GLOUCESTERSHIRE AIRPORT LTD

GREEN POLICY

Contents

1 Document History

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2 Record of Amendments

A/L No	*Amendment Incorporated*	*Initial*	*Date*
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3 Executive Summary

3.1 Gloucestershire Airport is committed to controlling the adverse effects of its operations and minimising its impact on the environment and the local community, whilst seeking to maximise the positive benefits from the airport.

3.2 The Company is fully committed to reducing its greenhouse gas emissions and understands the need to meet its environmental responsibilities. The Board of Directors have approved the development and implementation of this Green Policy to address all activities controlled by the Company.

3.3 This policy is a working document that will change and evolve as best practice and methods of improving the sustainability of airports are developed.

3.4 It details specific aims and encompasses a wide ranging scope to ensure direct and indirect environmental impacts of Airport operations are considered and, where possible, reduced or mitigated. This includes commitments to -

- Set targets for emission reduction;
- Development of a methodology to calculate emissions from aircraft;
- Identify mitigation measures already in place;
- Consider the environment in the future operation and development of the Airport;
- Develop a travel plan for Airport staff and users;
- Work with stakeholders to promote green policies and initiatives;
- Set a ceiling on total numbers of flights;
- Report progress and results annually

3.5 The Company fully expects to continue working with shareholders, local communities and the Planning Authorities in the ongoing development and implementation of the Green Policy.

3.6 Specialists were appointed in a variety of fields of expertise to assess report and establish baseline data. This will facilitate the setting of future reduction targets, particularly for those ground-based operations over which the Airport has direct control, such as energy consumption. These targets were set to reduce the Airport's consumption by 10% per annum for the first two years following introduction.

3.7 The Company will continue to record and respond to noise complaints from the local community and work with all stakeholders to minimise noise nuisance. Existing Noise Abatement procedures will continue to be regularly reviewed to ensure their effectiveness. Professional noise contouring has been undertaken, in accordance with Government requirements and noise monitoring will be undertaken in the communities surrounding the Airport. The Company wishes to reduce the percentage of noise complaints received year on year and will publish all relevant data.

3.8 A restriction on the total number of movements has been agreed at 95,000 per annum excluding police, medical, military and other emergency-related flights.

3.9 In conjunction with the Shareholders, a methodology was devised and independently verified to calculate current CO2 emissions from aircraft operations. This has been factored to include the predicted traffic levels after the completion of the Runway Safety Project and to set a future ceiling on emissions at 4000 Tonnes per annum. This level of CO2 emissions is equivalent to approximately 0.17% of the region's (Gloucester, Cheltenham, Tewkesbury) entire output.

3.10 Operational ceilings have been set at 1.5% of the total numbers of flights, to limit out-of-hours and nighttime activities. These are consistent with the Airport's current requirements but retain sufficient flexibility so not to onerously restrict the legitimate operations of our customers now, and in the future. Emergency, Police and Air Ambulance-related operations are excluded from any limitation; as are

aircraft arriving early or late for operational reasons - reflecting the important role the Airport plays in support of these flights. The Policy commits the Company to openly and transparently report details of its operations.

3.11 The Green Policy reflects those measures already in place to promote environmentally friendly surface transport to and from the Airport by staff, passengers and users. These formed the basis of a formal Travel Plan.

3.12 The Company has introduced schemes to record the amount of waste produced at the site and will set targets to reduce these levels in future. A 'Green Champion' was appointed to promote waste management issues. The Company is committed to ensuring that all disposal methods will meet or exceed national permitted limits and levels.

3.13 Water usage and quality within the Airport site will be monitored to ensure maximum efficiency and minimal pollution. The annual water quality report shall ensure that average pollutant levels do not exceed the discharge consent levels, as agreed by the Environment Agency.

3.14 The ecology of the 400-acre Airport site will be sensitively managed, within the Civil Aviation Authority's Safety Requirements to ensure minimal disruption to habitats during the course of normal airport operations and when considering future development. Grasses will be organically managed to preserve the natural environment and maintain the Green Belt buffer between the urban conurbations.

3.15 The policy culminates in a series of objectives, timeframes and ceilings. These are defined within the document to ensure its effectiveness now and in the future. Some targets will require development in the future but will only be amended in consultation with the shareholders. All targets will be regularly reviewed to ensure they remain specific, measurable, achievable, relevant and time based.

4 Purpose

4.1 Gloucestershire Airport recognises its responsibilities to the care for the environment and as a good neighbour to our community. To reinforce this, our policy statement is:

"Gloucestershire Airport is committed to controlling the adverse effects of its operations and minimising its impact on the environment and the local community, whilst seeking to maximise the positive benefits from the airport."

4.2 We will achieve this by:

a. Developing our employees to raise environmental standards by ensuring that they are well informed, well trained and committed to the environmental improvement process;

b. Working with our business partners to raise standards and encourage them to adopt environment policies and management systems. We will take a central role in co-ordinating and driving forward performance improvement;

c. Striving to be a better neighbour by engaging the local community in a two-way dialogue to understand their needs and playing an active part in meeting these needs;

d. Integrating sustainability principles into our business processes and decision making;

e. Meeting or exceeding all legal requirements.

4.3 This policy is a working document that will change as best practice and methods of improving the sustainability of airports are developed. It is about managing our business in a way that enhances the positive and minimises the negative economic, social and environmental impacts of our activities by taking current issues like safety and the environment seriously. It requires us to balance successfully the interests of our different stakeholders through the quality of the judgements that we make. Those stakeholders include our employees, customers, suppliers, investors, government bodies and the local communities around our airport. The trust of these groups is fundamental to our day-to-day business success and to protecting and enhancing its value into the future.

5 Aim

1. To demonstrate a commitment to minimising and reducing greenhouse gas emissions resulting from all activities at Gloucestershire Airport;

2. To define a reasoned methodology for measuring all greenhouse gas emissions generated by flying activities at Gloucestershire Airport;

3. To set a baseline and maximum level for greenhouse gas emissions from all activities at Gloucestershire Airport and to set targets to reduce these annually, where possible.

6 Scope

The development and implementation of the Green Policy will address the following specific areas:

- Setting an annual objectives for reducing greenhouse gas emissions from ground operations;

- Establishing the ‘carbon footprint’ of all existing and proposed flying activities (including any new scheduled services) and setting a ceiling on CO2 emissions from them;

- Identifying steps already taken to reduce climate change impact;
- Ensuring that climate change issues are addressed in future plans for the airport, including a full assessment of any new scheduled service routes and the impact of these on local air quality, noise levels and traffic congestion;
- Developing a green travel plan for employees, airport users and passengers;
- Using the green policy to work closely with tenants, operators and business users to reduce greenhouse gas emissions;
- Setting an annual ceiling on the number of aircraft movements;
- Annually reviewing our performance.

7 Introduction

7.1 Gloucestershire Airport is fully committed to reducing its greenhouse gas emissions and understands the need to meet its environmental responsibilities. Climate change is an important issue for Gloucestershire Airport, especially as global emissions from aviation are forecast to rise at a time when there are international targets to significantly reduce overall CO_2 emissions. We are committed to reducing our own climate impact by reducing the emissions as far as possible from sources within our own operations, and over which we have direct control.

7.2 We understand that an important component of Government policy is the inclusion of aircraft emissions in the EU Emissions Trading Scheme. We fully support the emissions trading scheme and strongly believe that this is the most effective market mechanism for achieving improvements in the aviation industry. We are also committed to the UK aviation industry's Sustainable Aviation Strategy, which sets out measures for aviation to minimise its impacts through technology and operational improvements.

8 Working with Stakeholders

8.1 We will actively encourage other organisations operating at or using the airport to adopt our green policies. We will work closely with the Shareholders, Local Planning Authority and Consultative Committee in achieving this.

8.2 Environmental issues are a standing agenda item at all Board, Management and Consultative Committee meetings.

8.3 Where practical, we are incentivising our charging schemes to encourage airport users to adopt green principles. We will achieve this by introducing policies that will encourage the efficient use of energy, e.g. reduced landing fees for diesel engines, or noise reducing propellers.

9 Community Relations

9.1 Community relations are a vitally important for the Airport. We therefore intend to highlight both ongoing and imminent issues relating to Gloucestershire Airport, with the view to facilitating a dialogue with the local community and other, relevant, interested organisations.

9.2 Gloucestershire Airport recognises that any development or evolution of an airport in particular, is of interest to the community at large and therefore intends to keep interested parties informed of forthcoming plans through both our website and direct contact with community representatives.

9.3 Gloucestershire Airport Consultative Committee (see section 10) has representation from a wide number of local interest groups including local residents' associations, city, borough and parish councils, airport users and airport/company management. This committee meets on a regular basis, and these meetings act as a catalyst to enable communication and consultation between the airport, its users and the local community. The committee regularly receives and reviews records of aircraft complaints from members of the public as well as reviewing airport operations.

9.4 Wherever possible, we will attend local residents associations, Parish Council meetings and community groups to present and discuss the Airport and its operations. Furthermore, we will continue to meet with local groups or individuals that have a specific concern.

10 Consultative Committee

10.1 Gloucestershire Airport hosts an Airport Consultative Committee whose purpose is to foster and maintain the best possible relations with local communities and other interest groups. This committee:

- Promotes the exchange of information and ideas.
- Allows concerns to be raised and taken into account by the Airport management, with both sides sharing a desire to resolve any issues that may emerge.
- Provides the opportunity for interest groups to reach a common understanding about the nature of the airport operation, thereby increasing the scope for issues to be resolved amicably.
- Promotes wider understanding of airport operations.
- Promotes better understanding by Gloucestershire Airport of the nature of its impact on local communities and businesses.

10.2 The committee comprises members who represent the interests of neighbouring parishes, aerodrome operators, local authorities, local business representative, aerodrome users and other interested parties. The position of Chairman is occupied by a person who is not closely identified with any sectional interest.

11 Noise

11.1 Noise is one of the most significant environmental impacts from airports and for many of our local residents; it represents one of the main causes of annoyance associated with living close to an airfield. Aircraft noise tends to dominate many people's assessment of the impact the Airport has on its neighbours and we consider this issue a priority.

11.2 Gloucestershire Airport works hard to minimise disturbance to local residents. We have designed and published noise abatement procedures for all aircraft using the airfield. These are published within statutory operational documents and amplified at local level by promulgation on our website, on the reverse of all our invoices and clearly displayed in the Pilot's briefing area. A copy of the Airport's procedures is attached at Appendix A. In addition to specific procedures relating to certain runways, the procedures state:-

"Operators of all aircraft using the aerodrome shall ensure at all times that aircraft are operated in a manner calculated to cause the least disturbance practicable in the areas surrounding the aerodrome. A medium density residential conurbation is situated to the east, south and southwest of the aerodrome. Whenever possible, pilots should avoid overflight of these areas, other villages, hamlets and residential areas in the vicinity of the aerodrome."

