Buildings Department
National Galleries of Scotland

ENVIRONMENTAL MANAGEMENT SYSTEM 2006-7

1 INTRODUCTION

The NGS *Environmental Policy* sets out the Galleries' policy to cause as little harm to the environment as they can, consistent with the furtherance of their mission. The purpose of this document, the *Environmental Management System*, is to give that aspiration a practical basis through the imposition of a written framework for analysing, setting targets and monitoring. Its structure is based on the ISO 1400 standard, but with the emphasis on brevity and clarity, and on the significant rather than the trivial.

During 2005/6 a (free) audit was commissioned from the Carbon Trust - an "Energy Management and Opportunities Assessment" for the entire estate, apart from the GMA (which was examined previously). This turned out to be a useful, practical study, the findings of which are substantially incorporated in this document. (The full text has been distributed to the Green Group and is otherwise available from the Buildings Department.) Generally NGS came quite well out of the report, with the exception of the issues of target setting and staff involvement.

2 REGISTER OF ENVIRONMENTAL ISSUES

Description	Environmental Impact	Financial Impact
Carbon Emissions[1]	*High*	*Significant (savings)*[2]
Noxious Gas Emissions	*Significant*	*Insignificant*
Ozone Depleting Emissions	*Low*	*Nil*
Light Pollution	*Low*	*Low (savings)*
Water Consumption	*Moderate*	*Significant (savings)*
Waste Disposal	*Significant*	*Nil*

[1] Carbon Emission is taken to represent, and be directly proportional, to energy use. KgC is the unit of measure.
[2] The implication of "Green" electricity is discussed below.

Procurement	*Moderate*	*Low(costs)*
Transport	*Moderate*	*Low*
Biodiversity[3]	*Moderate*	*Insignificant*

3 EXISTING MEASURES

The following measures and principals are applied by NGS in order to limit their environmental impact. They are formally reviewed and brought up to date annually.

3.1 Carbon Emission

NGS try to follow best practice for the type of buildings they operate. NGS are currently involved in a London based study to establish appropriate benchmarks for energy use.

- Energy consumption, whether by gas or electricity is converted into units of KgC. Information is collected from meters each month and the results are monitored in graphic form so that comparisons with previous results can be made. Much detailed information is now also available online from suppliers.

- A programme of building insulation has been "completed".

- Most lighting is low-energy fluorescent. Just about uniquely (with the Tate) most lighting of pictures is by wall washers of such type, sometimes supplemented by low energy halogen spot lights. Compact fluorescents are used "back of house" so that incandescent sources are rarely used on the estate. Light Emitting Diode (LED) sources are also used where practicable.

- Factor Correction equipment has been fitted to all electrical switchboards.

- Variable drive regulators have been fitted to the larger air handling motors.

- Inefficient mechanical & electrical plant is replaced with up-to-date energy-saving systems.

- Comprehensive maintenance programmes are employed to ensure plant is running efficiently and cleanly, thus reducing emissions from boilers, and prolonging plant life.

[3] That is the effects not included above: essentially grounds at the Dean & GMA

- *Building Management Systems* have been installed in the NG, RSA, and Dean to provide closer control and monitoring, and to ensure that the operation of plant is properly co-ordinated.

- Regular building inspection help ensure that services are running efficiently and that insulation to pipe and duct work is in good order. Repairs are speedily effected.

- Consultant designers are required to pay particular attention to the energy efficiency of building construction, the sourcing of materials, and whole life running costs. The Office of Government Commerce document *Achieving Sustainability in Construction Procurement* will be applied*. British Research Establishment Environmental Analysis Methods* (BREEAM) are used where appropriate. By their nature Galleries are fairly high consumers of energy due to the requirement to light the works and to control humidity and temperature at the same time. However the Museums & Galleries commission has published guides to the reduction of energy levels through design (*Museums Environment & Energy* and *Environmental Management* by May Cassar*)*; and the Granton Centre was designed to avoid the need for active cooling and de-humidification. The Carbon Trust will be consulted for (probably free) advice on major capital projects. Energy considerations are already an important part of the brief to designers for the PG.

