchanged. These new estimates still show BAU aviation emissions higher than the cap in each year.
70. Table 3 sets out the estimated CO₂ emissions savings for EU aviation as a whole on an 'all departing and arriving flights' basis (i.e. from flights departing from or arriving at EU airports), as this is the basis on which aviation is being included in the EU ETS. These estimates suggest that required 'effort' in the EU ETS will increase by around 80 million tonnes of CO₂ (MtCO₂) in 2020, and that the total 'effort' between 2012 and 2020 will increase by around 480 MtCO₂. The aviation sector will either have to abate a significant volume of its emissions itself out to 2020, or purchase allowances (and/or project credits) from the market and therefore fund emission reductions in other sectors.

Table 3: Forecast CO₂ emissions from flights arriving at and departing from the EU

All figures are in MtCO ₂									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
Business as usual emissions	235	241	248	253	258	264	271	277	285
Aviation sector cap	210	206	206	206	206	206	206	206	206
Savings/effort	25	36	42	47	52	58	65	72	79

Source: Bloomberg analysis based on EuroControl growth rates and CE Delft emission estimates

71. In terms of the marginal abatement cost curves that are included for the aviation sector in the DECC modelling framework, no abatement is assumed to take place within the aviation sector itself before 2020. This is due to the fact that fleet replacement in addition to the replacement that is expected to happen anyway by 2020 is likely to be small, given that aircraft have a lifespan of some 25 years. Furthermore, additional technology developments will also have long lead times. So, additional abatement brought on by the EU ETS within this timeframe is expected to be small. However, there may be certain additional measures that the aviation sector is able to implement before 2020, which would reduce aviation emissions below BAU and therefore the sector's demand for allowances and credits. By ignoring these potential abatement opportunities in this analysis, the cost estimates presented below may overestimate the total cost of the inclusion of aviation in the EU ETS.
72. As it is assumed that there will be no reduction in EU aviation emissions as a result of its inclusion in the EU ETS for the purpose of this modelling (i.e. EU aviation emissions will

³² Available at http://ec.europa.eu/environment/climat/aviation/pdf/sec_2006_1684_en.pdf.

³³ Available at

<http://www.eurocontrol.int/statfor/gallery/content/public/forecasts/Doc280%20MTF08%20Report%20Vol1%20v1.0.pdf>.

remain at BAU levels), and it is estimated that the inclusion of aviation in the EU ETS will lead to an increase in the 'effort' required in the EU ETS, additional abatement will need to be undertaken in the other sectors of the EU ETS to meet the cap, increasing the price of EUAs. Without aviation, the EUA price is estimated to be around £10 per tonne of CO₂ (tCO₂) in 2020. The inclusion of aviation in the EU ETS is estimated to increase the 2020 EUA price to around £16/tCO₂ in 2020. The estimated increase in the price of EUAs in the 'policy case' is thus around £6/tCO₂ in 2020. The estimates for other years are shown in Table 4.

Table 4: Carbon prices with and without aviation in the EU ETS

All carbon prices are in £'s per tCO ₂ in 2009 prices													
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
EUA price without aviation	8.4	8.5	8.6	8.8	8.9	9.0	9.2	9.3	9.4	9.6	9.7	9.9	10.0
EUA price with aviation	13.6	13.8	14.0	14.2	14.5	14.7	14.9	15.1	15.3	15.6	15.8	16.0	16.3

Source: DECC analysis

73. It should be noted the EUA price modelling assumes perfect foresight and is designed to capture the effect of changes in the fundamentals underpinning the EUA price rather than short term fluctuations. Thus the historical prices reflect a price consistent with the fundamentals and cost of carry rather than mirroring the EUAs prices seen in the actual carbon market. The estimated EUA prices rise over time with the cost of carry.
74. Due to the estimated increase in EUA prices, the abatement costs of meeting the cap in the non-aviation sectors of the EU ETS will be higher in the 'policy case' as more expensive abatement actions must be undertaken. However, as shown below, the aggregate additional abatement costs for firms in non-aviation sectors are estimated to be offset by the aggregate revenues that firms in the non-aviation sectors of the EU ETS will receive from selling EUAs to the aviation sector. As before, the total cost to the EU economy is the sum of the cost of individual abatement actions required to ensure the cap is met.
75. The total additional abatement costs for the EU of aviation entering the EU ETS equals the difference between the 'policy case' and the counterfactual. Table 5 presents the estimated total additional abatement costs for the EU as a result of aviation being included in the EU ETS in discounted present value terms.

Table 5: Estimated present value of the additional abatement costs for the EU

Present value of costs (£ billion 2009 Prices)	
Counterfactual	£14.3 billion
Policy Case	£19.0 billion
Total Additional Abatement Costs (Counterfactual minus Policy Case)	£4.7 billion

Source: DECC analysis

76. The annual breakdown of the estimated costs is presented in Table 6.

Table 6: Annual breakdown of abatement costs for the EU

Present value of costs (£ billion 2009 prices)														
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Counterfactual	2.2	2.3	2.3	2.3	2.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	14.3
Policy case	2.6	2.7	2.7	2.6	2.8	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	19.0
Additional Abatement Costs	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	4.7

Source: DECC analysis

77. Given that the costs have been estimated on the assumption that the aviation sector does not undertake any abatement itself, the aviation sector will therefore be a net purchaser of EUAs (allowances purchased over and above the ‘aviation cap’). The (present value) cost of net purchases of EUAs by the aviation sector is estimated at £5.6 billion. Thus, it is estimated that the total aggregate revenues that firms in the non-aviation sectors in the EU ETS will receive from the sale of EUAs to the aviation sector will exceed their aggregate additional costs of abatement due to the inclusion of aviation in the EU ETS by around £900 million.
78. It should be noted that in the above methodology, there is no consideration of the extent to which costs are passed through to consumers or whether EUAs are freely allocated or auctioned. The pass through of the costs of EUAs and credits to consumers is simply considered a transfer from consumers to producers. Similarly, the auctioning of EUAs is considered a transfer from producers and consumers to government. The inclusion of aviation into the EU ETS on an ‘all departing and arriving flights’ basis will mean that some non-EU passengers and firms face an increase in costs. **Therefore, the ‘net’ costs to the EU will be overstated in the above estimates.**

4.1.3. Approach to estimating the UK’s share of the EU-wide abatement costs

79. As in the case of estimating EU costs, the cost to the UK as a result of aviation being included in the EU ETS is estimated by comparing the costs in the counterfactual and the ‘policy case’.
80. Unlike the EU-wide costs, costs at Member State level may be higher or lower than simply the cost of additional abatement, as countries may be net buyers or sellers of EUAs. The ‘net economic costs’ to the UK (and all Member States) is the sum of:



81. Unfortunately, the available evidence does not allow us to break down the costs and benefits to consumers, producers and government. Within this impact assessment, a different approach is used for the aviation sector compared to non-aviation sectors.
82. For non-aviation sectors and for the purpose of this analysis, ‘UK firms’ refers to all installations that are participants in the EU ETS and are located in the UK, while ‘UK consumers’ refers to the purchasers of products from these companies. In reality, UK residents will purchase from firms that are located outside the UK, while some UK owned

firms will be located outside the UK and / or will sell to non-UK residents. However, the available evidence does not allow us to split the costs in this way. As a result of this assumption, it is assumed that the costs to 'UK consumers' from higher prices will be directly equal (and therefore cancel out) the increased revenues to 'UK firms' in this analysis. This is not likely to be the case in practice. The direction of bias as a result of this assumption is uncertain.

83. Firms will need to purchase EUAs and credits to account for any emissions above their free allocation. Any purchases of EUAs from the Government (through the auction mechanism) will be cancelled out in the 'net economic cost' as they will also be treated as a revenue to government. Therefore, the last two elements of the above equation can be simplified to the cost of purchasing EUAs and project credits from the market to account for the difference between the actual emissions from UK installations during the compliance period and the 'UK ETS cap' (free allowances these firms receive and the auction rights assigned to the UK government).
84. The 'net economic costs' to the UK of meeting the emissions cap covering non-aviation sectors of the EU ETS are therefore equal to:
- the cost of abatement actions undertaken by UK firms within the EU ETS; and
 - net purchases of EUAs and project credits by UK emitters multiplied by the price of EUAs and project credits respectively.
85. As noted in paragraph 72, the inclusion of aviation in the EU ETS is estimated to increase the price of EUAs for all sectors, and will therefore change the net economic cost to non-aviation sectors in the UK of meeting the emissions cap. The precise impact will depend on whether the UK is a net seller or net buyer of EUAs. As the non-aviation sectors of the EU ETS in the UK are estimated to be overall net sellers of EUAs between 2008 and 2020, the impact of a higher EUA price is estimated to decrease the overall net economic cost to these sectors of meeting the ETS emissions cap.
86. For the aviation sector, a variety of metrics could be used to apportion the EU aviation sector costs to the UK. These include the proportion of EU aviation emissions that are accounted for by:
- (i) Passengers who are UK residents;
 - (ii) Firms that are UK owned and / or registered;
 - (iii) Passengers or freight that departs from a UK airport;
 - (iv) Passengers or freight that departs from or arrives at a UK airport; or
 - (v) Passengers or freight that departs or arrives on a flight that the UK regulates under the ETS.
87. There are clearly merits in all of the above methodologies, although data availability limits the options that can be assessed in practice to methods (iii) and (iv). It should be noted that the methodology that is chosen will strongly influence the results. For example, using method (iii) would be broadly consistent with the treatment of aviation in the National Atmospheric Emissions Inventory, and would only cover departing flights. In contrast, using method (iv) would be broadly consistent with the way EU aviation sector costs have been estimated, and would cover both departing and arriving flights. However, if method (iv) was replicated for each Member State across the EU, the sum of costs would significantly exceed the total EU costs, as costs associated with intra-EU flights would be counted by both countries that a flight departs from and arrives at.
88. The proportion of EU aviation sector costs (and benefits) that are apportioned to the UK will therefore be strongly influenced by the method that is used. For the purposes of illustration only and to provide an estimate of the order of magnitude of the costs (and

benefits) to the UK, estimates using method (iii) have been used as a 'central' case, and estimates using method (iv) have been shown as a 'sensitivity test'.

