

# **A Scottish replacement to Air Passenger Duty**

## **Strategic Environmental Assessment Screening and Scoping Report**

**Report  
prepared by:**



**March 2016**

# Table of Contents

<b>1</b>	<b>Introduction .....</b>	<b>6</b>
1.1	Strategic Environmental Assessment (SEA) .....	6
1.2	APD in the UK.....	6
1.3	Devolution of APD.....	7
1.4	Context of a Scottish replacement to APD .....	8
1.5	Report Structure.....	11
<b>2</b>	<b>The approach to the assessment .....</b>	<b>12</b>
2.1	Aligning the environmental impacts with SEA topics.....	12
2.2	Development of assumptions.....	12
2.3	Scope of the assessment.....	14
2.4	Proposed assessment methodology .....	18
2.5	Alternatives .....	21
2.6	Identifying Mitigation and Monitoring Proposals.....	22
<b>3</b>	<b>Context for the SEA .....</b>	<b>24</b>
3.1	Requirements of the 2005 Act.....	24
3.2	Sourcing Baseline Information .....	24
3.3	Climatic Factors .....	25
3.4	Population and Human Health .....	32
3.5	Air Quality .....	36
3.6	Biodiversity, Flora and Fauna .....	39
3.7	Soil.....	42
3.8	Water .....	43
3.9	Landscape, Cultural Heritage and the Historic Environment.....	45
3.10	Material Assets .....	47
<b>4</b>	<b>Programme of works and next steps .....</b>	<b>52</b>
4.2	Responding to this document.....	53
	<b>Appendix 1: SEA Screening Report.....</b>	<b>55</b>
	<b>Appendix 2: Initial issues under consideration .....</b>	<b>62</b>
	<b>Appendix 3: Glossary .....</b>	<b>65</b>
	<b>Appendix 4: Respondent Information Form .....</b>	<b>67</b>

## Tables and Figures

Table 2.1	Overview of Environmental Impacts from Aviation .....	12
Table 2.2	Proposed Scoping In/Out of SEA topics.....	15
Figure 2.1	Example of proposed assessment format: Summary of findings .....	20
Figure 3.1	Breakdown of all Air Transport Movements using Scottish airports in 2014 .....	49
Figure 3.2	Breakdown of all air passengers using Scottish airports in 2014 .....	50
Figure 4.1	Indicative Policy and SEA Development Process .....	52

## Boxes

Box 2.1	Key assumptions and questions .....	13
Box 2.2	Example of proposed assessment format .....	19

# Foreword

“A consultation on a Scottish replacement to Air Passenger Duty” is a document seeking views on how a Scottish replacement to Air Passenger Duty (APD) should be structured and operated to help achieve the Scottish Government’s objective of generating sustainable growth by boosting Scotland’s international air connectivity.

Whilst aviation is seen as a key driver of growth, as with many other forms of transport, environmental impacts arise from activity in this sector. The impact on climate change and the potential for increase in air and noise pollution are the most common concerns associated with the aviation industry. However, growth at airports and an increase in travel to and from our airports may also result in other environmental effects. Loss of habitat, light and noise pollution and birdstrike can have an impact on wildlife, whilst airports are also significant users of resources such as water and energy, and are generators of waste.

Strategic Environmental Assessment (SEA) is a process of taking into account the potential environmental impacts that may arise from the implementation of certain Plans, Programmes and Strategies. It provides a means of identifying any significant effects that may arise and documenting these in an open and transparent way at a number of distinct stages. Screening and Scoping are two initial stages in this assessment process.

## **Why consult now?**

The aim of this report is to set out how the likely environmental effects that may arise from a Scottish replacement to APD will be considered. Views are being sought at this early stage to ensure that the assessment proceeds with an effective evidence base that has been informed by key stakeholders and organisations.

## **How to respond to this stage of the process?**

In order to help inform the SEA process, a number of questions have been set out below. The questions may help to structure a response, however additional points to consider are also welcomed. For ease, the questions have been set out under relevant headings and the Sections to which they relate to have been included.

### **Proposed Methodology (Section 2)**

This section sets out key assumptions and questions that have been developed to explore the likely significant effects.

**Question 1:** Do you agree with the key assumptions and questions as discussed on pages 12-13?

**Question 2:** Is it appropriate for the assessment to consider effects at differing geographical scales as discussed on page 18?

## Alternatives (Section 2)

At this stage three reasonable alternatives have been proposed and it is noted that these may evolve, and that further alternatives may be suggested as the policy develops.

**Question 3:** Are the proposed alternatives set out on pages 21-22 reasonable?

**Question 4:** Do you have suggestions for additional approaches to APD policy?

## Evidence baseline (Section 3)

The proposed evidence included in this joint Screening and Scoping Report will be used to inform the assessment process.

**Question 5:** Do you have any comments regarding the proposed evidence base for the assessment set out on pages 24-51?

**Question 6:** Is there further information you feel should be considered or included to further inform the assessment?

## Initial Findings (Appendix 2)

Some early assessment work has been undertaken to draw out an initial view on the environmental issues that are likely to be relevant for the subsequent assessment.

**Question 7:** Do you agree with these initial assessment findings set out on pages 62-64? Are there additional environmental issues that should be considered?

The consultation runs until **Friday 3 June 2016** and there are a number of ways that you can respond. Comments can be submitted:

- Online via the Scottish Government's consultation platform, Citizen Space, at <https://consult.scotland.gov.uk/fiscal-responsibility/air-passenger-duty>;
- By emailing your response (along with a completed Respondent Information Form – see Appendix 4) to [apd@gov.scot](mailto:apd@gov.scot); or
- In writing, by sending your response (along with a completed Respondent Information Form – see Appendix 4) to:  
Mike Stewart, Fiscal Responsibility Division, Scottish Government,  
Area 3D-North, Victoria Quay, Edinburgh, EH6 6QQ.

If replying via email or in writing please note that you **must** supply the completed Respondent Information Form at Appendix 4 with your response in order for us to be able to appropriately handle it and in particular understand if you are happy for us to publish it.

In addition to submitting your consultation response, we encourage you to engage in active dialogue on the matters raised both in this SEA Screening and Scoping Report and the Consultation Paper. You can submit your thoughts and ideas, as well as comment on others, at: <https://ideas.scotland.gov.uk/air-passenger-duty>. This dialogue is open for submissions until Friday 8 April 2016.

Following this period of consultation, the responses received on both the Consultation Document and this Screening/Scoping Report will be analysed. The findings of this analysis will be taken into account in the development of the Scottish Government's policy plans for a Scottish replacement tax and the SEA. An Environmental Report will be produced documenting the results of the assessment of the Scottish Government's emerging policy plans and the reasonable alternatives to these. Statutory public consultation will be subsequently undertaken on the Environmental Report and the outcomes of this consultation process will inform the preparation of the Scottish Government's final legislative proposals for a Scottish replacement tax.

# 1 Introduction

## 1.1 Strategic Environmental Assessment (SEA)

- 1.1.1 The Environmental Assessment (Scotland) Act 2005 (the 2005 Act) requires the assessment of certain Plans, Programmes and Strategies (PPS) that may have significant effects on the environment. As set out in the Screening Report presented in Appendix 1, the Scottish Government considers that future legislation to establish a Scottish replacement to APD falls under Section 5(4) of the 2005 Act, and that a reduction in the overall tax burden of APD has the potential to have significant environmental effects. The Scottish Government will therefore undertake a SEA to explore the potential for the policy to have significant environmental effects, either positive or negative.
- 1.1.2 The SEA has a number of distinct stages: Screening, Scoping, Environmental Assessment and the production of an Environmental Report, and Post Adoption Statement. At each stage, there is a requirement to consult with three statutory Consultation Authorities. These are Historic Environment Scotland, Scottish Natural Heritage (SNH) and Scottish Environment Protection Agency (SEPA).
- 1.1.3 The SEA is being undertaken by the Scottish Government's Environmental Assessment Team in accordance with the requirements of the 2005 Act. This Screening and Scoping Report sets out the findings of the Screening stage and details the proposed scope of the SEA to be undertaken on the Scottish Government's policy plans for a Scottish replacement to APD. Following this stage of the process, the assessment process will progress and the results of this will be written into an Environmental Report. This will be made publically available for a subsequent and final public consultation alongside the Scottish Government's emerging policy plans for a Scottish replacement to APD. The outcomes of this final consultation stage will inform the development of the Scottish Government's legislative proposals for a Scottish replacement tax.

## 1.2 APD in the UK

- 1.2.1 APD was first introduced in 1994 as an excise duty charged on passengers departing on chargeable flights from UK airports. With the exception of the power to set tax rates for direct long-haul flights departing from Northern Ireland (which has been devolved to the Northern Ireland Assembly), APD is currently reserved to the UK Parliament. The duty is charged to aircraft operators at a rate dependent on factors such as the final flight destination and class of travel, regardless of local connectivity and capacity.
- 1.2.2 From 1 April 2015 the structure of APD was revised and simplified, moving to the current system of two destination-based bands. In addition to a

reduced and standard rate of duty under each destination band, a higher rate applying to private jets was introduced on 1 April 2013. Destinations for flights leaving UK airports are split into different bands based on the distance of a country's/territory's capital city from London (Band A for distances of less than 2,000 miles from London, and Band B for distances of greater than 2,000 miles from London). Flights that do not leave the UK are always classed as Band A, unless they are otherwise exempt from charge.

## 1.3 Devolution of APD

- 1.3.1 Following the 2014 Scottish Independence referendum, the [Smith Commission report](#) was published on 27 November 2014 recommending, amongst other things, further devolution over elements of taxation and public spending to the Scottish Parliament. Paragraph 86 of the report recommended that “the power to charge tax on air passengers leaving Scottish airports will be devolved to the Scottish Parliament. The Scottish Government will be free to make its own arrangements with regard to the design and collection of any replacement tax, including consideration of the environmental impact.”
- 1.3.2 The Scottish Government announced in the [2015-16 Programme for Government](#)<sup>1</sup> and [Draft Budget 2016-17](#)<sup>2</sup> that it will reduce the burden of APD in Scotland by 50%, with the reduction beginning to be implemented when a new tax replacing APD in Scotland is introduced in April 2018 and delivered in full by the end of the next Scottish Parliament, expected to be in 2021. The tax will then be abolished completely when resources allow.
- 1.3.3 The proposal to devolve powers over APD to the Scottish Parliament, and others contained in the Smith Commission Report, is the subject of the Scotland Bill currently being considered at Westminster. The Scottish Government is now taking forward plans for a new tax to replace APD in Scotland from April 2018. The Scottish Parliament will be able to legislate for a new tax only once the Scotland Bill has been enacted.
- 1.3.4 The Scottish Government has established a stakeholder forum to help inform the policy development of a Scottish replacement tax. The Consultation Paper is being prepared at an early stage in this process to build upon early input from the forum and from other stakeholders, and seeks views from the public on how the new tax should be best structured and operate to help generate sustainable growth by improving Scotland's international air connectivity,

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<sup>1</sup> The Scottish Government (2015) A Stronger Scotland, The Government's Programme for Scotland 2015-16 [online] Available at: <http://www.gov.scot/Resource/0048/00484439.pdf> (accessed 08/09/2015)

<sup>2</sup> Scotland's Spending Plans and Draft Budget 2016-17 [online] Available at: <http://www.gov.scot/Publications/2015/12/9056/3> (accessed 09/03/2016) (accessed 09/03/2016)



- 1.3.5 Whilst published alongside the Consultation Paper, this Screening and Scoping Report and the subsequent SEA relate to development of a future Bill containing the legislative proposals for the new tax.

## 1.4 Context of a Scottish replacement to APD

- 1.4.1 The 2005 Act requires the consideration of the relationship between the Scottish Government's policy plans for a Scottish replacement tax and other relevant PPS. The following paragraphs provide specific detail on these, including voluntary commitments and visions.

- 1.4.2 UK APD is provided for in legislation by Part I Chapter IV and schedules 5A to 6 of the Finance Act 1994 and the following secondary legislation instruments:

- The Air Passenger Duty Regulations 1994, as amended;
- The Air Passenger Duty (Connected Flights) Order 1994, as amended;
- The Aircraft Operators (Accounts and Records) Regulations 1994, as amended;
- The Air Passenger Duty (Extended Schemes) Regulations 1995; and
- The Air Passenger Duty (Designated Region of the United Kingdom) Order 2001.

- 1.4.3 There are a number of policy and legislative drivers at the national and UK levels relating both to Scotland's economic ambitions, and also to ensure sustainable growth in the future to match these ambitions. Scotland's Economic Strategy sets out ambitions to create a more cohesive and resilient economy that improves the opportunities for business and the people of Scotland alike, based upon increasing competitiveness and tackling inequality. The Economic Strategy also discussed the findings of the Smith Commission and that responsibility for APD would "enable [Scotland] to set a policy that helps support our internationalisation ambitions, and in particular improve connectivity with major airport hubs". It also stated the importance of work to "expand the rail network and improve accessibility of ferries and airports" to "rural parts of Scotland"<sup>3</sup>.



- 1.4.4 These ambitions reflect those set out in the APD Consultation Paper, including the importance of transport investment in enabling this growth<sup>4</sup>. This is also reflected in Scotland's Infrastructure Investment Plan and updated programme and project pipelines published in early 2015<sup>5</sup>, in

<sup>3</sup> The Scottish Government (2015) Scotland's Economic Strategy [online] Available at: <http://www.gov.scot/Resource/0047/00472389.pdf> (accessed 08/09/2015)

<sup>4</sup> The Scottish Government (2015) A Stronger Scotland, The Government's Programme for Scotland 2015-16 [online] Available at: <http://www.gov.scot/Resource/0048/00484439.pdf> (accessed 08/09/2015)

<sup>5</sup> The Scottish Government (2015) Infrastructure Investment Plan [online] Available at: <http://www.gov.scot/Topics/Government/Finance/18232/IIP> (accessed 24/09/2015)

addition to being a key component of Scotland's National Transport Strategy prepared in 2010 and refreshed in 2015<sup>6</sup>.

- 1.4.5 These ambitions are also mirrored in the vision of 'A Connected Place' set out in National Planning Framework 3 (NPF3), which discussed improving connectivity in transport links between Scottish towns and cities, and proposals for airport enhancements at Aberdeen, Prestwick, Edinburgh, Glasgow and Inverness<sup>7</sup>. Scottish Planning Policy<sup>8</sup> (SPP) was published alongside NPF3 and set out how these visions will be delivered.



- 1.4.6 Once developed, the Bill containing the legislative proposals for the new tax will also sit within the context of a number of Scottish Government policies, including many focused on meeting ambitious statutory targets for the reduction of greenhouse gases (GHG), as set by the Climate Change (Scotland) Act 2009. The development of the 'Low Carbon Economic Strategy for Scotland: Scotland – A Low Carbon Society'<sup>9</sup> is a key component of a broader approach to meeting Scotland's climate change targets to securing the transition to a low carbon economy in Scotland. It is closely linked to the development of statutory Reports on Policies and Proposals (RPP) for meeting the greenhouse gas emissions targets. The second RPP ('Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013–2027: The Second Report on Proposals and Policies (RPP2)'<sup>10</sup>) was published in 2013. Work is currently ongoing to develop the third RPP which will cover the period to 2032. Together, these documents set out a range of proposals, policies and enabling measures to meet climate change targets and reduce GHG emissions across a wide range of sectors and industries.



## Collaborative Climate Change Action

- 1.4.7 The International Civil Aviation Organization (ICAO), a United Nations specialised agency, and the aviation industry, represented through the

<sup>6</sup> Transport Scotland (2010) Scotland's National Transport Strategy [online] Available at: <http://www.transportscotland.gov.uk/strategy/national-transport-strategy> (accessed 08/09/2015)

<sup>7</sup> The Scottish Government (2014) National Planning Framework 3 [online] Available at: <http://www.gov.scot/Publications/2014/06/3539> (accessed 08/09/2015)

<sup>8</sup> Scottish Government (2014) Scottish Planning Policy [online] Available at: <http://www.scotland.gov.uk/Topics/Built-Environment/planning/Policy> (accessed 22/09/2015)

<sup>9</sup> SEPA, HIE, Scottish Enterprise, Scottish Government (2010) A Low Carbon Economic Strategy for Scotland: Scotland – A Low Carbon Society [online] Available at: <http://www.gov.scot/resource/doc/331364/0107855.pdf> (accessed 22/09/2015)

<sup>10</sup> Scottish Government (2013) Low Carbon Scotland: Meeting our Emissions Reductions Targets 2013–2017 The Second Report on Proposals and Policies [online] Available at: <http://www.gov.scot/Publications/2013/06/6387> (accessed 02/02/2016)

cross-industry Air Transport Action Group (ATAG)<sup>11</sup>, are jointly endorsing collaborative efforts to reduce climate impacts. Common goals include: improving fuel efficiency by an average of 1.5% per year until 2020; stabilising net emissions from 2020 through carbon-neutral growth and reducing net aviation carbon emissions by 50% by 2050; relative to 2005 levels<sup>12</sup>. To achieve these measures, a comprehensive set of mitigation actions have been rolled out which include new, more efficient aircraft technology, sustainable alternative fuels and better use of infrastructure and operational improvements, particularly air traffic management<sup>13</sup>. The development of an effective, global market-based measure to fill any remaining emissions gaps is another measure in the four pillar strategy set to meet these targets<sup>14</sup>.

- 1.4.8 Other aviation mechanisms include the EU Single European Sky (SES) Initiative<sup>15</sup>. In addition to tackling issues such as air traffic safety, the SES has the potential to deliver benefits such as fuel efficiency. The objectives of the SES are met through the Civil Aviation Authority's (CAA) Future Airspace Strategy which sets out a plan to modernise airspace by 2020<sup>16</sup>. These initiatives are complementary and both have a common aim of reducing the environmental impact of aviation through the improved airspace design and new on-board and ground-based systems. These new technologies and procedures should allow flight routes to be more direct and reduce fuel burn<sup>17</sup>.

