

## UNIVERSITY OF EDINBURGH

**MINUTE OF A MEETING** of the Sustainable Laboratories Steering Group held in the Elder Room, Old College on Tuesday 17 November 2015.

**1 Welcome and Introductions**

The Convener welcomed attendees to the third meeting of the Group and outlined the agenda for the session.

**2 Minute**

The minute of the meeting held on 2 June 2015 was approved as a correct record.

**3 Matters Arising**

There were no matters arising not covered on the agenda or in post-meeting notes.

**SUBSTANTIVE ITEMS****4 Report from S-Labs Conference**

The Labs Sustainability Coordinator briefed the Group on findings and developments from the September 2015 S-Lab Conference in Leeds. Content from the lectures was available from the [S-Lab website](#). International presence at the event attested to the rising status of the awards. Ten representatives attended from UoE, an appropriate level given the range of content. Valuable insight was afforded into the various approaches being taken by different Universities, which was followed up through informal discussions between lectures. Attendance in future years was strongly recommended.

Members were keen for any feedback or recommendations around space standards. While there was no conclusive standard of square meterage per lab user, there were some examples of this being put in place. Some labs in the private sector such as AstraZeneca were using 13m<sup>2</sup> plus write up space. Wellcome Trust standards varied according to the science.

Action – AA to draft a briefing on the most pertinent case studies from other institutions.

**5 Lab Refurbishment Presentation – University of Strathclyde**

Energy & Environmental Manager Dean Drobot presented on lessons learned from lab refurbishments. Strathclyde had been involved with S-Labs from an estates point of view for 18 months, with Sustainable Labs Co-Ordinator Ruby Oun now on board to link estates and academic areas, investigating how to better support the needs of students and researchers. Laboratory Superintendent Alaine Martin, in post for 11 years, had been involved with six or seven major refurbishment projects in that time. Given the cost of lab refurbishments, it was essential that they last, with an expected lifespan of 15-20 years. Past refurbishment projects included a number of success stories, however there could be conflicting priorities between estates, which tried to make provision as generic as possible, and Schools which wanted clear ownership and specialist provision.

A new NMR facility (similar to Joseph Black at UoE) was created from fallow space in 2004. Its level 2 and level 4 teaching labs and organic chemistry research labs were refurbished in 2005/6. The level 7 organic chemistry lab was refurbished in 2007, the specialist forensic lab in 2008, and the specialised trace analysis lab in 2010. With each refurbishment Strathclyde learnt lessons which could be implemented in future projects.

Strathclyde worked with two design teams who had taken very different approaches. One had engaged with end users, sought critical information and clarification, asking questions regarding use, hazards and so forth. The other team did not engage beyond the initial meeting, did not share information, failed to collect vital information or did not use it, and did not seek technical input. Overall, the key aspects to making a project a success were

identified as: end user satisfaction; good quality product; safe; low maintenance; value for money; future-proof design; and never make assumptions (e.g. that a design team will know what needs to go into a lab).

The trace analysis lab was a positive example. Combining mass spectrometry and elemental analysis, the lab contained large kit needing routine maintenance. In order to do this safely, service galleys were created between banks of instruments. Gas cylinders were rationalised into one bank of gases fed on overhead gantries, allowing instruments to be moved relatively easily. Technicians and students had fed back positively on the changes.

On the less successful projects the key had been lack of consultation. Design teams had not asked what users were working with in these labs, resulting in significant retrofitting requirements (e.g. to raise taps up to accommodate glassware, provide eyewashes where users were working with solvents, retrofitting gas lines, replacing fume cupboards eaten away by acid). Cupboards fixed to the floor were a major problem as flexibility and movement were essential, to facilitate flooring repairs for example. One refurb needed to be redone six years on, leading to major expenditure for estates. Given uncertainty about the future of the space, this refurb was largely cosmetic, focusing on new floors, sink tops and sashes (£2.5K per fume cupboard, compared to £15K for full replacement).

The old microanalysis lab was in use from 1962 to 2010. The refurbished lab needed to have both temperature control (due to the mass specs and instrumentation) and fume cupboards, leading to issues around maintaining the temperature differential. The solution had been to create a small fume cupboard room in an adjoining space.

