Science & Technology Facilities Council

in brief

Welcome to another special edition of in.brief dedicated to environmental matters.

“Colleagues, a year on this is the second dedicated edition of in.brief focussing on the environmental impact of the STFC. It brings together and highlights the wide range of activities that the STFC engages in from how our wastes are disposed of; how little ends up in landfill; how much electricity, gas and water we use; through to the impact of video conferencing on our operations. Following the call for environmental improvement suggestions last year we learnt that many staff were not aware of just how much we already do, this edition will raise awareness and hopefully spur you to submit more environmental improvement suggestions as we launch a second call for ideas.”

Prof Colin Whitehouse, Chair of the STFC SHE Committee.

If you are inspired by the information contained here why not make an environmental improvement suggestion now! This is one of the few areas where we can all contribute and make an impact no matter how small.

While the suggestion scheme is always open we are placing a deadline of the 30 November so that we can gather as many of your ideas as we can. Don’t forget to think about the environmental impact of contractors and others that work with us on our sites

Notice board

Carbon footprint

Reducing our footprint to benefit science

Our facilities are working together to help reduce our carbon footprint, enabling us to spend more on science rather than on energy.

Video conferencing deserves a VC

Dreading getting stuck on the M6? Why not try a video conference instead? You could save time, money and reduce our carbon footprint.

Your voice

Your suggestions 2010/11

Many staff submitted ideas for environmental improvements last year. There were a number of common themes as well as ideas for specific areas.

Environmental suggestion

Policy and impact

STFC Environment Policy

Each year the STFC SHE Committee, with the Executive Board, review our Environment Policy to ensure it meets our needs and expectations. Check you know how it applies to you and your work!

Aspects and impacts at DL

As part of our Environmental Management system, we have undertaken an assessment of the overall environmental impact of STFC's operations on the Daresbury site.

Waste management

Waste disposal and recycling at DL

Whilst you may put all your waste in one bin it does not all end up in the same place. Our waste is sorted at a specialised plant and only 2% on average goes to landfill.

Waste disposal and recycling at RAL

Not all RAL's waste goes to landfill. Last year RAL generated 447 tonnes of which only 165 tonnes was sent to landfill. Visit the SHE Extravaganza on 09 November to find out more.

Energy efficiency

Energy and utility usage

STFC is, by its very nature, an intensive user of energy. Accelerators and high power lasers are very energy hungry. How do we compare to other institutions? Can we do anything about it?

scheme

We heard you in 2010/11 so make a difference and please keep sending your suggestions to help us improve our environmental impact.

Who's representing you?

Find out who works on the SHE Committees, how they work and who represents you.

Energy saving at Swindon

Small actions can make a difference if we all carry them out - Swindon Office is showing the way with a number of energy saving initiatives and environmental improvement schemes

Energy use at the UK ATC

UK ATC have been implementing various energy saving measures such as timer units, sensors, low wattage lamps and have been able to achieve significant reductions in energy usage.

Waste disposal and recycling at RAL

24 October 2011

Not all RAL's waste goes to landfill. Last year RAL generated 447 tonnes of which only 165 tonnes was sent to landfill. Visit the Safety Roadshow on 09 November to find out more.

Waste disposal and recycling at RAL

Did you know that averaged out over a year (April 10 to March 11) 446.6 tonnes* of waste left RAL. Of this 165 tonnes was sent to landfill and 281.6 tonnes was recycled (collected through R24 and the Dried Mixed Recycling (DMR) scheme). Through the various contracts on site we can dispose of and recycle all waste items from, batteries, obsolete equipment, scrap metals, waste oil, confidential waste, cardboard, furniture, printer cartridges, DMR (plastics, paper, coffee cups, aluminium cans) to name but a few. Even the waste cooking oil from the kitchen is collected and re-used as fuel for the lorries which deliver the produce.

Before RAL introduced DMR there was no recycling of office waste which meant that this was all going to landfill. Since we introduced the scheme we have diverted approximately 48.5 tonnes of waste away from landfill.

So THANK YOU, but we still need your help to recycle even more office and other waste. The DMR process is easy and most of us are already doing this at home; however it does take a little time to get used to it and requires a change to current behaviours. Please take a look at the Recycling at RAL notice as reminder of the DMR process.

To help with the recycling of batteries there is now a site map marked with the collection points which can be found on the SHE website.