- 1.4.9 Sustainable Aviation is described as a long term strategy which sets out the collective approach of the UK aviation industry to tackling the challenge of ensuring a sustainable future of the industry<sup>18</sup>. It is an alliance of UK airlines, airports, aerospace manufacturers and air navigation service providers and its goals and commitments cover climate change, local air quality and noise. The Sustainable Aviation CO<sub>2</sub> Road Map sets out a number of activities being



<sup>11</sup> Representing the Air Council International, International Air Transport Association, Civil Air Navigation Services Organisation, International Coordinating Council for Aerospace Industries Associations and International Business Aviation Council.

<sup>12</sup> Climate Summit 2014 (2014) Transport Aviation Action Plan Catalyzing Action [online] Available at: [http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/07/UN\\_ICAO-ATAG-Agreement\\_2\\_action-plan.pdf](http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/07/UN_ICAO-ATAG-Agreement_2_action-plan.pdf) (accessed 21/10/2015)

<sup>13</sup> Climate Summit 2014 (2014) Transport Aviation Action Statement Catalyzing Action [online] Available at: [http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/07/UN\\_ICAO-ATAG-Agreement\\_1\\_action-statement.pdf](http://www.un.org/climatechange/summit/wp-content/uploads/sites/2/2014/07/UN_ICAO-ATAG-Agreement_1_action-statement.pdf) (accessed 21/10/2015)

<sup>14</sup> ATAG (2013) Reducing emissions from aviation through carbon neutral growth from 2020 [online] Available at: <https://www.iata.org/policy/environment/Documents/atag-paper-on-cng2020-july2013.pdf> (accessed 21/10/2015)

<sup>15</sup> European Commission (2015) Single European Sky [online] Available at: [http://ec.europa.eu/transport/modes/air/single\\_european\\_sky/index\\_en.htm](http://ec.europa.eu/transport/modes/air/single_european_sky/index_en.htm) (accessed 30/09/2015)

<sup>16</sup> Civil Aviation Authority (undated) Future Airspace Strategy, the development of future airspace management [online] Available at: <http://www.caa.co.uk/default.aspx?catid=2408&pagetype=90> (accessed 30/09/2015)

<sup>17</sup> SESAR (undated) The Future of flying document [online] Available at: [http://ec.europa.eu/transport/modes/air/sesar/doc/2010\\_the\\_future\\_of\\_flying\\_en.pdf](http://ec.europa.eu/transport/modes/air/sesar/doc/2010_the_future_of_flying_en.pdf) (accessed 30/09/2015)

<sup>18</sup> Sustainable Aviation (2015) A strategy towards sustainable development of UK Aviation [online] Available at: <http://www.sustainableaviation.co.uk/our-story/> (accessed 24/11/2015)

undertaken in the sector to reduce CO<sub>2</sub> emissions. These include optimised aircraft operations and air traffic management, improvements in aircraft and energy efficiency and sustainable biojet fuels.

- 1.4.10 The Committee on Climate Change states that policy approaches to aviation emissions should be at global or EU level, given the international nature of the industry. Until these are agreed, it recommends that an appropriate long term planning assumption for aviation is for emissions to be around 2005 levels (37.5 Mt CO<sub>2</sub>) in 2050<sup>19</sup>.
- 1.4.11 Further information regarding other Plans, Programmes and Strategies of relevance to the context of a Scottish replacement to APD are considered throughout this document.

## 1.5 Report Structure

- 1.5.1 The following sections of the Screening and Scoping Report are set out as follows:
- Section 2 - Sets out the proposed approach to the SEA, detailing the scoping of environmental topics, the proposed methodology for undertaking the assessment (including the rationale for identifying mitigation and monitoring proposals) and assessing reasonable alternatives.
  - Section 3 – Sets out the context for the SEA and how the Environmental Baseline will be collated, including information likely to be included as baseline information.
  - Section 4 – Sets out the proposed programme of works for the policy development and its SEA, including an indicative timetable illustrating the integration between assessment and policy formation. This includes an indication of potential consultation timescales.

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<sup>19</sup> Committee on Climate Change (undated) Aviation [online] Available at: <https://www.theccc.org.uk/charts-data/ukemissions-by-sector/aviation/> (accessed 01/12/2015)

## 2 The approach to the assessment

### 2.1 Aligning the environmental impacts with SEA topics

- 2.1.1 The following Section of this Report discusses the work undertaken to set out the 'scope' of the environmental implications that may arise from a Scottish replacement to APD. This requires a consideration of the likely impacts across environmental SEA topics that are required to be considered, as set out in the 2005 Act. Table 2.1 sets out an example of how the environmental impacts from aviation may be considered within the relevant SEA topic area.
- 2.1.2 This should not be considered as an extensive list of potential environmental effects and has been included to illustrate the interconnections that occur between topic areas. Work will continue to progress in determining the likely significant environmental impacts.

**Table 2.1 Overview of Environmental Impacts from Aviation**

Environmental Impacts	SEA topics
Climate change	Climatic Factors
Noise	Population and human health, Biodiversity, flora and fauna.
Air Quality	Air Quality, Population and human health, Biodiversity, flora and fauna.
Resource use (e.g. water and generation of waste).	Material Assets, Water, Biodiversity, flora and fauna, Soil, Landscape, Cultural Heritage and the Historic Environment.
Biodiversity	Biodiversity, flora and fauna, Material Assets, Water.

### 2.2 Development of assumptions

- 2.2.1 Whilst the introduction of a Scottish replacement to APD is mainly a fiscal policy, there remains the potential for environmental effects through its implementation. In order to gain an insight into what change the policy may bring about, this assessment is based upon three assumptions that reflect the potential environmental consequences of using a Scottish replacement to APD to boost international air connectivity in Scotland. The assumptions reflect changes to the aviation industry that may arise as a consequence of its implementation. These draw upon analytical and modelling work carried out by Transport Scotland in September 2014 regarding the effects on emissions that may arise from the reduction or eventual removal of APD in

Scotland<sup>20</sup>. The assumptions are set out in Box 2.1 and have been informed by discussion and input from members of the Scottish APD stakeholder forum.

- 2.2.2 These assumptions have been used to develop three SEA questions that will be considered during the assessment process. The questions, which are set out below, will be used to draw out the likely significant environmental effects that may arise as a result of the reduction and eventual abolition of APD in Scotland.

### **Box 2.1 Key assumptions and questions**

The proposal to reduce and eventually abolish APD in Scotland will lead to an increase in the overall number of flights and could potentially create opportunities for new routes to be created.

**Q 1: What are the likely environmental effects that will arise from an increase in the number of flights?**

An increase in flight numbers will lead to an increase in overall GHG emissions (CO<sub>2</sub> and non-CO<sub>2</sub> emissions), even with advances in technology.

**Q 2: What are the likely impacts that may arise from increased GHG emissions?**

An increase in flight numbers will result in a rise in passenger numbers, both of which will place increased pressure on existing airport and interconnecting infrastructure.

**Q 3: What are the likely impacts that may arise from increased pressure on existing infrastructure?**

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<sup>20</sup> Transport Scotland (2015) Estimate of the Impact of Emissions of a Reduction in Air Passenger Duty in Scotland [online] Available at: <http://www.transportscotland.gov.uk/report/j340458-01.htm> (accessed 02/11/2015)

## 2.3 Scope of the assessment

- 2.3.1 The assumptions have been applied to help identify the likely environmental effects across the SEA topic areas and consider which impacts are likely to be significant and therefore “scoped in” to the assessment process. It is considered that potential impacts are likely to arise through an increase in flight and passenger numbers arriving in and departing from Scottish airports. Primarily this has the potential to result in an increase in GHG emissions and air pollutants associated with these additional flights and passenger numbers, alongside a range of associated secondary or indirect effects.
- 2.3.2 Changes under a new Scottish tax may also lead to an increase in the use of existing infrastructure in the vicinity of an airport and along transport routes between it and urban centres. This has the potential to lead to new infrastructure or upgrades of existing infrastructure to manage future growth in the sector. Both have the potential to increase GHG emissions and contribute to air pollution through construction activities and subsequent use. Other impacts associated with infrastructure requirements include potential negative impacts on biodiversity, soil and water.
- 2.3.3 Consequently, at this stage, it is considered there is potential for the Scottish Government’s emerging policy plans for a new tax to have a range of environmental effects, and as such, all SEA topic areas have been scoped into this assessment. Initial consideration has also been given to whether impacts are most likely to be of national significance or significant on a smaller scale. Further assessment work will continue to explore this.
- 2.3.4 Table 2.2 sets out the SEA topic areas and the initial consideration of the potential impacts that may arise. The topic areas of landscape and cultural heritage and the historic environment are likely to be considered together based upon similarities in potential effects in relation to visual effects and setting.



**Table 2.2 Proposed Scoping In/Out of SEA topics.**

SEA topic	Scoped in/out	Geographical Extent	Discussion
Climatic Factors	In	National	<p>Aviation and airports generate GHG emissions in a number of ways. Flights are the largest source, emitting large quantities of Carbon Dioxide (CO<sub>2</sub>) and Nitrogen Oxides (NO<sub>x</sub>), particularly during landing and take-off. Secondly, emissions arise from operations closer to the ground, such as journeys to and from the airport and airfield ground traffic and airport buildings.</p> <p>An increase in flight numbers and associated increase in ground traffic are therefore likely to have an impact on the level of GHG emissions.</p> <p>Infrastructure and construction at airports also generates CO<sub>2</sub> through the energy needed to produce and transport materials. Therefore, there is potential for an increase in GHG emissions, as a result of any new infrastructure required to support growth at airports.</p> <p>The aviation industry is already investing in further technological development. At this stage of the assessment it is uncertain whether improvements in reducing emissions in the sector, as a consequence of new technologies and other measures, will fully mitigate any predicted increase in emissions associated with the proposed reduction in APD. This will be considered in the SEA against the potential scale of growth in air and surface travel as a result of a Scottish replacement to APD.</p> <p>The SEA will also consider use of biofuels, as discussed by the aviation sector, to reduce carbon emissions and the need to ensure that sustainability in its use is maintained to minimise potential negative impacts.</p>
Population and human health	In	National with Smaller Scale Implications	<p>The Screening Report identified the potential for changes to noise levels associated with a projected increase in the number of flights arriving and departing from Scottish airports, alongside potential for changes to background air quality. Also identified are potential impacts from any</p>



SEA topic	Scoped in/out	Geographical Extent	Discussion
			<p>infrastructure works undertaken to help deliver increased flight and passenger numbers. It is noted that these are likely to be short term negative impacts.</p> <p>The potential for positive effects through greater connectivity, should additional flights and routes be introduced and enhancements made to existing transport infrastructure, has also been identified.</p>
Material assets (infrastructure and waste).	In	National with Smaller Scale Implications	<p>The Screening Report identified increased pressure on existing transport and airport infrastructure as a result of the proposal to reduce and eventually abolish APD leading to increased passengers and flights utilising Scottish airports. However, there is the potential to explore opportunities for greater transport connectivity and increased inter-modal travel through future upgrades of existing infrastructure and/or construction of new transport infrastructure between urban centres and airports.</p> <p>Airports consume resources and generate waste and an increase in flight and passenger numbers will increase this volume. The significance of these issues will be considered in the assessment.</p>
Air	In	Smaller Scale Implications (also see climatic factors and population and human health).	<p>The relationship between aviation and GHG emissions has been discussed under the heading of Climatic Factors. Emissions from flights can have implications on air quality, primarily around airports. Other sources of air pollution are generated as a result of aviation. Sources include the combustion of aviation fuel, vehicles travelling to and from the airport and ground service equipment. Construction of airport related projects can also lead to dust and emissions.</p> <p>An increase in flight numbers, in addition to increased journeys to and from airports, is therefore likely to have associated impacts on these identified sources of air pollutants and consequently impacts on air quality.</p>

SEA topic	Scoped in/out	Geographical Extent	Discussion
Biodiversity, flora and fauna	In	Smaller Scale Implications	This Screening Report identifies potential secondary and/or indirect impacts on these topic areas. In particular, the potential for negative effects as a result of changes to air quality, climatic factors (climate change), and from future infrastructure works, for example airport expansion, new transport infrastructure and construction. Airports are also large consumers of water and generate waste material.
Soil			
Water			The SEA will consider the potential range of secondary effects and whether these can be reasonably attributed to the development of a Scottish replacement to APD.
Landscape, cultural heritage and the historic environment			

## 2.4 Proposed assessment methodology

- 2.4.1 As discussed under the previous sections of this screening and scoping document, it is likely that many of the potential environmental impacts that arise will impact on differing geographical scales. This is a result of a combination of factors; such as the type of effect, the nature of the environmental receptor and whether the impacts are likely to occur only in certain locations. For example, some of the environmental effects that arise from the aviation sector occur at altitude and, as such, will likely be of consideration at a larger geographical scale in terms of potential impact and significance. Other environmental effects may be associated with airport infrastructure and, whilst potentially still significant in nature, are likely to be experienced at a smaller geographical scale. Appendix 2 sets out initial work that has been undertaken to examine the potential environmental effects that may arise under each SEA topic. The significance of these effects will be considered in the policy development and assessment stages following this initial consultation.
- 2.4.2 It is proposed that the assumptions developed for this assessment will be used to build on these initial findings and provide a structure for considering the potential impacts on each topic area. The assessment will be structured in a narrative format, centred on the issues that these key questions raise. This narrative will also set out the consideration of the reasonable alternatives discussed in Section 2.5 below and will explore the likely scale and significance of the impact and the nature of the predicted impact, for example, long term or short term, temporary or permanent. An example of this proposed format is shown below in Box 2.2.

## Box 2.2 Example of proposed assessment format

### SEA Topic: Climatic Factors

Q1: What are the.....increase in the number of flights?

Alternative 1...

Alternative 2...

Alternative 3.....

**Assessment findings:** Narrative discussion under each alternative of the likely impacts including geographical extent, likely significance, nature of impacts, the transboundary nature of any impacts and inter linkages between SEA topic areas.

Q2: What are the.....increased GHG emissions?

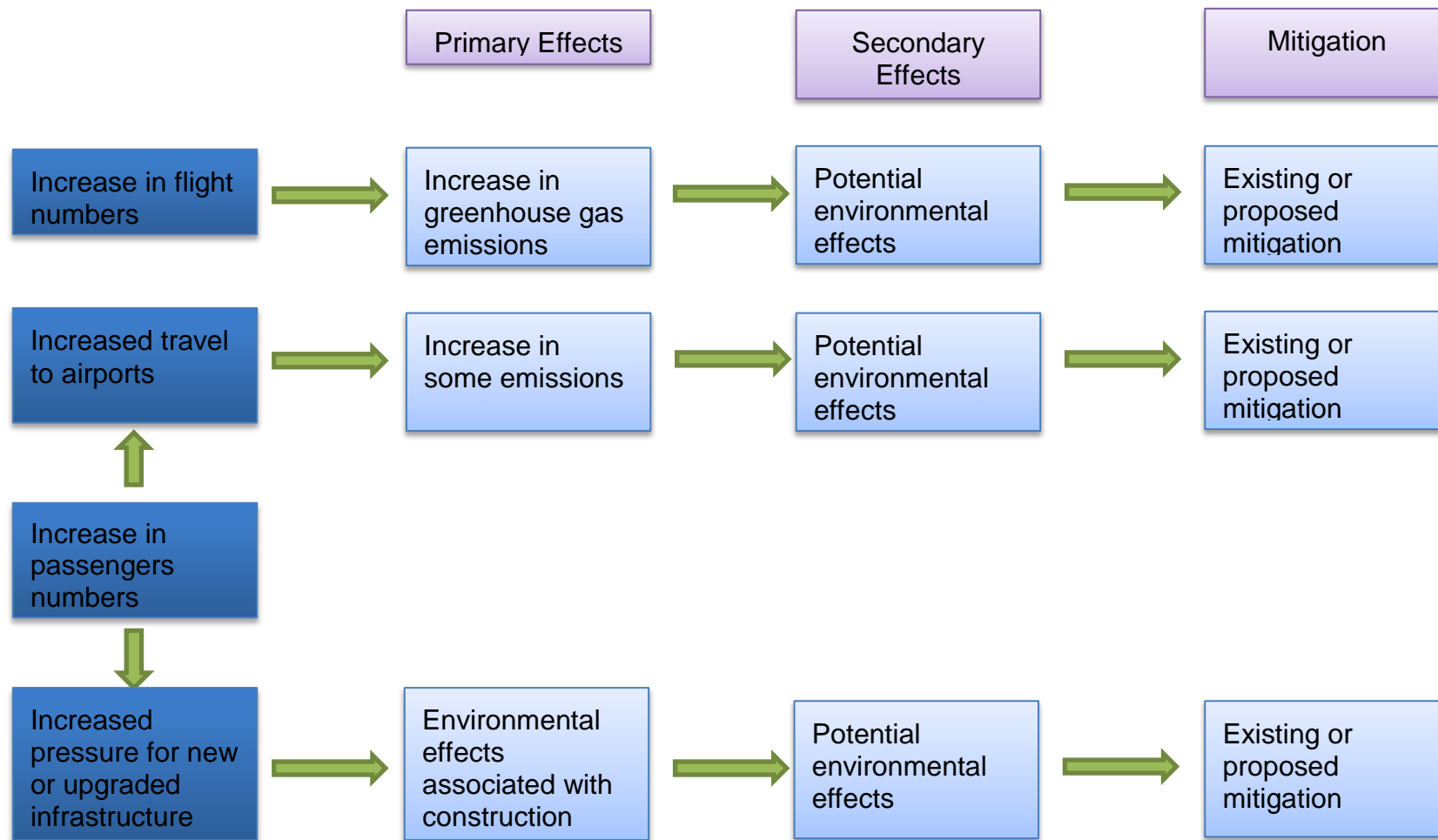
Alternative 1...