89. As the aviation sector is not assumed to abate any emissions beyond BAU out to 2020 for the purposes of this impact assessment, the 'net economic costs' to the UK of meeting the emissions cap in the aviation sector are assumed to be equal to the cost of purchasing EUAs and project credits from the market to account for the difference between the aviation emissions that it is estimated would be attributed to the UK during the compliance period and the indicative 'de facto UK cap' for aviation emissions, which is assumed to be the capped level of aviation emissions that it is estimated would be attributed to the UK during the compliance period (i.e. those allowances that are assigned to the aviation sector through free allowances and auctioning).
90. The inclusion of aviation in the EU ETS will therefore have the following impact on UK costs:
- Without aviation, the EUA price is estimated to be around £10/tCO₂ in 2020. The inclusion of aviation in the EU ETS is estimated to increase the 2020 EUA price to around £16/tCO₂ in 2020. The increase in the EUA price will result in non-aviation UK firms within the EU ETS collectively undertaking greater levels of abatement at a higher cost.
 - It is estimated that undertaking this abatement will reduce the net quantity of EUAs purchased by non-aviation sectors in the UK. However, as the UK is estimated to remain a net purchaser of EUAs overall (with the aviation sector included), the increase in the EUA price is estimated to increase the overall costs to the UK.
 - The 'UK aviation sector' itself will purchase EUAs and project credits to account for the difference between its actual emissions and the 'aviation cap'³⁴. To estimate this cost, the level of BAU emissions and an illustrative cap for the 'UK aviation sector' have been estimated.
91. The estimated BAU aviation emissions and illustrative 'aviation cap' for the 'UK aviation sector' are presented in Tables 7 and 8. These are based on the following:
- a) An estimate of an indicative 'de facto UK cap' for aviation emissions in the 'central' case is based on estimates of the average emissions from all flights departing from the UK in 2004, 2005, and 2006³⁵.
 - b) A sensitivity test has also been performed by estimating an indicative 'de facto UK cap' for aviation emissions on an 'all departing and arriving flights' basis. Simplistically, this has been estimated to be the sum of emissions from UK domestic flights (internal to the UK) and double the emissions from UK international departing flights (on the basis that departing and arriving will be broadly equal)³⁶. This could be considered to overestimate the volume of emissions associated with the 'UK aviation sector' because it has not been able to strip out the emissions from flights to and from other EU countries. Therefore, if other EU countries were to undertake similar analysis on the same basis, intra-EU flights would be double-counted. However, this overestimation for the UK implies that both the benefits and the costs have been overestimated proportionately in this scenario.
 - c) Estimates of the forecast level of CO₂ emissions from all flights departing from (and arriving into) the UK for the years 2012-2020 under BAU (i.e. in the absence of a cap) are based on a sensitivity test around the 'central' forecast of CO₂ emissions from flights departing from the UK published by the DfT in January 2009 that assumes no

³⁴ As noted above, this cost is the difference between the 'aviation cap' and the estimated aviation emissions. The 'aviation cap' includes free allowances to the aviation sector and the auction rights apportioned to the 'aviation sector'.

³⁵ As reported in the UK National Atmospheric Emissions Inventory.

³⁶ This approach has been taken as there are no available data on emissions from flights arriving into the UK.

airport expansion and GDP growth consistent with the HM Treasury PBR 2008³⁷. In light of the recent economic downturn and the decisions on airport expansion set out in *'The Coalition: our programme for government'*³⁸, it is considered that this sensitivity test represents the most appropriate DfT scenario of the CO₂ emissions from 'UK aviation' to use as BAU for the purposes of this analysis. However, this scenario still has a number of limitations. In particular, the economic growth rates for the near future which underpin these forecasts are above the recent forecasts of economic growth, so it is likely that these forecasts overstate the likely level of 'UK aviation emissions'. This will result in this Impact Assessment overstating the costs and benefits attributable to the UK.

- d) An estimate of the level of EUAs and project credits beyond the cap purchased by 'UK aviation' that would therefore be expected as a result of aviation joining the EU ETS from 2012. This also provides an estimate of the order of magnitude of the emission savings attributable to the UK. This will be equivalent to the difference between the cap on emissions, (a), and forecast BAU aviation emissions in the absence of a cap, (c).

Table 7: Illustrative estimates of UK aviation CO₂ emissions and savings on an all departing flights basis

All figures are MtCO ₂									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
BAU aviation emissions	41.8	42.8	43.7	44.3	45.2	45.5	46.6	46.9	47.4
Cap	35.6	34.9	34.9	34.9	34.9	34.9	34.9	34.9	34.9
Emissions Savings/ Effort	6.2	7.9	8.8	9.4	10.3	10.6	11.7	12.0	12.5

Source: Estimates based on DfT's UK Air Passenger Demand and CO₂ Forecasts, January 2009

Table 8: Illustrative estimates of UK aviation CO₂ emissions and savings on an all departing and arriving flights basis

All figures in MtCO ₂									
	2012	2013	2014	2015	2016	2017	2018	2019	2020
BAU Aviation emissions	81.2	83.1	84.7	85.9	87.7	88.2	90.3	90.9	91.8
Cap	69.0	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5
Emissions Savings/effort	12.2	15.5	17.1	18.4	20.1	20.6	22.7	23.4	24.3

Source: Estimates based on DfT's UK Air Passenger Demand and CO₂ Forecasts, January 2009

92. Table 9 presents the estimated illustrative costs to the UK as a result of aviation joining the EU ETS on an 'all departing flights' basis in discounted present value terms.

³⁷ This forecast of UK aviation CO₂ forecasts were produced using the following assumptions:

- The forecasts of passenger demand were produced assuming that each airport develops as necessary to fully utilise its current runway capacity. No further expansion of runway capacity is assumed.
- The forecasts assume fuel efficiency improvements in the form of both improvements to air traffic management and improvements in line with the EU manufacturers' target for fuel efficiency improvement for new aircraft by 2020, and that these aircraft form a larger share of the fleet over time. The forecasts do not assume any major new technological developments, nor the adoption of sustainable alternative fuels. The industry has suggested that these have the potential to offer significant reductions.

- Oil price assumptions are from DECC.

- GDP assumptions (economic growth) are from HM Treasury PBR 2008.

- Departing passengers are assumed to face an additional cost equal to the difference between Air Passenger Duty (APD) and aviation's climate change costs per passenger journey. Therefore, this forecast already partially reflects the additional cost that would be faced by passengers due to the inclusion of aviation in the EU ETS and the reduction in demand that would be expected to arise as a result. Compared to a forecast in which this additional cost did not apply, this reduces the level of abatement that would be required to meet the cap and consequently the estimated emission savings.

³⁸ Available at http://www.cabinetoffice.gov.uk/media/409088/pfg_coalition.pdf.

Table 9: Estimated present value of the costs to the UK on an all departing flights basis

Present value of costs (£ billion 2009 Prices)	
Counterfactual	£0.6 billion
Policy case	£1.1 billion
Total Additional Costs (Counterfactual minus Policy Case)	£0.5 billion

Source: DECC analysis

93. There are a number of uncertainties to bear in mind when considering and estimating such costs to the UK; not least is the fact that as noted above, the results have been based on a stylised version of 'UK aviation sector' costs.
94. An alternative approach to estimating the costs to the UK is to use the same basis as that presented in Table 8 but incorporating 'UK aviation' costs on an 'all departing and arriving flights' basis, rather than an 'all departing flights' basis. Table 10 shows the resulting estimated costs in discounted present value terms.

Table 10: Estimated present value of the costs to the UK on an all departing and arriving flights basis

Present value of costs (£ billion 2009 Prices)	
Counterfactual	£0.6 billion
Policy case	£2.1 billion
Total Additional Costs (Counterfactual minus Policy Case)	£1.5 billion

Source: DECC analysis

95. Table 11 presents the present value of the costs into its constituent parts: the costs for the 'UK aviation sector', and the additional costs for non-aviation sectors in the UK in discounted present value terms. Table 12 breaks down the total costs to the UK on an annual basis in discounted present value terms.

