Cambridge Conservation Forum

CambridgeConservationInitiative

transforming the landscape of biodiversity conservation

Reducing the carbon footprint of conservation organisations

A review of experience and best practice in the Cambridge conservation community

Authors and institutions involved in the Carbon Task Force which produced this document

Name	Organisation or department
Jason Cleeton	Carbon Management Task Force Co-ordinator
Chris Sandbrook	UNEP-WCMC
Holly Barclay	Department of Zoology, University of Cambridge
Laura Somerville	Fauna & Flora International (FFI)
Mike Rands	Cambridge Conservation Initiative
Pamela Abbott	Cambridge Conservation Forum/Natural England
Paul Hinds	Natural England
Roger Mitchell	Cambridge Conservation Forum/Amphibian & Reptile Conservation
Rosamunde Almond	Cambridge Conservation Initiative
Sarah Alsbury	RSPB
Toby Gardner	Department of Zoology, University of Cambridge
Amy Burden	IUCN

Other contributors

These people came to the initial discussion meeting at UNEP-WCMC on the 9th December, 2010.

Name	Organisation or department
Ben Phalan	Department of Zoology, University of Cambridge
David Thomas	BirdLife International
Emily Dunning	UNEP-WCMC
James Pearce-Higgins	British Trust for Ornithology (BTO)
Kerry Sykes	Finance Division, University of Cambridge
Martin Whiteland	Estate Management, University of Cambridge
Mary Hansford	TRAFFIC
Oliver Watts	RSPB

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Introduction

It is accepted that we need to take urgent action to reduce our greenhouse gas emissions. The UK target is to reduce greenhouse gas emissions by 80% by 2050 from the 1990 baseline. It is also widely recognized that climate change and biodiversity are interconnected therefore reducing our carbon footprints takes on additional importance to conservation organisations.

Cambridge Conservation Forum (CCF), a network of conservation practitioners and researchers in over 50 organisations, and **Cambridge Conservation Initiative (CCI)**, a collaboration of conservation organisations and the University of Cambridge, have created this report. We hope that by sharing our experiences and disseminating the information compiled here, we will encourage other organisations, companies and individuals to contribute to a continuous process of carbon reduction.

This document provides a process and an outline for a range of measures which are recommended for consideration and adoption to organisations and their employees in order to minimise the net CO_2 emissions across all working areas of an organisation.

The document is split into several headings based on the working area of interest within the organisation, and under each heading a list of measures are presented in the format of a 2×3 table. Depending on heading, the axes of the table are as follows:

- Impact *vs.* Cost
- Impact *vs.* Effort

The purpose of this table is to provide a scale of how the implementation of each measure may benefit the organisation in reducing its CO_2 emissions. It is therefore expected as a minimum requirement for all organisations to implement measures which are classed as High Impact-Low Cost/Effort, whilst measures which are classed as Low Impact-High Cost/Effort should be regarded as lowest priority. Depending on the size and nature of the organisation, and the CO_2 abatement measures already in place, the relative costs and benefits of each of the measures suggested in this document may of course vary from organisation to organisation, but it is hoped that this document will provide a reference point, from which each organisation can work towards their individual goals.

Under each heading is an additional case study, outlining existing CO_2 abatement measures carried out by a CCF/CCI member organisation. Each case study details the measure(s) carried out within the relevant working area of the organisation, the associated costs and complexities of those measures, and its degree of success in its implementation, in terms of CO_2 emissions reductions but also additional benefits, such as costs savings and rate of adoption amongst employees. These case studies should serve as an incentive to all conservation organisations of what can be achieved whilst implementing the measures outlined in this document.

Process for Reduction

A pre-requisite for following the measures in this document and lowering the carbon footprint of your organisation is to establish a **carbon baseline**. This is an analysis of the annual greenhouse gas emissions generated across all areas of your organisation, which will subsequently be used as a marker by which to set targets on emissions reductions. There are a number of useful tools and documents available online with which to calculate your CO_2 footprint:

The Carbon Trust: http://www.carbontrust.com/resources
10:10 : http://www.1010global.org/uk/resources
Defra: http://www.defra.gov.uk/environment/economy/business-efficiency/reporting/
http://www.defra.gov.uk/publications/2012/07/06/ghg-2012-conversion-factors-reporting/
DECC: http://www.decc.gov.uk/en/content/cms/emissions/crc_efficiency/guidance/guidance.aspx
Carbon Footprint: http://www.carbonfootprint.com/corporate.html

The carbon baseline should not be a stationary reference, and should be reviewed regularly. A suggested practice is to review the baseline every year, and to update it when changes in established methods of reporting greenhouse gas emissions affect your existing carbon baseline by +/- 5%, consistent with ISO16064 (Quantification and Reporting of Greenhouse Gas Emissions and Removals). Such changes may arise due to changes in emissions factors, or additional regulations, or changes in the structure of the organisation.