Alternative 2...

Alternative 3....

**Assessment findings:** Narrative discussion under each alternative.....

- 2.4.3 The initial work to identify relevant environmental issues presented in Appendix 2 has identified a number of potential linked primary and secondary effects for consideration. For ease of presentation, it is proposed that a format as set out below will be used to describe the links between the main findings of the assessment and will seek to include any mitigation measures where identified. An example of how these may be presented is shown below in Figure 2.1.



**Figure 2.1 Example of proposed assessment format: Summary of findings**

## Building on previous research and assessments

- 2.4.4 A considerable amount of research has been undertaken to explore the environmental effects that arise from activity in the aviation sector. For example, in 2011 the UK Government undertook a consultation on “A sustainable framework for UK aviation”<sup>21</sup>. Other relevant research includes the work undertaken by the Airports Commission in 2015<sup>22</sup>. This work considered the impacts of increasing the UK’s long-term aviation capacity and included an assessment of the potential implications on a number of factors such as surface access, noise and air quality.
- 2.4.5 In addition there are other policies and strategies with a connection to the air travel and transport sectors. Primarily, this work has related to strategic planning for infrastructure. The SEA undertaken on NPF3 and SPP in 2013 explored transport issues. In particular, this SEA involved the assessment of the vision of ‘A Connected Place’ including proposals for Scottish airport enhancements at Aberdeen, Prestwick, Edinburgh, Glasgow and Inverness, and improving transport links between cities (e.g. rail links). Transport connectivity for Scotland’s airports is also widely addressed through the Local Development Planning process, which are subject to SEA.
- 2.4.6 Where appropriate, this SEA will build on this, and other relevant work, to inform the evidence gathering and assessment process.

## 2.5 Alternatives

- 2.5.1 The 2005 Act requires that the potential for significant environmental effects of reasonable alternatives to the Scottish Government’s policy plans for a Scottish replacement to APD are assessed as part of the SEA process. In considering the recommendations of the Smith Commission and the ambitions set out in the Consultation Paper, a number of different outcomes to approaching the development of a Scottish replacement to APD have initially been identified.
- 2.5.2 It is proposed that the SEA will explore the implications of adopting each approach, focusing on the likely positive and negative effects that may be associated with each. It is expected that particular focus will be given to the potential for changes in the number of passengers and/or flights utilising Scottish airports, and the potential for this to have implications on the SEA topic areas including any indirect and/or secondary effects that may arise.
- 2.5.3 At this stage it is proposed that the SEA consider and compare the following reasonable policy alternatives for when the power to charge a tax on air

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<sup>21</sup> Department of Transport (2011) sustainable framework for UK aviation consultation [online] Available at: <https://www.gov.uk/government/consultations/sustainable-framework-for-uk-aviation-consultation> (accessed 25/02/2016)

<sup>22</sup> Airports Commission (2015) Airports Commission: Final Report July 2015 [online] Available at: <https://www.gov.uk/government/organisations/airports-commission> (accessed 30/11/2015)

passengers flying from a Scottish airport has been devolved to the Scottish Parliament:

- **Alternative 1:** The introduction of a Scottish replacement tax with the same design, structure and tax rates as UK APD. This would represent a 'like for like' approach.
- **Alternative 2:** The introduction of a Scottish replacement tax with the overall tax burden in Scotland (compared to UK APD) being reduced by 50% by the end of the next Scottish Parliament. The Scottish Government will consult on how the replacement tax should be designed and structured, exploring options such as changes in the method of charging (for example passenger or flight-based) and the methodology for determining rates and bands.
- **Alternative 3:** The Scottish Parliament does not legislate for a Scottish replacement tax. Once powers over APD had been devolved this would mean that there would be no tax on the carriage of air passengers from Scottish airports.

2.5.4 Although the Scottish Government has already set out its intention to reduce APD in Scotland by 50% by the end of the next Scottish Parliament (starting that reduction in April 2018), and to abolish the tax entirely when resources allow, these alternatives remain reasonable as considerations for the purpose of the SEA and will be given equal consideration during the SEA process.

2.5.5 It is also noted that these alternatives may evolve as the Scottish Government's policy plans for a replacement to APD are developed, including changes resulting from public and stakeholder consultation. There may also be further alternative approaches that can be applied within this initial set of alternatives, which consultees may wish to suggest or comment upon. For example, whether or not a future reduction in the overall tax burden is applied equally across all bands and rates, and whether the tax is charged on a per-passenger or per-plane basis. Alternatives are required to be reasonable and will recognise the role that legal and state aid issues play in this determination. Furthermore it is acknowledged that at this stage the alternatives and assumptions that underpin them could evolve as a result of policy changes in other European and UK administrations.

2.5.6 The results of the consultation on the policy and this report will be used to develop further reasonable alternatives for subsequent assessment.

## 2.6 Identifying Mitigation and Monitoring Proposals

2.6.1 A key part of the SEA process is the identification of mitigation and monitoring measures, which will encompass both measures currently in place and recommendations for new actions. Where possible, existing data sources and indicators will be discussed in the SEA through the collation of

baseline information and in the assessment proper. It is expected that this will be discussed in a specific section of the Environmental Report.

- 2.6.2 Any monitoring recommendations made in the SEA process are likely to focus on exploring the potential for significant environmental effects identified over the course of the assessment, and are likely to be linked to the implementation of mitigation or enhancement measures where appropriate.



## 3 Context for the SEA

### 3.1 Requirements of the 2005 Act

3.1.1 Schedule 3 of the 2005 Act requires that the following be identified when undertaking a SEA:

- Relevant aspects of the current state of the environment and its likely evolution without the plan or programme;
- Environmental characteristics of areas likely to be affected;
- Relevant existing environmental problems; and
- Relevant environmental protection objectives at the international, European or national level.

3.1.2 There are many objectives for environmental protection and enhancement detailed within existing legislation, policies, strategies and plans, and these form the context for the development of the SEA and consideration of the Scottish Government's policy plans for a Scottish replacement tax. For each environmental topic area scoped into the assessment, an initial summary of the existing environmental protection objectives have been set out in the following sections of this Report.

### 3.2 Sourcing Baseline Information

3.2.1 The following sections also set out initial information collated for the environmental baseline used to inform the Scoping stage of the SEA. It is noted that the environmental baseline will be progressively compiled as the assessment progresses to ensure that, as the Scottish Government's policy plans for a Scottish replacement to APD evolve, the evidence base of the SEA remains relevant in order to inform the policy development process.

3.2.2 Whilst undertaking the initial collation of baseline information presented in this Report, the differing geographical implications of potential environmental effects have been drawn out. For example, whilst the potential impacts on climatic factors as a result of GHG emissions are of a national scale, potential impacts on receptors such as water, soil and biodiversity are likely to be localised in the vicinity of the airport. As such, the following baseline information will reflect the relevant scales of effects. This will be explored as the assessment progresses and, where appropriate, maps could be used to illustrate potential impacts on known designations at site level.

3.2.3 As discussed previously, a number of assumptions have been made in order to consider the likely impact of a Scottish replacement to APD (see Box 2.1). At the end of each SEA topic, a table has been included setting out the identified environmental implications (key impacts) that are considered likely to arise based on these assumptions and key points related to the current state of the environment, pressures and trends.

## 3.3 Climatic Factors

### Environmental Objectives

- 3.3.1 International targets and mechanisms for addressing climate change are set by the Kyoto Protocol, which extends the 1992 United Nations Framework Convention on Climate Change (UNFCCC). The development of the Aichi Biodiversity Targets, whilst focused primarily on biodiversity, also set out targets for reducing pressures on ecosystems from sources such as climate change<sup>23</sup>.
- 3.3.2 In Scotland, the Climate Change (Scotland) Act 2009 establishes a framework for reducing Scotland's GHG emissions and sets targets for at least 42% lower than the baseline by 2020, and 80% lower than the baseline by 2050<sup>24</sup>. In October 2010, the Scottish Parliament passed legislation setting the first batch of annual targets up to 2022. Targets for 2023-2027 were set in October 2011, with subsequent targets to continue to be set at 5-year intervals<sup>25</sup>. Targets for the period 2028-2032 are required to be set in legislation no later than 31 October 2016. RPP<sup>26</sup> and RPP2<sup>27</sup> detail a range of proposals, policies and enabling measures to meet these targets, including those within the transport sector.
- 3.3.3 The EU Emissions Trading Scheme (ETS) is the main policy lever for addressing GHG emissions from the aviation sector<sup>28</sup>. Under the ETS, emissions from both domestic and international aviation are capped. For example, emissions were capped at 97% of average annual emissions for 2012, and from 2013–2020 they will be capped at 95%<sup>29</sup>.
- 3.3.4 As discussed previously, the aviation sector is taking a collaborative effort to reduce climate impacts based upon setting common goals for improving fuel efficiency and stabilising net emissions from aviation activities.

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<sup>23</sup> Convention on Biological Diversity (undated) Aichi Biodiversity Targets [online] Available at: <https://www.cbd.int/sp/targets/> (accessed 17/09/2015)

<sup>24</sup> Climate Change (Scotland) Act 2009 [online] Available at: <http://www.legislation.gov.uk/asp/2009/12/contents> (accessed 17/08/2015)

<sup>25</sup> Scottish Government (2014) Scottish Greenhouse Gas Emissions 2013 [online] Available at: <http://www.gov.scot/Resource/0047/00478796.pdf> (accessed 04/09/2015)

<sup>26</sup> Scottish Government (2011) Low Carbon Scotland - Meeting our Emissions Reduction Targets 2019-2022 [online] Available at: <http://www.gov.scot/Topics/Environment/climatechange/scotlands-action/lowcarbon/rpp> (accessed 17/08/2015)

<sup>27</sup> Scottish Government (2013) Low Carbon Scotland - Meeting our Emissions Reduction Targets 2013-2027 [online] Available at: <http://www.gov.scot/Topics/Environment/climatechange/scotlands-action/lowcarbon/meetingthetargets> (accessed 17/08/2015)

<sup>28</sup> European Commission (2015) Climate Action [online] Available at: [http://ec.europa.eu/clima/policies/ets/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/index_en.htm) (accessed 08/12/2015)

<sup>29</sup> Scottish Government (2013) RPP2 [online] Available at: <http://www.gov.scot/Publications/2013/06/6387/9> (accessed 09/12/2015)

- 3.3.5 An updated framework for adaptation to climate change impacts has been published, alongside 12 sectoral work streams<sup>30</sup>. The transport sector action plan considers the impacts of climate change on transport infrastructure such as airports, road and rail<sup>31</sup>. Scotland's Climate Change Adaptation Programme (2013–2017)<sup>32</sup> is in place to address the predicted impacts for Scotland set out in the UK Climate Change Risk Assessment (CCRA)<sup>33</sup>, and sets the framework for Scotland's adaptation to the predicted effects of climate change.

### Initial Environmental Baseline

- 3.3.6 Over the last 50 years, it has become increasingly apparent that the world's climate is changing at an unprecedented rate. Evidence of an increase in average global temperatures, along with an increase in GHG in the atmosphere, has led to the conclusion that human activities such as the use of carbon based fuels is the main reason for this increase<sup>34</sup>. Air pollution also often originates from the same activities that contribute to climate change (e.g. transport sources, energy generation).
- 3.3.7 The scientific consensus is that warming of the Earth's climate system is unequivocal and that it is very likely that anthropogenic GHG emissions have been the dominant cause of this warming since the mid-20th century<sup>35</sup>. For example, higher temperatures and increased precipitation were observed between 1961 and 2004, including as much as a 70% increase in winter precipitation in parts of northern Scotland and increased heavy winter rainfall events, particularly in northern and western regions<sup>36</sup>. This has the potential to have a wide range of direct, secondary or indirect effects on the natural environment, and has been identified as a primary pressure on many of the SEA topic areas (i.e. soil, water, biodiversity, cultural heritage and the historic environment). The predicted impacts from a changing climate have been discussed further under the relevant SEA topics in this Report.

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<sup>30</sup> The Scottish Government (2012) Sector Action Plans [online] Available at: <http://www.gov.scot/Topics/Environment/climatechange/scotlands-action/adaptation/AdaptationFramework/SAP> (accessed 09/09/2015)

<sup>31</sup> The Scottish Government (2013) Scotland's Climate Change Adaptation Framework – Transport Sector Action Plan [online] Available at: <http://www.gov.scot/Resource/Doc/175776/0114931.pdf> (accessed 09/09/2015)

<sup>32</sup> Scottish Government (2014) Climate Ready Scotland Scottish Climate Change Adaptation Programme [online] Available at: <http://www.gov.scot/Publications/2014/05/4669> (accessed 17/08/2015)

<sup>33</sup> UK Government (2012) UK Climate Change Risk Assessment [online] Available at: <https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-government-report> (accessed 17/08/2015)

<sup>34</sup> Scotland's Environment (undated) Climate change [online] Available at: [http://www.environment.scotland.gov.uk/our\\_environment/air\\_and\\_climate/climate\\_change.aspx](http://www.environment.scotland.gov.uk/our_environment/air_and_climate/climate_change.aspx) (accessed 04/09/2015)

<sup>35</sup> Intergovernmental Panel on Climate Change (2013) A report of Working Group 1 Summary for Policymakers [online] Available at: <https://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf> (accessed 02/02/2016)

<sup>36</sup> Scottish Greenhouse Gas Emissions 2010 [online] Available at: <http://www.scotland.gov.uk/Publications/2012/07/9583/downloads#res-1> (accessed 10/09/2015)

- 3.3.8 In 2013, 53.0 million tonnes carbon dioxide equivalent (Mt CO<sub>2</sub>e) of GHG emissions were emitted, a 3.6% reduction compared to 2012. Between 1990 and 2013, there was a 34.3% reduction in estimated Scottish emissions, with the main contributors to this reduction identified as waste management and in energy supply emissions. While energy generation was identified as the largest emitter of net emissions (16.0 Mt CO<sub>2</sub>e), transport including domestic and international aviation was the second largest contributor accounting for around a quarter of emissions (12.9 Mt CO<sub>2</sub>e)<sup>37</sup>.
- 3.3.9 Aircraft emit a range of GHG gases throughout the different stages of flight and are fairly unique in that they directly emit gases into the higher levels of the atmosphere. The GHG created by aviation are: CO<sub>2</sub>; Oxides of Nitrogen (NO<sub>x</sub>); Ozone (created by the reaction of sunlight and NO<sub>x</sub>); soot; aerosols; and water vapour (causing contrail or man-made cirrus clouds)<sup>38</sup>. CO<sub>2</sub> is generally viewed as the most problematic GHG and in aviation it is primarily generated by burning carbon-rich fossil fuels in engines. Aircraft emit CO<sub>2</sub> in direct proportion to the quantity of the fuel burned<sup>39</sup>.
- 3.3.10 Aviation currently accounts for approximately 6% of total UK CO<sub>2</sub> emissions. Of this around 90% of these emissions arise from international flights, and 10% from domestic flights<sup>40</sup>. In 2012 it was reported that emissions in the aviation sector have doubled since 1990; however it was noted that over the same time period, aircraft have become substantially more energy efficient through improvements in engine and airframe technology<sup>41</sup>. Whilst emissions have fallen by an average of 0.7% between 2009 and 2013, they are projected to rise in the future without further reduction measures<sup>42</sup>.
- 3.3.11 Research undertaken recently by Transport Scotland reports that reducing APD<sup>43</sup> on departures from Scotland is likely to lead to an increased demand, in particular, for short haul leisure seats<sup>44</sup>. Assuming a linear average relationship between passengers and emissions<sup>45</sup> these extra trips are forecast to generate an increase in emissions by 0.034 Mt CO<sub>2</sub>e over the full

<sup>37</sup> Scottish Government (2014) Scottish Greenhouse Gas Emissions 2013 [online] Available at: <http://www.gov.scot/Resource/0047/00478796.pdf> (accessed 04/09/2015)

<sup>38</sup> CAA (2015) Aviation's impact on climate change, Aviation, emissions and the greenhouse effect [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Climate-change/Aviation-and-climate-change/> (accessed 15/12/2015)

<sup>39</sup> SESAR (2015) Environment [online] Available at: <http://www.sesarju.eu/benefits/environment> (accessed 26/11/2015)

<sup>40</sup> CAA (2015) Aviation's impact on climate change, Aviation, emissions and the greenhouse effect [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Climate-change/Aviation-and-climate-change/> (accessed 15/12/2015)

<sup>41</sup> *ibid*

<sup>42</sup> Committee on Climate Change (undated) Aviation [online] Available at: <https://www.theccc.org.uk/charts-data/ukemissions-by-sector/aviation/> (accessed 01/12/2015)

<sup>43</sup> Based on a 50% reduction scenario

<sup>44</sup> Transport Scotland (2015) Estimate of the Impact of Emissions of a Reduction in Air Passenger Duty in Scotland [online] Available at: <http://www.transportscotland.gov.uk/report/j340458-01.htm> (accessed 02/11/2015)

<sup>45</sup> Total domestic/international emissions divided by total number of domestic/international passengers

course of a year<sup>46</sup>. In addition, if passengers switch from northerly English airports to Scottish airports in response to lower air fares, this may increase the emissions impact estimate to between 0.05 Mt CO<sub>2</sub>e to 0.06 Mt CO<sub>2</sub>e<sup>47</sup>.