Table 11: Estimated present value of the costs to the UK

Present value of costs (£ billion 2009 Prices)		
	All departing flights basis	All departing and arriving flights basis
Costs to the 'UK aviation sector' (buying EUAs and project credits)	£1.0 billion	£2.0 billion
Additional cost to non-aviation ETS firms (additional abatement + extra cost of net purchases)	£-0.5 billion (non-aviation sectors are net sellers)	£-0.5 billion (non-aviation sectors are net sellers)
Total Additional Costs (Present Value Cost)	£0.5 billion	£1.5 billion

Source: DECC analysis

Table 12: Estimated present value of the costs to the UK

Present value of costs (£ million 2009 prices)														
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
All departing flights basis	-23	-128	-167	-140	-120	126	140	156	140	138	150	135	112	520
Departing and arriving flights basis	-23	-128	-167	-140	-43	222	244	265	257	255	276	263	242	1525

Source: DECC analysis

96. The extent that these costs will be passed onto consumers is expected to vary between different sectors of the economy. However, where these costs are passed on to consumers, some of these costs are likely to be passed on to non-UK consumers. Furthermore, according to the current Aviation ETS Directive, the UK will receive auction revenues from all departing flights and flights arriving into the UK from outside the EU. Our analysis has considered auction revenues as a transfer from UK consumers to UK government, although in reality, many of these costs are likely to also fall on non-UK consumers.
97. It should also be noted that the additional costs to the UK non-aviation sector are the same regardless of how aviation costs are apportioned to the UK. These costs are entirely driven by the additional effort required across the EU ETS as a consequence of aviation joining the system, and the resulting change in the EUA price at the EU-level.
98. It is important to note that these approaches are intended to illustrate the potential costs to the UK under different assumptions, with the true impact expected to lie within the estimated range of £0.5 - £1.5 billion (present value) presented.

4.1.4. Costs to Participants

99. This section examines the administrative costs and charges for aircraft operators. In this section, the costs to the aircraft operators that the UK will regulate for the ETS are considered, rather than the costs associated with flights departing from (and arriving into) UK airports as in the previous section. The method that is used to estimate these costs is not therefore consistent with the method that is used to estimate the costs in the previous section.
100. The European Commission published its list of aircraft operators that are to be regulated by each Member State in the Official Journal of the EU (OJEU) on 22 August 2009³⁹. An updated version of the list was published in the OJEU on 28 January 2010⁴⁰. The European Commission's list indicates that 955 aircraft operators are to be regulated by the UK and are therefore subject to these Regulations. The initial publication of the list was subject to a consultation exercise by the European Commission, which ended on 31 March 2009.
101. The 2006 European Commission Impact Assessment⁴¹ concluded that the economic impact on the EU aviation sector as a whole from its inclusion in the EU ETS is expected to be marginal. The impact may vary from operator to operator depending on the number

³⁹ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:219:0001:0094:EN:PDF>.

⁴⁰ Available at <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:025:0012:0120:EN:PDF>.

⁴¹ Available at http://ec.europa.eu/environment/climat/pdf/aviation/sec_2006_1684_en.pdf.

of companies competing on each route, efficiency levels, and the types of customers catered for (e.g. predominantly business or leisure passengers). All operators would be expected to pass on, to a large extent or in full, the cost of participating in the scheme to their customers through increased fares, as it will amount to an operational cost like any other. Therefore, in the long term, aircraft operators would be likely to cover the increase in costs through increased fares; the impact on demand would be dependent upon the magnitude of this increase.

Annual subsistence charge

102. As noted in section 3.4, the ongoing cost of regulation borne by the regulator is recovered through the annual subsistence charge to participants, which allows the regulator to recover its costs not otherwise recovered under specific fees. The annual subsistence charges, banded by reference to the aircraft operator’s estimated annual emissions, are presented in Table 13 below.

Table 13: Annual Subsistence Charges

Operator’s estimated annual emissions	Base charge (£)	Variable charge (£)
Less than 50,000 tonnes	£1,920	£630
50,000 – 500,000 tonnes	£2,490	£830
More than 500,000 tonnes	£3,060	£1,020

Source: Environment Agency

103. In the first year a person becomes an aircraft operator, the variable element of the subsistence charge (25% of the subsistence charge) will be pro-rated from the date its plan is first issued, to reflect the fact that the regulators costs will be proportionately less where an operator is to be regulated for less than 12 months. However, the base charge (75% of the subsistence charge) will be payable by all operators, no matter at which point they join the System, reflecting the fact that the regulators incur 75% of the annual costs associated with regulating an operator, regardless of whether they are to be regulated for 12 months or less.

104. The European Commission’s list assigned 955 aircraft operators to be administered by UK regulators⁴². However, it is likely that 955 is an overestimate of the actual number of aircraft operators to be regulated by the UK in the period that the annual subsistence charges would apply. For example, a number of aircraft operators on the list will fall below the de-minimis thresholds to be eligible for entry into the EU ETS and consequently be exempt, and a number of aircraft operators on the European Commission’s list may no longer exist.

105. The Environment Agency has estimated that the annual subsistence charges shown above will deliver income which fully recovers the relevant costs that regulators expect to incur. The total cost of the annual subsistence charges that would be payable by all of the aircraft operators to be regulated by the UK has been estimated at around £1.1 million⁴³

⁴² It is highly likely that other aircraft operators will be added in future updates of the European Commission’s list.

⁴³ This is an estimate based on a) expected levels of compliance, and b) the fact that the vast majority of aircraft operators to be regulated have estimated annual emissions of less than 50,000 tonnes and so would incur the lowest annual subsistence charge.

by the Environment Agency. This estimate has been reflected in the estimates of the Costs that are presented on the 'Summary: Analysis and Evidence' sheet.

106. However, it should be noted that a significant proportion of the total cost of the annual subsistence charges will be payable by aircraft operators who are regulated by the UK but are from outside of the UK, and will not therefore count as a cost to the UK. For example, out of the 955 aircraft operators assigned to be regulated by the UK in the European Commission's list, the CAA have estimated that approximately 150 (about 15%) have a registered office (or private address if they are not a corporate entity) in England, Wales, Scotland or Northern Ireland. It has not been possible to estimate the proportion of the total cost of the annual subsistence charges that will be payable by such aircraft operators.
107. In addition, it should also be noted that a number of aircraft operators from the UK have been assigned to other EU Member States to regulate. The costs to these UK aircraft operators have not been included in the estimates of the Costs that are presented on the 'Summary: Analysis and Evidence' sheet.

Special Reserve administration cost

108. Under the Regulations that this impact assessment covers, new or fast-growing aircraft operators that wish to apply to the Special Reserve will be required to pay a fee. This will recover the administrative cost to the regulator including assessing the operator's eligibility, reviewing tonne-kilometre data and submitting the application to the Secretary of State. Any application to the Special Reserve incurs a fee of £1,120. No estimates of the proportion of operators that will apply to the Special Reserve are available. Therefore, it has not been possible to monetise the total cost of applications to the special reserve in this impact assessment.

Costs related to other charges

109. Under the Regulations that this impact assessment covers, varying an emissions plan would incur a charge of £430. In the event that the regulator is required to determine emissions on behalf of an aircraft operator, a charge of £115 per hour would apply. No estimates are available of the proportion of operators that will vary their emissions plans or will require the regulator to determine their emissions. Therefore, it has not been possible to monetise the total cost of these charges in this impact assessment.

Operating ban

110. The ultimate sanction that can be imposed upon an aircraft operator is an operating ban imposed by the European Commission. In order to apply for an operating ban, Government and regulatory bodies must provide sufficient evidence that an operator has fully failed to comply with the scheme. In this instance, an operating ban can be imposed by the European Commission which would prevent all aviation activity by an aircraft operator. This will only be the case where an operator has failed to comply with the system and its associated penalties for non-compliance. Repeated non-compliance could lead to the aircraft operator losing revenues through the inability to operate. For the purposes of this impact assessment, it is assumed that 100% of aircraft operators comply with the scheme.

Penalties for aerodrome operators

111. In the case where an operator's aircraft are required to be detained as a result of non-compliance, aerodrome operators are expected to provide reasonable advice and assistance in helping the regulator detain the requested aircraft. Where an aerodrome operator is deemed to have provided insufficient help and support in the detention of

aircraft of non-compliant operators, a penalty of £50,000, will be incurred. For the purposes of this impact assessment, it is assumed that all aerodrome operators provide sufficient help and support to the regulator and therefore incur no financial penalty.

Financial Penalties

112. Failure to comply with the Regulations can result in aircraft operators facing financial penalties. Many of these penalties were set out in the first stage Regulations. These are covered in the related impact assessment.

113. The second stage Regulations that are the subject of this impact assessment include several additional penalties. These are as follows:

- A new civil penalty of £1,000 for making a false or misleading statement in an application to the regulator in relation to applying to the Special Reserve.
- A new penalty for an operator that fails to comply with conditions in its emissions plan. For failure before 1 January 2012, the penalty is £500 and £50 for each day the aircraft operator fails to comply up to a maximum for £4,500. For failure from 2012 onwards, the penalty is £1,500 and £150 each day up to a maximum of £13,500.
- In the case where an operator does not surrender sufficient allowances to the registry by 30 April 2013 (and every year thereafter) to cover its reportable emissions during the preceding calendar year, a penalty will apply, as prescribed by the Aviation ETS Directive, of €100 for each tonne of CO₂ emitted for which the aircraft operator has not surrendered allowances.