- An apparently obvious method of cutting carbon emissions is to purchase "green" power. We did so between September 2003 and September 2004. We will continue to look at this option each time our contracts are renewed (given our charitable status carbon tax levy exemption, the additional cost is currently about £30,000) but see this option as an independent issue that does not absolve us from the responsibility to use less energy.

3.2 Noxious Gas Emissions

This is associated with the burning of fossil fuels and, to a large extent, is directly proportional to energy use, and hence Carbon emissions. However,

- where we have direct control of gas combustion on site we ensure that boilers are burning efficiently at the correct temperatures.

3.3 Ozone Depleting Emissions

NGS are committed to reducing the use of harmful ozone depleting substances such as CFCs, halons and carbon tetrachloride. Specific measures include the following:

- The replacement of all halon fire extinguishers with non-destructive gases (done).

- The specification of refrigerants for Air Conditioning and Refrigeration systems as per the recommendations of the Montreal Protocol (www.worldbank.org/montrealprotocol).

3.4 Light Pollution

Light pollution in the night sky is, in part, a measure of wasted light not illuminating an exterior object.

- Light pollution is now considered in the design and specification of light fittings. It is also a factor in wider discussions on the times of operation of exterior lighting.

3.5 Water Consumption

Sadly water no longer arrives by gravity from the Pentlands via Castlehill. Energy consumed for pumping is proportional to the amount used.

The greatest user of water on the estate is the UEDA Landform at the GMA.

- We maintain the use of flow control equipment and automatic cut off devices throughout the estate.

- We ensure that any leaks are dealt with quickly.

- Flushing of urinals is controlled by Passive Infra Red sensors. Trials of water-free urinals have been successful at the Dean.

3.6 Waste Disposal

Opportunities for the collection of waste for re-cycling are steadily increasing. Nearly all materials can be recycled, but it only makes sense to do so if the materials can be separated out and are in sufficient quantity.

- Cardboard
  Cardboard is collected by the Retail Department from the Galleries and is taken to the Retail Store from where it is picked up by *Edinburgh Recycling*.
- Paper

  Paper accounts for probably the largest amount of waste produced by NGS. *Hannay* now provides a weekly paper collection service from all our buildings at no charge. Boxes and bags are provided and it only requires staff to use them.
- Glass
  The main source of glass from the NGS is from the cafés and following functions. There are now recycling points at the Dean and GMA.
- Food Waste
  In the quantities currently produced this is only suitable for Landfill.
- Plastics and Cans
  There is now a recycling point at the Dean.
- Garden Waste
  Leaves are now collected and converted to leaf mould behind the GMA.
- Lamps
  Lamps are uplifted by Lampcare UK on behalf of Norland for safe disposal and recycling of their parts.
- Wood
  Wood is not generated in large enough amounts to consider recycling at this stage.
- Office Furniture and Equipment
  If office furniture has a second hand value, it is sold. Otherwise it goes away for landfill. Metal is recycled.
- Electrical Equipment
  Legislation is expected to be introduced in the autumn requiring all electrical equipment to be sorted for recycling. In the meantime fridges are recycled but there are no provisions in place for the receipt of much else. Old mobile telephones, batteries, and toner cartridges are sent to a charity for re-cycling.

3.7 Procurement

- In all contracting procedures NGS should monitor the availability and use of more environmentally friendly products with due regard to obtaining value for money, including “whole life” cost considerations.