11.3 We will continue to work with the consultative committee and our operators in helping reduce noise pollution. There will be ongoing consultation with our local community, aiming to maintain an active dialogue to build trust and understanding.

11.4 We aim to assure our stakeholders that we use the best practicable means to minimise aircraft noise impacts and will continue to do so in the future. We will: -

a. Conduct a Noise Impact Assessment of activities during our hours of operation. From the results, publish noise contour maps and implement any identified actions that may assist in reducing the level of environmental noise;
b. Monitor compliance with our noise abatement procedures for departing and arriving aircraft and analyse the noise and flight path of aircraft, including any visual intrusion;
c. Educating and reminding home-based operators of our published noise abatement procedures;
d. Publish our noise complaint data on the website;
e. Encourage the operational use of continuous descent approach (CDA) procedures;
f. Engage with communities affected by noise impacts to better understand their concerns and priorities;
g. Undertake noise monitoring in the community and record our findings to facilitate further analysis.

11.5 Furthermore, we promote and encourage operators to use noise reducing propellers and quieter, fuel-efficient diesel engines by offering environmental discounts on our fees and charges.

11.6 We also aim to give members of the public who wish to complain about aircraft noise or related issues an informative, helpful and friendly service (Appendix B). These complaints provide the statistics, which are compiled and publicly reported to the Airport Consultative Committee.

11.7 We provide a variety of options for logging a complaint including a dedicated telephone line and email address, all of which result in a direct action. This may, if requested, include a call back or personal visit from the Head of Operations or the Airport Director.

11.8 All letters of complaint received are directed to the Airport Director. The circumstances of the complaint are investigated in full and a written response supplied, providing a detailed account of the findings.

11.9 All complaints are recorded to ensure that each is handled in an efficient and standardised way. An investigation into the reported concerns will take place using the information provided and ATC records of traffic patterns throughout the same period. If a specific aircraft, operation or type of flight is identified, the operator of the aircraft is advised and requested to provide information about the complaint.

11.10 All complaints are maintained on file. At the end of each month, the records are analysed and the results used to: -

- Identify overall trends and investigate ways of mitigating problems by changing operational procedures;
- Provide bi-monthly reports to Churchdown residents through the Parish Magazine;
- Inform the Airport Consultative Committee of complaints received since the last meeting

11.11 We will set a benchmark for noise complaints based on the 2007/08 figures and strive to deliver a year-on-year reduction.

12 Aircraft, CO_2 Emissions and Gloucestershire Airport

12.1 Currently, there is no internationally agreed standard methodology for calculating CO_2 emissions from aircraft. The following methodology was devised, in consultation with the Shareholding Authorities and independently verified by John Baines as a suitable means of establishing a 'benchmark' for Gloucestershire Airport's current aircraft-related CO_2 emissions and establishing a ceiling for future emissions.

12.2 Gloucestershire Airport provides aircraft movement statistics to the Civil Aviation Authority on a monthly basis. These will be used to calculate emissions data. At this initial stage, only CO_2 emissions are considered, but the methodology will be extended in the future to cover other greenhouse gas emissions.

12.3 CO_2 Emissions and Piston-engine Aircraft - AVGAS

12.3.1 These aircraft constitute a high proportion (86% in 2007) of Gloucestershire Airport's traffic. This category includes most of the training and privately operated light aircraft and helicopters. Most are single-engine with 2 - 4 seats. Examples include:-

Eurostar – Modern, lightweight 2-seat basic trainer.

Piper Cherokee – In production from the mid-sixties to present day. 4-seat trainer/tourer, used extensively for private and commercial flight training.

Cessna 172 In production from the mid-sixties to present day. 4-seat trainer/tourer, used extensively for private and commercial flight training.

Robinson R44 helicopter – Modern 4-seat helicopter. Popular, entry-level business helicopter, frequently used for training.

Piper Seneca – Twin-engine, 6-seat entry level business aircraft, extensively used for advanced and commercial pilot training.

12.3.2 AVGAS fuel - Aviation gasoline, is similar to that used in motor cars, albeit with a higher octane rating. Given the complexities associated with the nature of local and circuit flights, a linear conversion of the Airport's total annual AVGAS fuel sales to CO_2 is considered to be the most appropriate method of establishing a benchmark. The current Department for Environment, Food and Rural Affairs (DEFRA) Conversion Factors (2013) give a litres to Kg CO_2 factor of 2.2615.

12.3.3 The modern Eurostar example shown above burns around 7 litres (1.5 Gallons) per hour in the economical cruise, compared with the Piper Cherokee, which uses around 23 litres (5 Gallons). Each aircraft has a cruising speed of around 100mph, giving an approximate comparison with car use of between 20 and 66 miles per gallon.

12.3.4 A small number of modern, piston-engine aircraft now use diesel engines. Whilst diesel engine technology has existed for many years, its use in aviation applications has been very limited, largely due to weight and complexity associated with liquid cooling. These aircraft use Jet-A1 fuel and offer an improved fuel efficiency of up to 60% over AVGAS engines. It is likely that further advances in technology will encourage usage that is more widespread. Gloucestershire Airport is home to a UK company that has designed, developed and is now manufacturing such an engine. Emissions from diesel-powered aircraft are captured from the calculation of Jet-A1 usage, given the very low numbers of aircraft involved at present. A specific methodology for diesel emissions may need to be developed as utilisation increases.

12.4 Turbine-engine aircraft – Jet A1

12.4.1 Whilst these represent a smaller proportion of Gloucestershire Airport's total traffic (13 - 15%), they are the largest revenue stream and constitute the majority of the Airports business and commercial flights, examples are:-

Cessna 208 Caravan – 14 seat/5 tonne utility aircraft

Let 410 – 19 seat commuter airliner – Isle of Man, Jersey & Belfast City scheduled services

Agusta 109 – 6 seat executive helicopter

Cessna Citation CJ3 – 8-10 seat executive jet

12.4.2 Jet A1 fuel is kerosene. The Department for Environment, Food and Rural Affairs (DEFRA), provides a Conversion Factor (2013) of litres to Kg CO_2 factor of 2.5418. The use of these types of aircraft varies extensively and a different methodology is required, to capture the global effects of CO_2 emissions from these aircraft and reflect the different way in which flights will operate from Gloucestershire Airport after the runway safety project is completed.

12.5 Methodology

12.5.1 The following parameters are used to establish current CO_2 emission levels by turbine-engine aircraft:-

a) The busiest 30-day period of the year is determined from annual statistics as 15th July to 15th August. All flights during this period are analysed. This ensures that the figures derived are representative of a 'worst case' scenario and do not underestimate emissions;

b) Operations in support of Police, Air Ambulance and military flights are excluded;

c) The Great Circle distance between Gloucestershire Airport and all destination/departure airports is calculated, using Google Earth. This distance is factored by a 8% uplift to account for non-direct routes and delays, in accordance with DEFRA guidelines;

d) The fuel burn per mile for each aircraft type is determined, using the manufacturers published data. Fuel burn is normally published on a per hour basis, this will be converted to per nautical mile by using the aircraft's published cruising speed;

e) This figure is factored by 5% to account for the Landing Take Off (LTO) cycle and climb sectors. This requires further expansion in the case of Gloucestershire Airport. DEFRA guidelines say that the LTO cycle should be factored by 10%. The International Civil Aviation Organisation (ICAO) define the LTO cycle as follows:-

Cycle	Power	Time spent (mins)
Take off	100%	0.7
Climb	85%	2.2
Approach	30%	4.0
Taxi/Ground idle	7%	26.0

The 26-minute ground/taxi time is not appropriate to Gloucestershire Airport. The taxiing distances involved and general operating efficiencies of a small Airport such as this means that ground/taxi time is substantially reduced, to the order of 10 minutes. This is based on operational experience and evidence from Air Traffic Control (ATC). These revised figures were added together to give a relevant LTO cycle equivalent to around half the ICAO standard. This was, in turn, applied to the DEFRA figure, reducing it from 10% to 5%.

f) The total distance calculated is multiplied by the fuel burn and converted to Kg CO_2 using the 2.5418 conversion factor;

g) This figure is divided by two, to account for 50% of emissions, assuming that the point of departure or destination airport accepts the remaining CO_2 emissions in their carbon accounting;

h) The result is multiplied by 12 to give an annual figure.

12.6 Post-RSP Calculations

12.6.1 To establish the post-RSP benchmark, an additional 60 flights were added to the dataset, accounting for one extra jet landing and taking-off per day. This estimate, together with the associated fuel sale, forms the basis of the business case supporting the project. As future journey distances are not known the average journey distance is applied.

12.6.2 Specifically, Chapter 11 of the Business Case stated the following:-

"With the RESA and ILS work completed, the Airport would be available to many more corporate aircraft. Some of these would find it beneficial to be based at Gloucestershire. A modest assumption would be for one additional aircraft in Year 4 and two in Year 5. Flight Partner Limited (2006) have already indicated that they are losing valuable business without the development work and EuroJet Aviation Limited (2006) have stated that they would consider Gloucestershire Airport as a preferred engineering base should the work be completed…

Note: *It is possible that home-based corporate aircraft would also generate hangarage income, although this is not assumed for the purpose of this analysis. For a single home-based corporate aircraft, the (conservative) assumption of 40 flights per year is used.*

As well as home-based corporate aircraft, the Airport would attract more visiting corporate aircraft from Year 4. One additional landing per day is a modest assumption for Year 4, two landings per day for Year 5…

Note: *For visiting corporate aircraft, the assumption of one additional landing per day is factored to a figure of 300 visits per year. This equates to a notional operation of 6 days out of 7. The airport opens seven days per week and experience shows that corporate aircraft operate every day of the week."*

12.6.3 This can be summarised as follows:-

Extra flights	**Year 4**	**Year 5**
Homebased	40	80
Visiting	300	600
Monthly average	28	57

For the purpose of these calculations this monthly figure has been rounded up to 60.

12.7 Radiative Forcing and other Greenhouse Gases

12.7.1 The emission factors refer to aviation's carbon dioxide emissions only. DEFRA methodology for RF calculations is emerging, although there currently remains uncertainty over the non-CO_2 climate change effects of aviation (including water vapour, contrails, NOx etc.).

12.7.2 Currently there is no suitable climate metric to express the relationship between emissions and climate warming effects from aviation but this is an active area of research. Nonetheless, it is clear that aviation imposes other effects on the climate, which are greater than that implied from simply considering its CO_2 emissions alone.