Innovation in space utilisation could lead to significant savings in terms of space charging (the chemistry lab yielded space savings of around £40K p.a). Where there were significant restrictions (e.g. windows along several walls) it could be prudent to split the lab, putting all fume cupboards in one space where solvent work could be done. At Strathclyde this would save up to £1million over the lifetime of the lab in space charges alone, not including the associated energy saving. Strathclyde additionally recommended auto sash closers on all fume cupboards, separate exhaust for vented cupboards and building supplies of nitrogen gas. These small changes were often value engineered out, yet could make a vast difference.

The same logic and criteria could be applied to new builds. If University controlled the process was relatively straightforward. In the case of a design and build it was vital to have tight control on requirements, evaluate all options and ensure all relevant information was gathered before going out to tender, as any subsequent changes were very expensive. It was important to keep a written record of what was agreed between the contractor and client.

Communication and information gathering was the critical first step to a successful project, establishing needs and then looking at these from a sustainability point of view to see what improvements could be suggested. It was vital to have a technical expert in place for projects, seconded in or employed by the University as liaison between estates and end users and feeding back to the design team, and these roles were becoming more commonplace.

Sustainable Labs Coordinator Ruby Oun outlined her first year in post, having been active in three of the 12 S-Lab criteria so far, with the aim to progress other areas next year. Traffic light posters had been designed (similar to those in use at Joseph Black) outlining good and bad fume cupboard practice. 42 fume cupboards in Chemistry had been upgraded from constant to variable flow. The introduction of automatic sash closers, funded by SALIX, had saved £50K. Waterless condensers were introduced, with students particularly positive on Asynt air condensers. Unichillers replacing two condensers per fume cupboard would create a saving of £25K p.a. Energy monitoring with different equipment was being carried out to raise awareness, identify the most energy intensive

and the cost if left on. Strathclyde had also held their first Sustainability Awards ceremony, sending the message that sustainability was important and valued, and a number of additional teams had joined since. There were a lot of opportunities for engagement with lab users and this area would be developed further. Plans for the next year included an energy and water incentive fund of £15K to help purchase energy efficient equipment and further energy monitoring, including a -80 freezer audit. There were plans to integrate S-Labs into the PhD research learning and development programme and to introduce a monthly S-Lab steering group.

Members thanked colleagues from Strathclyde for sharing their experiences, recognising the importance of involvement at the design stage from a technical person with an understanding of how the lab is going to run, and ensuring contractors have the right information from the outset to avoid additional costs. An experienced mechanical engineer was valuable in projects involving highly serviced buildings. Attendees generally advised against ring mains for deionised water as these had a relatively short lifespan and were expensive to maintain.

Attendees discussed their experiences of the SALIX funding application process - Strathclyde's primary source of funding for major projects - and of revolving green funds. It was possible to aggregate projects if they were over £5K. Published metrics were an early driver and starting point (e.g. Health & Safety lists depending on the class of lab) though there were not yet established metrics for sustainability. These could include heating, cooling and ventilation relative to occupancy, movement sensors and so forth. The more energy efficient the lab, the more money would be available for research.

As they were in the process of setting up a steering group, colleagues from Strathclyde were interested in how successful this group had been. Members had found SLSG helpful in giving access to a range of expertise and perspectives, allowing discussion of plans to establish consensus and identify issues. SLSG's membership was very mixed in terms of roles, responsibilities and status within the University, enabling the Group to give a more representative opinion.

## **6 SLSG Implementation Plan**

**C**

The Labs Sustainability Coordinator presented a quarterly update on progress against the Implementation Plan, split into 5 topics.

### A. Evidence Building

The Labs Coordinator had drawn together evidence on three topics: ventilation, cold storage and lab equipment.

### B. Training & Engagement

Work in this area had been taken forward through the Labs Workshops. There had been four meetings so far covering waste, procurement, utilities savings, design and CPD for technical staff. The workshops had been well-attended and topics for next year were being planned. Engagement materials had been developed including posters and induction materials. The S-Labs Conference had been useful in terms of generating soundbites and practical tips. Engagement with the School of GeoSciences had been initiated and other targeted areas included SCRM, Physics and Engineering.