The next steps

Once a carbon baseline has been established, your organisation can begin to address reducing its CO_2 footprint by implementing some of the measures presented in this document. When getting started, the following points should be considered:

- You need a clear message from the top of the organisation that this is important and they need to lead by example
- Transparency generates buy-in from staff to get involved
- Start with what you can easily achieve fast to encourage staff motivation and demonstrate the reductions being made
- Link each measure to cost efficiency and see if you can also demonstrate the cost saving at the same time to people realise it also makes financial sense
- If you are a complex organisation with multiple operations all over the country or world, don't be put off, and start by addressing what you can quickly gather data on
- Allocate sufficient time and resources for someone to monitor and measure your baseline on a permanent bases – you need to build it into the organisations structure and roles for it to be a sustainable process

Sustainable buildings

The benefits of a more environmentally sustainable working environment are two-fold: firstly, they can contribute to reduced energy bills; secondly, they provide a more pleasant working environment for employees which may lead to improved productivity within the workplace. New builds provide the blank canvas for a wide array of low-carbon or even carbon-neutral measures to be implemented, but there is still much that can be done with existing office premises.

	Low cost	**High cost**

High impact	• Installation of wall insulation in all exterior walls with cavities. Internal wall insulation fitted to the interior side of all solid exterior walls.
	• Full implementation of roof insulation in all buildings
		• Installation of internal/external insulation for solid exterior walls.
		• Double-glazing for all exterior windows
		• Installation of modern building controls for heating/lighting/hot water etc. Each control may implement one, or preferably a combination, of the following:
		  ○ Time switches, which may operate a fixed 24-hour control, or vary depending on day of the week. Optimum time switches automatically adapt depending on e.g. external conditions.
		  ○ Occupancy-based switches, e.g. passive infra-red sensors for lighting.
		  ○ Condition-based controls, e.g. thermostats which begin operation when a minimum temperature is reached, daylight sensors, humidity sensors.
		  ○ Variable controllers which provide a level of control based on demand. PID controllers can provide fast response with minimum overshoot.
		  ○ Interlocking controls e.g. switch off heating if a window is opened.

Medium impact	• Minimisation of floor space to reduce a heating space; a maximum of $10m^2$ per desk is recommended
	• Installation of between-floor insulation
		• Control of levels of light, glare and heat through exterior windows. Measures which may be implemented include:
		  ○ Blinds/curtains.
		  ○ External shading to reduce glare.
		  ○ Blank, insulated window panels to reduce light/glare and provide better insulation
		• Installation of de-stratification fans to recirculate heat in multi-storey buildings

Low impact	• Draught-proofing of doors, windows and exterior openings
	• Without compromising employee comfort, maximising utilisation of available natural light by, for example:
	  ○ Use of glass walls for meeting rooms.
	  ○ Placement of office desks near to windows/ skylights.
	• Use of draught lobbies to building entrances reduce heat lost to outside	

Case study: creating the Cambridge Conservation Campus (Cambridge Conservation Initiative)

The Cambridge Conservation Initiative, a collaboration between the University of Cambridge and leading conservation organisations around Cambridge, are creating a Conservation Campus through the refurbishment of an existing University owned 1970's building which will ultimately house around 500 people working in various fields of conservation (research, practice, teaching, policy, etc.) alongside the University's Museum of Zoology and members of the Zoology Department.

To ensure that the building is refurbished and then used to high levels of sustainability within a budget comparable with similar refurbishments elsewhere, a bespoke Sustainability Plan has been developed by the professional Service Engineers (Buro Happold Ltd – a globally recognised leader in sustainable buildings) in consultation with a Sustainability Focus Group comprising experts from the end users of the building and other members of the design team. This plan is designed to be more comprehensive and better suited to the refurbishment of an existing building than other assessments methods, such as BREEAM - the Building Research Establishment Environmental Assessment Method for buildings or the Leadership in Energy and Environmental Design (LEED) system which are primarily intended for use when creating new buildings.

The headline sustainability features being incorporated into the project are:

- Green roofs and walls to support urban biodiversity;
- Internal insulation, new double glazing and an energy efficient ventilation system which maximises the use of natural ventilation;
- A low carbon heat supply from a combined heat and power system that will connect in future to the Cambridge City Council led district heating strategy;
- Solar energy from photovoltaics;
- Low water use fixtures and fittings;
- Shared recycling facilities;
- A metering infrastructure to monitor and assess energy and water use across the building and encourage best practice.

The Sustainability Plan includes a Sustainability Framework which prescribes specific aims, targets, means of verification and design proposals for each of the following ten sustainability topics: (1) biodiversity and ecology, (2) collaboration and inclusion, (3) education and outreach, (4) energy and carbon, (5) health and wellbeing, (6) materials), (7) pollution, (8) transport and mobility, (9) waste,

and (10) water. For each of these topics the Plan then identifies a series of aims (often against more detailed sub-topics) along with targets, evidence required to assess effective delivery of the target, and those responsible for delivering that aim and maintaining delivery of the target(s).

References

Carbon Trust: offer a number of useful documents on implementing energy-saving measures within your office:

An overview: http://www.carbontrust.com/media/81389/ctv038-low-carbon-refurbishment-of-buildings-management-guide.pdf

Draught proofing (CTL1063): http://www.carbontrust.com/media/19465/ctl063_how_to_implement_draught_proofing.pdf

Roof insulation (CTL178): http://www.carbontrust.com/media/19469/ctl178-how-to-roof-insulation.pdf

Building Controls (CTV032): http://www.carbontrust.com/media/7375/ctv032_building_controls.pdf

CO2 Count: some useful suggestions can be found here http://www.co2count.org.uk/environment/firststeps.php

Best Office Practice & Consumables

In addition to the bricks and mortar, the choice and implementation of equipment within that building is of course a major factor towards its CO_2 footprint. Furthermore, many of the measures listed below require direct action to be taken by the employee, thus encouraging greater involvement and a sense of unity from everyone within the organisation.