- 3.3.12 There are many factors that affect the amount of CO<sub>2</sub> emissions from a flight. Some of these are within the gift of airlines to manage, such as operational features, some can be controlled or influenced by airports and regulators, and some are to do with weather. The main factors are: aircraft type; flight profile and distance; weight of the aircraft; operational procedures; use of next generation of biofuels; weather; and efficiency improvements<sup>48</sup>.
- 3.3.13 Air traffic management (ATM) affects when, how far, how high, how fast and how efficiently aircraft fly. These parameters in turn influence how much fuel a given aircraft burns, the release of GHG and other gases from the engine and how much noise an aircraft makes. The Single European Sky ATM Research (SESAR) is the technical pillar of the SES and aims to improve air traffic management. Specific objectives include a target of enabling a 10% fuel saving per flight from ATM alone, leading to a 10% reduction of CO<sub>2</sub> emissions per flight<sup>49</sup>. SESAR also state that enhancements in ATM, through the optimisation of flight trajectories, have the potential to reduce the cumulative in-flight CO<sub>2</sub> emissions up to 2020 by around 50 million tonnes<sup>50</sup>.
- 3.3.14 Engineering improvements, technological enhancements and advanced operations (including greater efficiency in air traffic management) all have a role to play to reduce aviation fuel use and associated carbon emissions. Significant progress has been made in establishing technology goals for reducing aircraft GHG emissions, on a per-flight basis, and efficiency is expected to improve continuously through 2050 and beyond<sup>51</sup>. However, whilst aircraft have become substantially more energy efficient through improvements in engine and airframe technology, projections show that GHG emissions will continue to grow in line with demand if greater improvements are not made<sup>52</sup>. This is mirrored in the findings of a trends assessment performed by the ICAO Committee on Aviation Environmental Protection (CAEP). This forecast that, even with the anticipated gain in efficiency from technological and operational measures, aviation CO<sub>2</sub>

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<sup>46</sup> Transport Scotland (2015) Estimate of the Impact of Emissions of a Reduction in Air Passenger Duty in Scotland [online] Available at: <http://www.transportscotland.gov.uk/report/j340458-01.htm> (accessed 02/11/2015)

<sup>47</sup> *ibid*

<sup>48</sup> CAA (2015) Aviation's impact on climate change, Aviation, emissions and the greenhouse effect [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Climate-change/Aviation-and-climate-change/> (accessed 15/12/2015)

<sup>49</sup> SESAR (2014) SESAR and the environment document [online] Available at: [http://ec.europa.eu/transport/modes/air/sesar/index\\_en.htm](http://ec.europa.eu/transport/modes/air/sesar/index_en.htm) (accessed 30/09/2015)

<sup>50</sup> *ibid*

<sup>51</sup> ICAO (undated) Environmental Protection Alternative Fuels [online] Available at: <http://www.icao.int/environmental-protection/Pages/alternative-fuels.aspx> (accessed 30/11/2015)

<sup>52</sup> CAA (2015) Aviation's impact on climate change, Aviation, emissions and the greenhouse effect [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Climate-change/Aviation-and-climate-change/> (accessed 15/12/2015)

emissions will increase in the next decade due to the continuous growth in air traffic<sup>53</sup>.

- 3.3.15 One approach to achieve carbon neutral growth from 2020 is the development and use of sustainable alternative fuels. These have a reduced carbon footprint compared to conventional jet fuel and therefore can reduce GHG emissions. It is predicted that sustainable fuels could contribute to an 18% reduction in the UK aviation's CO<sub>2</sub> emissions by 2050<sup>54</sup>. Some alternative fuels can also have beneficial impacts on engine emissions with regard local air quality<sup>55</sup>. However, there are long term challenges for development and deployment of alternative fuels; these include feedstock availability and sustainability, in addition to economics<sup>56</sup>.
- 3.3.16 Closer to the ground, airport related operations also contribute to climate change, for example passenger and workers travelling to and from the airport, airfield ground transport, airport buildings and airfield systems<sup>57</sup>. It should also be noted that below 1,000 ft, aviation related emissions also affect air quality<sup>58</sup>. This is covered under the topics of population and human health and air quality.
- 3.3.17 There is potential that changes to a Scottish APD could initiate modal shift. For example greater number and choice in short haul flights at a lower price could displace some rail movements. Similarly, changes to the new tax may also alter current patterns of competition between Airports in the North East and North West of England and those in the Central Belt of Scotland. This could result in changes to existing airport related movements between these regions. All of this has the potential to alter emissions and may also influence air quality.
- 3.3.18 Climate change is considered to be one of the most serious environmental threats to sustainable development, with adverse impacts expected on human health, food security, economic activity, natural resources and physical infrastructure<sup>59</sup>. Adaptation to the effects of climate change is now acknowledged as necessary for responding effectively and equitably to the impacts of climate change. The aviation industry may have to adapt to more severe weather patterns such as winds, storms and visibility affecting capacity, or efficiency and water shortage constraining airport

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<sup>53</sup> ICAO (undated) Environmental Protection Alternative Fuels [online] Available at: <http://www.icao.int/environmental-protection/Pages/alternative-fuels.aspx> (accessed 30/11/2015)

<sup>54</sup> Sustainable Aviation (2015) Sustainable Aviation CO<sub>2</sub> Road Map leaflet [online] Available at: <http://www.sustainableaviation.co.uk/road-maps/> (accessed 24/11/2015)

<sup>55</sup> ICAO (undated) Environmental Protection, Alternative Fuels [online] Available at: <http://www.icao.int/environmental-protection/Pages/alternative-fuels.aspx> (accessed 30/11/2015)

<sup>56</sup> *ibid*

<sup>57</sup> EUROCONTROL (2015) Climate change [online] Available at: <http://www.eurocontrol.int/articles/environmental-issues-aviation> (accessed 25/11/2015)

<sup>58</sup> *ibid*

<sup>59</sup> ICAO (undated) Climate change adaptation [online] Available at: <http://www.icao.int/environmental-protection/Pages/adaptation.aspx> (accessed 30/11/2015)



development<sup>60</sup>. Ten UK airports, including Edinburgh and Glasgow, will be reporting on how they are identifying and addressing the risk they may face from climate change under the Climate Change Act (2008) Reporting Power<sup>61</sup>.

#### Other non-CO<sub>2</sub> GHG

- 3.3.19 Aviation contributes towards climate change through a range of “non-CO<sub>2</sub>” impacts which occur at altitude. The warming and cooling effects of these emissions arise as a direct result of the atmospheric conditions in which they are emitted. For example, non-CO<sub>2</sub> emissions with climate impacts include water vapour and nitrogen oxides (NOx). Emissions of NOx result in the production of ozone, an air pollutant with harmful health and ecosystem effects and a GHG<sup>62</sup>.
- 3.3.20 Furthermore, the most significant GHG, CO<sub>2</sub>, does not have any additional impact due the differences in altitude; the impact is the same. However, other emissions such as NOx and water vapour can have more of an effect at higher altitudes. This greater effect is expressed by scientists as a multiplier<sup>63</sup>. Less is known about the effect of non-CO<sub>2</sub> GHG emissions and whilst there has been scientific advances regarding the extent of their impact on climate change, considerable scientific uncertainty remains<sup>64</sup>. However, recent research suggests that aviation CO<sub>2</sub> emissions should be multiplied by 1.9 times to take account of the added impact of these other gasses at altitude<sup>65</sup>.

#### IMPACTS

- An increase in GHG emissions (CO<sub>2</sub> and non GHG emissions) has been identified.
- Climate change impacts will have implications across all SEA topic areas.

<sup>60</sup> EUROCONTROL (2015) Environmental issues for aviation, climate change [online] Available at: <http://www.eurocontrol.int/articles/environmental-issues-aviation> (accessed 26/11/2015)

<sup>61</sup> Department for Transport (2011) Developing a sustainable framework for UK aviation [online] Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/2579/consultationdocument.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/2579/consultationdocument.pdf) (accessed 22/10/2015)

<sup>62</sup> ibid

<sup>63</sup> ATAG (undated) Aviation Benefits Beyond Borders Aviation and climate change [online] Available at: <http://aviationbenefits.org/environmental-efficiency/aviation-and-climate-change/> (accessed 10/12/2015)

<sup>64</sup> Department for Transport (2011) Developing a sustainable framework for UK aviation [online] Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/2579/consultationdocument.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/2579/consultationdocument.pdf) (accessed 22/10/2015)

<sup>65</sup> ATAG (undated) Aviation Benefits Beyond Borders Aviation and climate change [online] Available at: <http://aviationbenefits.org/environmental-efficiency/aviation-and-climate-change/> (accessed 10/12/2015)

## KEY POINTS

- The scientific consensus is that warming of the Earth's climate system is unequivocal and that it is very likely that anthropogenic greenhouse gas emissions have been the dominant cause of this warming since the mid-20th century.
- Transport, including domestic and international aviation was the second largest contributor of Scottish GHG emissions in 2013.
- Aircraft emit a range of GHG emissions at different stages of a flight and when emitted at altitude the same gas can have a different effect than at ground level.
- CO<sub>2</sub> is generally viewed as the most problematic GHG and in aviation it is primarily generated by fossil fuel use.
- Aviation produces other non-CO<sub>2</sub> GHG emissions which can contribute to climate change, however scientific uncertainty remains regarding this subject. Non-CO<sub>2</sub> emissions act as a multiplier.
- Early estimates show that a 50% reduction in APD will lead to an uptake in passenger numbers and trips. These extra trips are forecast to generate an increase in GHG emissions.
- Engineering improvements, technological enhancements, and advanced operations (including efficiency improvements in air traffic management) all have a role to play to reduce aviation fuel use and associated carbon emissions
- However, it is forecast that, even with the anticipated gain in efficiency from technological and operational measures, aviation CO<sub>2</sub> emissions will increase in the next decade due to the continuous growth in air traffic. Further reduction measures will be needed.
- Sustainable alternative fuels can reduce GHG emissions and are seen as one reduction measure; however, long term challenges regarding its development and deployment remain.
- Activities associated with flying such as onsite ground vehicles and journeys to and from the airport (for flights and work) also create CO<sub>2</sub> emissions. However, these are thought to be a small contributing source to overall emissions.
- Emissions at or below a certain altitude also have implications for air quality and consequently population and human health.



## 3.4 Population and Human Health

### Environmental Objectives

- 3.4.1 Many existing environmental protection objectives are relevant to population and human health, either directly or indirectly. For example, Air Quality Standards (Scotland) Regulations 2010<sup>66</sup> help set out current objectives and requirements for air quality. Protection is also afforded through existing legislation against noise and vibration nuisance at the both the European level through Environmental Noise Directive (2002/49/EC)<sup>67</sup> and the national level through legislation and regulations such as the Environmental Protection Act 1990 and Environmental Noise (Scotland) Regulations 2006<sup>68</sup>.
- 3.4.2 Other legislation, such as the Pollution Prevention and Control (Scotland) Regulations 2012<sup>69</sup> (PPC Regulations), also seek to provide protection for human health through introducing a more consistent and integrated approach to environmental protection to ensure that activities that may have a significant impact on the environment are strictly regulated. The PPC Regulations were designed to eliminate or minimise emissions to air, water and land and extended pollution controls to previously unregulated sectors. The Control of Pollution Act 1974<sup>70</sup> also sets out local authorities' duty to inspect and exercise powers concerning noise abatement zones, and provides a process for dealing with excess noise and disturbance from construction sites, amongst other issues.

### Initial Environmental Baseline

- 3.4.3 The Scottish Index of Multiple Deprivation (SIMD) ranks small areas (datazones)<sup>71</sup> from the most deprived to the least deprived. It analyses data from a number of indicators across the domains of income, employment, health, education, skills and training, housing, geographic access and crime. Key findings from the SIMD 2012 show that deprivation in Scotland has become less concentrated over time. In SIMD 2004, nearly half of all datazones in the most deprived 10% across Scotland were in Glasgow City.

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<sup>66</sup> The Air Quality Standards (Scotland) Regulations 2010 [online] Available at: [http://www.legislation.gov.uk/ssi/2010/204/pdfs/ssi\\_20100204\\_en.pdf](http://www.legislation.gov.uk/ssi/2010/204/pdfs/ssi_20100204_en.pdf) (accessed 17/08/2015)

<sup>67</sup> Environmental Noise Directive 2002/49/EC [online] Available at: [http://ec.europa.eu/environment/noise/directive\\_en.htm](http://ec.europa.eu/environment/noise/directive_en.htm) (accessed 17/08/2015)

<sup>68</sup> Environmental Noise (Scotland) Regulations 2006 [online] Available at: <http://www.legislation.gov.uk/ssi/2006/465/made> (accessed 17/08/2015)

<sup>69</sup> The Pollution and Prevention Control (Scotland) Regulations 2012 [online] Available at: <http://www.gov.scot/Topics/Environment/waste-and-pollution/Pollution-1/Industrial-Pollution/PPC> (accessed 17/08/2015)

<sup>70</sup> Control of Pollution Act 1974 [online] Available at: <http://www.legislation.gov.uk/ukpga/1974/40/contents> (accessed 11/09/2015)

<sup>71</sup> Datazones have roughly the same population, however the boundaries of datazones are kept constant although the populations may change over time. <http://www.scotland.gov.uk/Topics/Statistics/SIMD/FAQs>

This had dropped to 35.8% in 2012 with corresponding rises in other local authorities<sup>72</sup>. Glasgow City, Edinburgh City, West Lothian, Aberdeen City and South Lanarkshire have seen relatively large decreases in their share of datazones in the 15% most deprived areas in Scotland between SIMD 2009 and SIMD 2012<sup>73</sup>.

- 3.4.4 Air quality is important for both short and long-term human health, and poor air quality can have impacts on people with existing health issues. In general, healthy people may not suffer from any serious health effects from exposure to the levels of pollution commonly experienced in our urban environments. However, continual exposure can cause harm over the long term, and those with pre-existing health conditions such as heart disease, lung conditions and asthma can be adversely impacted by day-to-day exposure to air pollutants<sup>74</sup>. The sources of air pollution are discussed in further detail under Air Quality.
- 3.4.5 Noise is an issue at almost every airport. It has historically been the principle environmental issue for aviation and remains high on the agenda for public concern<sup>75</sup>. Aircraft noise is generated by both the engine and the airframe and is most evident during landing and take-off, with further noise generated from taxiing aircrafts, the application of reverse-thrust during landing, engine tests and airport vehicular traffic. However, noise impacts can also extend to vehicular and rail traffic to and from the airport, alongside noise disturbance associated with construction activities associated with infrastructure development.
- 3.4.6 The effects of disturbance, particularly increases in noise and nocturnal noise, are a complex area of study and the potential impacts on human health can be varied and wide ranging. It has been reported that noise can cause sleep disturbance which can impact on human health through fatigue, annoyance, low mood and impaired performance<sup>76</sup>. Losses of concentration, stress and anxiety amongst those affected by noise disturbance have also been observed in a range of noise impact studies<sup>77</sup>.
- 3.4.7 Technological developments and airport operational procedures can help reduce the impact of noise, for example, through creating quieter aircraft and air navigation service providers can design airspace, air traffic routes and

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<sup>72</sup> SIMD 2012 Results (2012) [online] Available at: <http://simd.scotland.gov.uk/publication-2012/simd-2012-results/overall-simd-results/key-findings/> (accessed 1/11/2013))

<sup>73</sup> *ibid*

<sup>74</sup> Scotland's Environment (undated) Air Quality [online] Available at: [http://www.environment.scotland.gov.uk/our\\_environment/air\\_and\\_climate/air\\_quality.aspx](http://www.environment.scotland.gov.uk/our_environment/air_and_climate/air_quality.aspx) (accessed 04/09/2015)

<sup>75</sup> EUROCONTROL (2015) Environmental Issues for aviation, aircraft noise [online] Available at: <http://www.eurocontrol.int/articles/environmental-issues-aviation> (accessed 25/11/2015)

<sup>76</sup> Clark C. and Stansfield S.A. (2011) The Effect of Nocturnal Aircraft Noise on Health: a Review of Recent Evidence [online] Available at: [http://www.hounslow.gov.uk/effect\\_aircraft\\_noise\\_health.pdf](http://www.hounslow.gov.uk/effect_aircraft_noise_health.pdf) (accessed 16/09/2015)

<sup>77</sup> Stansfield A.A. and Matheson M.P. (2003) Noise pollution: non-auditory effects on health [online] Available at: <http://bmb.oxfordjournals.org/content/68/1/243.full> (accessed 16/09/2015)

operations procedures that aim to reduce the number of people affected by noise<sup>78</sup>. It is reported that through improved technology, aircraft operations today are 75% quieter than they were 50 years ago<sup>79</sup>. Further design improvements offer the potential to reduce perceived noise from aircraft by 65% by 2050<sup>80</sup>. However, an increase in flight numbers will present a challenge in how the industry can grow without also increasing in existing noise implications of aviation. The laws around noise make it clear that sound only becomes noise when it exists in the wrong place or at the wrong time and so causes annoyance, sleep disturbance or other effects<sup>81</sup>. This means that airports in more densely populated areas will have greater impact, as more people are likely to be affected<sup>82</sup>.