### C. Utilities and Waste Efficiencies

The next area to be targeted would be utilities and waste efficiency, particularly focusing on potential financial savings. Discussions were ongoing regarding fume cupboard changes at Joseph Black and roll out of LED microscopes, dependent on funding. The College Registrar had agreed to cover half the cost of the microscopes, and other funding streams including SALIX were being investigated to cover the rest. A new lab equipment fund for small scale projects had been set up.

#### D. Outreach and Securing Funding

The presentation from Strathclyde was one aspect of the outreach programme which had seen different partner universities present at different meetings. The S-Lab event had been particularly useful in getting in touch with other institutions working in this area. Negotiations on funding the labs post were ongoing, using internal and external funds, possibly including support from Zero Waste Scotland if there was sufficient overlap to their work.

#### E. Estates Design and Construction

A well-attended labs workshop on design had taken place on 16 June. There had been significant engagement in this area, with the Labs Coordinator invited to attend meetings on the Darwin development, Demand Based Ventilation (DBV), and the IRR Bioquarter. Attendees discussed concerns that there was only one producer with an effective monopoly in DBV. Other institutions including Cambridge and Aberdeen, feeling the pros outweighed the cons, were currently working toward implementation. Strathclyde were at a similar stage to UoE, waiting to see if it was effective elsewhere and if other suppliers came on to the market.

The aim was to be more strategic about finances and self-sustaining savings in future. Estates were currently working on a project with Engineering deciding whether sustainable systems could be incorporated at greater capital cost but with a 3-5 year payback. The Sustainable Campus Fund would be particularly valuable in rolling out improvements across schools. Aggregation made for better control over the process. The SCF would initially be funded at £1million, to set the direction of travel, and aim to generate savings within one year.

### **ROUTINE ITEMS**

#### **7 Breakout Session – Long Term Strategic Priorities & Future of the Group**

The Labs Coordinator facilitated a group break-out session to discuss 3-5 year objectives and targets for lab sustainability - with an emphasis on energy savings and resource efficiency to inform the new Implementation Plan - and evaluate the Group so far, review its remit vis-à-vis labs workshops, and consider next steps.

##### Group A

This group recognised positive discussions and generation of ideas at SLSG, but less success in terms of implementation due to internal barriers which the Group had not yet succeeded in breaking down. More input was needed from academics and senior management, as well as greater student involvement. In terms of future objectives the group highlighted financial and carbon savings in the face of rising utility prices. A fund was needed to support and implement change.

##### Group B

Members recognised the contribution of the Labs Coordinator in engaging and taking plans forward, and the need for dedicated funding to support this role and further labs projects. In terms of 3 -5 year objectives, the group proposed that new up to date design guidelines be produced so all labs across the University would start from the same high level criteria, with internal estates guidelines feeding in, not just using BREEAM but also colleagues' own experience surfaced through wider consultation undertaken at an early stage by the managers and engineers responsible. The group acknowledged the time and budgetary pressures involved, but despite the initial resource requirement this would be gotten back tenfold at the end of the project. A soft landings process beyond practical completion was strongly recommended and needed to be costed in. Effort should be made to influence the procurement process, which was still largely focused on cost, to take a broader perspective. Videos were felt to be very useful in communicating good practice in labs.

There was scope to video demos of O&M manuals at Roslin, though the manuals themselves were still necessary to give the full picture. Existing apprenticeship programmes could be developed and new schemes introduced.

### Group C

This group acknowledged the diverse representation and outreach efforts of SLSG, though it had not yet managed to achieve tangible outputs. Current membership was CMVM heavy and colleagues were asked to nominate potential representatives from the College of Science & Engineering. It was proposed that separate Labs Steering Groups for the two Colleges be set up, feeding in to the main group. Though the intention was to develop objectives across the five main areas, availability of funding may dictate objectives to some extent (e.g. Zero Waste Scotland and a focus on resource efficiency). Overall the aim was to develop an easily communicable vision of where the group wanted labs sustainability to be and promote this to relevant departments, organisations and individuals to secure buy-in and funding. It would be necessary to monitor lab developments within UoE to inform the Group's plans and projects and develop metrics to measure success.

Action – All to send their nominations to the Secretary.

### Group D

The group advised involving SRS Communications and Marketing in future planning. The goal was to get the knowledge of the group back to academics and budget holders who had the influence to roll schemes out. SLSG and the labs workshops were felt to be running well, though concerns were raised about representation of SLSG at SRS Committee and communication up to University level. The group advised enhancing the visibility of monetary savings and where they feed back to. Further engagement with students and academics was recommended, including involving Chancellors Fellows in discussions.