	Low cost	High cost

High impact	• Installation of seven-day plug-in timers to switch off equipment e.g. over weekends.
	• Elimination of fax machines in favour of emails.
	• Recycling facilities readily available to all employees, and clearly identified for the following forms of waste:
	  ○ Paper (including magazines, booklets, envelopes, paper cups)
	  ○ Cardboard
	  ○ Cans and
	  ○ Plastic packaging
	  ○ Food/organic waste
		• All electrical equipment certified with a recognised Energy Label scheme e.g. Energy Star, European EcoLabel, Energy Saving Recommended
		• Replacement of lighting with light-emitting diode (LED) alternatives.

Medium impact	• Overnight switch-offs of monitors and, wherever possible, PCs. • Automatic Standby functions on all computers, printers, copiers etc. • All printers/copiers with double-sided capabilities (which should be set as default) as well as option to reduce printing quality. • Replace printing paper with partially or fully-recycled paper. • Assess lighting requirements and reduce number of light bulbs in low use areas e.g. corridors	• All computers with flat-screen LCD monitors. • Replacement of standalone devices with combined printer/copier/scanners. • Replacement of incandescent bulbs with compact fluorescent lighting (CFLs)

Low impact	• Matching equipment to tasks e.g.
	  ○ Use of top-end PCs with high processing power (and thus high power consumption) should be avoided wherever possible.
	  ○ Low-spec printers for bulk printing.
	• Optimisation of equipment location. Heat-generating equipment should be located in open, well-ventilated areas.
	• Involvement of all staff in routine office house-keeping checks as means of raising employee awareness.
	• Where vending machines are used:	

	○ Set at a temperature which minimises energy usage without deterioration of the product's shelf life. ○ Use minimal lighting. ○ Allow users to use their own cups/mugs.	

Case Study: Conservation Paper & Printing (Fauna & Flora International)

Fauna & Flora International's Paper and Printing Policy:

The Forest Stewardship Council (FSC) and Programme for the Endorsement of Forest Certification (PEFC) are the only certification systems to offer genuine certainty about responsible forest management. FSC and PEFC certifications are beneficial to people and nature. They are shown to: improve the conservation status, enhance biodiversity levels, improve pay for workers, increase the attention to worker safety, provide training for workers and stimulate the development of community infrastructure. Wherever possible, FFI use FSC/PEFC certified/100% recycled paper for all printed material. Uncoated stock is the preferred choice, although matt, silk and glossy are used on certified and recycled paper in special circumstances.

Fauna & Flora International (FFI) uses printing companies that have strong environmental policies and are an ISO 14001 accredited supplier. In selecting a printing company, its environmental policies should:

- *be FSC and/or PEFC accreditation and use soy sustainable/vegetable based inks;*
- *regularly evaluate operations to minimise waste and ensure efficiency;*
- *actively promote recycling both internally and amongst customers and suppliers;*
- *source and promote a product range which minimise the environmental impact of both production and distribution;*
- *meet or exceed all environmental legislation relating to the company; and*
- *implement a training programme for staff to raise awareness of environmental issues and enlist their support in improving the company's performance*

All FFI's organisational communications such as newsletters and headed paper are printed on 100% recycled material. Their scientific journal, Oryx, is currently printed on 100% FSC Mixed Source and their internal printing paper is currently 75% recycled. FFI are continuous looking to source paper to higher specification that meets their hardware limitations.

The sourcing of paper and printing at FFI is coordinated by two members of staff, so it is fairly straight forward to adhere to, monitor and implement the policy. The cost for implementing this policy is minimal. According to the Paper Calculator by using 100% chlorine free bleached paper that is 75% - 100% recycled, FFI saves an average of approximately 10 CO_2 equivalent per year (or 40% per year) compared to using standard non-recycled chlorine bleached paper.

References

10-10
IT Checklist: http://files.1010global.org/1010InternationalGraphics/Checklists/ITChecklist-GlobalActionPlan.pdf

Businesslink.gov.uk
Office Equipment: http://www.businesslink.gov.uk/bdotg/action/layer?topicId=1086891593

Carbon Trust
Office Equipment Technology Overview:
http://www.carbontrust.com/media/13113/ctv005_office_equipment.pdf
Office-based companies guide (CTV007):
http://www.carbontrust.com/media/13151/ctv007_office_based_companies.pdf
Raising employee awareness: http://www.carbontrust.com/resources/reports/advice/employee-awareness-and-office-energy-efficiency

Energy Label Schemes
Energy Star: http://www.energystar.gov/
European Eco Label: http://ec.europa.eu/environment/ecolabel/
Energy Saving Trust Recommended: http://www.energysavingtrust.org.uk/Organisations/Business-services/Energy-Saving-Trust-Recommended

Shrink Paper
A range of technology tips: http://www.shrinkpaper.org/pages/tips-and-tools/technology-and-systems-that-save-paper.shtml
List of resources and links: http://www.shrinkpaper.org/pages/tips-and-tools/useful-links-and-resources-2.shtml

Environmental Defence Fund's Paper Calculator
The Paper Calculator estimates the saving you can make in terms of wood, water and energy, and the cuts in pollution and solid waste.
For more information visit http://www.papercalculator.org

Low-carbon energy

The means of generating heat and electrical power within your organisation is a fundamental factor to the organisation's CO_2 footprint. A number of renewable alternatives – wind, solar, geothermal – can be implemented on a micro-scale, and the Renewable Heat Incentive (RHI) and Feed-In Tariff schemes which have been introduced by the government provide financial benefits for surplus generation. However, an increasing number of electricity suppliers are emerging which offer tariffs wholly or substantially dependent on renewables.