- 3.4.8 Under the EU Environment Noise Directive, any airport with more than 50,000 aircraft movement a year or that has a significant noise impact on a densely populated urban area, must produce a noise action plan and strategic noise maps<sup>83</sup>. These must be updated every five years. However, whilst noise is regulated to some extent at all UK airports, noise impacts vary between airports and so do the legal requirements. For example, some local authorities have placed additional obligations on airports through the planning framework. This can include a cap on the total number of aircraft movement or restrictions on night flights. Currently, some form of restriction exists on night flights at nineteen UK airports<sup>84</sup>. The Scottish Government produces noise maps of Scottish airports in response to the EU Directive for Assessment and Management of Environmental Noise (2002/49/EC)<sup>85</sup>.
- 3.4.9 The 33<sup>rd</sup> ICAO Assembly adopted Resolution A33/7 introducing the concept of a “balanced approach” to noise management, thereby establishing a policy approach to address aircraft noise<sup>86</sup>. This set out four ways to reduce airport noise, these are: the reduction of noise at source, through operational measures, through land use planning and restrictions on operations.
- 3.4.10 Sustainable Aviation has produced a Noise Road Map. This sets out four areas of work which can be prioritised to reduce noise before operational

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<sup>78</sup> CAA (2015) Aviation noise and why it matters [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Noise/Aviation-noise-information/#noisemanagementbyairports> (accessed 15/12/2015)

<sup>79</sup> Sustainable Aviation (2015) Noise Road Map [online] Available at: <http://www.sustainableaviation.co.uk/road-maps/> (accessed 24/11/2015)

<sup>80</sup> *ibid*

<sup>81</sup> CAA (2015) Aviation noise information [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Noise/Aviation-noise-information/#noisemanagementbyairports> (accessed 15/12/2015)

<sup>82</sup> *ibid*

<sup>83</sup> *ibid*

<sup>84</sup> *ibid*

<sup>85</sup> Scottish Government (2007) Scottish Noise Mapping [online] Available at: <http://www.scottishnoisemapping.org/> (accessed 22/12/2015)

<sup>86</sup> EUROCONTROL (2015) Environmental Issues for aviation, aircraft noise [online] Available at: <http://www.eurocontrol.int/articles/environmental-issues-aviation> (accessed 25/11/2015)

restrictions should be considered. These comprise aircraft and engine technology, operational improvements, land use planning and noise communication and community engagement<sup>87</sup>. However, the Road Map also notes that there are many variables, such as volume, duration, pitch and tone that can cause someone to be annoyed by aircraft noise. Some the aviation industry can control; others will require a multi-stakeholder approach to resolve.

- 3.4.11 The recently published Airport Commissions report<sup>88</sup> set out the findings of an assessment for proposals to expand the aviation sector against a wide range of factors, including noise. The Commission recommended that the favoured proposal for expansion be taken forward in combination with a significant package of measures to address its environmental and community impacts. Many of the mitigation measures proposed focused on noise abatement, such as the use of “noise envelopes” and a ban on all scheduled night flights.
- 3.4.12 Whilst there could be some correlation between increased volume of traffic in and around airports and risk of collision and accidents, it is difficult to identify with any certainty the likelihood and scale of risk. There are several factors outside of the bounds of the policy that would influence this risk, such as modal competition, road design, speed restrictions and driver skill. It is considered that this SEA process cannot assess this potential secondary effect with appropriate certainty and that effects would not be significant at the national scale of this assessment.

## IMPACTS

- Changes in noise levels and air quality may arise through increased flight and passenger numbers and increased traffic to and from airports.
- Accessibility may be improved through increased connectivity of associated infrastructure and more frequent and diverse flight routes.

<sup>87</sup> Sustainable Aviation (2015) Noise Road Map [online] Available at: <http://www.sustainableaviation.co.uk/#section-home> (accessed 24/11/2015)

<sup>88</sup> Airports Commission (2015) Airports Commission: Final Report July 2015 [online] Available at: <https://www.gov.uk/government/organisations/airports-commission> (accessed 30/11/2015)

## KEY POINTS

- Air quality is important for both short and long term human health
- In particular, poor air quality can have impact on people with existing health issues, such as respiratory issues like asthma or lung conditions.
- Noise is generated at all airports from a number of sources such as aircraft noise, airport vehicle operations and associated transport rounds to and from airports.
- Noise disturbance is a difficult issue to evaluate as it is open to subjective reaction, however the impacts on human health can be significant.
- Noise can have a number of negative health impacts, such as fatigue, impaired performance, stress and anxiety.
- Noise is regulated to some extent at all UK airports, with some additional obligations applied through planning frameworks at local authority level.
- Technological and operational improvements, land use planning and community engagement are mechanisms that can be applied to reduce noise impacts.
- Many airports are obligated under law to produce a noise action plan and strategic noise maps which must be updated every five years.

### 3.5 Air Quality

#### Environmental Objectives

- 3.5.1 Scotland's air quality environmental protection objectives are largely derived from the EC Air Quality Directive (2008/50/EC) and the 4th Air Quality Daughter Directive (2004/107/EC)<sup>89</sup>, via the Air Quality Standards (Scotland) Regulations 2010<sup>90</sup> which transposes these Directives into a Scottish context. These objectives are largely aimed at reducing air emissions that are potentially harmful to human health and the environment, and together they set out the requirement for monitoring with a particular focus on areas where air pollution is concentrated.

#### Initial Environmental Baseline

- 3.5.2 As discussed above under 'Population and Human Health', air quality is important for both short and long-term human health, and poor air quality can have impacts on people with existing health issues<sup>91</sup>. However, air pollution can also cause adverse effects in the wider environment; for example, it can add nutrients to water bodies and soils and contribute to their

<sup>89</sup> EC (2015) Air Quality – Existing Legislation [online] Available at: [http://ec.europa.eu/environment/air/quality/legislation/existing\\_leg.htm](http://ec.europa.eu/environment/air/quality/legislation/existing_leg.htm) (accessed 17/08/2015)

<sup>90</sup> The Air Quality Standards (Scotland) Regulations 2010 [online] Available at: [http://www.legislation.gov.uk/ssi/2010/204/pdfs/ssi\\_20100204\\_en.pdf](http://www.legislation.gov.uk/ssi/2010/204/pdfs/ssi_20100204_en.pdf) (accessed 17/08/2015)

<sup>91</sup> Scotland's Environment (undated) Air Quality [online] Available at: [http://www.environment.scotland.gov.uk/our\\_environment/air\\_and\\_climate/air\\_quality.aspx](http://www.environment.scotland.gov.uk/our_environment/air_and_climate/air_quality.aspx) (accessed 04/09/2015)

acidification, can impact on both plant and animal life, and can also damage the fabric of buildings and monuments<sup>92</sup>.

- 3.5.3 The quality of Scotland's air has improved considerably over the last few decades. Between 1990 and 2013 there have been decreases of 81% for Carbon monoxide (CO), 67% for Nitrogen oxides (NO<sub>x</sub>), 66% for non-methane VOCs, 53% for PM<sub>10</sub> and 87% for SO<sub>2</sub><sup>93</sup>. However, air pollution is still estimated to reduce life expectancy of every person in the UK by an average of 7–8 months<sup>94</sup> and there are still some towns and cities where air quality is of concern<sup>95</sup>.
- 3.5.4 Where air quality objectives<sup>96</sup> are not being met, local authorities have set up Air Quality Management Areas (AQMAs). Some 15 of Scotland's 32 local authorities have currently declared a total of 35 AQMAs. The majority of these are declared in urban areas as a result of NO<sub>x</sub> alone or in combination with PM<sub>10</sub> levels, primarily as a result of traffic emissions. While none of these areas have been declared as a consequence of aviation activities, several AQMAs have been declared along popular traffic routes to and from several airports (e.g. Glasgow Road at Ratho and St Johns Road in Edinburgh, and Paisley Town Centre)<sup>97</sup>.
- 3.5.5 Emissions attributed to aircraft operations that have local air quality effects are the oxides of nitrogen (NO<sub>x</sub>), carbon monoxide (CO), unburned hydrocarbons, sulphur dioxide (SO<sub>2</sub>), fine particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>) and odour<sup>98</sup>. These can arise from a number of sources, for example, the combustion of aviation fuel, wearing of tyres, vehicles travelling to and from airports, operation of ground service equipment and construction activities associated with infrastructure development have all been identified as sources of pollutants<sup>99</sup>.
- 3.5.6 Air pollution at airports arises from a combination of aircraft and road traffic emissions and aviation air quality concerns are principally related to the

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<sup>92</sup> Scotland's Environment (undated) Air Quality [online] Available at: [http://www.environment.scotland.gov.uk/our\\_environment/air\\_and\\_climate/air\\_quality.aspx](http://www.environment.scotland.gov.uk/our_environment/air_and_climate/air_quality.aspx) (accessed 04/09/2015)

<sup>93</sup> Scottish Government (2015) Air Quality - Air Pollutant Emissions, High Level summary of Statistics Trend [online] Available at: <http://www.scotland.gov.uk/Topics/Statistics/Browse/Environment/trendairpollutants> (accessed 22/09/2015)

<sup>94</sup> *ibid*

<sup>95</sup> Scotland's Environment (undated) Air [online] Available at: <http://www.environment.scotland.gov.uk/get-informed/air/> (accessed 22/09/2015)

<sup>96</sup> As included within DEFRA (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland [online] Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/69337/pb12670-air-quality-strategy-vol2-070712.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69337/pb12670-air-quality-strategy-vol2-070712.pdf) (accessed 22/09/2015)

<sup>97</sup> Air Quality in Scotland (undated) Air quality management areas [online] Available at: <http://www.scottishairquality.co.uk/laqm/aqma> (accessed 04/09/2015)

<sup>98</sup> EUROCONTROL (2015) Local Air Quality [online] Available at: <http://www.eurocontrol.int/articles/environmental-issues-aviation> (accessed 25/11/2015)

<sup>99</sup> Aviation Environment Federation (2007) Planning Guide [online] Available at: <http://www.aef.org.uk/uploads/PlanningGuide2.pdf> (accessed 09/09/2015)



areas on and around airports, with emissions from ground transport identified as the most significant source at some airports<sup>100</sup>. For most airports, the most significant air quality emissions presently come from ground transport, such as cars, buses and trains<sup>101</sup>. However, because of factors such as growth in demand, more public transport access to airports, and the long service life of aircraft, it is widely expected that aircraft will eventually become the dominant air quality related pollution source for many airports<sup>102</sup>.

- 3.5.7 Aircraft engines produce emissions that are similar to other emissions resulting from any oil based fuel consumption. These, like any exhaust emissions, can affect local air quality at ground level. It is the emissions from aircraft below 1,000 ft above the ground (typically 3 kilometres from departure or, for arrivals, around 6 kilometres from touchdown) that are chiefly involved in influencing local air quality<sup>103</sup>. These emissions disperse with the wind and blend with emissions from other sources such as road transport pollution.
- 3.5.8 Over recent years, many airports and airlines have made changes to their operations to help improve air quality through improvements to aircraft and engine design, operational procedures and fuels<sup>104</sup>. Technical information has also been produced, for example, Sustainable Aviation's advice Industry Code of Practice "Reducing the Environmental Impacts of Ground Operations and Departing Aircraft"<sup>105</sup>. Internationally work is being undertaken by ICAO on initiatives to improve air quality, as well as proposing mitigation measures<sup>106</sup>.

## IMPACTS

- Changes in air quality may arise through increased flight and passenger numbers and increased traffic to and from airports.

<sup>100</sup> EUROCONTROL (2015) Local Air Quality [online] Available at: <http://www.eurocontrol.int/articles/environmental-issues-aviation> (accessed 26/11/2015)

<sup>101</sup> *ibid*

<sup>102</sup> *ibid*

<sup>103</sup> *ibid*

<sup>104</sup> CAA (2015) Aviation's impact on air quality [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Aviation-s-impact-on-air-quality/> (15/12/2015)

<sup>105</sup> Sustainable Aviation (2015) Technical Papers, Departures Code of Practice [online] Available at: <http://www.sustainableaviation.co.uk/technical-papers/> (accessed 26/11/2015)

<sup>106</sup> ICAO (undated) Local Air Quality [online] Available at: <http://www.icao.int/environmental-protection/Pages/local-air-quality.aspx> (accessed 26/11/2015)

## KEY POINTS

- Scotland's air quality has improved considerably over the last few decades; however, there are still some towns and cities where air quality is of concern.
- Air quality can have a range of adverse environmental effects including impacts on biodiversity.
- Aviation air quality concerns are principally related to the areas on and around airports.
- Air pollution from airports and aviation can arise from a number of activities, such as the combustion of aviation fuels, wearing of tyres and vehicles travelling to and from airports.
- It is reported that on average, emissions from aircraft are responsible for approximately half of air quality related emissions, with emissions from ground transport identified as the most significant sources at some airports. However, it is expected that aircraft will eventually become the most dominant source.
- The aviation industry is working to reduce the levels of pollutants emitted through measures such as surface access plans, technological improvements and operation procedures.
- Guidance and Codes of Practice are also available on this topic.

## 3.6 Biodiversity, Flora and Fauna

### Environmental Objectives

- 3.6.1 The existing environmental protection objectives stem from a number of pieces of legislation and policy relating to the protection of biodiversity, flora and fauna. These objectives largely aim to protect habitats and species from disturbance and damage by identifying areas of particular value, defining a hierarchy of protection from the international and European levels to the local level; including a range of international conventions (e.g. the development of the Aichi Biodiversity Targets<sup>107</sup>).
- 3.6.2 At the European level, the Natura 2000 network of sites aims to protect key natural assets under the EC Habitats<sup>108</sup> and Birds Directives<sup>109</sup>; both of which have been transposed into UK and Scottish regulations. The designation of European protected species and identification of species and habitats as being the most threatened and requiring conservation action in the UK Biodiversity Action Plan (BAP)<sup>110</sup> and its successor the UK Post-2010 Biodiversity Framework<sup>111</sup>, alongside the aims of policies such as the 2020

<sup>107</sup> Convention on Biological Diversity (2010) Strategic Plan for Biodiversity 2011-2020, including Aichi Biodiversity Targets [online] Available at: <https://www.cbd.int/sp/default.shtml> (accessed 17/09/2015)

<sup>108</sup> European Commission, The Habitats Directive [online] Available at: [http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm) (accessed 07/05/2015)

<sup>109</sup> European Commission, The Birds Directive [online] Available at: [http://ec.europa.eu/environment/nature/legislation/birdsdirective/index\\_en.htm](http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm) (accessed 07/05/2015)

<sup>110</sup> JNCC (2012) The UK Biodiversity Action Plan [online] Available at: <http://jncc.defra.gov.uk/page-5705> (accessed 17/08/2015)

<sup>111</sup> JNCC (2012) The UK Post-2010 Biodiversity Framework [online] Available at: <http://jncc.defra.gov.uk/page-6189> (accessed 17/08/2015)



Challenge for Scotland's Biodiversity<sup>112</sup>, also provide a range of conservation objectives relevant to the development of the proposed Scottish replacement to APD.

- 3.6.3 Beyond current and proposed habitats and species designations (i.e. Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites and Sites of Special Scientific Interest (SSSI)) and other modes of recognition (i.e. National Parks, Local Nature Reserves (LNR)), there are also longer term aspirations for enhancing biodiversity, improving landscape-scale ecological networks and addressing the impacts of climate change on the natural environment.

### Initial Environmental Baseline

- 3.6.4 Scotland is rich in biodiversity, demonstrated in the wide array of species and habitats seen within its many unique terrestrial, coastal and marine ecosystems. Biodiversity plays a key role in both the functioning of ecosystems and in supporting our lives through the provision of crucial resources like fresh air, clean water and food<sup>113</sup>. It is commonly used as a measure of the health of ecosystems, and provides the ecosystem services that are the basis of life, such as soil formation, nutrient recycling, flood regulation and pollination, amongst others<sup>114</sup>. As such, biodiversity is closely linked with other environmental topics such as water and soil.
- 3.6.5 Many of Scotland's species and habitats are recognised for their vulnerability and/or importance at the European, UK and national levels. This is demonstrated through the establishment of environmental designations including some 153 SPAs, 239 SACs, 51 Ramsar sites, 1,425 SSIs and 30 Marine Protected Areas. Some of these sites are located in the vicinity of Scotland's airports; with many more located along air traffic flight paths and near to important transport hubs connecting these facilities with our urban centres. For example, Glasgow Airport is located adjacent to Black Cart SPA and Glasgow-Prestwick Airport is located approximately 200m south east of Troon Golf Links and Foreshore SSSI. In addition, Edinburgh airport is located adjacent to the River Almond which flows into the Firth of Forth, which is itself an SPA.
- 3.6.6 Biodiversity loss has been well documented over the last 50 years, and today there are a range of pressures that have the potential to impact on Scotland's wildlife and biodiversity. Key issues such as land use pressures

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<sup>112</sup> Scottish Government (2013) 2020 Challenge for Scotland's Biodiversity: A Strategy for the conservation and enhancement of biodiversity in Scotland [online] Available at: <http://www.gov.scot/Resource/0042/00425276.pdf> (accessed 17/08/2015)

<sup>113</sup> SNH (2012) Safeguarding Biodiversity [online] Available at: <http://www.snh.gov.uk/protecting-scotlands-nature/safeguarding-biodiversity/> (accessed 22/10/2015)

<sup>114</sup> Mackey E.C. and Mudge G.P. (2010) Scotland's Wildlife: An assessment of biodiversity in 2010, Scottish Natural Heritage, Inverness [online] Available at: <http://www.snh.gov.uk/docs/B811968.pdf> (accessed 04/09/2015)

(i.e. loss or damage of natural habitats), pollution of air, water and land, amongst others, have been noted<sup>115</sup>. Airports can impact on biodiversity in a number of ways, including loss or degradation of habitats and through impacts on wildlife as a result of light and noise pollution.

- 3.6.7 Birds in particular can be a significant hazard to aircraft, particularly during take-off and landing. The CAA states that roughly 85% of bird strikes in the UK involve aircraft below 800 feet in altitude<sup>116</sup>. As a consequence, control measures such as deterrents, for example, noise and flare guns and culls are used at many UK airports to reduce bird strike. There is also an online system for reporting incidents. For this assessment a relevant example might be the consideration of effects on Whooper Swans that are the qualifying feature for the Black Cart SPA close to Glasgow Airport, and existing mitigation measures.
- 3.6.8 Changes in land use can also create direct or indirect pressures on biodiversity, with infrastructure enhancement or expansion having the potential for impacts to Scotland's biodiversity; notably negative effects such as reduction, fragmentation or isolation of habitats.
- 3.6.9 The predicted effects of climate change and the potential for associated impacts on biodiversity, flora and fauna are well documented, with evidence already showing the wide ranging effects that a changing climate can have on flora and fauna species and their habitats<sup>117</sup>.