- NGS comply with guidelines laid down by the Scottish Executive Procurement Committee in its Procurement of Timber and Timber Products. (http://www.scotland.gov.uk/Resource/Doc/1265/0005315.pdf). All suppliers used by the National Galleries of Scotland undertake to use wood from sustainable sources, and timber is selected using the Friends of the Earth Good Wood Manual. On occasions when rare or endangered species are required for matching antique works second hand timber is recycled as far as possible. If it is essential to use new timber, proof of a valid CITES licence is sought. The Department of the Environment and Rural Affairs (DEFRA) has now approved 4 timber schemes as providing the necessary assurances that the timber bought under these schemes has been legally harvested from sustainably managed forests. These schemes are: Forest Stewardship Council (FSC), Canadian Standards Association (CSA), Pan European Forest Certification (PEFC), Sustainable Forestry Initiative (SFI). [4]

- There is (albeit, by its own admission, inadequate) guidance available on sustainable procurement in conformity with EU regulations. www.publications.parliament.uk/pa/cm200405/cmselect/cmenvaud/266/26603.htm

- All white goods purchased are A or AA or AAA rated for energy efficiency.

3.8 Transport

NGS does not have a comprehensive transport policy that would cover green issues. However environmental issues are well represented in the regulations for expenses, which require staff "to travel by the most cost effective means, taking into account safety, operational and environmental considerations" and that "public transport should be used whenever possible". Further, the point is made that "aircraft are the least energy-efficient form of transport and emit proportionately more CO2 per passenger per mile than any other mode of transport. . . . . In deciding whether to travel by air, staff and Trustees should balance cost effectiveness against environmental impacts, and consider carefully whether air travel can be justified in the circumstances".

The following practical measures are in place:

[4] (DEFRA will continue to monitor how these schemes work in practice through its Central Point of Expertise on Timber (CPET). CPET is operated on behalf of DEFRA by ProForest which is a company with wide experience in responsible purchasing. CPET operate a helpline service for public procurement officers and their suppliers, giving advice on how to specify legal and sustainable timber and how to ensure that they are getting what they ask for.)

- All galleries have bicycle racks.

- Signage and marketing encourage the use of public transport and walking / cycling between the Galleries.

- NGS provide a bus between the Galleries which staff and visitors are encouraged to use.

- When acquiring new vehicles fuel consumption and pollution are important considerations. Liquid petroleum gas and battery powered vehicles will be examined each time vehicles are replaced, but at present they are expensive, and diesel is considered the most practically efficient option.

3.9 Biodiversity

Clearly all polluting activities (see above) contribute to a global affect on biodiversity. However we have specific responsibilities to the flora and fauna on our own grounds, principally at the GMA and the Dean. The following management policies are undertaken:

- Grass around the margins of the park and under the trees is allowed to grow longer to encourage different plant species and provide animal habitats.

- The bank down to the water of Leith from the GMA is lightly managed, and fallen timber is retained on site as habitats and resources.

- There are some excellent trees, notably two Spanish Chestnuts at the GMA. All proposed tree maintenance activities are discussed with the Tree Officer at the council prior to any action.

- A recent planting campaign has increased the diversity and number of shrubs and trees.

- Large flocks of seagulls have threatened to damage the ecology of the GMA ponds and surrounding areas. They are discouraged by the use of a hawk.

4 TARGETS 2006/7

4.1 Carbon Emissions

The Carbon Trust report was critical of the lack of numerical targets for energy reduction in the previous year's plan. Therefore:

- NGS is adopting a target reduction in energy use of 10% over two years - that is by April 2008.

The Carbon Trust report notes that "Facilities staff at the National Galleries are very conscious of the environmental impact and cost of their use of fuel, and a number of opportunities for energy saving had already been identified by NGS staff prior to the survey"[5]. In order to achieve the targets, the following measures will be taken:

- Improved monitoring of energy use to provide baseline data and to identify excessive consumption. This will include reliable monthly reading of all meters, and monitoring of detailed information from the supply companies' own websites.

- The continuing replacement of remaining electro-magnetic luminaires with high-frequency electronic ballasts – this year concentrating on the NG.

- The replacement of tungsten halogen lamps, if technically possible in the Weston Link restaurant and shop.

- The commissioning of infra-red lighting sensors at the Mound. A general reduction in lighting levels out of hours.

- Energy considerations to be written as a significant element to the brief for the new PG Project

- The agreement of outside smoking arrangements at the GMA that do not involve the opening of the entire loading bay door (another attempt).