114. For the purposes of this impact assessment, it is assumed that 100% of aircraft operators comply with the scheme.

Administrative costs and fees covered in the impact assessment for the first stage of the transposition of the Aviation ETS Directive⁴⁴

115. The total fees payable by aircraft operators that will be regulated by the UK to cover the additional operating costs that will be incurred by the regulatory bodies in terms of receiving, reviewing and approving benchmarking plans and emissions plans were estimated at around £0.7-1.4 million in the impact assessment for the first stage of the transposition of the Aviation ETS Directive.

116. Administrative costs for aircraft operators that will be regulated by the UK are very uncertain, and were also discussed in the impact assessment for the first stage of the transposition of the Aviation ETS Directive. These indicative estimates suggested that the total of these administrative costs for all UK regulated aircraft operators could be in the order of £6.2 to £10.7 million in the first year (including one-off costs) and of the order of £2.7 million to £6.2 million in ongoing annual operational costs in subsequent years. However, because a significant number of these aircraft operators will be from outside of the UK, a significant proportion of these costs will be incurred by them and will not therefore count as a cost to the UK.

117. No further evidence on these administrative costs has become available after the publication of the impact assessment for the first stage of the transposition of the Aviation ETS Directive. Therefore, these administrative costs are not discussed further in this impact assessment.

⁴⁴ Available through http://www.decc.gov.uk/en/content/cms/consultations/aviation_euets/aviation_euets.aspx.

118. To avoid double counting, these costs are not presented in the 'Summary: Analysis and Evidence' sheet above.

4.1.5. Costs to Government and Regulatory Bodies

119. The estimated costs to Government and regulatory bodies are likely to be predominantly administrative. For example, when necessary, the Government could be involved in collecting evidence in order to request an operating ban from the European Commission.

120. The Environment Agency of England and Wales (EA) will be responsible for regulating the majority of airlines to be regulated by the UK and will also operate the registry system for all UK regulated airlines, when it becomes operational.

121. The costs to regulatory bodies of ongoing regulation of emissions plans and applications to the Special Reserve are expected to be covered by the fees that will be charged to aircraft operators. These costs are therefore not added to total costs in order to avoid double counting.

122. Start-up costs will be incurred by Government and the regulatory bodies to 2012. These were estimated, over the three year period, at around £1.3 million in the impact assessment for the first stage of the transposition of the Aviation ETS Directive. To avoid double counting, this cost is not presented in the 'Summary: Analysis and Evidence' sheet above.

Costs related to detention provisions

123. Responses to the consultation indicated that the Regulations could potentially impact on the aircraft leasing and aircraft mortgaging markets due to the risk that some aircraft could be potentially detained and sold under the Regulations. It is considered that the risk that aircraft could be detained and sold could potentially result in some additional costs to aircraft leasing companies, aircraft financiers and / or aircraft operators. However, no evidence is available on the potential magnitude of this cost. Due to the limitations of the available evidence base, it has not been possible to monetise this cost in this impact assessment.

4.1.6. Costs to consumers

Impact on EU fares

124. Taking into account both economic theory and evidence, it is expected that, at least in the long term, aircraft operators will be able to pass on, to a large extent or in full, the cost of participating in the EU ETS to their customers. If costs are not covered then in the long term, the position would be unsustainable for the aircraft operator. Assuming 100% cost pass-through, the European Commission's 2006 impact assessment⁴⁵ calculates the cost of compliance in terms of allowances purchased, and therefore fare increases, at both flight level (relevant for both passenger and freight prices) and ticket prices (relevant only for passenger prices) for a return journey in 2020.

⁴⁵ Available at http://ec.europa.eu/environment/climat/pdf/aviation/sec_2006_1684_en.pdf.

Table 14: Potential Impact on EU Fares in 2020

	Flight level (total increase per aircraft)	Increase in return ticket prices
Short haul	€96 - €481	€0.9 - €4.6
Medium haul	€190 - €498	€1.8 - €9.0
Long haul	€1,884 - €9,422	€7.9 - €39.6

Source: European Commission Impact Assessment 2006⁴⁶

125. The first figure in the range is the price increase when assuming an allowance price of €6 per tonne CO₂ and the second figure in the range is the price increase when assuming an allowance price of €30 per tonne. The current DECC estimates of carbon prices consistent with the current targets⁴⁷ have a central estimate of €18, with a range of €10-€23. Thus the range of price impacts is likely to be slightly narrower than outlined above. The European Commission states that as a proportion of the total ticket price, these increases appear modest and would therefore have a limited impact on reducing future forecast demand.

Impact on UK fares

126. In January 2009, the Department for Transport published its '*UK Air Passenger Demand and CO₂ Forecasts*⁴⁸'. This included an assessment of the impact of aviation entering the EU ETS as a sensitivity test. Since publication of the January 2009 forecasts the Government has adopted a new approach to carbon valuation⁴⁹, which replaces the Shadow Price of Carbon approach used previously. This includes a short-term traded price of carbon that is based on estimates of the price of EUAs. Values of the short-term traded price of carbon consistent with the estimated monetised costs in this impact assessment have been used to update the fares analysis that formed part of the assessment of aviation entering the EU ETS in the January 2009 report. Apart from the new values of the cost of carbon, the other assumptions remain unchanged from the January 2009 report.

127. Tables 15 and 16 show average UK fares for all domestic, short-haul and long-haul flights for the counterfactual case where aviation is not included within the EU ETS, and the policy case where aviation is included from 2012. It should be noted that in all tables, UK fares are for single journeys only.

⁴⁶ An explanation of the calculations made is given in Annex 8 of the European Commission's Impact Assessment.

⁴⁷ Available at

http://www.decc.gov.uk/media/viewfile.ashx?filepath=what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation/1_20100610131858_e_@@_carbonvalues.pdf&filetype=4

⁴⁸ Available at <http://www.dft.gov.uk/pgr/aviation/atf/co2forecasts09/>.

⁴⁹ These values are now based on the cost of mitigating emissions. The 'traded price of carbon' takes account of aviation's inclusion in the EU ETS (but on an 'all departing flights' basis rather than the 'all departing and arriving flights' basis that has been agreed). Further details on these values are available at

http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/valuation/valuation.aspx.

Table 15: Average UK single ticket price without aviation in the EU ETS (2004 prices)

	Short Haul	Long Haul	Domestic
2012	£55	£255	£60
2013	£54	£252	£59
2014	£53	£248	£58
2015	£52	£244	£56
2016	£51	£242	£55
2017	£50	£240	£54
2018	£49	£237	£54
2019	£49	£235	£53
2020	£48	£233	£52

Source: DfT analysis

Table 16: Average UK single ticket price with aviation in the EU ETS (2004 prices)

	Short Haul	Long Haul	Domestic
2012	£59	£274	£62
2013	£58	£270	£60
2014	£56	£267	£59
2015	£55	£263	£58
2016	£54	£260	£57
2017	£54	£258	£56
2018	£53	£256	£55
2019	£52	£254	£54
2020	£52	£252	£53

Source: DfT analysis

128. Table 17 below shows the estimated increase in average UK fares as a result of aviation's inclusion within the EU ETS from 2012 for single domestic, short-haul and long-haul flights. The estimated increase in the fare is approximately 2-3% of the average price of a domestic single ticket. The increase for short-haul represents approximately 6-7% and the increase for long-haul approximately 7%. The average estimated increase in fares across all flights is approximately 6-7%.

Table 17: Increase in average single ticket price with aviation in the EU ETS (2004 prices)⁵⁰

	Short Haul	Long Haul	Domestic
2012	£4	£19	£1
2013	£4	£19	£1
2014	£4	£19	£1
2015	£4	£19	£1
2016	£4	£19	£1
2017	£4	£19	£1
2018	£4	£19	£1
2019	£4	£18	£1
2020	£4	£18	£1

Source: DfT analysis

⁵⁰ The increase in the average single ticket price declines over time for all categories. Whilst the traded price of carbon increases over time, the downward impact on fares from improvements to the fuel efficiency of the fleet and air traffic management, and increasing passenger load factors, dominates the effect of this.

129. It should be noted that there is significant uncertainty over the precise impact upon fares and that the modelling undertaken represents the best possible estimate at UK level.

130. The increase in ticket prices as a result of aviation joining the EU ETS ensures that fares more fully reflect the environmental consequences of air transport.

Impact on demand

131. The resulting impact on demand has not been modelled for this impact assessment but it is expected that the increase in fares will have a limited impact on reducing forecast demand. This is because evidence suggests that UK passenger demand is relatively unresponsive to a change in price⁵¹. For example, the responsiveness of domestic passengers to a change in air fares is estimated to have a price elasticity of -0.3; that is, for every 1% increase in fares, demand for domestic flights will reduce by 0.3%. So the estimated 2-3% increase in domestic fares as a result of aviation's inclusion in the EU ETS is expected to lead to a less than 1% reduction in the demand for domestic flights.