IMPACTS	<ul style="list-style-type: none"> <li>• Infrastructure requirements (including construction activities) can lead to negative impacts on habitats and species.</li> <li>• Noise and light disturbance from aviation activity can impact on biodiversity.</li> <li>• Bird populations can both harm and be harmed by aircraft.</li> </ul>
KEY POINTS	<ul style="list-style-type: none"> <li>• Scotland is rich in biodiversity and many species are of international, European or International importance.</li> <li>• Airport operations have the potential to affect local biodiversity, for example, loss or fragmentation of habitats through infrastructure requirements.</li> <li>• Bird strikes, impacts from air, soil and/or water pollution, also have the potential to adversely affect biodiversity, flora and fauna.</li> </ul>

<sup>115</sup> Biodiversity Scotland (2014) Climate change [online] Available at: <http://www.biodiversityscotland.gov.uk/biodiversity/pressures/> (accessed 24/09/2015)

<sup>116</sup> Civil Aviation Authority (2015) Our sustainability objective, CAA Environmental Programme 2014-2016 [online] Available at: <http://www.caa.co.uk/Environment/CAA-and-the-environment/Our-sustainability-objective/> (accessed 15/12/2015)

<sup>117</sup> Biodiversity Scotland (2014) Climate change [online] Available at: <http://www.biodiversityscotland.gov.uk/biodiversity/pressures/climate-change/> (accessed 24/09/2015)

## 3.7 Soil

### Environmental Objectives

- 3.7.1 Environmental protection objectives include those developed at the European level to recognise the importance of soil resources, such as the EC Thematic Strategy for Soil Protection<sup>118</sup>. National commitments for sustainable soil management are also in place, particularly the protection of valued soils such as prime quality agricultural land and peatlands which, for example, are set out in Scotland's National Peatland Plan<sup>119</sup>. The development of documents such as the Scottish Soil Framework also provide a process for stakeholders to work together to improve soil protection.

### Initial Environmental Baseline

- 3.7.2 Soil is essentially a non-renewable resource and is fundamentally one of Scotland's most important assets<sup>120</sup>. It supports a wide range of natural processes and underpins much of our natural environment, and through this important role helps to provide a wide range of environmental, economic and societal benefits. For example, soil provides the basis for food, controls and regulates environmental interactions such as regulating water flow and quality; it stores carbon and provides a platform for buildings and roads<sup>121</sup>. As a consequence, there is an intrinsic relationship between soil health and other environmental topics; biodiversity, water and air quality in particular.
- 3.7.3 While Scotland's soils are considered to generally be in good health, there are a range of pressures on them. These pressures are likely to increase in the future with greater demand for resources and development associated with population growth.
- 3.7.4 Climate change, loss of organic matter, soil sealing through development and construction activities, loss of biodiversity and deposition of acidifying and eutrophying air pollutants are considered to be key threats to Scotland's soils. Many of these have the potential to affect soil functions and are difficult to reverse and, in the case of climate change, this has the potential for not only national impacts, but impacts on a global scale<sup>122</sup>. However, at present there is a lack of information on threats to soil functions, particularly

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<sup>118</sup> EC (2015) Soil, The Soil Thematic Strategy [online] Available at: [http://ec.europa.eu/environment/soil/three\\_en.htm](http://ec.europa.eu/environment/soil/three_en.htm) (accessed 17/08/2015)

<sup>119</sup> SNH (2015) Scotland's National Peatland Plan, Working for our Future [online] Available at: <http://www.snh.gov.uk/docs/A1697542.pdf> (accessed 16/09/2015)

<sup>120</sup> Scottish Government (2006) Scotland's Soil Resource Current State and Threats [online] Available at: <http://www.scotland.gov.uk/publications/2006/09/21115639/7> (accessed 22/10/2015)

<sup>121</sup> Scottish Government (2009) Scottish Soil Framework [online] Available at: <http://www.scotland.gov.uk/Publications/2009/05/20145602/0> (accessed 17/09/2015)

<sup>122</sup> *ibid*

relating to the extent of soil sealing, changes in soil biodiversity and compaction of soils.

IMPACTS	<ul style="list-style-type: none"> <li>• Infrastructure requirements (including construction activities) pose a threat to soil.</li> </ul>
KEY POINTS	<ul style="list-style-type: none"> <li>• Soil is essentially a non-renewable resource and is fundamentally one of Scotland's most important assets.</li> <li>• Climate change, loss of organic matter, and soil sealing through development and construction activities are considered to be key threats to Scotland's soils.</li> </ul>

## 3.8 Water

### Environmental Objectives

- 3.8.1 Relevant environmental protection objectives are set out in a range of water and coastal policies, notably Scotland's two River Basin Management Plans (RBMPs)<sup>123</sup> which aim to improve the overall condition of surface water bodies both inland and at the coast. Water condition objectives for all water bodies, including marine waters up to 1 nautical mile offshore and Scotland's groundwater resources, are set at the European level through the Water Framework Directive (WFD)<sup>124</sup>. The Directive sets out the requirements for an assessment of both chemical and ecological status, alongside clear considerations for the status of biodiversity.
- 3.8.2 The protection of Scotland's water resources has been translated to the national level through the establishment of legislation and regulations such as the Water Environment and Water Services (Scotland) Act 2003<sup>125</sup> and the Water Environment (Controlled Activities) (Scotland) Regulations 2011<sup>126</sup> (CAR). The development of the latter was undertaken to specifically control pollution relating to industry discharges.
- 3.8.3 The Flood Risk Management (Scotland) Act 2009 and subsequent regulations and orders<sup>127</sup> provide for the management of flood risk and translate the EU Floods Directive<sup>128</sup> to the national context.

<sup>123</sup> SEPA (2015) River Basin Management Planning [online] Available at: <http://www.sepa.org.uk/environment/water/river-basin-management-planning> (accessed 17/08/2015)

<sup>124</sup> Directive 2000/60/EC Establishing a Framework for Community Action in the Field of Water Policy [online] Available at: [http://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC\\_1&format=PDF](http://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF) (accessed 17/08/2015)

<sup>125</sup> Water Environment and Water Services (Scotland) Act (2003) [online] Available at: <http://www.legislation.gov.uk/asp/2003/3/contents> (accessed 17/08/2015)

<sup>126</sup> Water Environment (Controlled Activities) (Scotland) Regulations (2011) [online] Available at: <http://www.legislation.gov.uk/ssi/2011/209/contents/made> (accessed 17/08/2015)

<sup>127</sup> Scottish Government (2015) Flood Risk Management Act 2009 [online] Available at: <http://www.gov.scot/Topics/Environment/Water/Flooding/FRMAct> (accessed 17/08/2015)

## Initial Environmental Baseline

- 3.8.4 Scotland's water resources also provide a wide range of benefits across a number of environmental topic areas. Together with other environmental topics, including soil and air, our water resources play a key role in supporting the health of our ecosystems and, in doing so, also make a significant contribution towards sustaining our health and prosperity. They also support a diverse array of habitats and contain a wide array of both nationally and internationally important species such as Atlantic salmon and freshwater pearl mussels.
- 3.8.5 In recent decades, significant improvements to water quality in our many rivers, canals and estuaries in particular have been observed and there have been significant reductions in pollution. However, resources such as the rivers across Scotland's central belt and east coast require additional work to achieve Scotland's overarching target of all water bodies achieving 'good or better' for overall status<sup>129</sup>.
- 3.8.6 Human activity is the primary pressure on our water resources, particularly for our rivers, canals, estuaries and coastal waters. Urban diffuse pollution, such as run off from hard surfaces in urban areas, potentially contaminated with oil, petrol and toxic metals can be washed into drains, polluting nearby water courses. Airports, airport related development and aviation affect water quality in several ways, such as run off from building and concreted areas and through the use and storage of potential pollutants such as fuel and de-icing fluids. There are strict rules in place around the storage and handling of fuels however, and advice on the possible environmental impacts of de-icing chemicals is provided<sup>130</sup>.
- 3.8.7 Alongside the potential for increased demand and development pressure in the future, the effects of climate change are also predicted to be an ever increasing pressure and are likely to present a significant challenge to ambitions for improving water quality<sup>131</sup>.
- 3.8.8 Airports are large consumers of water, for example, with previous consumption per person figures reported as being between 10 to 32 litres per person<sup>132</sup>. Water consumption, waste and gas and electricity use are usually considered as part of an airport's sustainability performance or

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<sup>128</sup> Directive 2007/60/EC The EU Floods Directive [online] Available at: [http://ec.europa.eu/environment/water/flood\\_risk/](http://ec.europa.eu/environment/water/flood_risk/) (accessed 17/08/2015)

<sup>129</sup> Scotland's Environment (2015) Water [online] Available at: <http://www.environment.scotland.gov.uk/get-informed/water/> (accessed 15/09/2015)

<sup>130</sup> CAA (2015) Aviation's impact on water quality [online] Available at: <http://www.caa.co.uk/default.aspx?catid=2917&pagetype=90&pageid=16563> (accessed 22/10/2015)

<sup>131</sup> Scotland's Environment (2015) Water [online] Available at: <http://www.environment.scotland.gov.uk/get-informed/water/> (accessed 15/09/2015)

<sup>132</sup> CAA (2015) Aviation's impacts on water [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Local-impact/Aviation-s-impact-on-water/> (accessed 15/12/2015)

corporate responsibility. These set out measures such as monitoring use and conservation measures for that airport.

IMPACTS	<ul style="list-style-type: none"> <li>Increased contamination may arise through pollutants used in operational activities entering into water courses.</li> <li>Infrastructure requirements (including construction activities) may arise from increased flight and passenger numbers.</li> <li>Possible increase in the use of resources such as water.</li> </ul>
KEY POINTS	<ul style="list-style-type: none"> <li>Water resources play a key role in supporting the health of our ecosystems and support many nationally and internationally important species.</li> <li>Impacts from urban development and pollution are a key pressure on water quality.</li> <li>Airports are large consumers of water with previous consumption per person figures reported as between 10 to 32 litres per person</li> </ul>

## 3.9 Landscape, Cultural Heritage and the Historic Environment

### Environmental Objectives

- 3.9.1 Environmental protection objectives are in place at both international and national levels, emphasising a broad and inclusive approach to landscape protection and enhancement that encompasses the value of all landscapes, and not just designated areas. The European Landscape Convention<sup>133</sup> lays the foundation for these objectives.
- 3.9.2 Key national objectives such as the establishment of the National Scenic Areas (NSA) Programme and the development of Wild Land Areas by Scottish Natural Heritage (SNH)<sup>134</sup>, demonstrate a continuing commitment to recognise the special qualities of nationally important landscapes. Alongside this, the planning system also recognises and protects landscapes and seascapes at the local level. This includes the establishment of regional and local designations and recognition of their importance such as Local Landscape Areas (LLAs) and Special Landscape Areas (SLAs).
- 3.9.3 Relevant cultural heritage objectives are set out in a number of legislative documents focused on the protection of valued sites, townscapes (i.e. places, buildings and open spaces), buildings, archaeological sites, battlefields, wrecks and landscapes that have been recognised at the international, national and local levels through a hierarchy of designations. These broadly include the Historic Environment (Amendment) Scotland Act

<sup>133</sup> European Landscape Convention (2009) [online] Available at: <http://www.coe.int/en/web/landscape/home> (accessed 17/09/2015)

<sup>134</sup> SNH (2014) Wild Land [online] Available at: <http://www.snh.gov.uk/protecting-scotlands-nature/looking-after-landscapes/landscape-policy-and-guidance/wild-land/> (accessed 07/05/2015)



2011<sup>135</sup> and Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997<sup>136</sup>.

- 3.9.4 The Scottish Historic Environment Policy (SHEP) 2011<sup>137</sup> provides an overarching framework for historic environment policy in Scotland. It emphasises the importance of preserving recognised sites and features, avoiding negative impacts on them and their wider setting, whilst contributing to their enhancement where appropriate. Its key objectives also extend to taking into account, and avoiding damage to, or the loss of, currently unknown archaeology.

### Initial Environmental Baseline

- 3.9.5 Scotland's diverse and distinctive landscapes are a significant part of the country's natural and cultural heritage, making an important and positive contribution to the economic, cultural and social wellbeing of the nation. Some 40 NSAs<sup>138</sup>, two Geoparks<sup>139</sup> and two Biosphere Reserves<sup>140</sup> have been established in Scotland reflecting, at least in part, the outstanding scenery and landscape value of these areas. Local designations, referred to as LLAs and SLAs by different local authorities, have also been established in many regions of Scotland to provide an additional tier of recognition. However, no NSAs<sup>141</sup>, LLAs or SLAs have been designated near to Scotland's five main airports.
- 3.9.6 While cultural heritage and historic assets are distributed widely throughout Scotland, there are clusters of sites in and around our settlements and also around our coastlines. Many listed buildings and recorded historic features (e.g. recorded in the Canmore Database) have been identified not just in the vicinity of Scotland's airports, but in many cases within airport boundaries<sup>142</sup>. For example, Edinburgh Airport is in proximity to a number of listed buildings and scheduled monuments, such as Gogar Mains Fort and Huly Hill cairn and stone circle. Within its boundary lie features with historic records such as Catstane scheduled monument. Similarly, a wide range of features with

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<sup>135</sup> Historic Environment (Amendment) (Scotland) Act 2011 [online] Available at: <http://www.legislation.gov.uk/asp/2011/3/contents/enacted> (accessed 17/08/2015)

<sup>136</sup> Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 [online] Available at: <http://www.legislation.gov.uk/ukpga/1997/9/contents> (accessed 17/08/2015)

<sup>137</sup> Historic Scotland (2011) Scottish Historic Environment Policy, December 2011 [online] Available at: <http://www.historic-scotland.gov.uk/shep-dec2011.pdf> (accessed 17/08/2015)

<sup>138</sup> SNHi [online] Available at: <http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/map/> (accessed 15/09/2015)

<sup>139</sup> SNH (undated) Geoparks [online] Available at: <http://www.snh.gov.uk/enjoying-the-outdoors/what-can-i-see/geology-rocks/geoparks/> (accessed 22/09/2015)

<sup>140</sup> SNH (2015) Biosphere Reserve [online] Available at: <http://www.snh.gov.uk/protecting-scotlands-nature/protected-areas/international-designations/biosphere/> (accessed 22/09/2015)

<sup>141</sup> SNHi [online] Available at: <http://www.snh.gov.uk/publications-data-and-research/snhi-information-service/map/> (accessed 15/09/2015)

<sup>142</sup> RCAHMS and Historic Scotland (2015) PastMap [online] Available at: <http://pastmap.org.uk/> (accessed 15/09/2015)

historic and heritage records have been identified near to and/or within the boundaries of Scotland's other main airports including Glasgow, Glasgow-Prestwick and Aberdeen, and many of its smaller airports.

- 3.9.7 Inappropriate development is seen as a key pressure on the historic environment, landscape and cultural heritage, both directly in terms of damage to known and unknown features, and in relation to potential site and setting impacts. There are also potential impacts on coastal landscapes and the historic environment as a result of climate change.

IMPACTS	<ul style="list-style-type: none"> <li>• Infrastructure requirements (including construction activities) may arise as a result of increased flights and passenger numbers.</li> </ul>
KEY POINTS	<ul style="list-style-type: none"> <li>• Scotland's diverse and distinctive landscapes are a significant part of the country's natural and cultural heritage.</li> <li>• Key pressures on our landscapes, cultural heritage and historic environment include climate change and inappropriate development.</li> </ul>

## 3.10 Material Assets

### Environmental Protection Objectives

- 3.10.1 Under the topic heading of material assets, the assessment is expected to focus primarily on the potential for effects on infrastructure associated with the development of a Scottish replacement to APD, particularly in relation to airport facilities and associated transport infrastructure.
- 3.10.2 While existing policies relating to infrastructure and facilities are wide-ranging, they largely share the common aim of contributing to the core planning objectives of supporting sustainable development, reducing GHG emissions, and making the best use of Scotland's resources and existing infrastructure.
- 3.10.3 The "Making things last"<sup>143</sup> consultation on creating a more Circular Economy in Scotland was published in August 2015. A circular economy is an alternative to a traditional linear model of "make, use, dispose". It aims to keep resources in use for as long as possible, extracting the maximum value from them whilst in use. Together with the Zero Waste Plan<sup>144</sup> and

<sup>143</sup> Scottish Government (2015) Making things last Consultation Economy in Scotland [online] Available at: <http://www.gov.scot/Publications/2015/08/2820> (accessed 02/12/2015)

<sup>144</sup> Scottish Government (2013) Scotland's Zero Waste Plan [online] Available at: <http://www.gov.scot/Topics/Environment/waste-and-pollution/Waste-1/wastestrategy> (accessed 02/12/2015)



Safeguarding Scotland's Resources<sup>145</sup>, these documents set out Scottish Government policy on waste management.