12.7.3 The application of a 'multiplier' to take account of non-CO_2 effects is a possible way of illustratively taking account of the full climate impact of aviation. A multiplier is not a straightforward instrument. In particular, it implies that other emissions and effects are directly linked to production of CO_2, which is not the case. Nor does it reflect accurately the different relative contribution of emissions to climate change over time, or reflect the potential trade-offs between the warming and cooling effects of different emissions.

12.7.4 On the other hand, consideration of the non-CO2 climate change effects of aviation can be important in some cases, and there is currently no better way of taking these effects into account. A multiplier of 1.9 is recommended as a central estimate, based on the best available scientific evidence.

12.7.5 The relevance of radiative forcing effects from Gloucestershire Airport's traffic warrants further consideration. Only a very small proportion of the Airport's traffic, estimated at less than 2%, cruises at the highest levels of the atmosphere. The vast majority of turboprops cruising at much lower levels.

12.7.6 Given the scientific uncertainty and the nature of Gloucestershire Airport's traffic it has been agreed that this figure should not be applied at this initial stage. However, this will be kept under regular review and as the science becomes available, the methodology will be updated to include radiative forcing.

12.8 Implementation, development and reporting

12.8.1 Preliminary calculations have established a CO_2 'footprint' from current aircraft operations (2007) as shown below:-

Fuel type	Volume sold (Litres)	CO_2 Output (Tonnes)
AVGAS	609 578	1361.2
Jet A1	1 518 035	2421.5
	Total	**3782.7**

12.8.2 Applying the forecast post-RSP traffic levels, this is expected to increase as shown:

Fuel type	Estimated Volume(Litres)	CO_2 Output (Tonnes)
AVGAS	580 000	1299.5
Jet A1	2 620 000	2674.4
	Total	**3973.9**

12.8.3 The annual calculations for AVGAS will be completed by 30th April each year. Jet A1 calculations will be completed by 15th September each year.

12.8.4 Fuel sales for AVGAS show a gradual downward trend reflecting a reduction in the volume of flights as well as technological advances in engine and aircraft design.

12.8.5 In 2012, the Airport began the sale of unleaded AVGAS, known as UL91. The removal of tetra-ethyl lead additive from AVGAS is obviously a significant environmental improvement. DEFRA has not yet published conversion factors for this particular grade of fuel; however, it will be treated as AVGAS for conversion purposes.

12.8.6 Jet A1 fuel sales are expected to increase significantly after the RSP is complete because the additional useable runway will enable executive jets to take off with more fuel on board and fly direct to their destinations. Currently, stops have to be made at an intermediate airfield to take on more fuel. The project delivers an environmental benefit by reducing the number of landing and take-off cycles and delivers a business benefit to the Airport.

12.8.7 All results will be provided to the Shareholders, the Local Planning Authority and made available via the Airport website.

12.8.8 An independent assessment and verification of the calculations will be undertaken by John Baines, or other such consultant, as appointed by the Shareholders. Verification will include confirmation that DEFRA conversion factors are correct and current.

12.8.9 It is proposed that as the policy develops further, the methodology would include: -

a) Setting a carbon emissions reduction target;
b) The calculation of other greenhouse gases;
c) Assessment of interim months to monitor performance;
d) The application of a factor or alternative method of calculation for Radiative Forcing effects;

12.9 Future calculations

12.9.1 Using the methodology and based upon the calculations shown at paragraph 8.7.2 above, our current calculated figure stands at 3979.3 Tonnes. Gloucestershire Airport undertakes to ensure that future CO_2 emissions from aircraft operations do not exceed a ceiling of 4000 Tonnes CO_2 in the course or normal Airport operations.

12.9.2 This ceiling is based on actual data factored to include the extra traffic anticipated post-RSP. It is representative, realistic and based on 'real' flights. This is indicative of a genuine commitment to maintain the status quo at Gloucestershire Airport and not to seek or encourage operations that would significantly increase emissions. It precludes for example, the introduction of long distance scheduled services or operations by large passenger jets. The runway safety project will bring about a change in emphasis from quantity to quality of flights. It will enable existing operators and future customers to use fuel more efficiently and improve payload. A graphical representation of this shift in traffic pattern is shown in Appendix C.

12.10 Contextual comparison

12.10.1 With no standardised methodology for calculations on this nature, it is difficult to define a comparator with which to contextualise this figure. Given the local significance of stakeholders to this policy, it is considered that expressing the total as a percentage of total regional emissions may assist in this regard.

12.10.2 Regional emission data, by Local Authority area is published. The total emissions (2005-6) for each of the local authority areas were as follows: -

Gloucester	704,000 Tonnes
Cheltenham	654,000 Tonnes
Tewkesbury	1,040, 000 Tonnes

12.10.3 CO_2 emissions from aircraft operations from Gloucestershire Airport are equivalent to 0.17% of the region's output.

13 Operational Controls

13.1 Aircraft Movements

13.1.1 The airport accepts the concept of an overall 'ceiling' on total numbers of aircraft movements at a reasonable level, allowing for future growth and not onerously restricting certain operations.

13.1.2 In the late eighties, total aircraft movements at the airport peaked at 102,000, measured between April 1988 to April 1989, although numbers have been less than this since, averaging around 82 000 flights per calendar year. The airport undertakes to ensure that the peak figure is not exceeded in the future. Therefore, a ceiling on total aircraft movements, excluding police, medical and other emergency-related flights was originally set at 102,000.

13.1.3 During the development of this Policy, however, concern was expressed from some quarters that such a level could be perceived as a 'target' and that increasing aircraft movements to those levels would constitute a substantial increase in operations. Whilst the Airport acknowledges these concerns, the business plan, post-RSP does not envisage substantial growth in air traffic and there are, categorically, no plans, now or in the foreseeable future to stimulate, encourage or otherwise attract major traffic growth.

13.1.4 Nevertheless, any business needs to be able to respond to changes in its operating environment. This is particularly relevant in the current economic climate and it is important that any ceiling set on aircraft movements does not impinge on the Airport's ability to trade efficiently, effectively and profitably. In balancing these factors against the principle objective of this policy to minimise the environmental impact of Airport operations, it is important that a realistic ceiling be applied.

13.1.5 By analysing the annual calendar year figures for Gloucestershire Airport, as published by the CAA, the average of the three busiest years, of the last twenty, was considered to be the most appropriate level for an operational ceiling. These are 1988 (88 000), 1989 (95 000) and 1992 (90 000), giving an average of 91 000.

13.1.6 The Airport are therefore prepared to accept a ceiling of 95,000 flights per annum, excluding police, medical and other emergency-related flights.

13.1.7 The Airport is required by the CAA to record and report the number of aircraft movements. This information will be regularly provided to the shareholders and published on the Airport website, enabling simple monitoring by stakeholders.

13.1 Opening Hours

13.1.1 The normal operating hours (Local Time) at Gloucestershire Airport are as follows:

Summer: Monday to Friday 0830 – 1930; Sat & Sun 0900 – 1930
Winter: Monday to Friday 0830 – 1930; Sat & Sun 0900 – 1800

13.2.2 Sometimes, flights are accepted outside these hours, subject to the availability of Air Traffic Control (ATC) and Airport Fire Service staff, and subject to a surcharge. The majority of these flights take place within 2 hours of normal opening or closing time. This has been the pattern of operating hours for more than 35 years.

13.2.3 By way of example, the following data was captured during the period 29 Oct 2007 – 26 Oct 2008: -

Total flights during the period: 75,711

Total out-of-hours flights: 708
Percentage of annual total: 0.9%

These can be broken down further as follows: -

Fixed wing	475	0.6%	
Helicopter	233	0.3%	
Emergency	177	0.2%	
Special event	22	0.03%	(Cheltenham races/rugby)
Manx2 flight	142	0.2%	

Analysing these even further in relation to the period before or after closing time the following can be derived: -

Within 5 min	113	16%
Within 1 hour	567	80%
Within 2 hours	651	92%
> 2 hours	57	8%

13.2.4 Sometimes, there are circumstances beyond the Airport's control that affect the times of arriving or departing aircraft, such as, the flow of air traffic through European airspace, which is regulated by Eurocontrol. 'Slot times' are issued to departing aircraft by the Integrated Flight Processing Unit (IFPU) in Brussels. Each aircraft is allocated a specified departure time and air traffic controllers have

a small time frame around the slot in which to depart the aircraft. It sometimes means that slot times are allocated a few minutes before airport opening times and more frequently, in-bound flights are delayed at their point of departure resulting in aircraft landing after official closing time.

13.2.5 Additional delays and alterations occur when aircraft encounter head or tail winds affecting their flight times. It is essential that the Airport retains this degree of flexibility to account for delays and the legitimate operational requirements of our customers. Without this degree of flexibility aircraft may be forced to hold unnecessarily or even divert to other airports, which would ultimately be more detrimental to the environment.

13.2.6 Some homebased private aircraft are also permitted to operate when the airport is closed. Private operators must apply for approval to join the scheme, providing details of their Public Liability Insurance. These flights are only permitted during daylight hours (i.e. after sunrise and before sunset), subject to specified weather conditions and must be notified in advance to ATC. Repeat circuit flying is **not** permitted. No commercial or training flights are permitted to operate when the airport is closed.

13.2.7 Certain helicopter operators, normally connected with Police and Air Ambulance services are permitted to operate at any time, without prior notification**.**

13.2.8 Although it is not clear that current Airport operating hours are causing specific environmental problems, to give the shareholders greater certainty and comfort, the Airport would be prepared to accept a voluntary limitation on airport operating hours to those currently operating. Provided that:-

a) any limitations are set so as not to unreasonably restrict the airport's normal operations;
b) police, medical and emergency flights are excluded from the restricted hours of operation.

13.2.9 We accept that a ceiling of no more than 1.25% of our total annual movements, excluding police, emergency services and military related flights, and those arriving early or late for operational reasons, be permitted to take place more than 30 minutes outside of our published hours.

13.2.10 No more than 100 movements per calendar year will be permitted to take place during the night time hours of 2300 - 0600.

13.2.11 As the Airport is required by the CAA to record the timing of air movements, information on movements outside the specified operating hours can be regularly provided to stakeholders.

13.2.12 It is important to note that airport operational hours are substantially constrained by staffing levels. In particular, air traffic controllers have set rostered duty limitations relating to the length of shifts and duties beginning before 0800. In order to extend the existing opening hours it would be necessary for the airport to employ additional ATC, fire service and operational staff. The costs associated with this would not be covered by the small proportion of flights that require to operate early or late, meaning that the business case for any extension of hours is very weak.

14 Air Quality

14.1 The Government has identified the need to take action to reduce air pollution and has committed to delivering cleaner air through its UK Air Quality Strategy, published in 2000.