132. For the purposes of this impact assessment, the following illustrative approach has been used to provide an indication of the potential order of magnitude of the demand reduction at the EU level. The overall (long run) price elasticity of UK terminal passenger demand is estimated to be around -0.5⁵², and the average estimated increase in air fares for UK flights is 6-7% (paragraph 128). This implies that the order of magnitude of the overall reduction in UK terminal passenger demand due to the inclusion of aviation in the EU ETS could be approximately 3%. If it is assumed that there is an equivalent reduction in the overall number of flights (including freight flights) and therefore emissions at the EU level, it could reduce aviation emissions by around 8.5 MtCO₂ in 2020 and 70 MtCO₂ cumulatively from 2012-2020 at the EU level. Such demand (and associated emissions) reductions are not included in the analysis due to their significant uncertainty but if realised, they might be expected to have the following effects:

- Less effort would be required from elsewhere in the EU ETS: the reduction in demand for aviation would imply that this was cheaper than the alternative of purchasing allowances (although not costless) and thus the overall costs of the policy would be lower. If this reduction in demand (and emissions) was realised, the EUA price is estimated to fall by around €1/tCO₂, due to the reduction in demand for allowances by the aviation sector. We estimate the cumulative discounted cost to the EU from the need to undertake less expensive abatement would be around £700m lower (i.e. costs in paragraph 75 would fall from £4.7 billion to £4.0 billion). This reduction in cost will be partly offset by a utility loss associated with reduced aviation demand and there may also be a change in the costs to the aviation industry associated with changing supply. We have been unable to estimate the value of these costs, so have not included this effect in the key figures on the summary sheet.
- As the EU ETS cap will not change in light of any demand reduction, there will be no reduction in global CO₂ emissions overall (as less effort would be required from elsewhere within the ETS). However, as the climate change impact of aviation emissions are greater than the CO₂ impact alone⁵³, a reduction in demand which resulted in fewer flights would result in a benefit in terms of a

⁵¹ Further information on the responsiveness of UK passenger demand to air fares can be found in Chapter 2 of the UK Air Passenger Demand and CO₂ Forecasts report from January 2009 which can be accessed at:

<http://www.dft.gov.uk/pgr/aviation/atf/co2forecasts09/>.

⁵² See <http://www.dft.gov.uk/pgr/aviation/atf/co2forecasts09/>.

⁵³ Understanding of the impacts of CO₂ emissions on the climate is relatively good. However, aviation has effects on climate beyond that resulting from its CO₂ emissions and for these other emissions there are significant uncertainties (although the impacts of NO_x emissions are relatively better understood than other non-CO₂ emissions). Recent research (Lee et al 2009) describes aviation's total climate change impacts using the standardised unit Global Warming Potential. This research concludes that aviation's total climate change impact is equivalent to between 1.3-2.0 times greater than its CO₂ emissions alone.

reduction in non-CO₂ emissions (such as nitrogen oxides (NO_x)) from aviation. When valued in line with the recent guidance⁵⁴, such emissions reductions across the EU could represent a benefit of around £830 million (Present Value).

4.2 **Benefits**

133. The principal benefit associated with aviation entering the EU ETS from 2012, and the Regulations that facilitate this, will be the reduction in CO₂ emissions resulting from EU aviation emissions being capped. The following section describes how the analysis for estimating the value of the benefits from the Regulations that has been conducted for this impact assessment.

4.2.1. **Approach to estimating the EU-wide CO₂ emissions savings from the inclusion of aviation in the EU ETS**

134. The inclusion of aviation in the EU ETS is complementary to the EU's 2020 target to reduce GHG emissions by 20% below 1990 levels by 2020, increasing to 30% if an international agreement is reached. The 20% EU target includes CO₂ emissions from flights departing from EU airports. The Aviation ETS Directive goes beyond this and covers CO₂ emissions from all flights arriving at and departing from EU airports.

135. The estimated EU-wide reduction in CO₂ emissions from the inclusion of aviation in the EU ETS is simply the difference between forecast EU aviation CO₂ emissions under Business as Usual (BAU) (i.e. in the absence of the inclusion of aviation in the EU ETS) and the level of the cap on EU aviation CO₂ emissions following the inclusion of aviation in the EU ETS.

136. EU aviation BAU emissions and the EU-wide aviation cap are shown in Table 3 above. The inclusion of aviation in the EU ETS is estimated to result in annual CO₂ savings across the EU in the region of around 80 MtCO₂ by 2020. The estimated emissions savings over the whole period 2012 to 2020 amount to around 480 MtCO₂.

4.2.2. **Monetising the EU-wide CO₂ emissions savings**

137. In the UK's impact assessment of the EU's 2020 Climate and Energy package (April 2009)⁵⁵, the value of the emissions reduction benefit associated with the package was based on the damage costs avoided owing to reduced EU GHG emissions. The impact assessment asserted that the EU's emissions reduction commitment could be pivotal to achieving a global climate change deal that puts the world on an emissions pathway consistent with stabilising atmospheric GHG concentrations at 450 parts per million (ppm) to avoid dangerous levels of climate change. This is highly significant for the assessment of benefits, since, according to the evidence of the Stern Review, the social cost of carbon will depend on the final stabilisation level of global emissions – it is higher at higher stabilisation levels.

138. **Without a global deal**, global GHG emissions could continue to grow at BAU levels, increasing the stock of GHGs in the atmosphere and the damage done (owing to the consequences associated with climate change) by additional emissions. In this BAU

⁵⁴ Guidance can be found at; http://www.decc.gov.uk/en/content/cms/statistics/analysts_group/analysts_group.aspx. Note this approach uses the traded price of carbon as a proxy for the value of the climate change externality not captured by targets.

⁵⁵ Available at:

http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/carbon_budgets/carbon_budgets.aspx.

See in particular pp13-14 for a detailed explanation of the scenarios used.

scenario, the damage of each additional tonne of GHG emitted is valued at the BAU 'social cost of carbon' (SCC).

139. **With a global deal**, the stock of GHGs in the atmosphere would be reduced, as would the damage done by each additional tonne of GHG emitted – in this case the lower '450ppm' SCC value is used⁵⁶.
140. The methodology used in this impact assessment is consistent with the approach used in the EU Climate and Energy Package Impact Assessment⁵⁷. To illustrate the uncertainty, the EU commitment is considered in light of the following two scenarios which are intended to represent the maximum and minimum benefits that could be associated with the Aviation ETS Directive:

Scenario A: Estimate of the avoided climate change damage costs assuming that the Aviation ETS Directive in conjunction with the EU Climate and Energy Package is pivotal to achieving a global deal

- In the 'policy case', it is assumed that the Aviation ETS Directive in conjunction with the EU Climate and Energy Package is pivotal to achieving a global deal, consistent with delivering a 450ppm stabilisation of GHG atmospheric concentrations. Hence emissions are valued at the SCC associated with a 450ppm stabilisation trajectory (around £27.9/tCO₂ in 2020 (in 2009 prices)).
- In the counterfactual (what would otherwise happen), it is assumed that no global deal is reached. In this case the global emissions trajectory is on a BAU path, so a BAU SCC is used (around £96.9/tCO₂ in 2020 (in 2009 prices)).

141. The value assigned to the avoided climate change damage reflects the difference in emissions between the counterfactual and the policy case with aviation included in the EU ETS as part of the EU package.

$$\begin{array}{rcccl}
 \text{Avoided} & = & \text{Aviation not included} & \times & \text{BAU} & - & \text{Cap on aviation} & \times & \text{450ppm} \\
 \text{damages} & & \text{in EU ETS (hence} & & \text{SCC} & & \text{emissions within the} & & \text{SCC} \\
 & & \text{BAU aviation} & & & & \text{EU ETS} & & \\
 & & \text{emissions)} & & & & & & \\
 & & & & & & & & \\
 & & \underbrace{\hspace{10em}} & & & & \underbrace{\hspace{10em}} & & \\
 & & \text{Counterfactual} & & & & \text{Policy case} & &
 \end{array}$$

142. Under Scenario A, the total avoided damages are therefore equal to the sum of a) the reduction in aviation emissions valued at the BAU SCC (around £97/tCO₂ in 2020 (in 2009 prices)) and b) the reduction in the damage costs of the capped level of aviation emissions within the EU ETS due to the SCC declining from the BAU SCC to the 450ppm SCC (around £28/tCO₂ in 2020).

143. It should be noted that – even though it is assumed here that the EU commitment is pivotal to a global deal – only the benefits (and costs) associated with the EU's own emissions reductions from aviation (assuming the aviation cap shown in Table 3) and the reduced climate change damage costs associated with the EU's remaining aviation emissions are estimated. The benefits and costs associated with other countries / regions reciprocal action are not included. In other words, in this scenario coordinated action by many

⁵⁶ See the UK Climate Change Act Impact Assessment (2008) for the specific SCC values used, available at: http://www.decc.gov.uk/en/content/cms/legislation/cc_act_08/cc_act_08.aspx

⁵⁷ To note that this is adapted from – rather than an exact replication of – the UK's impact assessment for the EU Climate and Energy Package Impact Assessment.

countries / regions is necessary to achieve a global deal that moves the world to a lower emissions trajectory, but only the benefits of aviation's emissions reductions are estimated.

Scenario B: Estimate of the avoided damage costs assuming that a global deal to stabilise at a 450ppm emissions trajectory will be reached anyway

- In the 'policy case', it is assumed that there is a global deal consistent with delivering a 450ppm stabilisation of GHG atmospheric concentrations. Hence emissions are valued at the SCC associated with a 450ppm stabilisation trajectory.
- In the counterfactual, it is assumed that a global deal is still reached. In this case the global emissions trajectory is still on a 450ppm path. Emissions savings in the counterfactual are therefore also valued at the SCC associated with a 450ppm stabilisation trajectory.