	Low cost	High cost
High impact	• Moving to a renewables-only electricity supplier or tariff.	• Installation of onsite biomass-fuelled boiler(s) for heat generation – compliant with government's Renewable Heat Incentive (RHI) • Installation of pole-mounted wind turbine(s) for electricity generation – compliant with government's Feed-in Tariff scheme
Medium impact	• Replacement of existing boilers with high efficiency (>90% electricity to heat conversion) condensing boilers • Moving to electricity tariff which provides a percentage of its energy from renewables in excess of the Renewables Obligation (11.1% , or 4.0% for Northern Ireland as of 2010/11)	• Installation of ground- or air-source heat pump – compliant with government's Renewable Heat Incentive (RHI) • Installation of roof-mounted photovoltaic cells for electricity generation – compliant with government's Feed-in Tariff scheme • Installation of roof-mounted wind turbines – compliant with government's Feed-in Tariff scheme • Installation of CHP boiler – compliant with government's Feed-in Tariff scheme
Low impact		• Installation of solar-thermal heating – compliant with government's Renewable Heat Incentive (RHI)

Case Study: Moving to a green energy electricity supplier (Fauna & Flora International)

In November 2011, Fauna & Flora International (FFI) switched the electricity supply in its main Jupiter House office to Ecotricity – the UK's first green electricity supplier. FFI opted for the slightly more expensive 'New Energy Plus' tariff over Ecotricity's 'New Energy' option as this guaranteed a 100% green electricity supply:

> ***New Energy*** *is dedicated to new build. All the green energy in this tariff comes from our own windmills. It's a growing component - this year 64 per cent - as we keep building more windmills.*
> ***New Energy Plus*** *is for businesses that want a 100 per cent green supply now, while we build more. This tariff has the same component of our own green electricity as our New Energy tariff, but is topped up with somebody else's green electricity making it a 100 per cent green tariff. (www.ecotricity.co.uk)*

When FFI opened a second Cambridge office in November 2012 they switched the supply there as well. In addition to electricity this office has a gas supply which FFI can control, so they opted to have gas supplied by Ecotricity as well.
Ecotricity publish information on the break-down of the fuel mix in their electricity each year and the CO2 emissions this represents compared to the national average. This shows that they generated 64% of the electricity they supplied from renewable sources in 2011-12, compared to the mere 9.2% which is the national average. The current renewable element of the electricity supplied by the National Grid has fallen further.

FFI's previous electricity supplier at Jupiter House was British Gas. Based on FFI's actual electricity consumption, they believe that by switching their electricity supplier they prevented the emission of approximately 6 tonnes of CO2 equivalent in 2012.

References

DECC
Feed-In Tariffs:
http://www.decc.gov.uk/en/content/cms/meeting_energy/Renewable_ener/feedin_tariff/feedin_tariff.aspx
Renewable Heat Incentive:
http://www.decc.gov.uk/en/content/cms/meeting_energy/Renewable_ener/incentive/incentive.aspx

Energy Saving Trust
Generating Energy: http://www.energysavingtrust.org.uk/Generating-energy

Renewable Energy Suppliers
Ecotricity: http://www.ecotricity.co.uk/
http://www.ecotricity.co.uk/our-green-energy/our-green-gas
Green Energy: http://www.greenenergy.uk.com/
OVO: http://www.ovoenergy.com/our-energy/

Domestic and International Travel

Travel demands perhaps provide the biggest headache for many organisations in their quest to enhance their green credentials; quite often they are written off as a "necessary evil" to achieving a greater good. Yet there is significant scope to reduce the CO_2 footprint attributable to travel – both domestically and internationally – without compromising the organisation's goals. The mode of transport, particularly for domestic travel, is important, but so is a greater sense of organisation, and an assessment of what your goals are; is that flight out to Brazil really going to achieve anything that a video-linked meeting could not?

	Low Effort	High Effort

High impact	• Use of video/phone conferencing or conferring by email in place of meetings, where applicable.
	• Use of public transport e.g. rail as favoured mode of domestic transport.
	• Careful selection of meeting venue with the aim of minimising carbon footprint, which should:
	  ○ Be at, or within immediate vicinity of, the maximum possible number of attendees.
	  ○ Be located somewhere with good public transport links to all attendees.
	  ○ Provide limited visitor parking to encourage the use of public transport.
	• Travel arrangements co-ordinated such that if multiple meetings/activities are to be carried out within close vicinity, they may be done so within a single round trip.
	• Tele/video conference facilities made available to all employees.
		• Set up division / team carbon quotas
		• Avoidance of domestic flights at all costs.

Medium impact	• A plan of objectives outlined before all meetings to maximise productivity and efficiency. • Avoidance of overseas travel for single-day meetings/events.	• Maximisation of advance notice prior to meetings in order to reduce travel fares. • Organisation of lift-sharing when car is the only appropriate mode of domestic transport. • A cycle loan or purchase scheme applicable for all employees. • Organisation of taxi/vehicle-hire schemes using environmentally friendly vehicles.