- The closing of outside Gallery doors at the GMA and Dean in winter when not in use (again).

[5] Extract from the supplementary Executive Briefing Report

- The development of an energy awareness campaign for Gallery staff. Training to be arranged for Green Group, Head Warders, Supervisors and any other interested staff.

- Replacement of the existing GMA boilers with condensing boilers.

- .The installation of valve insulation jackets.

- The employment of humidity control only in those (RSAB) exhibitions that demand them.

- Weston Link kitchen ventilation to be controlled automatically.

The Carbon Trust report identified opportunities for low energy humidification systems. However NGS have found these problematic in the past, especially at the Dean exhibition galleries (due to gypsum in the water supply) which led to smells in the galleries and an impossible cleaning, maintenance and inspection regime. (NGS are currently free from high risk legionella sources.) However the technology should be reassessed for future major project or plant replacement proposals. Failing the opportunity for low energy humidification, the fuel source should, where possible, be gas not electricity.

Attention was also drawn in the report to the inefficient lighting gondolas in galleries A2-A6 at the Mound.

4.2 Water Consumption

- Install meter for the UEDA Landform.

- Install meters to identify heavy use / loss of water at the Mound.

4.3 Waste Disposal

- Improve staff awareness of NGS re-cycling procedures

- Reduce waste paper through full use of photocopier options

- Build bin store at NG

- Construct new hard standing for a variety of bins at the Dean

- Investigate off-site composting for balance of grass not composted at the GMA

4.4 Procurement

- Investigate the specification of recycled products (eg paper)

4.5 Transport

- Encourage bicycle use by promoting the mileage rates.
- The installation of additional bicycle racks at the RSA.

4.6 Biodiversity

- Feed grass, and control moss, with dehydrated kelp meal in place of chemicals, following successful trials of seaweed-based fertilisers last year.
- Promote allotment composting.
- Control grey squirrels to reduce bark stripping.
- Minimise disturbance of the badger sett.
- Compost 50% of grass with 100% of leaves.

5 IMPLEMENTATION OF TARGETS

Successful implementation of targets depends on management commitment, and staff with clear areas of responsibility:

Energy Monitor (Carbon Emissions)	Kate Roberts, Buildings Department
Waste Manager / Procurement	Michael Browne, Buildings Department
Energy Auditor	Bill Darling, Buildings Department
Policy Director	Robert Galbraith, Buildings Department
Green Journalist	Sally Groom
Green Promoter, RSA & Weston Link	Gwen Milligan
Green Promoter, NG	Penny Carter
Green Promoter, PG	Imogen Gibbon
Green Promoter, GMA	Alice Strang
Green Promoter, Dean	Mhairi Scott

This forum constitutes a Green Group, which has regular, minuted meetings at which targets are set up and monitored, responsibilities are allocated, and at which all green issues arising are discussed. A function of the forum is to promote a culture of green awareness throughout the organisation and to act as

a conduit for ideas. However the Carbon Trust was concerned at the lack of both training and an awareness campaign. The Trust has therefore offered to provide training, in collaboration with NMS, NLS and NMRS; and the raising of awareness in staff will follow.

In 2006-7 Green Group gallery representatives will be invited to report at gallery Fabric Meetings and generally increase their visibility and authority.

6 AUDIT

An audit report on progress achieved in respect of the targets set out in this plan will be prepared before the end of the financial year.

7 SUPPLEMENTARY INFORMATION

Additional environmental issues are covered elsewhere in other NGS reports. Only this passing reference is therefore made to the following:

6.1 Dangerous Chemicals

NGS use very small quantities of toxic materials, usually in the Conservation Department. Their handling and disposal are covered under Health & Safety regulations.

6.2 Disaster Planning

NGS have a separate Disaster Plan which would, amongst other things, mitigate the environmental effects of a disaster. Given the nature and value of the Collection, the Galleries also devote considerable resources to the prevention of disasters in the first place.