14.2 A study of local air pollution concentrations concluded that the proposed development of the airport would not compromise local air standards. The air quality data was taken directly from the Air Quality Monitoring Station (AQMS) in Cheltenham. This station lies directly under our main flight path (runway 27) and monitored the air quality for several years. The air quality in Gloucestershire is very good with all indicators showing low pollution. Furthermore, the main local pollution influences are motor vehicle traffic and there does not appear to be any major regional point source influences.

14.3 The Airport will also investigate alternative monitoring points, given the availability of locally sourced data.

14.4 We will continue to monitor data from the Department of Environment and Rural Affairs (DEFRA) on a regular basis, comparing our aircraft movement data to ensure our operations are not significantly affecting air quality.

14.5 Using the most recent data from DEFRA as a data set, the South West region, as a whole, shows the current level of pollution as 'Low'.

14.6 The main sources of local air pollution around Gloucestershire Airport are:

a. Aircraft operations close to and on the ground
b. Road vehicles at the airport
c. Traffic to and from the airport

14.7 To help mitigate the impact of aircraft operations we will:

a. Supply alternative power sources so that aircraft on the ground can turn off their engines
b. Improve operational procedures to minimise the time spent on the ground during the landing and take off cycles
c. Invest in technology that aids air navigation, e.g. Instrument Landing System (ILS) and Global Positioning System (GPS);
d. Encourage training providers to invest and promote the greater use of training simulators.

15 Ground operations

15.1 We have identified the main sources of CO_2 linked to our ground operations as:

a. Energy use in buildings and infrastructure;
b. Transport to and from the Airport;
c. Airside vehicles;
d. Aircraft movements on the ground;
e. Auxiliary Power Units (or 'APU') which aircraft use to provide air conditioning and lighting when they are on the ground;
f. Energy consumption in our supply chain.

15.2 Gloucestershire Airport commissioned a specialist energy advisor, Severn Wye Energy Agency, to investigate the environmental control of our buildings and operational activities. By utilising previous energy bills, supported by site visits and surveys, they identified areas where we can maximise the efficient use of energy. The results of their survey (Appendix D) and subsequent action plan (Appendix E) were implemented, where practical, over a set period. This enabled us to establish a baseline for our energy consumption and set an annual target for reducing carbon emissions by 10% per annum for the following two years.

15.3 Throughout this period, we will continue to promote energy efficiency within our buildings by:

a. Introducing a dedicated Green Champion to monitor, educate and promote green initiatives and best practices;
b. Achieving behavioural change by educating staff to conserve energy used by switching off when not in use and general energy saving awareness;
c. Ensuring energy efficiency is built into the design of new and existing facilities, e.g. retrofitting program of low energy lamps throughout the Airport;
d. Investigating energy-efficient technology; e.g. integral Passive Infrared detection will be investigated to control lighting within public areas allowing lights to reduce output by 90% during periods of low/no occupation or movement;
e. Extracting the most value from resources and minimising waste by reducing the amount of waste produced and by recycling wherever possible;
f. Identifying sources of renewable energy;
g. Investigating tools to improve data on energy use.

15.4 We will continue to identify potential improvements to technical and aircraft operational procedures by:

a. Supplying power from the Terminal so that aircraft can turn off their engines when on the apron;
b. Reducing emissions from vehicles at our airport;
c. Ensuring all airside vehicles comply with MoT emissions standards in order to qualify for an airside pass;
d. Improved operational procedures to minimise the time spent on the ground during the landing and take off cycles;
e. Technological investment in air navigation aids, e.g. Global Positioning Systems (GPS) and Instrument Landing Systems (ILS).

15.5.2 The on-going policy of replacing lighting and heating with energy efficient units is also moving forward with approximately 60% of the on site units being replaced where appropriate.

15.5.3 We have continued our programme of installing ‘Smart meters’ which will allow us to monitor electric usage more closely, which in turn helps to identify peak areas. These can then be targeted with measures to help reduce consumption.

15.5.4 A complete analysis of our vehicle fleet has been carried out and recorded. The results are published in Appendix F.

16 Green Travel Plan

16.1 An important factor in reducing the Airport’s carbon footprint is encouraging all Airport users to travel to site in an environmentally friendly manner. Our Green Travel Plan was published in 2011

16.2 Overtime, we have introduced several schemes to mitigate further the environmental impact of our travel, such as:

a. Rosters have been arranged to allow for car sharing;
b. We have been extensively involved with Sustrans in the creation and development of a cycle link between Cheltenham and Gloucester, which passes through the Airport and actively encourage members of staff to utilise the route;

c. We are also investigating the Governments cycle to work scheme and have installed shower facilities in our departments to encourage the use of cycles;
d. We purchased software enabling some administrative staff to work remotely from home;
e. We promote flexible working for non-operational staff, enabling them to avoid peak travel times;
f. Where possible, we use public transport for business travel.

17 Waste

17.1 We aim to achieve more with less, to reduce inefficient use of resources and to mitigate the increasing costs of waste management to the business. We will achieve these goals by recycling and minimising our own waste stream and influencing airport users to manage their waste production and disposal.

17.2 To achieve this we have calculated how much waste we are generating and the costs involved by utilising existing data on resource use and waste disposal, e.g. from meters, invoices and purchase records.

17.3 This data will be captured by the following:-

a. **inputs**, e.g. raw materials purchases (cost and quantity), electricity consumed, water used;
b. **outputs**, e.g. units of production (fuel sales);
c. **levels of waste**, e.g. how much is recycled, number of skips collected each week, waste disposal charges.

17.4 We plan to monitor all waste caused as a direct result of our actions. We will commit to minimising the amount of waste for disposal by:-

a. Identifying and prioritising waste streams;
b. Reducing waste by recycling where possible;
c. Encouraging Airport tenants and operators to develop recycling schemes;
d. Recovering and recycling waste oils, batteries, tyres etc;
e. Donating surplus furniture and IT equipment to community projects;
f. Encouraging staff to re-use and recycle, through staff awareness training;
g. Re-using scrap paper and printing double-sided, where appropriate;
h. Strive to become a paperless business by issuing documents electronically, rather than in paper form and printing when only absolutely necessary;
i. When producing hard copies of documents printers will be configured to print double sided;
j. Nominating a Green Champion to implement and promote waste minimisation within the company;
k. Setting up an employee suggestion scheme to generate ideas.

17.5 We already have a number of recycling and waste reduction schemes in place, including:

a. Fuel recycling programme;
b. Waste Oil collection service;
c. Encouraging a paperless workplace by utilising electronic technology;
d. Office Paper (all grades);
e. Cardboard;
f. Glass Bottles;
g. Aluminium cans;
h. Newspapers/Magazines/Brochures etc.;
i. Waste & Scrap Metal;
j. Waste timber and pallets;
k. Waste electrical equipment.

17.7 Gloucestershire Airport has also subscribed to Envirowise, a Government sponsored organisation set up to assist local businesses in reducing their environmental impact.

17.8 Furthermore, to ensure we remain compliant with current legislation Gloucestershire Airport has a waste management policy in place that ensures:

a. Companies that remove waste from the site are licensed to do so;
b. All our waste is segregated, stored and labelled correctly;
c. Everyone who deals with waste will be instructed on how it is handled and disposed of.

18 Water Quality

18.1 Gloucestershire Airport is located on a natural sub-grade of Lias clays at an elevation of approximately 31m above sea level. All rainfall at the site falling onto the runway, taxiways and aircraft stands discharges into the ground through a series of drains and into the ground through soak-aways. The drainage system therefore mimics the natural drainage of the surrounding area into groundwater.

18.2 The Environment Agency has also set discharge consent levels in respect of the quality of surface water, which may be discharged from the Airport into the local watercourses. Although the Airport Company is the holder of these consents, surface water quality on-site is determined by the activities of the many organisations operating at the Airport. Regular monitoring takes place to identify any activity, which could give rise to pollution. The results of the monitoring will be published annually. We will work with the Agency to better understand the consent levels and use as a means to reduce the consent levels to as low a reasonably practical.

18.3 There are a number of airport activities, which have the potential to cause pollution to groundwater if not properly managed. These include:

a. De-icing of airside areas
b. Vehicle and aircraft washing
c. Aircraft and vehicle maintenance
d. Spillages, and venting from aircraft refuelling
e. Fire training (Note: RFFS only use an environmentally friendly fire fighting foam during training exercises)
f. Spillages of domestic fuel oil

18.4 In addition, the Airport invested in a new Fire Training rig in 2006 to reduce the need for training foam. It operates by burning propane gas, which eliminates the use of aviation or petroleum fuel. The Fire Training Ground is close to the watercourse and procedures are in place to ensure any operations do not adversely affect the brook.

18.4 A complete Pollution Prevention Plan has been designed, in partnership with the Environment Agency and our objective is to manage water and land quality to protect the environment at all times and to ensure compliance with regulations now and in the future.

18.5 We plan to manage surface water quality on site by:

a. Monitoring surface and foul water discharges to ensure compliance with agreed consent limits;
b. Maintaining and improving surface and foul water drainage systems;
c. Briefing service partners and contractors on their responsibilities for pollution prevention;
d. Minimising the impact of any accidental spillages through containment and robust emergency reporting procedures.

18.6 We are in consultation with the Environment Agency with a view to reducing our discharge consent limits, thereby ensuring higher water quality standards.

18.7 Internally and in the buildings within our control we will:

a. Monitor, check and record meter readings;
b. Regularly check pipes for leaks, especially during winter;
c. Implement water minimisation measures;
d. Fit water minimising controls where possible, e.g. push taps, flow regulator/restrictors, cistern displacement devices, spray nozzles on hoses, low flush toilets and sensor urinal flushing controls.

18 Landscape and Ecology

18.8 Gloucestershire Airport will provide an attractive landscape consistent with Airport safety requirements. To support this, a detailed ecological and wildlife constraints survey was carried out against our safety proposals. This, coupled with detailed and extensive cooperation with the Environment Agency, has resulted in a recommendation that the proposals will not only have a minimal impact on the environment but will actually be an enhancement.

18.9 The Airport site covers a total area of approximately 400 acres and is located adjacent to rural areas and close to residential communities. A combination of soft and hard landscaping will be used to improve the quality of the landscape on the Airport site and will continue to be implemented as development takes place. Decorative planting around the Airport entrance and terminal buildings provides a welcoming approach.

18.10 In airside areas, strict guidelines apply to the management of the grasslands bordering runways and other operational areas, and consequently opportunities for landscape and wildlife enhancement are limited by Civil Aviation Authority safety requirements for aircraft.

18.11 Standard procedure is to employ a year-round long grass policy, maintaining grasses at between 6-8” in length to discourage roosting and feeding. Pesticides and chemicals are not routinely used in our grass management programme and cut grass is used for silage by the farmer adjacent to the Airport. This environment, in itself, has an, albeit limited, carbon sequestration effect and provides an open and visually apparent ‘green’ landscape, maintaining the Green Belt buffer between the urban conurbations around the Airport.