Low impact	• Issuing of fuel cards to all employees to encourage responsible vehicle usage.	

Case Study (1): 3% annual reductions in travel-based CO_2 emissions (RSPB)

As part of their long-term goal of reducing greenhouse gas emissions by 15% from their 2010 baseline levels by 2015, and by 30% by 2020, RSPB have been reducing their travel-based CO_2 emissions year on year by 3%. This has been largely delivered through reducing travel, increasing use of trains (for both car and short haul air journeys), reducing improving fleet vehicle efficiency, and energy efficiency measures including voltage optimizers for sites with 3-phase supply. RSPB introduced a carbon monitoring system for travel as a part of their financial control system, and estimate energy use for the RSPB from data for the Lodge and Gatehouse visitor centre.

In order to keep hitting their annual 3% target, RSPB are implementing the following strategy:

- Encouragement of pro-active advance travel planning based on models that have been trialled in different parts of the RSPB, including International and East England Regional Office.
- Encouragement of staff to hold more VC and audio meetings, and less face-to-face meetings, where these involve travel; and will upgrade VC facilities
- All new replacement vehicles will continue to be the most efficient in the class.
- Electric vehicles offer the most promising route to meeting longer-term targets but are currently not suited to all tasks and they depend on more on-site renewables if they are to deliver large emission reductions. RSPB will therefore begin to develop EV infrastructure, through opportunistic installation of charging points and vehicle acquisition, with the aim of full fleet replacement in 2015-2020 (subject to EV's meeting operational requirements). RSPB's first EV fleet vehicle was purchased late 2011, with a second to follow early in 2012.
- All staff registered as drivers of RSPB fleet vehicles will have compulsory eco-driving training.

Case study (2): The Cambridge Cycle Challenge (various)

The Cambridge Cycle Challenge is an annual scheme and competition, aimed at raising the usage of bicycles within organisations and their respective departments within Cambridge. Prizes are awarded based on the breadth of participation rather than the absolute mileage covered, with prizes awarded to the organisations or departments who get the largest percentage of members to cycle for 10 minutes or more; bicycles are provided to workplaces to incentivise participation in the challenge. CCF/CCI members who participated last year include UNEP-WCMC, FFI and TRAFFIC: with 88.1% of their employees participating, FFI won the prize for organisations with 50-199 members in 2011, with UNEP-WCMC winning the previous year. The 2011 scheme amounted to over 148,000 miles covered over nearly 23,000 trips over a 3-week period, equating to a saving of nearly 38,000 tonnes of CO_2.

Full details of the scheme can be found here:
http://www.lovetoride.net/cambridgeshire

References

Businesslink.gov.uk
Creating a workplace travel plan:
http://www.businesslink.gov.uk/bdotg/action/layer?r.i=1080445605&r.l1=1079068363&r.l2=1086029607&r.l3=1080440643&r.t=RESOURCES&topicId=1079934951
Reducing vehicle emissions:
http://www.businesslink.gov.uk/bdotg/action/layer?r.i=1080445605&r.l1=1079068363&r.l2=1086029607&r.l3=1080440643&r.t=RESOURCES&topicId=1080531485

Schemes & Initiatives for Sustainable Business Travel initiative dedicated to sustainable business travel
ways2work: http://ways2work.bitc.org.uk/
Travel For Work: http://www.tfw.org.uk/index.php

Car-pooling schemes
CarpoolWorld: http://www.carpoolworld.com/
Carpooling.co.uk: http://www.carpooling.co.uk/carshare/Cambridge.html

Sustainable Meetings and Events

An unsustainable paradox is that many practising conservationists, who speak out against excess carbon emissions, frequently engage in long distance air travel as a consequence of their international work. Conservationists also get involved in large, international meetings and events which further boost their individual carbon footprints. Whilst at times there seems to be no real substitute for meeting face to face, the knowledge and realities of climate change should persuade this group to find creative and constructive ways to reduce their own carbon emissions.

	Low Effort	**High Effort**

High impact	• Choose sustainable venue (ideally with environmental policy and action plan for meeting).
	• Ask participants to use public transport and ensure location of venue and timing of meeting is convenient for this.
	• Have a paperless meeting with minimal printed material available (tell people in advance).
	• Use recycled paper.
	• Minimise use of paper and plastic and recycle what is used.
	• Minimise folders and hand-outs, especially glossy, which only get thrown away.
	• Substitute face to face meeting with virtual meeting, for example through video conferencing or Skype, and if multiple participants are in the same place, investigate which local venues have the best video-conferencing facilities.
	• Make outputs from meeting available electronically and discourage printing.
		• Employ a consultant to assess the carbon emissions associated with a given meeting and to implement strategies which will make the organisation's meetings greener (this would be a high cost option as well as high effort)
		• Set carbon targets related to meeting travel for each person in the organisation to incentivise people to take a bus, walk or cycle to local meetings.
		• If organising an international meeting either:
		  ○ Automatically offset all the flights through an accredited scheme
		  ○ Institute an 'opt-in' policy where people can choose to offset as part of their registration.