The SHE website displays a full list of Waste disposal and recycling contact points. If in doubt about what should happen to an item please contact Graham Rowley Ext 6587 or support services Ext 6779 or Ext 5612.

Biffa will be at the SHE Road Show on 09 November so come a long and find out happens to the DMR once it leaves RAL.

*figures recorded through the contract with Interserve only

Energy use at the UK ATC

24 October 2011

UK ATC have been implementing various energy saving measures such as timer units, sensors, low wattage lamps and have been able to achieve significant reductions in energy usage.

One of the main objectives of the Estates Team for 2010-12 is to drive down the amount of energy being used across the estate. Commencing in August 2010 and for a period of 24 months, each building was being monitored to measure the amount of electricity being used.

Between August 2010 and July 2011 a baseline measurement has been taken using a Hawk 5000 Energy Analyser. After measuring a particular building for a period of one month, alterations or modifications were made to try and reduce the power being used. Changes were made to the way equipment was used by adding timer units, sensors, low wattage lamps etc and certain pieces of equipment were modified to work more efficiently.

Now we are into the second monitoring period, results recorded in August and September has identified a reduction in electricity usage.

Building	Month of Monitoring	2010	2011	Reduction
Lodge/Workshops/Villas	August	38,984kWh	26,842kWh	12,142kWh
South Building	September	15,929kWh	9,183kWh	6,746kWh

Overall this is a reduction of 18,888 kWhs of energy in two sets of buildings. The results may be offset against a reduction of technical energy being used but we feel that the changes made to equipment use and inclusion of energy saving devices has made a significant contribution to reducing electricity usage.

It is intended to continue with the monitoring program until July 2012. At this point we will be able to compare figures for both recording periods.

Solar Energy Use

Part of 2012 capital works programme at the UKATC is to upgrade the old laboratory space in the 1967 Building. As part of the project, investigations are underway to ascertain a costing recovery profile for introducing a 50 Kw photovoltaic (PV) solar panel system to the flat roof space of the building.

PV has numerous environmental benefits: it does not pollute, it reduces carbon footprint, it is silent, solar panel require little maintenance and we do not have to rely on transportation of energy. Overall it is estimated that we will see 8% - 12% annual return on any investment and make a significant saving on our electricity bill. It would be the intension to invert 100% of the energy created back into the national grid so as to make a maximum saving on energy being used. The PV panels have a 25 year output guarantee and the panels will continue to work at 98% efficiency at the end of this period.

Environmental initiatives at Swindon Office

24 October 2011

STFC Swindon Office continues to fully participate in the environmental activity at Polaris House.

Energy Saving

A number of energy saving measures have been implemented over the past three years as part of our on-going commitment to meeting the objectives set in ISO14001:

- The Heating, Ventilation and Air Conditioning plant and gas boilers were all replaced reducing both electricity and gas consumption
- A new lighting control system has been installed in the MSCP which has resulted in a drop in our electricity use of approximately 40%.
- We installed equipment that now regulates the amount of voltage required to power the electrical plant on the Polaris House site
- The majority of office areas have been refurbished with new PIR lighting thus reducing consumption;
- Timer switches have been put in all out kitchen/tea point areas which is saving 156,000kw of electricity pa.
- Staff are encouraged to turn lights off in meeting rooms when not in use and not to leave PC's switched on overnight.

Environmental Improvement

Swindon Office has also implemented a number of environmental improvement schemes:

- The Biodiversity Plan was completed in June, and saw the planting of many new shrubs, trees and flowers around the site. We also installed bird boxes, two of which have been fitted with cameras that operate using solar batteries.
- The facilities for cyclists have been much improved and we now have a drying room, together with two unisex and one disabled shower located on the ground floor near the main Reception.
- In July 2011 the Councils contributed £1,000 towards the Swindon Walk It project which has resulted in the setting up of a new website that enables staff to plan their walking route to work as well as finding out about other local walking activities.

New initiatives

We are currently progressing with a Travel Plan for the site and are working closely with Swindon Borough Council who has recently been successful in obtaining funding from DoT's local sustainable transport fund (LSTF). The fund has allocated £4.4 million and objectives include plans to reduce congestion on Swindon's road network by targeting car trips that could be replaced by cycling, walking, public transport and car sharing (or eliminated altogether by initiatives such as home working). The Councils are one of eight local employers engaged on this 3-4yr project.