18.12 Our commitments to enhancing the landscape are to:

a. Avoiding ecological disturbance both during normal Airport operations and any development activity;
b. Carrying out ecological assessments in consultation with neighbouring local authorities and conservation groups when considering future development.

19 Objectives

20.1 Implementation and review

20.1.1 This document specifies a number of objectives, thresholds and ceilings for various aspects of our Green Policy. Some are immediately measurable; others will require further development, investigation and will evolve with the policy itself over a period.

20.1.2 This is a working document: it may be necessary to review and amend the targets or timeframes specified as the business, technology and reporting methods develop. We will consult with our stakeholders before significant changes are made.

20.2 Annual Review

20.2.1 An annual review will be carried out by the Airport Director and Officers of the respective Councils. The annual review will also be the platform from which to agree new targets for the forthcoming year.

20.3 Ground Operations

20.3.1 An annual reduction target of 10% is set for the first two years for the reduction of CO2 emissions from ground-based operations following the recommendations of Severn Wye Energy Agency.

20.4 Aircraft emissions

20.4.1 Using the methodology defined earlier in this document, Gloucestershire Airport undertakes to ensure that CO_2 emissions from aircraft operations do not exceed a ceiling of 4000 Tonnes CO_2 in the course or normal Airport operations. The totals calculated will also be expressed as a percentage of regional emissions, as published by DEFRA.

20.5 Operational Controls

20.5.1 The ceiling for total annual aircraft movements (excluding emergency, Police and Air Ambulance-related flights), measured by calendar year is set at 95 000.

20.5.2 The ceiling for out-of-hours flights (excluding emergency, Police and Air Ambulance-related flights, or those arriving early or late due to operational reasons) is set as not more than 1.5% of the annual total.

20.5.3 Not more than 100 flights per annum (excluding emergency, Police and Air Ambulance-related flights) will be permitted during the hours of 2300 – 0600.

20.6 Air Quality

20.6.1 Air quality will continue to be reviewed on a regular basis

20.7 Travel Plan

20.7.1 Performance targets for the travel plan have been set, subject to approval, and will be reviewed annually along with the Green Policy.

20.8 Noise complaints

20.8.1 Total numbers of noise complaints will be reported and expressed as a percentage of annual aircraft movements. This policy seeks to ensure that this percentage decreases year on year.

20.9 Waste management

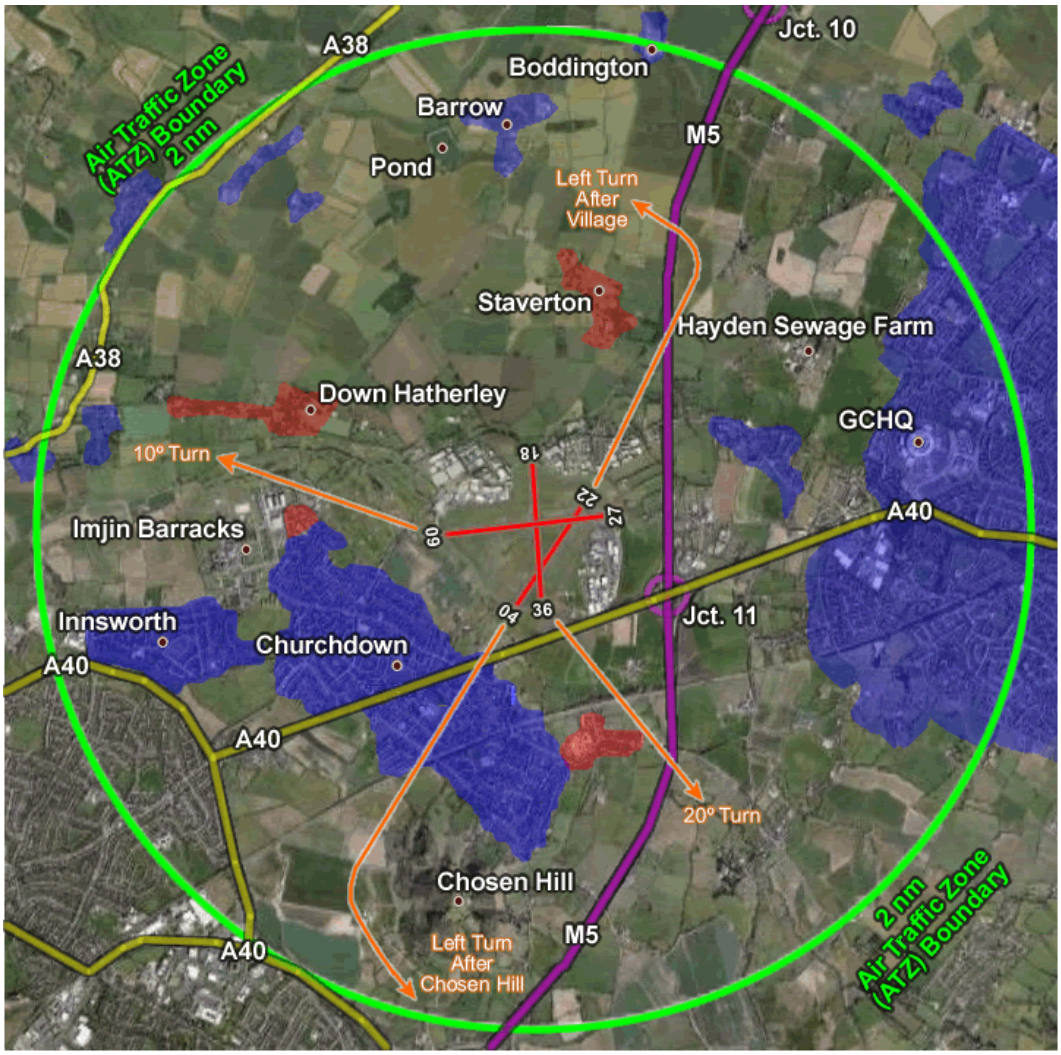
20.9.1 A baseline for waste in relevant categories has been established and annual reduction targets set.

20.10 Water quality

20.10.1 The annual water quality report shall ensure that average pollutant levels do not exceed the discharge consent levels, as agreed by the Environment Agency.

20 Appendix A – Noise Abatement Procedures

EGBJ Noise Abatement Procedures
At Gloucestershire Airport we are always trying to achieve a minimal noise level environment for our neighboring residential areas, villages, hamlets and properties. All local and visiting pilots are to observe the following noise abatement procedures unless otherwise instructed by ATC or if avoiding immediate danger:



SOLID BLUE indicates the residential areas to be avoided whenever possible, with **SOLID RED** highlighting the specific areas to be avoided during departure procedures detailed below:

Runway 27 departures - aircraft are to execute a right turn to maintain a track of 280º MAG to avoid the housing estate on the left and the village with the church on the right - fixed wing aircraft MUST NOT turn before the upwind end of the runway due to helicopters turning inside them.

Runway 18 departures - aircraft are to execute a left turn to maintain a track of 160º MAG avoiding the school and residential area on the right - fixed wing aircraft MUST NOT turn before the upwind end of the runway due to helicopters turning inside them.

Runway 22 departures - no left turns permitted until past Chosen Hill.

Runway 04 departures - no left turns permitted until past Staverton Village.

21 Appendix B – Noise Complaints Procedure

The following information is provided on the Airport website: -

Noise Complaints

Gloucestershire Airport is the UK's busiest general Aviation airport, handling between 70 -90 000 flights per year. We work hard to minimise disturbance our operations can cause to local residents. Our neighbourhood protection policies include: -

- Strict noise abatement procedures which we regularly remind our home-based operators to follow.
- We offer incentives (in the form of discounts) for operators to fit silencers to their aircraft.
- We operate a 'preferential runway' scheme when conditions allow to minimise noise nuisance.
- Off-airfield noise monitoring takes place at various locations around the airfield.
- We have produced Noise Contour maps in accordance with Government requirements **Please click here**
- Briefing sheets for visiting pilots, detailing our noise procedures

If you wish to complain about operational noise or other disturbance issue, we operate a formal complaints procedure. You may make a complaint by:

- Telephone report
- Personal visit
- Letter
- Electronically **Please click here**

All complaints received by telephone or personal visit are recorded by our Reception staff in the complaints database. If a response is requested, details are passed to the senior management team, who will contact you at the earliest opportunity.

What else happens to my complaint?
At the time of your complaint, we will try to identify the aircraft involved by contacting air traffic control. It helps if you can be as accurate as possible in your description of the aircraft colour, markings, time of the incident and, if possible, the registration letters. We will then advise the aircraft operator of your complaint and request feedback from them.

All complaints are maintained in a database. The records are analysed and the results used to:

- Identify overall trends and investigate ways of mitigating problems by changing operational procedures;
- Provide bi-monthly reports to Churchdown residents through the Parish Magazine;
- Inform the Airport Consultative Committee of complaints received since the last meeting.
- Produce annual statistics on noise as required by our Green Policy

FAQ's

Why do flights sometimes operate outside the Airport's published hours?

The normal operating hours (Local Time) at Gloucestershire Airport are as follows:
Summer: Monday to Friday 0830 1930; Sat & Sun 0900 1930
Winter: Monday to Friday 0830 1930; Sat & Sun 0900 1800

Sometimes, flights are accepted outside these hours, subject to the availability of Air Traffic Control (ATC) and Airport Fire Service staff, and subject to a surcharge. The majority of these flights take place within 2 hours of normal opening or closing time. This has been the pattern of operating hours for more than 35 years.

Emergency, Police and Air Ambulance-related operations are excluded from any limitation; as are aircraft arriving early or late for operational reasons - reflecting the important role the Airport plays in support of these flights.

Some homebased private aircraft are also permitted to operate when the airport is closed. Private operators must apply for approval to join the scheme, providing details of their Public Liability Insurance. These flights are only permitted during daylight hours (i.e. after sunrise and before sunset), subject to specified weather conditions and must be notified in advance to ATC. Repeat circuit flying is **not** permitted. No commercial or training flights are permitted to operate when the airport is closed.

Why don't aircraft always follow the noise abatement procedures? (click here to view the Noise abatement map)

In certain circumstances and with certain types of aircraft, it is not possible for pilots to comply with the published procedures. In simulated emergency situations or during other training exercises, the performance of the aircraft may be limited. For example, a twin-engined aircraft simulating an engine failure will have limited turn capability.