## **8 Labs Business Case Options**

**D**

The Labs Coordinator outlined potential 5 Year Labs savings programmes. Paper D was a summary and visual representation of the spreadsheet circulated following June's meeting, comprising low, medium and high approaches and related resource implications. Four to six actions were planned for the first year, with a number of schemes identified at Joseph Black which were ready to go once funding was secured. Actions tagged as 'Low' were those from the original proposal which could be done in five years. 'Medium' projects were around two years. The aim was for annual savings of £200K in two years through short-term intensive projects. 'High' projects had no financial boundary.

The intention was to use these plans to develop a case for a Sustainable Campus Fund and link to University plans for a 10% utilities cost saving in two years. The final page gave costs, payback periods and carbon savings. The Low actions were the most attractive and readily achievable. The original business case would be expanded, using this Group to check assumptions and advise on which one to pitch for.

Action – All to review the paper, interrogate the figures, sense check and feed back to Andrew.

Action – AA to circulate the spreadsheet including the actual figures.

Action – AA to check if the cost of equipment disposal was included and liaise with FR on general figures.

Action – AA to change CO<sub>2</sub> savings for Medium from 2 to 5 years, to ensure like for like comparisons.

The findings of the Roslin cold storage study may be insufficient in themselves to persuade a large percentage of lab users to change temperatures. Progress could be made by clearing out old samples and if this was done ruthlessly and systematically it could

significantly cut the number of freezers. If funding could be secured for Schools to purchase the hardware and charge PIs a fee for the space then a more efficient approach could be adopted. Under this approach initial SLAs would include the temperature the freezers would be maintained at, so researchers would know from the beginning what they were signing up to, rather than changing temperatures halfway through. A high level of academic support and enforcement would be needed to implement the change.

Action – All to feed back their thoughts to Andrew.

## **9 Funding for Sustainable Laboratories Role**

The Convener gave a verbal update on funding scenarios for the Sustainable Laboratories role, including a proposal for shared funding from across the colleges over three years, linked to three year objectives, as a shared endeavour and commitment. UoE was continuing to make a case to Zero Waste Scotland. The Scottish Funding Council, while expressing interest, lacking immediate funds. Persuading other universities in Scotland to demonstrate that they wanted to take part would help, but it would be difficult to persuade other institutions to demonstrate that interest without the required funding. There were too many other commitments for labs funding to succeed in the planning round. SALIX and capital funding would also be pursued.

Action – All to share their ideas any other potential sources of funding.

## **10 Climate Strategy Review, Utilities Project & Sustainable Campus Fund Update**

The Engagement Manager gave a verbal update on progress of the Climate Action Plan, utilities targets, and potential for a Sustainable Campus Fund. Despite positive developments including the CHP, UoE was not on track to achieve reduction targets. This was largely due to expansion of the campus and student numbers, which was set to continue. Looking at relative targets gave a better picture, but UoE still needed to take action. There were positive stories around the waste figures, commuting, and energy and infrastructure in the longer term. There would be further review of how the targets were set. Performance data had been published in the Annual Report and Accounts for the first time this year, putting climate targets into the main University story. A carbon forecasting and scenarios tool was being developed to help in setting future targets.

Action – All interested in seeing or testing out the tool to contact SRS.

Consultation was ongoing on best practice in carbon management within the sector. The baseline, boundary and scope had been reviewed and a business case around renewables was being developed and would soon be available for circulation. The deadline for the new Climate Action Plan was April 2016. The utilities target was a 10% reduction against business as usual over two years – effectively a £1.8m saving. SLSG would need to identify opportunities for labs to feed in to the utilities saving and to integrate with the Climate Strategy Review.

## **ROUTINE ITEMS**

### **11 Thematic Workshops & Utilities Working Group meetings**

The Labs Coordinator presented for noting this summary and action log from the recent Labs Workshops on Lab Design, Utilities and CPD, as well as Utilities Practical Planning meetings. The workshop had discussed S-Lab design principles, the second version of which had recently been circulated.

Action – All to review and share their thoughts with Andrew to feed back to S-Lab.

### **12 Any Other Business**

There were no other matters raised by Group members.

**E**