144. The value assigned to avoided climate change damage reflects the difference in emissions between the counterfactual and the policy case with aviation included in the EU ETS, as in Scenario A.

$$\begin{array}{rcccl}
 \text{Avoided} & = & \text{Aviation not included in} & \times & \text{450ppm} & - & \text{Cap on aviation} & \times & \text{450ppm} \\
 \text{damages} & & \text{EU ETS (hence BAU} & & \text{SCC} & & \text{emissions within} & & \text{SCC} \\
 & & \text{aviation emissions)} & & & & \text{the EU ETS} & & \\
 & & \underbrace{\hspace{15em}} & & & & \underbrace{\hspace{15em}} & & \\
 & & \text{Counterfactual} & & & & \text{Policy case} & &
 \end{array}$$

145. Under Scenario B, the total avoided damages are therefore equal to the reduction in aviation emissions valued at the 450ppm SCC (£28/tCO₂ in 2020). Unlike Scenario A, the damage costs of the capped level of aviation emissions remains the same in the both the Counterfactual and Policy case under Scenario B.

146. These scenarios demonstrate two possible states of the world, given the uncertainties when looking to 2020. Scenario A is based on the assumption that the Aviation ETS Directive in conjunction with the EU Climate and Energy Package is able to provide the impetus to prompt the rest of the world to take action to reduce emissions. In this case, the benefits assessed capture the estimated proportion of the benefits that aviation might account for, given that it is part of a wider package of measures, and it is the package of measures as a whole that is assumed to provide the impetus for action.

147. In scenario B, the assessment is more straightforward, but one would have to believe that a global deal to limit emissions and ensure the world is on a 450ppm emissions trajectory would be reached even without the Aviation ETS Directive as part of the EU package.

148. Table 18 presents the estimates of the value of the potential emissions savings given in Table 3, valued in line with the two scenarios above for valuing emissions, in discounted present value terms.

Table 18: Estimated EU-wide benefits from aviation joining the EU ETS from 2012 on an 'all departing and arriving flights' basis (present value of benefits, 2009 prices)

Present value of benefits (£ billion 2009 prices)										Total
	2012	2013	2014	2015	2016	2017	2018	2019	2020	
Scenario A	13.0	13.4	13.7	13.8	14.0	14.2	14.4	14.7	15.0	126.3
Scenario B	0.5	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5	9.6

Source: DECC / DfT analysis

149. On this basis, the present value of the EU-wide benefits have been estimated to be in the range of £9.6 to £126.3 billion in 2009 prices. The Best Estimates on the ‘Summary: Analysis and Evidence’ sheet use Scenario A. This is in line with the approach taken for the UK’s impact assessment of the EU’s 2020 Climate & Energy package. This is justified as a substantial climate change offer from the EU is necessary to secure a global deal.

4.2.3. Approach to estimating the UK’s share of the EU-wide benefits

150. As noted above, there is no agreed methodology for assigning aviation emissions to individual countries, and it is therefore not clear how the ‘UK aviation sector’ should be defined. For the purpose of apportioning EU-wide benefits to the UK, the same methods that were used to apportion the EU-wide costs to the UK have been used. This involves determining ‘UK aviation emissions’ and the associated ‘UK aviation cap’ on the basis of the emissions associated with ‘all departing flights’ and ‘all departing and arriving flights’. The approaches for estimating these are given in 4.1.3, and the estimated emission savings that can be apportioned to the UK are given in tables 7 and 8.

151. This suggests that CO₂ emission savings that could be attributable to the UK are around 12.5 MtCO₂ in 2020 on an ‘all departing flights’ basis and around 24.3 MtCO₂ in 2020 on an ‘all departing and arriving flights’ basis. The cumulative savings from 2012 to 2020 using these methodologies are around 90 MtCO₂ and 174 MtCO₂ respectively.

4.2.4. Monetising the UK emissions savings

152. As for EU-wide CO₂ emissions savings, the UK’s share has been monetised in line with the two scenarios described in Section 4.2.2.

153. Tables 19 and 20 present the estimates of the value of the potential emissions savings given in Tables 7 and 8, valued in line with the two scenarios, in discounted present value terms.

Table 19: Estimated UK share of EU-wide benefits from aviation joining the EU ETS from 2012 on an ‘all departing flights’ basis (present value of benefits, 2009 prices)

Present value of benefits (£ billion 2009 prices)										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Scenario A	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	22.0
Scenario B	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1.8

Source: DECC / DfT analysis

Table 20: Estimated UK share of EU-wide benefits from aviation joining the EU ETS from 2012 on an ‘all departing and arriving flights’ basis (present value of benefits, 2009 prices)

Present value of benefits (£ billion 2009 prices)										
	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Scenario A	4.6	4.7	4.7	4.7	4.8	4.8	4.8	4.8	4.8	42.8
Scenario B	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	3.5

Source: DECC / DfT analysis

154. This approach is consistent with the approach that was used to monetise the EU-wide costs above: only the benefits (and costs) associated with the UK’s own emissions reductions from aviation (assuming the ‘de facto UK aviation cap’ shown in Section 4.1.3)

and the reduced climate change damage costs associated with the UK's remaining aviation emissions are estimated.

155. On this basis, the UK benefits have been estimated to lie within the range of £1.8 to 22.0 billion (present value) in 2009 prices on an 'all departing flights' basis. On an 'all departing and arriving flights' basis, the estimated benefits attributable to the UK lie within the range £3.5 to £42.8 billion (present value). **It should be noted that in this context "UK benefits" should be interpreted as a UK contribution to the global benefits of action to tackle climate change.** They do not reflect specific estimates of climate change damage avoided in the UK.

4.3 Overall impact of the aviation sector joining the EU ETS

156. The analysis of the costs and benefits as described above allows the illustrative overall impact on the EU and UK to be estimated. Two factors have a significant impact on the estimates of costs and benefits in net present value terms, illustrating the range of uncertainty.
157. First, the approach to valuing the benefits has a significant impact. The net benefits to the EU in net present value terms are estimated to be around £5 billion if it is assumed that an international deal to achieve a 450ppm emissions trajectory will happen anyway. If it is believed that the Aviation ETS Directive in conjunction with the EU Climate and Energy package is pivotal to the world moving from a BAU emissions trajectory to a 450ppm emissions trajectory, then these net benefits rise to around £122 billion. It should be noted that the proportion of this total that would be wholly attributable to the Regulations that transpose the Aviation ETS Directive is very uncertain.
158. Second, how the 'UK aviation sector' is defined and hence how costs and benefits are apportioned to the UK has a significant impact on the estimates for the UK. On the basis of the 'departing flights only' estimates, the estimated net present value range is +£1.3 to +£21.5 billion (benefits exceed costs). On the basis of the 'all departing and arriving flights' estimates above, the benefits are estimated to exceed the costs by a range of £2.0 to £41.2 billion in net present value terms.
159. The best estimate of the Net Benefit shown on the 'Summary: Analysis and Evidence' sheet above is £21.5bn billion in net present value terms. This is based on an 'all departing flights' only basis for assigning aviation emissions (and benefits and costs) to the UK in a scenario where including aviation in the ETS (along with the EU Climate & Energy Package) is pivotal to the world moving to a 450ppm emissions trajectory.

5. SPECIFIC IMPACT TESTS

5.1 Competition Impact Assessment

160. The results of the competition impact assessment are provided in **Annex 2**, and provide an overview of the potential impacts of the Regulations on the level of competition between aircraft operators. In summary, the assessment suggests that the most important aspects of the Regulations in terms of their impact on competition are the operation of the Special Reserve, which helps to reduce the competitive advantage of incumbent operators over new entrants but does not eliminate it; the potential for carbon leakage outside of the EU; and the incentive placed on aircraft operators to reduce compliance costs by reducing their CO₂ emissions through a reduction in fuel use, which is expected to improve their competitiveness.

5.2 Small Firms Impact Test

161. The costs and benefits of the Regulations to transpose the Aviation ETS Directive are likely to vary across aircraft operators.
162. Commercial aircraft operators⁵⁸ operating either fewer than 243 flights per period for three consecutive four-month periods or flights with total annual emissions lower than 10,000 tonnes CO₂ per year are not performing an aviation activity as defined in Annex I of the Aviation ETS Directive and are therefore exempt from these Regulations.
163. Exemptions for commercial aircraft operators below the de-minimis threshold means that they will not have to face the costs of complying with the Regulations that are the subject of this impact assessment. These exemptions reflect the recognition of the need to ensure that the EU ETS operates efficiently by minimising transaction costs and other costs associated with achieving emissions reductions through a market-based measure. In addition, they are intended to help achieve the aim of not placing undue burdens on commercial aircraft operators below the de-minimis threshold and therefore minimising the risk that the Regulations would unduly limit or damage the opportunities for small businesses.
164. The de-minimis threshold does not apply to non-commercial operators (however, all flights performed by aircraft with a certified maximum take-off mass of less than 5,700kg are exempt⁵⁹). Therefore small operators (such as business jets, for example) which operate flights into or out of EU airports, and are to be regulated by the UK, will be required to comply with these Regulations. This will impose costs on those aircraft operators, which may be relatively significant. For example, complying with the Regulations involves some costs which are set on a flat fee basis (albeit within payment bands, depending on emissions), such as the annual subsistence charge. Such flat fees are likely to be relatively more significant for smaller firms within each band than for larger firms.
165. Aircraft operators will need to invest some resource in familiarising themselves with the requirements of the Regulations being placed upon them. It is unlikely that small aircraft operators will be regulatory specialists and therefore they may require more time to understand new Government Regulations than an average large aircraft operator.
166. Costs may in some cases be relatively large for small operators compared to larger ones if, for example, the Regulations would require additional data to be collected, or reporting mechanisms to be set up, than would otherwise have been the case. Small operators would, however, be encouraged to comply with the Regulations in a cost-effective way.
167. It is important to note that the Regulations will apply to operators regulated by the UK in a non-discriminatory way. The significance of the costs faced by each aircraft operator, relative to its size, will depend on a range of factors such as the system already in place, staff time and knowledge and so on. Given the highly varied mix of operator sizes and business models, it is expected that the impacts will also vary.