Generally, our noise abatement procedures ask our operators to avoid over flight of residential areas, *wherever possible*. The vast majority of our flights operate under what are called Visual Flight Rules (VFR), which means they navigate and avoid other aircraft by visual means (i.e. looking out of the window). ATC do not give these aircraft specific heading to fly, or tell them to turn at certain geographical points. Pilots normally use distance features on the horizon, rather than specific buildings close by to navigate. Downward vision from light aircraft is generally not good. Most pilots will be unable to see what is directly below them.

Pilots are responsible for their own separation from other aircraft and will frequently need to adjust their circuit pattern, particularly when there are lots of aircraft in the circuit. Adding in the effect of the wind, which will, of course, differ on every occasion, it should be apparent that it is not possible for aircraft to follow a specific track over the ground.

Why do the same aircraft fly over every few minutes?

During the flight training process, students are required to fly 'circuits'. This is a very important part of a students training as it incorporates all of the basic flying manoeuvres: take off, climbing, medium level turns, levelling off, straight and level flying, descending and landing. A normal circuit session will last approximately 45 minutes, with each circuit taking between 5 – 7 minutes, and this is why you will repeatedly see the same aircraft.

Why don't light aircraft have silencers?

Modern aircraft are now being manufactured with quieter engines. There are a number of these modern aircraft based at the airport already and, in time, they will make a significant difference to the amount of noise generated.

Why are twin engined aircraft so noisy?

When a student learns to fly a twin engine aircraft, they are required to train in asymmetric flying operations to simulate the loss of an engine. When flying asymmetrically, one engine is 'feathered'. This means the engine is intentionally throttled back to idle power and the RPM on the remaining engine is increased to compensate for it, increasing the noise.

Most of the students learning to fly a twin engine aircraft are training commercial pilots. These are the pilots who will go on to fly passenger aircraft. All commercial pilots have to begin their training at an airport like ours, and on the smaller aircraft. Gloucestershire Airport is proud to be one of the best training airfields in the country, offering student pilots a large range of facilities and full air traffic control.

How do pilots judge their height?

Our runways are equipped with Precision Approach Path Indicators (PAPI's), which are a guide to height for pilots when landing. In the middle of the picture to the left, you will see 4 red lights in a row. The lights are set at a particular angle which, to the pilot on final approach, will appear either red or white. The colour of the light indicates to the pilot whether they are above, below or on the correct approach path. 4 red lights indicate that the aircraft is too low and 3 red lights and 1 white light indicates that the aircraft is slightly too low. 4 white lights indicate that the aircraft is too high and 3 white lights and 1 red light indicate that the aircraft is slightly too high. If the pilot can see 2 red lights and 2 white lights, the aircraft is on the correct approach path. In this photograph, the lights to the left of the runway are showing all red. This is because the photographer is below the correct glidepath. The pilot of the aircraft, however, would be seeing two red and two white lights

What are the rules on low flying?

Rules of the Air state that an aircraft shall not be flown closer than 500 feet to any person, vessel, vehicle or structure. However, this **does not** apply to an aircraft that is taking off or landing.

Why do pilots sometimes cut their engines after take off?

Student pilots practise 'engine failure after take off' drills as part of their flight training. The flying instructor will idle the aircraft engine to simulate a failure, but the engine is not switched off and easily powered up again following the manoeuvre.

Why don't you use a different runway?

Aircraft take off and land into wind, with the wind being predominantly from the West in this area. However, when conditions allow, Air Traffic Control will vary the runway direction whenever possible.

Noise abatement procedures apply to most of our runways to minimise noise to our neighbouring residential areas. All pilots are encouraged to fly considerately and in accordance with the noise abatement procedures.

What about military aircraft?

Military aircraft use Gloucestershire Airport on a regular basis for training and refuelling. Military aircraft are not bound by the Rules of the Air, and the Civil Aviation Authority does not have authority over military aviation; which is controlled by the Ministry of Defence.

Complaints and enquiries about military aircraft should be made to:

Ministry of Defence, Directorate of Air Staff
Complaints and Enquiries Unit
Zone H, 5th Floor
Main Building
London
SW1A 2HB

Tel: 0207 218 6020

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22 Appendix C – Traffic Patterns

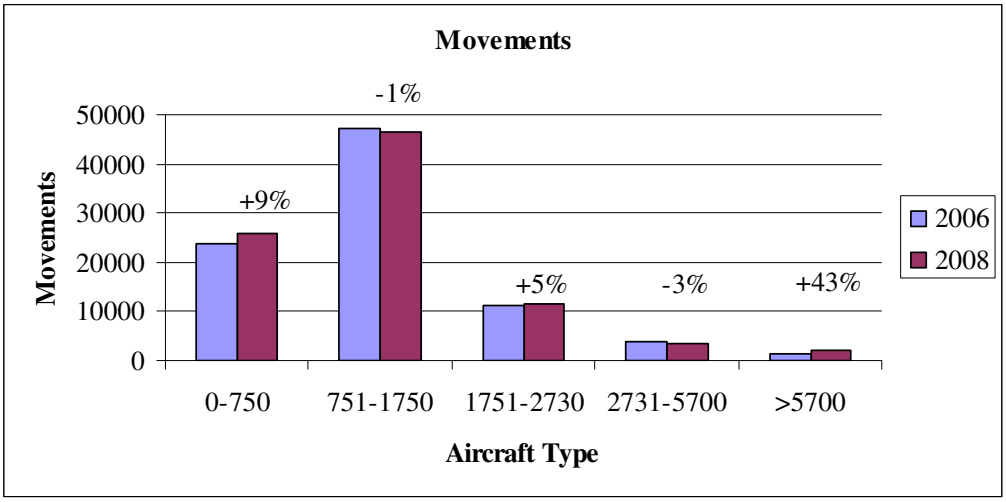
The Shareholders raised the following question during earlier scrutiny of the runway safety project.

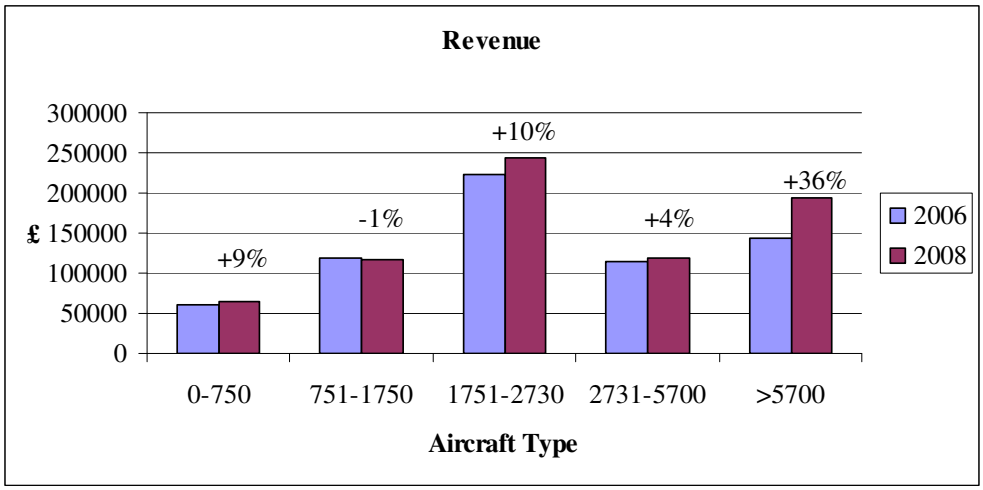
Question 2
Categorise aircraft movements into groups and clearly show how this relates to the business case

The full dataset presented in the previously supplied spreadsheet does not correlate directly with the notional forecasts shown in the Business Case because it is based on the actual breakdown of 2006 flights. Nevertheless, the data can be used to demonstrate the percentage revenue increases and the shift in types of traffic, before and after the project is completed.

To simplify the data, the following parameters have been applied. Aircraft have been grouped by Maximum Take Off Weight (MTOW) range in kilograms, as per the CAA statistical reporting criteria. These weight bands broadly coincide with the various types of flight taking place at the Airport. The number of flights is multiplied by a factored 'landing fee' based on current tonnage rates, with a nominal figure of £5 per landing applied to aircraft below 1750Kgs, reflecting the various discounts applied to 'Club' and 'Private' aircraft, which often carry out repetitive circuit training.

MTOW Band	Type of flight	Mvmts Current	Mvmts Post-RSP	Revenue Current	Revenue Post RSP	% mvmts	% revenue
0 - 750	Private	23752	25808	59380	64520	+9%	+9%
751 - 1750	Club	47195	46675	117987.5	116687.5	-1%	-1%
1751 - 2730	Comm. Training	11127	11658	222597	244705	+5%	+10%
2731 - 5700	Other	3779	3663	114624.5	118867	-3%	+4%
>5700	Business	1429	2047	143068	194249	+43%	+36%
	TOTAL	**87282**	**89851**	**657657**	**739028.5**	**+3%**	**+12%**





The key points to note are:

- Whilst movements increase by 3%, revenue increases by 12% overall.
- Business traffic grows by 43%, yielding a 36% increase in revenue.
- Training flights, which will remain, by far the highest in terms of movements, decrease by 1% overall, but revenue from Commercial Training, increases by 10% primarily from ILS Approach Training.

It should be noted that the revenue figures derived from the table above, do not fully reflect the discounts and differentials applied to various operators and take no account of fuel sales, the Company's biggest revenue stream.

23 Appendix D – Severn Wye Energy Advisors

Please refer to the document previously circulated

24 Appendix E – Action Plan

Gloucestershire Airport

Action plan: No Cost Measures

Action	Implementation date	Cost (£)	Person Responsible
Establish a simple written energy policy including cost considerations, energy management issues, and objectives.	MARCH 2010	0	D JONES.
Undertake a competitive tender for electricity supplies.	JANUARY 2010	0	K MEADWELL
Check and record meter readings monthly.	JANUARY '10	0	D JONES
Establish an energy monitoring spreadsheet to record monthly energy consumption.	JANUARY '10	0	D JONES K MEDWELL
Consider energy efficiency and calculate whole life costs and consider new technology such as LED airfield lighting when procuring new equipment: Energy costs are frequently much higher than acquisition costs.	MARCH 2010	0	D JONES
Ensure there is a 3-4°C "dead band" between heating and cooling temperatures on office Daikin units	MARCH 2010	0	D JONES
Establish guidelines for cooling electronic equipment: Cooling to 23°C is typically sufficient. Use outside air and reuse waste heat where practicable.	—	0	—
Check terminal building walls are insulated	MARCH '10	0	D JONES
Reseat loose ceiling tiles above office stationary cupboard	JANUARY '10	0	D JONES
Defrost fridges periodically	JANUARY '10	0	D JONES
Adjust office equipment power saving settings as appropriate.	MARCH '10	0	D JONES.