Environmental Aspects and Impacts Assessment at DL

24 October 2011

As part of our Environmental Management system, we have undertaken an assessment of the overall environmental impact of STFC's operations on the Daresbury site.

Although there is not the business incentive for STFC to have environmental management certification such as ISO 14001, we have taken the decision to put in place a system which complies with this standard.

A key milestone in this process is an overall assessment of the impact of the organisations operations on both the local and global environment. This is called an Environmental Aspects and Impacts assessment (think of it as an environmental risk assessment). This process looks at wider issues than pure legislative compliance and allows us to identify areas where we have signicant environmental impact and where we should focus our limited resources to make a significant impact.

The first of these assessments was undertaken recently on the Daresbury site and the significant issues have been reported to the site Environment Committee and the STFC SHE Committee.

The plan is to roll this process out across the rest of the STFC UK sites (RAL and ROE - Swindon have this in place as part of their ISO 14001 certification).

The following significant local aspects were identified at DL:

Aspect	Impact	Action
Spill of fuel or chemicals	Water Pollution Ground contamination	Issue was storage of fuel in Garage area. Contractors have been told NOT to store in area and to refuel in suitable location
Generation of garden waste	Indirect impacts on waste disposal. Ground contamination	Exemption permit was required for certain activities. This is now in place.
Refigerant gas release (site air conditioning systems).	Climate change Ozone layer depletion.	Estates team are working with maintenance contractor to ensure all data is transferred to STFC. Only use correctly licensed contractors.
hazardous material spill during delivery or movement around site.	Water pollution; Ground contamination.	Logistics will be supplied with a drain cover that can be put in place during delivery of hazardous liquids.
Refrigerant gas release (computing centre)	Climate change; Ozone layer depletion	FM-200 removed. New system will be liquid based. Discussions in had as to possible impacts of this change.
Storage and use of trichloroethylene	Water pollution; Ground contamination; reduction in local air quality.	Solvent management plan in place. Use of less hazardous replacement cleaner for smaller items.

As well as these global issues:

Aspect	Impact	Action
Electricity and gas use	Non-renewable resource depletion;	Staff awareness. Participation in CRC (business driver).

	Climate change.	Council wide energy saving initiatives (de-centralised gas boilers, power conditioning, solar and wind energy use).

2010 Environmental Suggestions

24 October 2011

Many of you submitted suggestions for environmental improvements last year. There were a number of common themes as well as suggestions relating to specific areas.

Over 50 suggestions were submitted last year. With a number of staff making similar suggestions (great minds think alike!). These were all submitted to site Environment Committees for consideration and the results were presented to the STFC SHE Committee at its last environmentally focussed meeting.

A number of the articles in this edition of inBrief have been prompted by your suggestions and the SHE events taking place in November will also feature contributions prompted by the suggestions.

Some of the more common suggestions were:

PIR detectors in offices and corridors

This is actively considered by Estates and Building Projects when planning refurbishments along with more modern lighting which can also reduce electricity consumption.

Switching off IT equipment in silent hours

There are a number of facets to this suggestion. Switching off peripherals such as monitors and printers is probably a good idea and some sites have been issuing timer switches which can be plugged into monitors or local printers where these are not required out of hours.

The advice on switching processor boxes off is not as clear cut. It may be that remote access to the machine is required out of hours or the machine may be left active so that unused processor time can be used for one of the distributed computing initiatives. The advice in this case is that you consult your local IT support. It may be that the machine can be switched off over the week-end but is required to be powered up during the week.

Use of Printers

A number of you had suggestions concerning printers. CICT at RAL and DL are now reviewing the provision of centralised printing services. These centralised printers are generally set to default to double sided printing however if you have a local printer which you would like to set to print double sided we have produced a simple guide which should help.

Recycling of various forms of waste

This seems to be a failure in communication on our part. The SHE Road Shows which will be taking place at DL and RAL over the next few weeks will have contributions from the waste management firms that we use. These firms will be presenting details of how our waste is managed and how it is sorted and recyclable material extracted with a view to minimising the amount that goes to landfil.

Where the suggestion was more specific the site Environment Committees have responded.

We are still open to suggestions, so if you have any more great ideas that could save energy or improve our local environment then let us know.