5.3 Equality Impact Tests

168. This proposal has been screened for its likely impact (positive or adverse) on the equality groups and, where required, an Equality Impact Assessment has been completed.

⁵⁸ Directive 2008/101/EC defines “commercial air transport operator” as an operator that, for remuneration, provides scheduled or non-scheduled air transport services to the public for the carriage of passengers, freight or mail.

⁵⁹ A full list of exemptions can be found at Annex I (c) to the Aviation ETS Directive, available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:008:0003:0021:EN:PDF>.

5.4 Human Rights

169. The proposals include provisions allowing for the imposition of financial penalties for breach of the Regulations and from 2012 allow for the detention and sale of aircraft as part of the enforcement regime. Accordingly, these proposals appear to engage fundamental rights to property (Protocol 1, Article 1) and to a fair trial (Article 6).
170. The imposition of civil penalties on regulated bodies for breach of regulatory requirements is permissible as long as the penalties are reasonable and proportionate. There will be a right of appeal against the imposition and/or amount of any penalty imposed by a regulator to (as appropriate) the relevant authority – namely the Secretary of State, the Welsh Ministers, the Scottish Ministers and the Planning Appeals Commission. The appellate body will be empowered, inter alia, to quash the penalty imposed or substitute a lesser sum, and will itself be subject to judicial review. This will provide an appropriate right of access to an independent and impartial tribunal.
171. The detention of an aircraft under the Regulations would involve the control of the use of property, and the sale of an aircraft either the deprivation or the control of the use of property, within the meaning of Article 1 of Protocol 1. The right to property is not an unqualified right. Deprivation of property in the public interest and subject to the conditions provided for by law is allowable. Furthermore, Article 1 expressly permits the control of the use of property in accordance with the general interest, or to secure the payment of taxes, contributions or penalties. The Regulations contain conditions and safeguards that should be sufficient to ensure that the power to detain is exercised proportionately. Furthermore, the exercise of the power of detention is subject to judicial review, and no aircraft may be sold without the leave of the court.

Annexes

Annex 1 should be used to set out the Post Implementation Review Plan as detailed below. Further annexes may be added where the Specific Impact Tests yield information relevant to an overall understanding of policy options.

Annex 1: Post Implementation Review (PIR) Plan

A PIR should be undertaken, usually three to five years after implementation of the policy, but exceptionally a longer period may be more appropriate. A PIR should examine the extent to which the implemented Regulations have achieved their objectives, assess their costs and benefits and identify whether they are having any unintended consequences. Please set out the PIR Plan as detailed below. If there is no plan to do a PIR please provide reasons below.

Basis of the review: [The basis of the review could be statutory (forming part of the legislation), it could be to review existing policy or there could be a political commitment to review];

The European Commission must review Directive 2008/101/EC before 1 December 2014. With a view to informing the Commission's review process, which could lead to proposals to revise the Directive being brought before the European Council and Parliament, the Government will undertake its own review of the implementation of the Aviation EU ETS during the course of 2014.

Review objective: [Is it intended as a proportionate check that regulation is operating as expected to tackle the problem of concern?; or as a wider exploration of the policy approach taken?; or as a link from policy objective to outcome?]

The purpose of the review will be to feed into the European Commission's review of Directive 2008/101/EC.

Review approach and rationale: [e.g. describe here the review approach (in-depth evaluation, scope review of monitoring data, scan of stakeholder views, etc.) and the rationale that made choosing such an approach]

A full review will be undertaken. In order to feed into the European Commission's obligation to review Directive 2008/101/EC before 1 December 2014, the Government will need to take account of the following aspects of the its implementation of the Aviation EU ETS in the review, which are the same as those that the European Commission is required to consider:

- (a) the implications and impacts of Directive 2008/101/EC as regards the overall functioning of the Community scheme;
- (b) the functioning of the aviation allowance market, covering in particular any possible market disturbances;
- (c) the environmental effectiveness of the Community scheme and the extent by which the total quantity of allowances to be allocated to aircraft operators under Article 3c should be reduced in line with overall EU emissions reduction targets;
- (d) the impact of the Community scheme on the aviation sector, including issues of competitiveness, taking into account in particular the effect of climate change policies implemented for aviation outside the EU;
- (e) continuing with the special reserve for aircraft operators, taking into account the likely convergence of growth rates across the industry;
- (f) the impact of the Community scheme on the structural dependency on aviation transport of islands, landlocked regions, peripheral regions and the outermost regions of the Community;
- (g) whether a gateway system should be included to facilitate the trading of allowances between aircraft operators and operators of installations whilst ensuring that no transactions would result in a net transfer of allowances from aircraft operators to operators of installations;
- (h) the implications of the exclusion thresholds as specified in Annex I in terms of certified maximum take-off mass and number of flights per year performed by an aircraft operator;
- (i) the impact of the exemption from the Community scheme of certain flights performed in the framework of public service obligations imposed in accordance with Council Regulation (EEC) No 2408/92 of 23 July 1992 on access for Community air carriers to intra-Community air routes
- (j) developments, including the potential for future developments, in the efficiency of aviation and in particular the progress towards meeting the Advisory Council for Aeronautics Research in Europe (ACARE) goal to develop and demonstrate technologies able to reduce fuel consumption by 50 % by 2020 and whether further measures to increase efficiency are necessary;
- (k) developments in scientific understanding on the climate change impacts of contrails and cirrus clouds caused by aviation with a view to proposing effective mitigation measures.

Baseline: [The current (baseline) position against which the change introduced by the legislation can be measured]

The baseline scenario against which the changes introduced by the legislation will be measured is the scenario in which aviation does not join the EU ETS.

Success criteria: [Criteria showing achievement of the policy objectives as set out in the final impact assessment; criteria for modifying or replacing the policy if it does not achieve its objectives]

The success criteria for this policy are as follows:

- 1.) Aircraft operators deliver sufficient emissions reductions internally or through the purchase of allowances elsewhere in the system to meet the cap on aviation emissions.
- 2.) Emissions reductions are delivered cost effectively.
- 3.) Emissions reductions are a result of the inclusion of aviation in the EU ETS.
- 4.) Aircraft operators comply with the requirements of the legislation to enable the efficient functioning of the EU ETS.

Monitoring information arrangements: [Provide further details of the planned/existing arrangements in place that will allow a systematic collection systematic collection of monitoring information for future policy review]

Aircraft operators are required by the Directive and the UK Regulations to monitor and report their emissions annually to the UK regulators.

Stakeholders and enforcers will be consulted as part of the review.

Further information monitoring will be undertaken as necessary and reviewed regularly.

Reasons for not planning a PIR: [If there is no plan to do a PIR please provide reasons here]

N/A

Add annexes here.

Annex 2: Competition Impact Assessment Results

Potential implications for competition

- A1. When compared to the base case where aviation is not included in the EU ETS, the Regulations that are the subject of this impact assessment must be considered in the context of their potential implications for competition in the markets that are directly or indirectly affected.
- A2. The following sections are structured in line with the OFT guidance: "Completing competition assessments in Impact Assessments" (2007)⁶⁰.

Affected Markets

- A3. All flights departing from or arriving at an airport situated within the EU will be covered by the EU ETS. However, there will be several exemptions:
- Commercial aircraft operators operating fewer than 243 flights per period for three consecutive four-month periods, and commercial aircraft operators operating flights with total annual emissions lower than 10,000 tonnes of CO₂ per year are considered small emitters and will be exempt.
 - In addition, flights performed by aircraft with a certified maximum take-off mass of less than 5,700kg will also be exempt⁶¹.
- A4. The Directive states that an operator with a valid operating licence granted by the UK will be allocated for regulation to the UK. All other operators, including those from outside the EU, will be regulated by the Member State attributed with the greatest estimated emissions from flights performed by that aircraft operator in 2006, or for an operator who began operations after 2006, the first calendar year in which they began operating. On this basis, the UK will be responsible for regulating around 955 aircraft operators.
- A5. Given the generally competitive nature of the aviation industry, it is likely that, although it is the relevant aircraft operators that will be required to comply with these Regulations, there will be implications for secondary markets, namely air passengers. Paragraphs 124 to 130 in the evidence base above present analysis of the potential impact on passenger fares when aviation is included in the EU ETS.

Competition Impact

- A6. In line with the OFT guidance, the impact of the Regulations on each of the markets identified has been taken into account by addressing four key questions, relative to the base case of the aviation sector not participating in the EU ETS.

Direct limits on the number of suppliers?