Signed on behalf of ..... Date 13/12/10

Action plan: Low Cost Measures

Action	Implementation date	Approximate Cost (£)	Person Responsible
Place water coolers and hydroboil on appropriately set time switches	N/A	£5 per unit	D JONES.
Install presence detectors on arrivals hall lighting	REVIEW APRIL 2013	£50 per sensor	D JONES
Install insulation above site managers office	N/A	£300	D JONES
Replace T12/T8 fluorescent tubes with T5s and adapters.	ON GOING.	£10 per adapter	D JONES
Install timer controls on heaters if electric heating to be retained	PROGRAMME TO REPLACE EXISTING HEATERS INITIATED.	—	D JONES.

Signed on behalf of ..... Date 13/12/10

Action Plan: Capital Cost measures:

Action	Implementation date	Approximate Cost (£)	Person Responsible
Verify fire station lighting requirements and install sensors and T5 fluorescent lights if appropriate	SENSORS NOT APP REVIEW JULY 2011		D JONES
Investigate alternative heating system for terminal building and/or other heated areas and implement findings	FINANCIALLY UNVIABLE REVIEW APRIL 2013		D JONES.

Signed on behalf of ..... Date 13/12/10.

25 Appendix F – Vehicle Fleet (2012)

Peugeot Partner Van. 2000cc. Diesel Estimated mileage per annum; **3500**
= 340.95 lpa (ltrs per annum**)**

Ford Transit 'Tipper'. 2496cc Diesel Estimated mileage per annum; **2000**
= 363 lpa

Great Dane 'Chariot' 1000cc Petrol Estimated hours per annum; **40**
= 10 lpa

Scag 'Tigercat' 1000cc Petrol. Estimated hours per annum **480**
= 117 lpa

JCB 3CX Site Master 4400cc Diesel Estimated hours per annum; **200**
= 1000 lpa

Leyland 'Roadrunner. 6000cc Diesel Estimated hours per annum; **1,040**
= 18,720 lpa

Leyland Daf. 12000cc Diesel Estimated hours per annum; **1,040**
= 28,080 lpa

Ford Galaxy 2000cc Diesel Estimated mileage per annum; **1000**
= 105 lpa

Diesel total litres per Annum = 49,243
Petrol total litres per Annum = 127

26 Appendix G – Annual Reviews

In 2012, the Joint Airport Working Group requested that all targets and parameters be collated as a specific appendix for future reviews.

26.1 Ground Operations

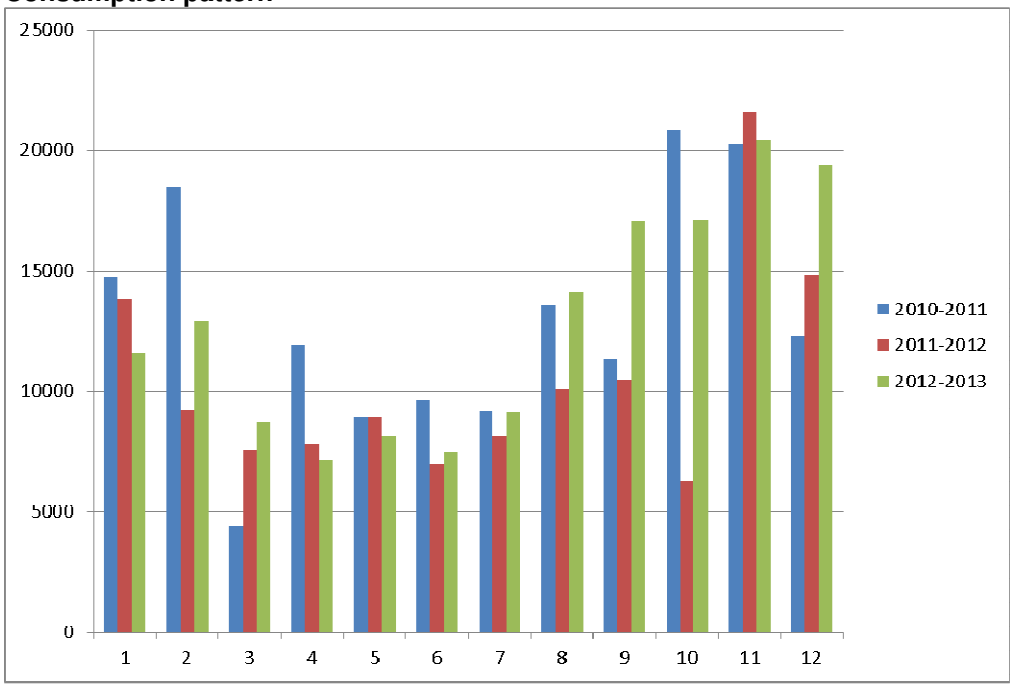
26.2 An annual reduction target of 10% was set for the first two years for the reduction of CO_2 emissions from ground-based operations following the recommendations of Severn Wye Energy Agency.The three principle Airport buildings are considered separately for energy use: -

26.3 **SE1 Terminal Building and main hangar**

The building

SE1 and the Main Terminal have the highest concentration of computers, printers, and other office equipment on the airport site. Along with this it is also heated by an electric heater system that is relatively inefficient compare with the modern equivalent. Despite this, it is an area where staff education can contribute to energy reductions along with initiatives such as reducing lighting levels throughout the building.

Consumption pattern



Analysis
Following 'benchmarking' in 2010, annual energy use has been calculated as follows:

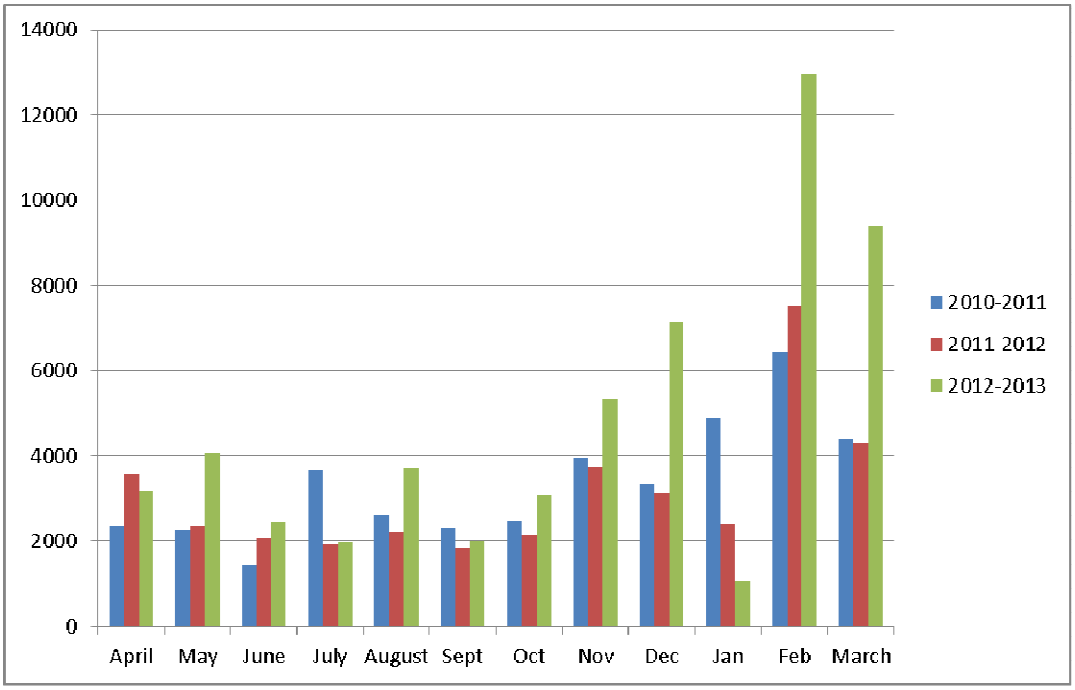
Year (Apr-Mar)	KW/h used	% Change/Year
2010-2011	155781	
2011-2012	125731	-19%
2012-2013	153307	+22%
Overall % Chg		-1.6%

The positive work done since 2009 in education and installtion of more efficient lighting was undone by significantly increased heating use during the exceptioanlly cold winter of 2012 into 2013. This highlights the inefficiency of the building's reliance on electrical heating. Nevertheless, the overall trend is marginally down.

Further Initiatives
Continuing staff education, Major investment in the heating and lighting systems is required to continue the downward trend. Further investigation of the feasibility of photovoltaic generation is ongoing.

26.4 **Fire Station & hangar SE27**

The building
Fire Station and hangar SE27 is the Airport Fire Service headquarters. It contains office space, rest/meal area and bays for the services fire appliances. As with other areas of the airport it is heated by relatively inefficient electric heaters and the storage bays are lit with an equally dated lighting system.
.
Consumption pattern
(Graph overleaf)



Analysis
Following 'benchmarking' in 2009/10, the energy use is determined as follows: -

Year	Total KW/h	% Change/Year
2010-2011	33416	
2011-2012	35053	+4.8
2012-2013	66049	+93.4
Overall % Chg		+97.1

Energy utilisation had been relatively stable, however the cold winter again resulted in a significant increase in energy consumption, particularly as additional electrically powered 'warm air' heaters were temporarily used in the Fire Station bays to prevent the emergency vehicle water lines from freezing.

This building is also used to charge the Airport's two electric vehicles (tugs) and future 'everyday' consumption is likely to remain at a higher level than the benchmark.