Medium impact	• Use catering companies which source local food to reduce the number of food miles. • Either make all the food served at the meeting vegetarian or reduce the amount of meat and fish to reduce the carbon footprint of the catering • Meet in the building near to or where most delegates work to reduce the number of miles travelled • Seek green accommodation for delegates close to meeting venue.	• Measure carbon use for each element of the meeting and aim to drive this down for each similar event in the future. • Use low impact paper • If organising a meeting with local participants, encourage people to travel by bus, bike or on foot, with an incentive such as a green sticker on their badge. • Encourage people to offset their air miles when flying to international meetings.

Low impact	• Drinking water should come from taps not plastic bottles. • Avoid disposable items in catering.	• Minimise the amount of black and dark colours on the printed pages to reduce ink use.

Case Study (1): Greening the Cambridge Conservation Forum Symposia (CCF)

For their Summer 2012 Symposia, the CCF Committee decided to serve only vegetarian food for the lunch which, according to various sources, reduced the carbon footprint of the lunch by about 25% compared with a lunch containing meat and fish*. This menu change was explained to the delegates who, in their feedback comments, praised both the initiative and the quality and taste of the lunch. So, for the CCF Annual Symposium in 2013, the initiative to decrease the carbon footprint of the event was taken two steps further. Not only was a vegetarian lunch served again, but printed paper hand-outs were limited to just the agenda and delegates list and the delegates were also asked to travel to the symposium in as low carbon way as possible and record their mode of travel and mileage. Sixty-six delegates (about half the total attending) submitted their travel details: foot, bike, car and train. Most came on foot or by bike, though there were 144 miles recorded by train and 1148 by car. From the information supplied it was calculated that some 0.24 tonnes of carbon were used by half the delegates in getting to and from the symposium venue, so it can be estimated that the whole audience used about half a ton of carbon. CCF have made a financial contribution to the local Great Fen Project to help offset the carbon used on the basis that re-wetting the peat in the Project will reduce the emissions from the oxidising peat. Again, the Symposium delegates expressed their support for these carbon reduction attempts, which are now a planned part of each future symposium.

** By working out the typical greenhouse gas emissions associated with the production of 61 different categories of food, using supermarket data supplied by Booths, Professor Nick Hewitt of Lancaster University and Mike Berners-Lee of Small World Consulting, were able to work out that the combined greenhouse gas emissions from the foods we eat in the UK are the equivalent of 167 million tons of carbon dioxide equivalent, and switching to vegetarian or vegan diets could cut this by between 22 and 26 per cent*
Reference: Energy Policy, Volume 43, April 2012, Pages 184–190

Case Study (2): The benefits of video- and teleconferencing (Natural England)

Managing travel has been central to Natural England's achievement of halving its operational carbon emissions. In 2007, business travel made up over a third of its carbon footprint, with a sizeable proportion used for internal-facing meetings. The organisation recognised that reducing the size of this footprint meant influencing the day-to-day decisions of its staff about how and where they travelled, and what alternatives to cars were available. It created a carbon budgeting system, whereby an amount of carbon was allocated to each of its 2500 staff to 'spend' on travel over the year based on their role and responsibilities with their performance being monitored and reported monthly. To support low carbon alternatives a range of tools were made available including the provision of rail ticket printers in offices, introduction of teleconferencing and video-

conferencing, low emission vehicles and lots of guidance and awareness raising materials on our intranet.

As a result, the carbon footprint of business travel fell by over a third as staff utilised these new tools and alternatives. Teleconferences and, initially, videoconferences replaced many regular face-to-face meetings, although the latter reduced once people became more familiar with the technology and culture of hosting a meeting by telephone. The benefits were not only environmental; the business currently saves over £1.5M a year in direct travel costs as well as staff reporting improved productivity and work-life balance because of the reduced need for travel.

References

Papers
Fox, H.E. et al (2009) 'Why do we fly? Ecologists' Sins of Emission', Frontiers in Ecology and the Environment, Vol 7, No 6, pp 294-296.

Links to online documents
UN Environment Programme 'Green Meeting Guide 2009': This guide is designed to assist organisers and hosts of small- to medium-sized meetings of up to 200 participants in greening their meetings - from partners meetings to small conferences. It is applicable to all organisations, not just those within the UN system
http://www.unglobalcompact.org/docs/issues_doc/Environment/Green_Meeting_Guide_WEB.pdf

US Environmental Protection Agency: Guidelines for organising and hosting 'green' meetings
http://www.epa.gov/oppt/greenmeetings/

US Environmental Protection Agency: A guide for Federal purchasers but useful general guidelines
http://www.epa.gov/epp/pubs/meet/greenmeetings.htm

Wikipedia: A page on green conventions with a series of links to related external material and reports
http://en.wikipedia.org/wiki/Green_convention

The Green Meetings Industry Council: A global community dedicated to sustainability in the meeting and events industry, and the site includes tips, case studies and resources
http://www.gmicglobal.org/

The 2011 European Ecological Federation Congress: this report is a sustainability assessment of an international event which attracted 1000 scientists
http://c.ymcdn.com/sites/www.gmicglobal.org/resource/collection/FB7AE5BE-60DC-40AE-B5A8-B28A0F858DA4/EEF_event_sustainability_report.pdf

Corporate Culture

The underpinnings of a how an organisation works on a day-to-day basis can easily be taken for granted, but further investigation can highlight an alarming wastage of materials and resources. Whether it's reformatting standardised documents to a use a more tree-friendly amount of paper on printing, or doing away with the need to print altogether in a bid to create a paperless office, these measures once again call upon every employee within the organisation to contribute to the cause.