- A7. The extent to which the Regulations would directly limit or increase the number of suppliers in the market has been considered. Any such effect would only be considered likely if compliance with the Regulations were to involve:
- the award of exclusive right to supply; or
 - procurement from a single supplier or restricted group of suppliers; or

⁶⁰ Available at http://www.of.gov.uk/shared_of/reports/comp_policy/oft876.pdf.

⁶¹ A full list of exemptions can be found in Annex I of the Directive (2008/101/EC), <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:008:0003:01:EN:HTML>.

- the creation of a form of licensing scheme; or
- a fixed limit (quota) on the number of suppliers.

A8. None of the Regulations would appear to have elements within them that would directly limit or increase the number of suppliers.

Indirect limits on the number or range of suppliers?

A9. The extent to which the Regulations would indirectly limit or increase the number of suppliers in the market has also been considered. Any such effect would be considered likely if compliance with the Regulations significantly raised the costs (relative to the base case) of:

- new suppliers relative to existing suppliers;
- some existing suppliers relative to others; or
- entering or exiting an affected market.

A10. Two particular areas have been identified as relevant: the existence of the Special Reserve and international competition. Each is discussed in turn below.

(i) The Special Reserve

A11. The costs faced by new suppliers relative to existing suppliers are likely to differ, particularly in relation to the volume of allowances that will need to be bought and surrendered for compliance. The most significant cost differential that may arise results primarily from the allocation mechanism, as explained in section 3.1.

A12. The Aviation ETS Directive allows for 3% of allowances to be placed into a Special Reserve. The Special Reserve will be available to both new entrants and fast-growing aircraft operators. As explained in paragraphs 28 to 39 in the evidence base above, aircraft operators who are new entrants (i.e. that began operating between 1 January 2011 and 31 December 2014) or have an annual average compound rate of growth of more than 18% between 2010 and 2014, would be eligible to apply for free allowances from the Special Reserve. The allocation of those allowances will be based on activity and will reflect the benchmarking system used for the initial allocation.

A13. Aircraft operators who undertake flight activity into or out of EU airports *after* 2012 and could not therefore apply for free allowances on the basis of 2010 tonne-kilometre activity would face higher compliance costs (compared to existing operators) as a result of being required to purchase all the allowances necessary to cover their emissions. Some existing aircraft operators would therefore have a cost advantage over new entrants. Such a cost advantage could potentially allow existing operators to offer lower fares and gain market share from new entrants, or act as a barrier to entry into particular sub-markets. Access to free allowances from the Special Reserve is therefore intended to counter this potentially adverse competition effect.

A14. The ability of fast growing aircraft operators to apply for free allowances from the Special Reserve is also intended to promote competition because it provides for a more level playing field for those aircraft operators who had a relatively low level of activity in the benchmark year (such as relatively new aircraft operators), and who would otherwise therefore have received few or no free allowances.

A15. Although the Special Reserve allows new and fast-growing aircraft operators to receive a free allocation, they will not actually be entitled to their allocation until 2017. Therefore an operator that qualifies for a free allocation through the Special Reserve, as a result of becoming an aircraft operator between 1 January 2011 and 31 December 2014, will not receive any free allowances to cover its emissions before 2017. An aircraft operator

beginning aviation activity in, for example, 2011, will therefore be required to purchase allowances from auction or on the open market for six years before they will be entitled to any free allocation. From 2017, an aircraft operator will then receive an allocation for the final four years, to 2020.

A16. The Special Reserve therefore aims to prevent competitive distortions by removing any barriers to entry created by the free allocations to incumbent aircraft operators. Without the Special Reserve, the adverse effects on competition would be likely to be greater. However, it will not prevent these effects altogether due to the fact that entrants will not be able to receive any free allocation until 2017. Since incumbent operators will receive free allocations from 2012, new and fast-growing operators will be at a potential competitive disadvantage since they will have to cover a larger proportion of the cost of their CO₂ emissions.

(ii) International competition

A17. The international nature of the aviation industry means that there are potential competition issues resulting from the regional (i.e. European Union) coverage of the EU ETS. These may result from the fact that for flights operating into or out of EU airports, emissions of CO₂ must be matched by surrendering an equal number of allowances. The cost of those allowances would need to be met by the aircraft operator in the first instance but, in a competitive industry such as aviation, it is likely that those costs would be passed through to passenger fares. Flights that do not arrive into or depart from EU airports would not face similar cost increases.

A18. Such cost differentials mean that the risk of carbon leakage should be considered. In a generic sense, carbon leakage refers to the possibility that there is an increase in CO₂ emissions from some countries as a reaction to emissions reductions by other countries. This could broadly mean that activity taking place in the EU with a CO₂ impact will be displaced outside the EU.

A19. There are several ways in which carbon leakage could potentially occur when aviation joins the EU ETS. For example, freight or passenger aircraft that had previously travelled into, out of, or via the EU, may choose instead to travel on routes that avoid the EU completely because it is relatively cheaper for them to do so. There would be two potential consequences of this:

- a) the emissions associated with these journeys may still occur but are displaced outside of the scope of the EU ETS and therefore go unchecked; and
- b) EU-based operators may lose revenue and market share to operators who do not have to fly into or out of the EU.

A20. For example, a flight from Asia to the US can be made via an EU hub airport, or a non-EU airport. If the fare differential between the two possible options as a result of aviation joining the EU ETS were sufficient enough to mean that it was now relatively cheaper to hub via a non-EU airport when otherwise a passenger would have chosen an EU-hub, passenger demand may shift. If this were in turn sufficient to cause flight patterns to change such that flights shift to avoid the EU, then this would represent carbon leakage.

A21. For those routes where viable alternative routes through non-EU hubs are available, the viability of some flights to/from the EU could in some cases be at risk. This is driven by the reduction in transfer passengers which in the case of some routes, make up a significant proportion of overall passengers on particular flights. A reduction in flights to/from the EU could impact on the connectivity of the EU with the rest of the world.

A22. Participants of the EU ETS that operate long-haul intercontinental flights into and out of the EU would be more likely to be affected by international competition than aircraft operators whose operations are mainly within the EU. This is because all flights within the EU will be subject to similar cost implications, which significantly reduces the risk of competition effects.

A23. A further risk of carbon leakage could be that EU based operators may choose to relocate their businesses to non-EU countries to avoid being subjected to the EU ETS. However, there are likely to be cost and practical barriers to this change. The Commission's Impact assessment (2006) states that:

"...the analysis concluded that it was highly unlikely that EU or non-EU airlines would choose to re-locate their hub from being inside the EU to outside the EU. This was because airlines primarily choose the location of their hub based on the concentration of economic activity in the surrounding area. In addition, changing a hub is costly".

A24. Freight aircraft may also be at risk from carbon leakage effects in some cases due to the generally low profit margins and the availability of alternative means of transport over shorter distances. A risk of leakage may arise if customers shipping freight respond to air cost increases by transporting goods further by road transport.

A25. It should be noted that there are barriers to international competition and relocation that are likely to limit aviation's exposure to carbon leakage, such as whether viable alternatives to flights via the EU actually exist and whether the change in fares is enough to make passengers change behaviour to the extent that this impacts on flight movements.

Limits on the ability of suppliers to compete

A26. This criterion assesses the extent to which Regulations might limit or increase the ability of suppliers to compete. This is likely to be the case if the Regulations control or substantially influence:

- the price(s) a supplier may charge;
- the characteristics of the product(s) supplied;
- innovation to introduce new products or supply existing products in new ways;
- the sales channels a supplier can use, or the geographic area in which a supplier can operate;
- the ability of suppliers to advertise their products; or
- the suppliers' freedom to organise their own production processes or their choice of organisational form.

A27. In this context, the main impacts of aviation being included in the EU ETS relate to the compliance costs imposed on aircraft operators.

A28. There are likely to be beneficial impacts as a result of these Regulations in the sense that because the costs of compliance (in terms of the purchase of allowances) are related to the volume of emissions, this should provide the incentive for aircraft operators to operate more efficiently in order to reduce emissions. For example, it may be possible for operators to better match aircraft to particular routes, given likely load factors and demand, in order to minimise fuel requirements (and hence CO₂ emissions).

A29. In addition, these Regulations should provide the incentive for airlines, and therefore manufacturers, to innovate to improve the fuel efficiency of aircraft and reduce emissions. In turn, this would reduce the costs of compliance.

A30. Therefore, some aspects of these Regulations are likely to have a beneficial effect on competition.

Limits on the incentive of suppliers to compete

A31. This criterion assesses the extent to which the Regulations would reduce or increase suppliers' incentives to compete vigorously. This is likely to be the case if the Regulations:

- exempt suppliers from general competition law;
- introduce or amend intellectual property regime;
- require or encourage the exchange between suppliers, or publication of information on prices, costs, sales or outputs; or
- increase the costs to customers of switching between suppliers.

A32. Assessing these factors, it is not likely that there would be adverse effects on the incentive of suppliers to compete as a result of these Regulations.

Conclusions

A33. This assessment has sought to provide an overview of the potential impacts of the Regulations on the level of competition between aircraft operators. The assessment suggests that the most important aspects of the Regulations in terms of their impact on competition are the operation of the Special Reserve, which helps to reduce the competitive advantage of incumbent operators over new entrants but does not eliminate it; the potential for carbon leakage outside of the EU; and the incentive placed on aircraft operators to reduce compliance costs by reducing their CO₂ emissions through a reduction in fuel use, which is expected to improve their competitiveness.