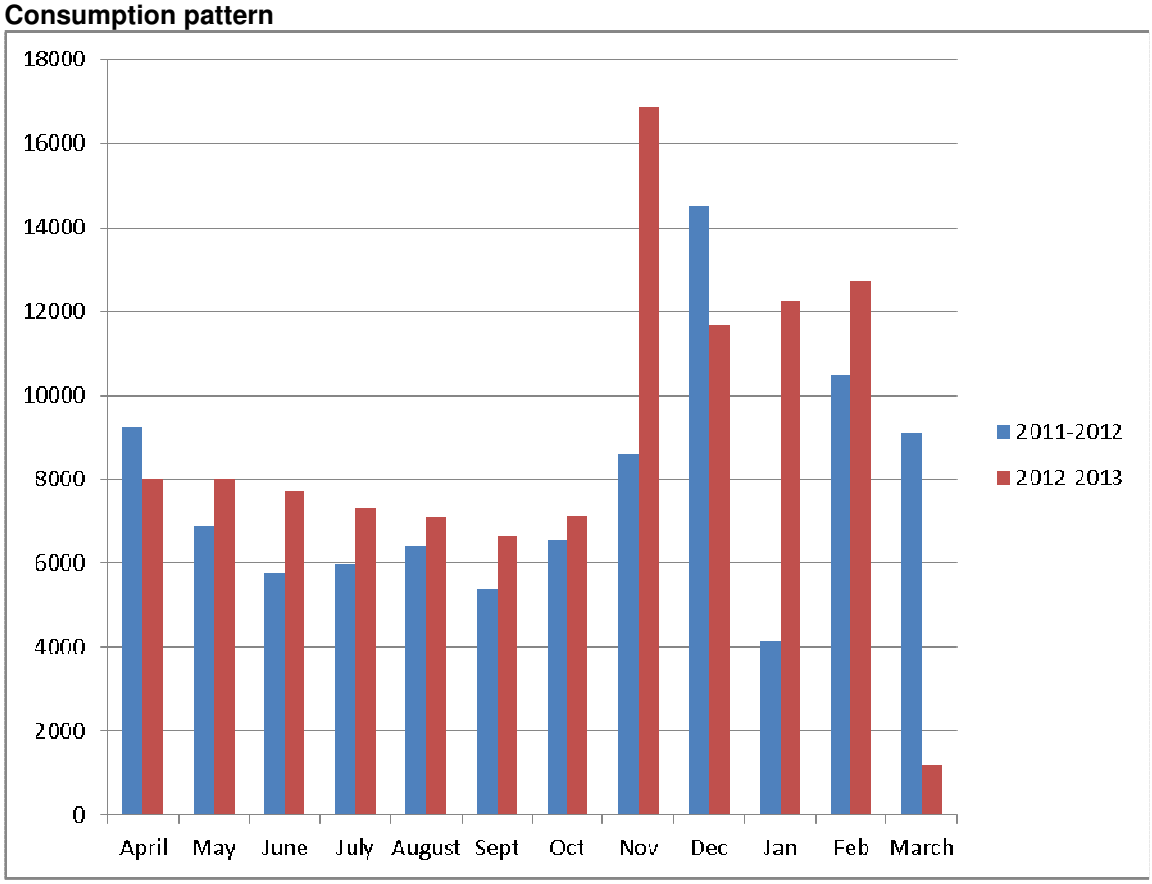
Further Initiatives:
As stated in previous years, energy reductions could be achieved with major investment in replacement of the lighting and heating systems with more energy efficient units

26.5 **Control Tower**

The building

The Control Tower not only is the centre for controlling airport movements but is also the source of power for all of the safety significant navigational equipment, radar and runway lighting. It contains a main viewing area (VCR), office space, and kitchen area. The percentage of domestic usage is relatively low, compared with the consumption of the navigational and ATC equipment.

Consumption pattern



Analysis
Following 'benchmarking' in 2010/11, the energy use is determined as follows: -

Year	Total	% Change
2011-2012	93080	
2012-2013	106654	+14.5

The energy use in the building is clearly consistent with seasonal temperature variation, again highlighting the inefficiency and dependence on electrical heating. The changes completed to the Airport's runway lighting system as part of the runway safety project, should deliver a small saving in future years.

Further Initiatives:
Investment in a new heating system alongside updating lighting would help to reduce energy levels. However, the buildings age and layout make any initiative's effects limited. Larger savings would be difficult due to the equipment contained within the building and its importance to airport operations.

26.6 **Vehicle use**
Vehicle fleet utilisation is shown at Appendix F. Most significantly, since the 2012 review, the Airport has acquired a further electric tug, which will further reduce diesel fuel use.

26.7 **Ground emission totals**

Collating the data for ground-based emissions gives the following summary: -

Period 2009 – 2013

2009/10

Source	**Volume**	**Kg/CO_2**
Electricity =	299807 KWh	(157,278)
Diesel =	51,834 ltrs	(138272)
Petrol =	117 ltrs	(270)

Tonnes CO_2 = 295.82

2010/11

Electricity =	280200 KWh	(146,992)
Diesel =	49,883 ltrs	(133,067)
Petrol =	117 ltrs	(270)

Tonnes CO_2 = 280.33

2011/12

Electricity =	246490 KWh	(129,308)
Diesel =	49,608 ltrs	(132,334)
Petrol =	117 ltrs	(270)

Tonnes CO_2 = 261.91

2012/13

Electricity =	326,010 KWh	(170,829)
Diesel =	49,243 ltrs	(130,986)
Petrol =	127 ltrs	(292)

Tonnes $CO_{2=}$ 302.11

26.8 **Conclusion**

The extreme winter of 2012/13 resulted in a significant increase in energy use at the Airport. This, in turn, reversed the overall downward trend in energy usage since benchmarks in the Green Policy process became available. This highlights the Company's dependence on electrical heating.

26.9 Aircraft emissions

Using the methodology defined earlier in this document, Gloucestershire Airport undertakes to ensure that CO_2 emissions from aircraft operations do not exceed a ceiling of 4000 Tonnes CO_2 in the course of normal Airport operations.

The calculations for 2012 are as follows: -

Total Jet A1 emissions	1539.481 Tonnes
Total Avgas emissions	1110.400 Tonnes
Total	**2649.866 Tonnes**

The 2012 data shows a marked reduction, more than 527 Tonnes, or 16.6% lower than the previous year. There are some key factors influencing this reduction.

DEFRA has now published guidance for calculating air travel emissions, primarily from an airline passenger perspective. It does however; now specify a 'distance' factor of 8%, rather than the 10% previously used in the calculations.

Specifically, two of the resident business jets at the Airport have been upgraded in the reporting period, both with significantly more efficient aircraft. Furthermore, the Isle of Man, Belfast and Jersey services have been operated by a Let 410 aircraft, replacing the Dornier 228, again with a notable difference in fuel burn.

Avgas emissions have also reduced by more than 100 tonnes. This is largely due to the largest flying school, Aeros Flight Training, introducing 3 modern Tecnam aircraft to their fleet.

26.10 **Operational Controls**

The ceiling for total annual aircraft movements (excluding emergency, Police and Air Ambulance-related flights), measured by calendar year is set at 95 000.

The ceiling for out-of-hours flights (excluding emergency, Police and Air Ambulance-related flights, or those arriving early or late due to operational reasons) is set as not more than 1.5% of the annual total.

Not more than 100 flights per annum (excluding emergency, Police and Air Ambulance-related flights) will be permitted during the hours of 2300 – 0600.

26.11 **2012 figures**

Total number of flights in 2012	73778
Total number of flights out-of-hours	539
Percentage of out-of-hours	0.73%

	Number	**% of total flights**
Total number of exempt flights	125	0.17
Manx2 flights delayed/early due to operational reasons	28	
Total number of 'qualifying' flights	386	0.52
Total number of 'qualifying' flights between 23-0600	9	0.01

		% of out of hours flights
Qualifying flights within 5 minutes of opening time	42	10.9
Qualifying flights within 30 minutes of opening time	126	32.6
Qualifying flights within 1 hour of opening time	235	60.9
Qualifying flights within 2 hours of opening time	363	94.0

26.12 **2011 figures**

Annual total mvt	67022	
Total out of hours	669	1.0%
Total emergency related	103	
Qualifying out of hours	566	0.84%
Total 23-0600	8	
Within 5 mins	84	
Within +/- 30 mins	340	
Within +/- 1 hour	464	
Within +/- 2 hours	538	

26.13 **Conclusion**

The percentage and number of out-of hours flights reduced in 2012 and no Green Policy parameters were exceeded.

26.14 **Noise complaints**

A total of 417 complaints were received during 2012. This equates to 0.56% of the total annual movements. Two individuals, however, generated 321 of these (178 & 143). One, in particular, has elected to file two complaints for every out of hours flight; one of the grounds of it being out of hours, and one on the grounds of noise.

This represents an increase on 2011 data (280 complaints, 0.41%) but a reduction on the 2010 peak (587 complaints, 0.87%)

If reports from the two most prolific complainants are temporarily discounted from the datasets, the underlying trend is downward.

26.15 Waste **management**

A baseline for waste in relevant categories was established in 2011 as follows: -

Cardboard	12 x 1100ltr bin
Plastic	72Kg
Paper	187Kg

Significant progress was made during 2012 with the recycling scheme rolled out to all Airport tenants. Consequently, recycling rose substantially.

2012 Recycling

Cardboard	18 x 1100ltr bin
Plastic	142Kg
Paper	1500Kg

26.16 **Narrative**

2012 Update

The Green Policy has been revised to update the text and incorporate previous committee recommendations at this, the fourth annual review. The document, and indeed the policy, continues to evolve. Significant progress has been made in key areas, with pleasing progress in aircraft CO_2 emissions, despite a 10% increase in aircraft movements. Fleet modernisation and more accurate DEFRA emission calculation methodology have delivered improved emission performance while out-of-hours activity and waste recycling have also seen notable betterment.

The harsh winter in this reporting period, however, significantly affected energy usage and served to highlight the inefficiency of the Airport's electric heating. It will be difficult to achieve better heating performance without significant infrastructural investment but schemes are currently under consideration for photovoltaic cell generation in the car parking area and on other Airport buildings. The installation of 'smart' metering technology across the Airport site is nearly complete and Severn Trent is continuing to roll out their water metering programme across the site.

Following completion of the Runway Safety Project, the Airport ecology, particularly in the new footpath area around the RESA continues to improve. The Airport is engaged in a joint project with Churchdown Parish Council and other stakeholders to develop a number of circular 'Airport walks', focussing on the ecology of the immediate area. This community engagement, combined with the unique environment of a 'controlled access' area should make for some interesting and diverse habitats in the years to come.

The RESA area has seeded naturally and the newly planted hawthorn hedges are beginning to establish, although the Airport must continue to maintain a low bird hazard environment through deterrent techniques. Within and since the reporting period, the Airport has also hosted a number of sporting events, including 1 mile, 4km and 10km running races, a cycling endurance event and even an outdoor Shakespeare play. These non-aviation and 'low carbon' activities will continue to develop community involvement.

Noise complaints have reduced in real terms, although the statistics are somewhat skewed by two complainants whose reports account for more than 77% of the annual total. Again, fleet modernisation is thought to account for a significant proportion of the reduction with modern light aircraft and high performance business jets being noticeably quieter than the aircraft they have replaced.

Out-of-hours activity remains at a low level, well within the agreed Green Policy parameters. The JAWG and Consultative Committee agreed to a variation of the scheme to facilitate certain types of flight within 30 minutes of published opening and closing times although the Airport has not yet implemented any operational changes to take advantage of this increased weekday flexibility as demand remains low.

Progress is being made in rolling out the Green Policy to other Airport tenants. At least one has installed a waste oil heating system, thereby recycling their own aircraft used engine oil, and another has installed PV cells on their business premises.

Sales of the new unleaded grade of AVGAS fuel have more than doubled since the new grade was introduced and a 'product recovery system' for Avgas and Jet A1 fuels now ensures that the majority of quality control samples are recycled into stock after removal of contaminants and settling.

Work is on going with the Environment Agency to review and update the discharge consent held for the Airport's sewage system, which has continued to meet permitted levels throughout the reporting period.