	Low Effort	High Effort

High impact	• Documents, reports etc. to be made available online to all employees to whom they are applicable to, via local network or intranet.
	• Reduction of internal email via such measures as:
	  ○ Encouragement for all employees to make full use of emails.
	  ○ Fill-out Forms to be made available to edit online as Word document or PDF format.
		• Encouragement of all employees to use low-carbon methods of travelling to and from work by, for example:
		  ○ Provision of cycle-parking, as well as shower/changing facilities
		  ○ In-house schemes for car-sharing and cycle rental.
		  ○ Limited provision of car-parking; parking spaces should not outnumber employees.
		  ○ Training programme for all staff members to raise awareness over work-related environmental issues.
		  ○ CEO and senior management lead by example.

Medium impact	• Placement of posters/reminders in appropriate locations to encourage carbon-cutting activities amongst employees.	• Cancellation of all direct ("junk") mail received by the company.
Low impact	• Word document templates which reduce paper usage by e.g. reduced margins, smaller font sizes, should be made available to all employees.	

Case Study: Carbon Conversations

Recently featured by The Guardian as "one of the 20 best climate change solutions" Carbon Conversations is a series of six facilitated group meetings aimed at halving the CO_2 footprint of those involved by focusing on more psychological aspects of how people behave. Each meeting is held between 6-10 participants at a variety of venues, from people's homes to community centres, to create an informal and non-judgemental atmosphere. The meetings focus on the four key areas of one's CO_2 footprint: home energy, travel, food and other consumption. Participants typically reduce their footprint by 1 tonne over the course of the meetings, with the ultimate goal of halving their footprint over a 4-5 year period.

Carbon Conversations has already been seen participation by a number of members of the CCF community, and the course actively encourages a passing down of its teachings; some 10% of participants train to themselves become facilitators, making it an excellent means of passing on sustainable working practice to fellow colleagues.
Reference: http://www.guardian.co.uk/environment/2009/jul/13/manchester-report-carbon-conversations

References

Carbon Conversations
http://carbonconversations.org/

Creating a paperless office

http://www.shrinkpaper.org/
http://www.smallfirminnovation.com/2011/10/six-tips-to-getting-started-with-a-paperless-office/
http://www.fpb.org/hottips/303/Top_10_benefits_a_paperless_office_can_provide.htm

Carbon Accounting

It is impossible to draw up a plan of action on reducing the CO_2 footprint of one's organisation without first carrying out a thorough carbon assessment and identifying the areas which most require attention. Electricity and gas usage are easily metered, but detailed records of transport usage require full cooperation from all employees. Only then can a Carbon Baseline be determined, and placed as a marker in the sand for subsequent target-setting.

	Low Effort	**High Effort**
High impact	• Recording of monthly meter readings • Installation of electricity/gas usage monitors which display current and past energy performance, with conversion of data into equivalent CO_2 emissions.	• With the assistance of a trained consultant, the carrying out of a comprehensive annual energy survey. – some organisations offer this for free. • Compilation of an annual energy report, made available to all employees. • Establishment of a Carbon Baseline as a reference against which subsequent emissions and energy usage statistics are compared against. • Training, internally or externally, of staff in low-carbon business practice
Medium impact	• Collection of travel receipts from employees. • Calculation of travel distances and associated CO_2 emissions based on mode of travel. • Stream line your systems so that carbon information can be collected at the same time as travel forms or other documentation needs to be filled in.	• Organisation of weekly out-of-hours walk-rounds to monitor use of lighting, office equipment etc. • Collection of data from waste collection provider on tonnage of waste-to-landfill and waste-to-recycling.
Low impact	• Issuing of fuel cards to all employees to account car mileage and fuel costs.	

Case Study: Setting a Standard (Natural England)

Following on from the successful reduction of their carbon footprint to 50% of 2007 levels in 2010, Natural England defined a set of standards and principles which outlined the methods in which the organisation would conduct its carbon accounting and calculate its carbon baseline. The standard is compliant with requirements of the Carbon Trust Standard (based on ISO 14060-1:2006 for the measurement of corporate carbon emissions), and provides a clear synopsis of the data sources used in the carbon footprint calculation for both on-site and travel-related energy usage, in addition to any emission conversion factors used. The methodology for calculating the carbon baseline is to be reviewed on an annual basis, with the aim of achieving continual year-on-year reductions to the carbon footprint of the organisation; the baseline will be published yearly in the Annual Report and Corporate Plan, and will be made available online via the website, and members of staff will be made further aware of the standard via regular news items, and by the recognition of good practice through Sustainability Champions.

References

Carbon Trust: A guide to energy surveys
http://www.carbontrust.com/media/7393/ctg055_energy_surveys.pdf

DEFRA: A guide to how to measure and report your GHG emissions
http://www.defra.gov.uk/publications/2012/02/13/pb13310-ghg-small-business-guide/

Please refer also to the *Process for Reduction* section for various tools for calculating CO_2 footprint.