## Initial Environmental Baseline

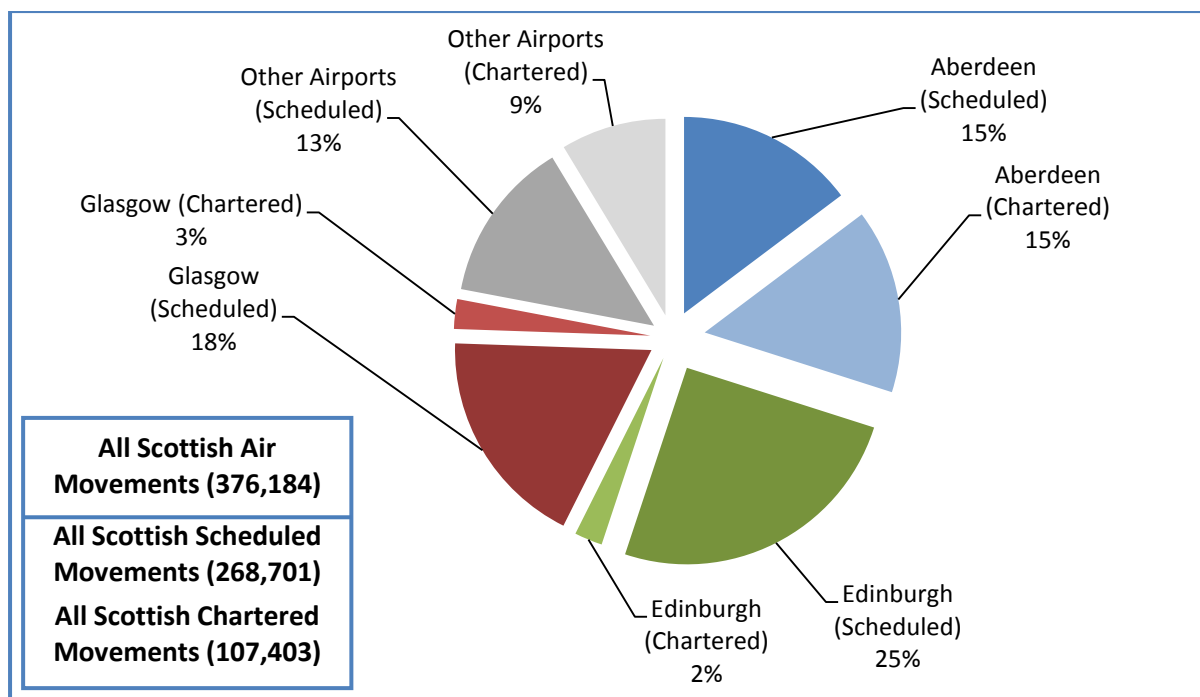
- 3.10.4 Scotland has five main airports including Glasgow, Glasgow Prestwick, Edinburgh, Aberdeen and Inverness, that cater for both domestic and international flights. There are also many regional airports spread across the country in locations such as Dundee, Wick/John O'Groats, Campbeltown, Islay, Tiree, Outer Hebrides, Orkney and Shetland<sup>146</sup> that provide connectivity between parts of Scotland and provide lifeline air services for many routes that would not be commercially viable without Scottish Government support<sup>147</sup>.
- 3.10.5 Over 376,000 scheduled and chartered air transport movements were recorded at Scottish airports in 2014. As shown in Figure 3.1, around 78% of these movements were recorded at Aberdeen Airport (29.9%, equating to 112,537 movements), Edinburgh Airport (27.5%, equating to 103,388 movements) and Glasgow Airport (20.6%, equating to 77,477 movements). Around three-quarters of these movements were classed as 'scheduled movements flights with the remainder classed as 'chartered' movements. Over half of Scotland's 'chartered' movements were at Aberdeen Airport.

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<sup>145</sup> Scottish Government (2013) Safeguarding Scotland's Resources [online] Available at: <http://www.gov.scot/Publications/2013/10/6262> (accessed 02/12/2015)

<sup>146</sup> Visit Scotland (2015) Travel Around Scotland By Plane [online] Available at: <http://www.visitscotland.com/travel/around-scotland/air> (accessed 10/09/2015)

<sup>147</sup> Transport Scotland (2015) Lifeline Air Services [online] Available at: <http://www.transportscotland.gov.uk/node/89> (accessed 10/09/2015)

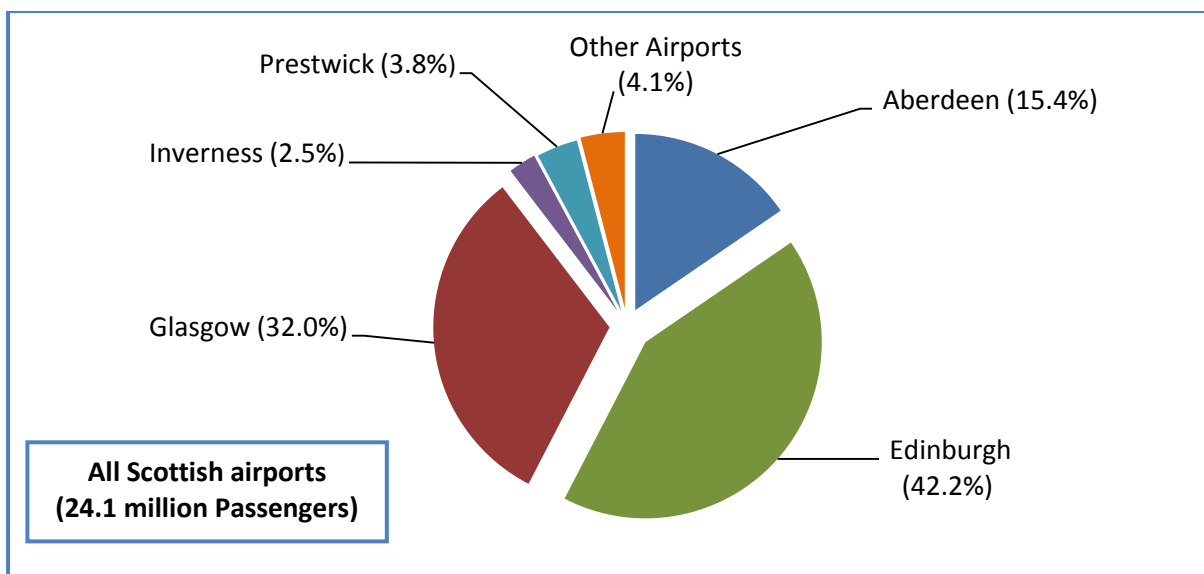


**Figure 3.1 Breakdown of all Air Transport Movements using Scottish airports in 2014<sup>148</sup>**

3.10.6 In 2014, over 24 million passengers passed through Scotland's airports, either on scheduled flights, chartered flights or in transit. Of these, Edinburgh and Glasgow were Scotland's busiest airports, handling almost three-quarters of these passengers (equating to around 10.2 million and 7.7 million passengers respectively) through their terminals. As shown in Figure 3.2, Aberdeen (3.7 million passengers), Glasgow Prestwick (0.9 million passengers) and Inverness (0.6 million passengers) handled around one-fifth of passengers between them, and Scotland's other airports handled the remaining 4% of passengers (1.0 million passengers)<sup>149</sup>.

<sup>148</sup> CAA (2015) Summary of Activity at Reporting Airports 2014 [online] Available at: <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/> (accessed 10/09/2015)

<sup>149</sup> ibid



**Figure 3.2 Breakdown of all air passengers using Scottish airports in 2014<sup>150</sup>**

3.10.7 Scotland's airports are generally well connected to nearby urban centres by public transport services, in particular Scotland's five main airports. For example, Edinburgh Airport is connected by public transport services from Glasgow and Edinburgh, Glasgow and Glasgow Prestwick airports by public transport services from Glasgow, Aberdeen Airport by public transport services from Aberdeen, and Inverness Airport by bus services from Inverness, Elgin, Forres and Nairn.

3.10.8 In a 2014 UK-wide survey, some 81% of adults who had flown from a UK airport reported that, the last time they had travelled to the airport, they did so by private transport (i.e. car, van, taxi, minicab). However, this indicates a downwards trend, with this proportion having fallen from 87% in 2010 and 90% in 2006. Around half of these drove themselves and left their vehicle at or near the airport, a quarter had travelled by taxi/minicab, a fifth given a lift by someone else whose vehicle was not left at the airport, and the remainder had been given a lift by someone else who had left their car at the airport. Just 18% of trips to the airport were made using public transport, with 8% by bus or coach, 7% by train and 3% by underground/metro<sup>151</sup>.

3.10.9 A number of airports produce surface access strategies which set out alternative travel options to and from the airport for not only passengers, but workers and suppliers too<sup>152</sup>. Examples of measures that airports have

<sup>150</sup> CAA (2015) Summary of Activity at Reporting Airports 2014 [online] Available at: <http://www.caa.co.uk/Data-and-analysis/UK-aviation-market/Airports/Datasets/UK-Airport-data/Airport-data-1990-onwards/> (accessed 10/09/2015)

<sup>151</sup> Department for Transport (2014) Statistical release, Public experiences of and attitudes towards air travel: 2014 [online] Available at: [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/336702/experiences-of-attitudes-towards-air-travel.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/336702/experiences-of-attitudes-towards-air-travel.pdf) (accessed 24/09/2015)

<sup>152</sup> CAA (2015) Aviation's impact on surface access [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Local-impact/Aviation-s-impact-on-surface-access> (accessed 24/09/2015)

already undertaken include investment in new or improved infrastructure to enhance traffic flow and ease congestion, encouraging the use of public transport and actively discouraging the numbers of car journeys to and from the airport<sup>153</sup>.

- 3.10.10 Aviation activity also generates considerable waste that requires disposal. This comprises waste generated on aircraft, at the terminal and that generated by constructing new airport infrastructure<sup>154</sup>. Many airports publish key waste performance data, for example, published figures show the total waste generated from Edinburgh airport was 1,392 tonnes (2014) and Glasgow airport reported total waste figures of 1,925 tonnes (2012)<sup>155</sup>. Waste is managed locally by airports and some airlines have policies in place to help reduce the amount that is generated and encourage the re-use and recycling of waste generated. Sustainable Aviation also works collaboratively to share best practice and seek ways to increase the recycling of aircraft cabin waste.

IMPACTS	<ul style="list-style-type: none"> <li>Increased pressure on existing infrastructure from changes in flight numbers, patterns and passenger numbers has been identified.</li> <li>Accessibility may be improved through increased connectivity of associated infrastructure and more frequent and diverse flight routes.</li> <li>Increased flight and passenger numbers may have an impact on the amount of waste generated.</li> </ul>
KEY POINTS	<ul style="list-style-type: none"> <li>Almost three quarters of passengers using Scottish airports did so through Edinburgh and Glasgow.</li> <li>Just 4% of all passengers travelled through airports outside of Scotland's five main airports (Edinburgh, Glasgow, Glasgow Prestwick, Aberdeen and Inverness).</li> <li>While some 81% of passengers departing or arriving in a UK airport travelled to or from the airport by private transport, this proportion has fallen over the last nine years (87% in 2003).</li> <li>Surface access strategies are produced and published by a number of airports. These set out ways to improve access to the airport, examples of proposed measures include the encouragement of the use of public transport.</li> <li>Aviation generates considerable waste comprising that generated on the aircraft, at the terminal and from construction activities, such as new airport infrastructure.</li> <li>Most airports and airlines publish data regarding waste management approach and performance.</li> </ul>

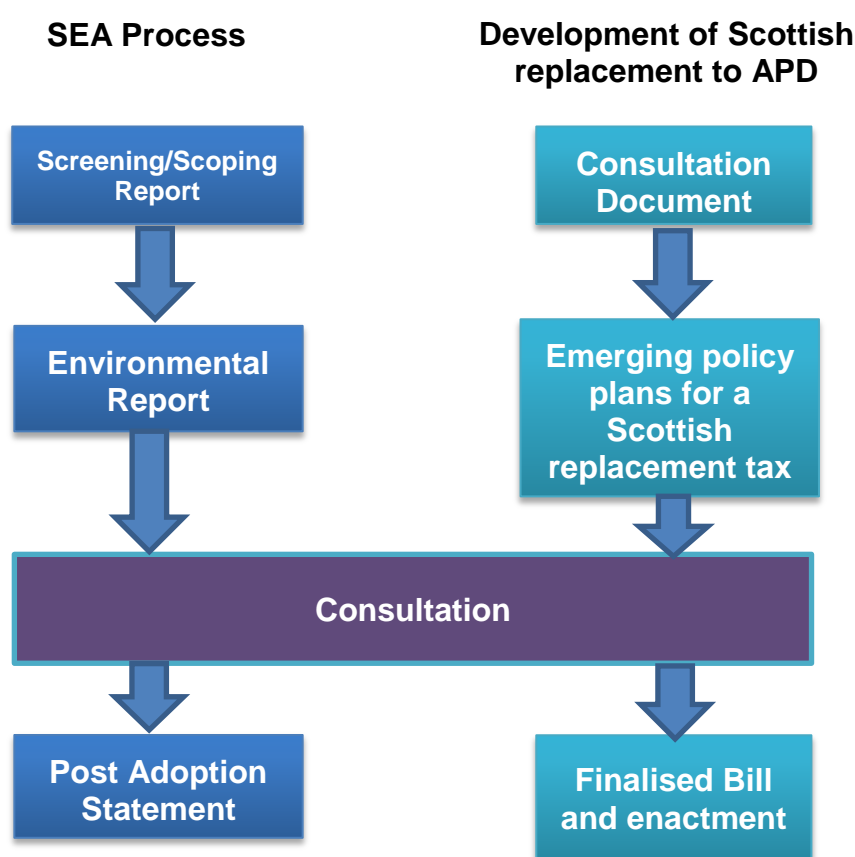
<sup>153</sup> CAA (2015) Aviation's impact on surface access [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Local-impact/Aviation-s-impact-on-surface-access> (accessed 24/09/2015)

<sup>154</sup> CAA (2015) Aviation and Waste [online] Available at: <http://www.caa.co.uk/Environment/Environmental-information/Information-by-environmental-impact/Local-impact/Aviation-s-impact-on-waste/> (accessed 15/12/2015)

<sup>155</sup> idib

## 4 Programme of works and next steps

- 4.1.1 The SEA Environmental Report (which will include an outline of the Scottish Government's emerging policy plans for a Scottish replacement tax) is expected to be made available for consultation in Summer 2016. An outline of the indicative policy and SEA development process is illustrated in Figure 4.1.
- 4.1.2 A 10 week period of consultation on the SEA Environmental Report (and the Scottish Government's emerging policy plans for a Scottish replacement tax) is expected to be undertaken. Following conclusion of this, the views expressed in the public and stakeholder consultation processes will be analysed and used to inform the development of a Bill containing legislative proposals for a Scottish replacement tax. It is anticipated that the Bill will be introduced early in the next Scottish Parliamentary session, with the new tax coming into effect from 1 April 2018.



**Figure 4.1 Indicative Policy and SEA Development Process**

## 4.2 Responding to this document

- 4.2.1 In order to help inform the SEA process, a number of questions have been set out in this document and are repeated below. The questions may help to structure a response, however additional points to consider are also welcomed. For ease, the questions have been set out under relevant headings and the Sections to which they relate to has been included.

### **Proposed Methodology (Section 2)**

This section sets out key assumptions and questions that have been developed to explore the likely significant effects.

**Question 1:** Do you agree with the key assumptions and questions as discussed on pages 12-13?

**Question 2:** Is it appropriate for the assessment to consider effects at differing geographical scales as discussed on page 18?

### **Alternatives (Section 2)**

At this stage three reasonable alternatives have been proposed and it is noted that these may evolve, and that further alternatives may be suggested as the policy develops.

**Question 3:** Are the proposed alternatives set out on pages 21-22 reasonable?

**Question 4:** Do you have suggestions for additional approaches to APD policy?

### **Evidence baseline (Section 3)**

The proposed evidence included in this joint Screening and Scoping Report will be used to inform the assessment process.

**Question 5:** Do you have any comments regarding the proposed evidence base for the assessment set out on pages 24-51?

**Question 6:** Is there further information you feel should be considered or included to further inform the assessment?

### **Initial Findings (Appendix 2)**

Some early assessment work has been undertaken to draw out an initial view on the environmental issues that are likely to be relevant for the subsequent assessment.

**Question 7:** Do you agree with these initial assessment findings set out on pages 62-64? Are there additional environmental issues that should be considered?

- 4.2.2 The consultation runs until **Friday 3 June 2016** and there are a number of ways that you can respond. Comments can be submitted:
- Online via the Scottish Government's consultation platform, Citizen Space, at <https://consult.scotland.gov.uk/fiscal-responsibility/air-passenger-duty>;
  - By emailing your response (along with a completed Respondent Information Form – see Appendix 4) to [apd@gov.scot](mailto:apd@gov.scot); or
  - In writing, by sending your response (along with a completed Respondent Information Form – see Appendix 4) to:  
Mike Stewart, Fiscal Responsibility Division, Scottish Government,  
Area 3D-North, Victoria Quay, Edinburgh, EH6 6QQ.
- 4.2.3 If replying via email or in writing please note that you **must** supply a completed Respondent Information Form (provided at Appendix 4) with your response in order for us to be able to appropriately handle it and in particular understand if you are happy for us to publish it.
- 4.2.4 In addition to submitting your consultation response, we encourage you to engage in active dialogue on the matters raised both in this SEA Screening and Scoping Report and the Consultation Paper. You can submit your thoughts and ideas, as well as comment on others, at: <https://ideas.scotland.gov.uk/air-passenger-duty>. This dialogue is open for submissions until Friday 8 April 2016.
- 4.2.5 Following this period of consultation, the responses received on both the Consultation Document and this Screening/Scoping Report will be analysed. The findings of this analysis will be taken into account in the development of the Scottish Government's policy plans for a Scottish replacement tax and the SEA.
- 4.2.6 An Environmental Report will be produced documenting the results of the assessment of the Scottish Government's emerging policy plans and the reasonable alternatives to these. Statutory public consultation will be subsequently undertaken on the Environmental Report and the outcomes of this consultation process will inform the preparation of the Scottish Government's final legislative proposals for a Scottish replacement tax.

# Appendix 1: SEA Screening Report

## STEP 1 – DETAILS OF THE PLAN

**Responsible Authority:**

The Scottish Government

**Title of the plan:**

A Scottish replacement to Air Passenger Duty

**What prompted the plan:**

(e.g. a legislative, regulatory or administrative provision)

Air Passenger Duty (APD) was first introduced in 1994 as an excise duty charged on passengers departing on chargeable flights from UK airports. With the exception of direct long-haul flights departing from Northern Ireland, which has been devolved to the Northern Ireland Assembly (NIA), it is currently reserved to the UK Parliament. The duty is charged to aircraft operators at a rate dependent on factors such as the final flight destination and class of travel.

In 2014, the Smith Commission recommended that “the power to charge tax on air passengers leaving Scottish airports will be devolved to the Scottish Parliament”. The Scotland Bill 2015-16 will, assuming it is enacted, devolve that power to the Scottish Parliament.