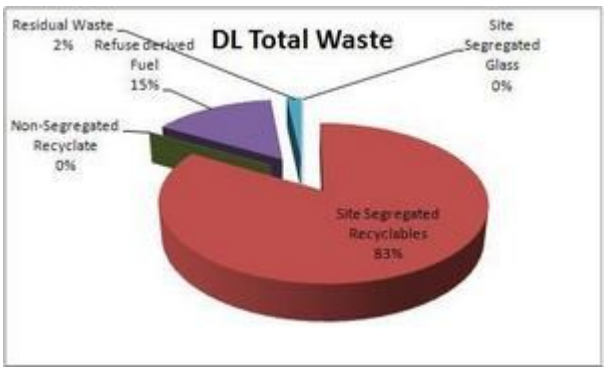
Waste Disposal and Recycling at DL

24 October 2011

Whilst you may put all your waste in one bin it does not all end up in the same place. Our waste is sorted at a specialised plant and only 2% on average goes to landfill.

The general waste (waste that goes into the yellow bins) that is taken off site by our waste management firm, Bagnall and Morris, is taken to a specialised recycling plant which sorts our waste into three main categories: recyclable material; non-recyclable waste that they feed into a 'waste to energy' plant; and finally a residual that goes to landfill.

The average breakdown can be seen in the chart below:



The environmental saving, assuming that is would otherwise have gone to landfill, is around 150,000kg CO^2 (or 35,000 miles in a 2.0 litre diesel saloon).

You can help removing the plastic covers from junk mail that you throw away and any similar simple separation that would make recovery at the plant easier.

We do also directly recycle some waste streams (2010/11 figures):

Metal (kg)	666,609
Wood (kg)	24,000
Cardboard/Paper (kg)	3,902
Waste Electronic Equipment (kg)	1,070

Bagnall and Morris will have a stand at our SHE Road Show on 01 November, so it you want to get more information come and have a chat to their representative.

STFC Energy and Utility Usage

24 October 2011

STFC is, by its very nature, an intensive user of energy. Accelerators and high power lasers are very energy hungry. How do we compare to other institutions? Can we do anything about it?

As a provider of large scale facilities for the UK, the STFC is bound to use a lot of energy. This does not mean that we can waste it. This article shows how much electricity, gas and water we use and gives some indication of where it is used. Also by separating out the large facilities it gives you some idea of where you can make a difference locally in your office.

The overall use of utilities over the past three years is:

	2008/9	2009/10	2010/11
Electricity (kWh)	123,629,069	120,032,518	96,129,949
Natural Gas (kWh)	16,816,179	15,656,996	15,972,701
Water (m^3)	171,458	163,028	120,243

Some of the decline in electricity use from 9/10 to 10/11 will have been due to the shutdown of the SRS.

If we add in the small amount of propane gas usage and convert to equivalent carbon dioxide (CO_2) emissions, STFCs 'Carbon Footprint' is:

	2008/9	2009/10	2010/11
Electricity ($kgCO_2$)	66,883,326	64,937,592	52,006,302
Natural Gas ($kgCO_2$)	3,087,450	2,874,624	2,932,588
Propage Gas ($kgCO_2$)	92,096	70,519	24,425
TOTAL ($kgCO_2e$)	70,062,873	67,882,736	54,963,316

Improvements in metering on the sites does allow us to make a correction for the large facilities which account for roughly 50% of the overall electricity usage. This would make the total CO^2 for the rest of the organisation (mostly offices and labs) around 30,000,000 kg CO_2 equivalent, that's about 18,000 kg CO_2 per staff member per year.

To put the total without the large facilities into some sort of context, the carbon footprints of some UK Universities are shown below:

University of Oxford	~72,000,000 kg CO_2 equiv
University of Bath	~24,000,000 kg CO_2 equiv
University of Aberdeen	~23,000,000 kg CO_2 equiv

To put the 'per staff member' usage into perspective 18,000 kg of CO_2 can be related to the amount of CO_2 18 trees absorb in their lifetime or about 95,000 miles in a 2.0 litre diesel car (*)

(*) Carbon conversion factors

2011 SHE Road Shows

24 October 2011

Each year SHE Group have marked European Safety Week with an event. This year we are doing something different...

Inspired by our colleagues at Swindon, the SHE events this year are different - bigger and involving a much wider range of external participants in a "Fayre" or "Expo" format, allowing you to wander, discuss, pick up information and samples, and enter competitions etc.