Carbon Offsetting

Carbon offsetting refers to the process of conducting or participating in projects or schemes which reduce CO_2 or other GHG emissions in compensation for emissions which occur within another part of your organisation. The purpose of this document is to define a Best Working Practice; carbon offsetting should not be seen as a satisfactory substitution to the practices outlined hitherto. However, where it is neither appropriate nor realistically feasible to carry out such practices, carbon offsetting projects may be considered as an acceptable means of lowering the carbon footprint of your organisation; carbon offsetting may also be considered as a supplementary measure to those outlined in this document which yields further reductions in carbon footprint, or even creates a negative footprint.

In 2008 CCF, in conjunction with UNEP-WCMC issued a report on Carbon Offsetting Strategy within CCF [1]. The report provides recommendations for partaking in offsetting projects, at an organisational, forum and individual level. There are ambiguities entailed within certain carbon offsetting schemes, and care should be taken in their selection; in particular, a single carbon offset credit may be sold multiple times by a retailer, so it is of paramount importance to enlist in a scheme whereby the credit is "retired" on purchase, to ensure a legitimate reduction in organisational carbon footprint. It is recommended to participate in schemes and projects which reflect the expertise of your organisation. A list of recognised carbon offsetting standards and agencies is outlined in Table 1.

It should be re-iterated that carbon offsetting should not be considered as the first port-of-call for reducing the carbon footprint of your organisation. In the 2008 Carbon Offsetting Strategy report, carbon offsetting is listed as the fifth – and final – step in managing your organisation's carbon footprint.

References

[1] Jourdain C. Developing a Carbon Offsetting Strategy for the Cambridge Conservation Forum. Imperial College London (2008)

Table 1: Recognised Carbon Offsetting Standards and Schemes[1]

Name	Market	Focus	Governance/legitimacy
Fully-fledged standards			
Clean Development Mechanism (CDM) http://cdm.unfccc.int/index.html	R+V[1]	All sectors, projects in developing countries.	United Nations Framework Convention on Climate Change (UNFCCC), CDM Executive Board, public comments and external verification.
Joint Implementation (JI) http://ji.unfccc.int/index.html	R+V	All sectors, projects in Annex 1 countries.	UNFCCC, JI Supervisory Committee, public comments and external verification.
Voluntary Carbon Standard and registry http://www.v-c-s.org/	V	Modelled on the CDM, with the aim to reduce transaction costs. All sectors. Integrates methodologies from other project development standards (CDM, Climate, Community & Biodiversity Standard (CCBS), Gold Standard).	The standards were developed by the International Emissions Trading Association (IETA) and the World Business Council for Sustainable Development (WBCSD) in an effort to represent the private sector interests in the development of the voluntary carbon market. No public consultation is required for project approval. Multiple registry system based in North America, France, London and Asia Pacific managed by financial institutions (Caisse des Depots, Bank of New York Mellon, TZ1, and APX Inc.). Use of CDM methodologies.

[1] R= Regulated; V= Voluntary

Name	Market	Focus	Governance/legitimacy
Verified Emission Reduction (VER) + http://www.global-greenhouse-warming.com/VER-plus.html	V	Modelled on the CDM. No co-benefits. Trading under this standard is sought by project developers before registration of their project under the CDM. Most sectors are eligible apart from hydrofluorocarbons, large hydro and nuclear projects. Land use change projects including Reducing Emissions from Deforestation and Degradation (REDD) are eligible.	Standard developed by an accredited CDM auditor. Follows the CDM and JI procedures.
Chicago Climate Exchange http://www.chicagoclimatex.com/	R	A voluntary cap-and-trade scheme in the USA which also allows the import of qualifying offset credits.	Membership is voluntary, but the system is based on legally-binding rules.
Project development standards			
Gold Standard and retailers http://www.cdmgoldstandard.org/	V + R	Beyond CDM requirements. Projects limited to the application of energy efficiency or renewable technologies. Sustainable development criteria. Gold Standard registry in development. Simplified guidelines for voluntary offsets with the aim to include a broad range of projects.	Non-profit foundation supported by over fifty national and international environmental NGOs. The Standards main objectives are to support long-term climate mitigation and to stimulate local sustainable development
Project-development standards and methodologies: biosequestration projects			
Clean Development Mechanism (CDM) afforestation and reforestation http://cdm.unfccc.int/Projects/pac/pac	R+V	Methodologies for Afforestation and reforestation projects.	International Transaction Log and CDM Registry.

Name	Market	Focus	Governance/legitimacy
ar.html			
"Agriculture, Forestry and Land-Use" section of the Voluntary Carbon Standard (VCS) & registry http://www.v-c-s.org/afl.html	V	Reduce transaction costs, generate permanent reductions, basic environmental and social benefits. Agriculture, Forestry and Other Land Uses.	VCS Registry in development.
Climate, Community & Biodiversity Standard (CCBS, new version expected October 2008) http://www.climate-standards.org/	V	Projects that deliver climate, community and biodiversity benefits in an integrated sustainable manner.	Developed by the Climate, Community & Biodiversity Alliance, NGOs and independent experts. Each project is subject to a public consultation phase. There is no registry as this Standard is applicable during project development phase only.
Plan Vivo http://www.planvivo.org/	V	Rural small-scale community projects promoting sustainable livelihoods. Based on Payments for Ecosystem Services.	Run by the Plan Vivo Foundation, research and non-profit organisations. Registry.
Carbon Fix http://www.carbonfix.info/	V	Insurance on permanence, transparent track-and-trace system. Google Map function.	Developed by scientists. Registry.