**Plan subject:** (e.g. transport)

Fiscal, transport, economic.

**Screening** is required by the Environmental Assessment (Scotland) Act 2005.

Based on Boxes 3 and 4, our view is that:



**An SEA is required, as the environmental effects are likely to be significant:** Please indicate below what Section of the 2005 Act this plan falls within



Section 5(3)



Section 5(4)



**An SEA is not required, as the environmental effects are unlikely to be significant:** Please indicate below what Section of the 2005 Act this plan falls within



Section 5(3)



Section 5(4)



## STEP 1 – DETAILS OF THE PLAN (CONTINUED)

**Contact details:**

Environmental Assessment Team  
The Scottish Government  
Area 2-H (South)  
Victoria Quay  
EH6 6QQ

**Date:**

March 2016

## STEP 2 – CONTEXT AND DESCRIPTION OF THE PLAN

**Context of the Plan:**

With the Scotland Bill currently being considered at Westminster containing provision for the devolution of powers over APD to the Scottish Parliament, the Scottish Government intends to introduce a Bill before the Scottish Parliament early in the next Parliamentary session legislating for the introduction of a new tax replacing APD in Scotland which will come into effect from 1 April 2018.

**Description of the Plan:**

The Consultation Paper is being prepared ahead of the development of legislative proposals in order to seek views on the technical structure and operation of a Scottish replacement to APD. The Paper outlines the Scottish Government's commitment to reducing the overall burden of APD in Scotland by 50% by the end of the next session of the Scottish Parliament, with the reduction beginning to be implemented in April 2018, and for the tax to be abolished entirely when resources allow.

**What are the key components of the plan?**

One of the key components of the Consultation Paper is the development and discussion on proposals for designing and structuring a Scottish replacement to APD, in addition to setting out proposals for how the tax will be administered once coming into effect. These proposals are being developed to support the strategic objective to help generate sustainable growth by boosting Scotland's international connectivity.

The Consultation Paper will note that there are different options for implementing the Scottish Government's proposed policy of reducing the overall burden of APD in Scotland by 50% during the next Scottish Parliament. It will not necessarily involve adopting the current UK rate and band structure, reducing each rate by 50% or immediately implementing the reduction in full on 1 April 2018.

The development of legislative proposals for a Scottish replacement tax will be informed by engagement with stakeholders before, during and after publication of the proposals set out in the Consultation Paper, and from analysis of the responses to the consultation.

## STEP 2 – CONTEXT AND DESCRIPTION OF THE PLAN (CONTINUED)

**Have any of the components of the plan been considered in previous SEA work?**

No.

However, a number of SEAs have been undertaken that are likely to be of relevance to the assessment of the potential for environmental impacts that may be associated with the ambitions and proposals set out in the Consultation Paper. For example, the development of the Strategic Transport Projects Review undertaken by Transport Scotland in 2008 looked at Scotland's transport links and was subject to SEA. The assessment of proposals for Scottish airport enhancements at Aberdeen, Prestwick, Edinburgh, Glasgow and Inverness, and improving links between cities (e.g. rail links) were considered in the SEA undertaken for the National Planning Framework 3 (NPF3) and Scottish Planning Policy (SPP) in 2013.

**In terms of your response to Boxes 7 and 8 above, set out those components of the plan that are likely to require screening:**

Based on the information set out above, the key components of the Consultation Paper are likely to require screening.

**STEP 3 – IDENTIFYING INTERACTIONS OF THE PLAN WITH THE ENVIRONMENT AND  
CONSIDERING THE LIKELY SIGNIFICANCE OF ANY INTERACTIONS**

- ✓ Direct Impact
- ✓ Indirect Impact
- ✗ No impact

Plan Components	Environmental Topic Areas										
	Biodiversity, flora and fauna	Population and human health	Soil	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	Inter-relationship issues	
Introduction of a Scottish APD to replace the existing duty administered by the UK Government.	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	<b>Explanation of Potential Environmental Effects</b>
											The issues involved in designing the technical structure and collection and management of the new tax are largely administrative in nature. As such, it is considered that this is unlikely to result in significant environmental effects.
											<b>Explanation of Significance</b>
											Significant environmental effects are considered to be unlikely.

- ✓ Direct Impact
- ✓ Indirect Impact
- ✗ No impact

Plan Components	Environmental Topic Areas										Explanation of Potential Environmental Effects
	Biodiversity, flora and fauna	Population and human health	Soil	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	Inter-relationship issues	
A 50% reduction in APD for flights departing Scottish airports.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	<p>There is a likelihood of a number of potential environmental effects from an increase in flight and passenger numbers generated as a result of reducing the overall burden of APD in Scotland by 50% by the end of the next Scottish Parliament, and to eventually abolish it entirely when resources allow.</p> <p>The potential for direct negative effects for <b>climatic factors</b> was noted, particularly associated with any increase in carbon emissions occurring due to a potential increase in flight and passenger numbers and associated activity.</p> <p>There could also be mixed effects for material assets. For example, the proposal could have the potential for positive effects for Scottish airports, particularly those receiving long-haul international flights, and also for Scottish businesses in the tourism and services sectors if an increase in visitor numbers were to occur. However, there is also the potential for increased pressure on existing infrastructure and services, which could in turn lead to infrastructure requirements. While this may have negative impacts, such as those associated with construction activities (<b>air quality, biodiversity, soil and population and human health</b>), there is also the potential for positive effects from increased connectivity (<b>population and human</b></p>

											<p><b>health).</b></p> <p>The potential for indirect/ secondary effects on other environmental topic areas has also been identified, such as <b>biodiversity, water, soil, human health</b>, due largely to the clear links between climate change and these environmental receptors. In particular, the potential for adverse impacts associated with the construction of new or upgrading of existing infrastructure to accommodate increased arrivals and departures from Scottish airports.</p>
											<p><b>Explanation of Significance</b></p> <p>The ambitions of a Scottish replacement to APD are likely to complement and work in-combination with the ambitions and actions set out in wider policy such as Scotland's Economic Strategy, NPF3. However, in some instances, the proposed reduction could also work against overarching policy objectives; most notably Scotland's commitments to reducing GHG emissions.</p> <p>It is also noted that existing mechanisms are currently in place to manage the potential for adverse impacts associated with infrastructure development; notably the Town and Country Planning system and the requirement for associated environmental assessments where appropriate.</p> <p>It is expected that these issues will be explored in the further in the SEA when considering the likelihood of significant environmental effects.</p>

#### STEP 4 – STATEMENT OF THE FINDINGS OF THE SCREENING

##### **Summary of interactions with the environment and statement of the findings of the Screening:**

(Including an outline of the likely significance of any interactions, positive or negative, and explanation of conclusion of the screening exercise.)

The Consultation Paper is expected to seek views on the technical structure and operation of a new tax to replace APD in Scotland from April 2018. The Paper will also outline the Scottish Government's commitment to reducing the overall burden of the new tax by 50% by the end of the next session of the Scottish Parliament, and to eventually abolish it entirely when resources allow. This stage in the process is seen as the first step in the development of draft legislative proposals for the new tax.

A reduction or eventual abolition of APD in Scotland has the potential to increase the numbers of flights and passengers entering and leaving Scottish airports. In turn, this may give rise to significant impacts on climatic factors through increasing GHG emissions associated with from aviation and travel to and from airports. Increased pressure on existing infrastructure through increased visitor arrivals and departures on road and rail networks between airports and transport hubs could also have negative impacts on these material assets. Mixed effects may arise on population and human health from impacts associated with any changes to existing, or construction of new infrastructure as a consequence of an increase in flight and passenger numbers. For example, construction may lead to negative effects through noise and dust, however, there may be opportunities to explore greater connectivity and accessibility.

The Screening identified the potential for secondary or indirect environmental effects for the other SEA topic areas, primarily as a consequence of increasing GHG emissions and the potential need for new or upgraded infrastructure to cater for increased passenger accessibility (e.g. airport facilities, transport infrastructure connections). The SEA will explore the likely interactions between these topics and the potential for direct, indirect and secondary effects.

Based on the findings as set out above, the Scottish Government considers that the development of legislation for a Scottish replacement to APD falls under Section 5(4) of the Environmental Assessment (Scotland) Act 2005, and that proposals to reduce the overall burden of the new tax, or to eventually abolish it when resources allow, have the potential to have significant environmental effects. Therefore, the Scottish Government proposes undertaking an SEA to explore the significance of these identified positive and negative environmental effects.

When completed send to: [SEA.gateway@scotland.gsi.gov.uk](mailto:SEA.gateway@scotland.gsi.gov.uk) or to the SEA Gateway, Scottish Government, Area 2H (South), Victoria Quay, Edinburgh, EH6 6QQ.

## Appendix 2: Initial issues under consideration

The following table sets out initial assessment work undertaken to draw out the environmental issues that are likely to arise as a result of a proposal to reduce and eventually abolish APD in Scotland. The findings are based on key assumptions and consider additional relevant information to be taken into account in determining significance, such as existing planning mechanisms and commitments to international agreements.

### SEA assumptions

1. The proposal to reduce and eventually abolish APD in Scotland will lead to an increase in the overall number of flights and could potentially create opportunities for new routes to be created.
2. An increase in flight numbers will lead to an increase in overall GHG emissions (CO<sub>2</sub> and non-CO<sub>2</sub> emissions), even with advances in technology.
3. What are the likely impacts that may arise from increased pressure on existing infrastructure?

SEA topic	Geographical Extent	Identified Changes	Identified Main Environmental Impacts/ Nature of identified impact	Direct/Indirect	Long Term/Short Term	Permanent/Temporary	Transboundary	Relevant Considerations
Climatic Factors	National	Increased flight and passenger numbers and ground traffic for operations and maintenance. Potential infrastructure requirements as result of increased aviation and traffic activity.	<p>Increase in greenhouse gas (GHG) emissions. Climatic change impacts as a result of increase in GHG emissions (note: this will have implications across all SEA topics).</p> <p>Negative impacts have therefore been identified.</p>	<p>Mixed.</p> <p>There will be direct impacts arising from the identified increase in flight and passenger numbers. Indirectly, impacts will arise through an increase in associated activity, such as ground traffic.</p>	Long Term.	Permanent	Yes	<p>Technological advances, including aircraft technology and sustainable fuel alternatives. International commitments, such as improving fuel efficiency and operational improvements at individual airports. Initiatives such as the EU European Single Sky Initiative. Other considerations include those such as Sustainable Aviation, a long term strategy whose goals and commitments include the reduction of carbon emissions from the aviation sector.</p>
Population and human health	National with Smaller Scale Implications	Increased flight numbers and traffic activity to and from airports with an additional potential requirement for infrastructure due to increased activities.	<p>Changes to noise and air quality levels can have negative implications for population and human health. However, there is the potential for positive effects from greater connectivity should additional flights and routes be introduced and connectivity enhanced.</p> <p>Mixed impacts have therefore been identified.</p>	<p>Indirect</p> <p>This has been identified as an indirect result of a Scottish Replacement to APD.</p>	Long Term	Permanent.	No	<p>Existing national legislation relating to air quality (discussed below) and noise. Noise is regulated to some extent at all UK airports; however noise impacts vary between airports, as do legal requirements. Technological developments and operational procedures can help reduce the impact of noise.</p> <p>Technological and operational improvements, land use planning and community engagement are mechanisms that can reduce noise impacts. Many airports are obligated under law to produce a noise action plan and strategic noise maps which must be updated every five years.</p>



SEA topic	Geographical Extent	Identified Changes	Identified Main Environmental Impacts/ Nature of identified impact	Direct/Indirect	Long Term/Short Term	Permanent/ Temporary	Transboundary	Relevant Considerations
Material Assets (infrastructure and waste)	National with Smaller Scale Implications	<p>Increased flight and passenger numbers, including increased traffic to and from airports, is likely to place pressure on existing infrastructure (both airport and interconnecting routes).</p> <p>There is likely to be a relationship between resource use and waste generation.</p>	<p>Potential benefits may be realised through exploring opportunities to enhance greater transport interconnectivity and inter-modal transport. However, the potential for future upgrades of existing infrastructure and/or construction of new transport infrastructure between urban centres and airports is likely to have a number of environmental impacts; for example, negative effects on water, biodiversity and soil.</p> <p>Mixed impacts have therefore been identified.</p>	<p>Indirect</p> <p>This has been identified as an indirect result of a Scottish Replacement to APD.</p>	Long Term	Permanent.	No	<p>Scotland has five main airports, with many regional airports spread across the country. These are generally well connected to nearby urban centres, however in 2014 a survey reported that some 81% of those who flew from UK airports travelled there by private car. A number of airports produce surface access strategies which set out alternative travel options to and from airports.</p>
Air quality	Smaller Scale Implications	<p>Increased flight numbers and ground traffic for operations and maintenance. Potential impacts as a result of infrastructure requirements and increased traffic activity.</p>	<p>Increased air pollution can have negative implications for population and human health and the environment, such as biodiversity, flora and fauna impacts.</p> <p>Negative impacts have been identified.</p>	<p>Mixed.</p> <p>Direct impacts are likely to arise from an increase in flight and passenger numbers. Indirectly, there may be impacts on air quality as a result of construction activity that may be required for infrastructure. However, this is likely to be over the short term or for the duration of the works being undertaken,</p>	Long Term/Short Term	<p>Mixed.</p> <p>Impacts arising from changes in flight and passenger numbers will be experienced over the long term whilst construction activities and air pollutants arising from these will be over the short term.</p>	No	<p>Existing legislation aims to reduce air emissions that are potentially harmful to human health and the environment. There are no specific air quality targets for the UK aviation industry however; instead air quality is measured as part of the local authority's duties. Where air quality objectives are not being met, local authorities have set up Air Quality Management Areas.</p> <p>The aviation industry is working to reduce the levels of pollutants emitted through measures such as surface access plans, technological improvements and operation procedures. Guidance and Codes of Practice have also been produced. In addition, some alternative fuels have the potential to reduce PM emissions from engines.</p>



SEA topic	Geographical Extent	Identified Changes	Identified Main Environmental Impacts/ Nature of identified impact	Direct/Indirect	Long Term/Short Term	Permanent/ Temporary	Transboundary	Relevant Considerations
Biodiversity, flora and fauna	Smaller Scale Implications	Increased flight numbers and ground traffic for operations and maintenance. Potential impacts as a result of infrastructure requirements and increased traffic activity.	Potential for negative effects on these receptors from future construction works, such as expansion, new infrastructure and associated construction activities. These are considered to be secondary effects that may arise through increased aviation activity. In addition, light and noise pressures and bird strike can have a negative impact on biodiversity.  Negative (location specific) effects have therefore been identified.	Indirect.  This has been identified as an indirect result of a Scottish Replacement to APD.	Mixed.  Long term implications through infrastructure requirements leading to loss or fragmentation of habitats. Short term construction impacts.	Mixed.	No	Existing legislation affords protection to these topics, such as the EC Habitats and Birds Directive and current planning mechanisms (Environmental Impact Assessment and Habitats Regulatory Appraisal). However, impacts from urban development and pollution are considered a key pressure on these topic areas.
Soil								
Water								
Landscape, cultural heritage and the historic environment								

## Appendix 3: Glossary

APD	Air Passenger Duty
AQMA	Air Quality Management Area
ATAG	Air Transport Action Group
ATM	Air Traffic Management
BAP	Biodiversity Action Plan
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication
CAR	Controlled Activity Regulations
CCRA	UK Climate Change Risk Assessment
CO	Carbon monoxide
CO <sub>2</sub>	Carbon dioxide
EC	European Commission
ETS	Emissions Trading Scheme
EU	European Union
GHG	Greenhouse Gas(es)
ICAO	International Civil Aviation Organization
LLA	Local Landscape Area
LNR	Local Nature Reserve
Mt CO <sub>2</sub> e	Million Tonnes Carbon dioxide Equivalent
NIA	Northern Ireland Assembly
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides
NPF3	National Planning Framework 3
NSA	National Scenic Area
O <sub>3</sub>	Ozone
PfG	Programme for Government
PM	Particulate Matter
PPC	Pollution, Prevention and Control
PPS	Plans, Programmes and Strategies
RBMP	River Basin Management Plan
RPP	Low Carbon Scotland: Meeting our Emissions Reduction Targets 2010 – 2022: The Report of Policies and Proposals
RPP2	Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013 – 2027: The Second Report of Policies and Proposals
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Agency
SES	Single European Sky
SESAR	Single European Sky ATM (Air Traffic Management) Research
SHEP	Scottish Historic Environment Policy
SI	Statutory Instrument
SLA	Special Landscape Area
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPP	Scottish Planning Policy

SSSI	Site of Special Scientific Interest
The 2005 Act	Environmental Assessment (Scotland) Act 2005
UK	United Kingdom
UNFCCC	United Nations Framework Convention on Climate Change
VOC	Volatile Organic Compound
WFD	Water Framework Directive

# Appendix 4: Respondent Information Form

## A Scottish replacement to Air Passenger Duty – SEA Screening and Scoping Report



### RESPONDENT INFORMATION FORM

**Please Note** this form **must** be returned with your response.

Are you responding as an individual or an organisation?

- ☐ Individual  
☐ Organisation

If you are an organisation please indicate which category best describes your organisation:

- ☐ Academic or Research Institute  
☐ Community organisation  
☐ Local government  
☐ Private sector organisation  
☐ Public body, including Executive Agencies, NDPBs etc.  
☐ Representative body for professionals  
☐ Third sector / equality organisation  
☐ Others – please state:

Full name or organisation's name

Phone number

Address

Postcode

Email

The Scottish Government would like your permission to publish your consultation response.

Please indicate your publishing preference:

- ☐ Publish response with name
- ☐ Publish response only (anonymous)
- ☐ Do not publish response

We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for the Scottish Government to contact you again in relation to this consultation exercise?

- ☐ Yes
- ☐ No



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