At the events at the beginning of November (01 November at DL and 09 November at RAL) various organisations will be vying to give you useful information (and maybe freebees):

- Health advice from your local Occupational Health advisor;
- Advice on healthy eating;
- Advice from the NHS Stop Smoking team;
- Fire safety in the home;
- Home security;
- The usual quizzes (win an iPod Nano);
- Find out where your site waste goes; and
- We may even try to sneak some SHE advice in (DSE and PPE equipment)!

So take a break, book 30 minutes in your calendar and visit the SHE events at RAL and DL.

DL - B Block Atrium 10:00-14:00, 01 November

RAL - R18 Central Exhibition Area, 10:00-14:30, 09 November.

Video conferencing deserves a VC

24 October 2011

Dreading getting stuck on the M6?
Why not try a video conference instead?

Do you realise how much STFC Video Conferencing (VC) contributes to reducing our Environmental foot print and improving our effectiveness? Every VC between STFC sites or between the STFC and collaborators saves wasted travel time on the part of STFC staff, as well as its cost, and every VC potentially takes a car off the road reducing the STFC's carbon footprint.

A simple analysis of the VC traffic between DL and the rest of the STFC for a month in 2010 revealed that over 160 VC meetings were held involving 1,300 people! Of the VC meetings about 90% of them were between DL and other STFC sites and on average each VC involved eight people.

Some simple assumptions using this basic data result in some staggering statistics ...

- Assuming each VC saves the car miles of half the attendees, four people per meeting, that attendees would have used two cars for the journey and that the round trip distance between DL and RAL, SO or ROE is about 340 miles this equates to 1,300,000 car miles a year or 50 times around the earth or 100 round trips to Cape Town! More importantly assuming these cars use petrol this equates to 500 tonnes of carbon dioxide/year which equates to the carbon dioxide used by 500 oak trees during their life. Not forgetting the cost of the petrol (£200,000) and hiring the cars.

Or

- Assuming each VC saves the travel time of half the meeting's attendees and for simplicity assume that the car journey time between DL and RAL, SO or ROE is about three hours - this equates to 46,000 working hours a year or 28 man years effort! Clearly some staff might use choose to travel by rail and can work for part of the journey but this can be offset by longer journey times. Twenty-eight man years effort equates to £1.4 million per year!

While some of these assumptions are great simplifications ... we would use the phone, email or not hold the meeting ... they help illustrate the scale of the impact using VCs can make to our time effectiveness as well as our carbon footprint.

Do you have to make that journey? ... do you need the meeting at all? could you use e-mail, phone, or VC?

If you have to travel remember to offer a lift to colleagues, and that the carbon emissions per mile by train are about a third of that by car!

If you want to know more about how STFC VC can support your work don’t hesitate to contact Media Services!

STFC Facilities working to reduce our Carbon Footprint

24 October 2011

STFC facilities continue to look for ways to help with our Carbon Footprint and enable us to spend more of our precious resources on science rather than on energy.

With the cost of energy ever increasing, our large facilities like ISIS, ALICE and Diamond are always looking for ways to reduce energy and utility costs.

During the **ALICE** April 2011 Shut-down, the cryogenics and controls teams upgraded the Liquid Nitrogen distribution system by installing automated control valves and integrating them into the accelerator control system. After five months of system operation, a reduction of 50% liquid nitrogen consumption has been realised (~£35,000 / annum). This saving equates to a payback period of less than three months for the installation of the new system, thus realising a significant reduction of the ALICE Carbon Foot print.

Following on from the work of their Tiger Team, **ISIS** have been taking the team's suggestions forward:

- an estimated £30,000 a year has been saved by 'dimming' the magnetic proton beam transport lines to the two target stations whenever the beam is unexpectedly tripped off for significant durations.
- reductions have been made in the lighting in the large halls. R6, R55 and R80 lighting is now reduced or turned off in the evenings and overnight when users are not expected to be present. This could amount to roughly ~300 MWh or ~£20,000 a year.
- A further possible saving of about £45,000 a year has also been identified following a review of the water and air cooling system.

Diamond's energy saving program has saved around £135,000 in 2010.

The on-going program, run by IFM, continues to deliver impressive savings and includes a range of projects including:

- Light sensors and lighting enhancements.
- Reduction in Air Handling Units' running time.
- Further enhancements to the building management system.
- Variable speed pump drive installation.
- Liquid nitrogen system reconditioning.