INNOVATION REVIEW

ISSUE 3, May 2010

SUSTAINABLE BUILDING DESIGN AND REFURBISHMENT IN SCOTLAND

GLASGOW HOUSING ASSOCIATION’S SUSTAINABLE SOCIAL HOUSING
HISTORIC SCOTLAND: ENERGY EFFICIENT TRADITIONAL BUILDINGS
HLM’S DESIGN FOR HIGHLANDS HOUSING FAIR
CONTENTS

ABOUT CIC START ONLINE 4
EDITORIAL 5
COMPETITIONS 6-7
SUSTAINABLE REFURBISHMENT ONLINE EVENT ON FRIDAY, 4TH JUNE 2010 8
Introduction to the seven webcasts 8-11
How to register at this FREE event 12
Online exhibition and networking 13
OTHER EVENTS 14
Initiatives to support construction innovation in Scotland – 10 June 2010 14
Scottish Environmental Technology Network Annual Conference - 15 June 2010 15
SUPPORT 16-17
Technology Strategy Board competitions 16-17
RESEARCH 18-23
Historic Scotland: Innovative solutions to make traditional buildings more energy efficient 18-23
INNOVATIVE PRACTICE 24-30
Glasgow Housing Association and PRP Architects 24-30
HLM’s design for the housing expo in Inverness 31-38
Lighting refurbishment by Collective Architecture 39-50

Alleviating fuel poverty
VIDEO INTRODUCTION

Jim Sneddon, Executive Director of Regeneration, of Glasgow Housing Association (GHA) talks about the aims of GHA in commissioning a low carbon housing project.

Design by PRP Architects
More on pages 24-30
Historic Scotland: Innovative solutions to make traditional buildings more energy efficient
More on pages 18-23

HLM’s design for the housing expo in Inverness
More on pages 31-38

Regeneration and lighting by Collective Architecture
More on pages 39-50
What is CIC Start Online?

- A three-year project of seven Scottish universities funded by European Regional Development Fund and Scottish Government's SEEKIT programme

- AIM: To embed sustainable building design and refurbishment into practice

- OBJECTIVE: To support academic/industry collaboration in developing and testing innovations, and to disseminate the outcomes in order to facilitate the application of innovations in practice

- WHY?
  - To reduce CO₂ emissions and other negative environmental impacts from buildings
  - To reduce fuel poverty and improve indoor climate
  - To create jobs and support competitiveness of Scottish construction industry through innovation
  - To remove the barriers to the application of innovation in practice

- HOW?
  - Through competitions for academic/industry feasibility studies and for 10-days free academic consultancy on sustainable building design and refurbishment
  - By testing innovations at the testing facilities of the project partners’ institutions
  - By publishing guidelines for the application of innovations in practice
  - By developing and publishing database of design solutions for sustainable refurbishment
  - By providing assistance and advice on sustainable building design and refurbishment to Scottish small to medium sized enterprises
  - By disseminating the project outcomes through the project website, seminars, interactive webinars, webcasts and three whole-day online events that will include an exhibition, a conference and networking facilities
  - By publishing information on products and services for sustainable building design and refurbishment offered by Scottish small to medium sized businesses registered with CIC Start Online.

BENEFITS OF FREE MEMBERSHIP

- Publish information on your company’s products or services for sustainable building design and refurbishment
- Receive a set of headphones with a microphone, monthly E-News and quarterly Innovation Review
- Ask for advice/assistance

Please click here to access the registration page at the project website

www.cicstart.org
Welcome to the third issue of Innovation Review, a quarterly online publication of the CIC Start Online project which publishes news on the context and support for, and research and best practice in sustainable building design and refurbishment. The project activities have recently been included in The Green List 2010, a selection of top 20 projects and initiatives for sustainable development in Scotland in the competition organised by the Scottish Sustainable Development Forum (SSDF). This recognition will enable us to use The Green List logo and promote the project at the events organised by SSDF across Scotland and to reach even more potential beneficiaries of the project activities.

In the second round of the CIC Start Online competitions, closed on 15th May 2010, eight applications for feasibility studies and two applications for academic consultancy have been received. The list of successful applicants will be provided in the next issue. Scottish small to medium sized enterprises are invited to submit applications for the third round by 15th September 2010.

As the webcasts and exhibition booths will remain available until 31st May 2011, you can return to watch the webcasts again and visit the exhibition booths.

As Historic Scotland has been engaged in research into innovative options for improving the energy efficiency of traditional buildings, their article in this issue provides information on two testing programmes into improvements to windows and wall insulation.

Innovative practice is presented by two projects for more sustainable housing. Glasgow Housing Association has commissioned PRP Architects to design energy efficient social housing that will reduce energy costs for tenants and alleviate fuel poverty. HLM Architects present their project for the Highlands Housing Fair in Inverness. Innovative lighting in regeneration projects designed by Collective Architecture show how imaginative lighting can transform the appearance of buildings or playfully provide weather forecast to the passers by.

We look forward to receiving articles written by practitioners on innovations for sustainable building design, construction and refurbishment applied in their projects. Please click here to access Guidelines for articles published on the CIC Start Online website. If you have any questions related to the articles that you would like to submit, please contact me by email to Branka@cicstart.org or by telephone on 0141 273 1408.

Kind regards,
Branka
COMPETITION FOR FEASIBILITY STUDIES

Access to information and the application form at the CIC Start Online website

CALL FOR APPLICATIONS

CIC Start Online is running a competition for joint ACADEMIC/INDUSTRY FEASIBILITY STUDIES. The first round of applications was submitted by 15\textsuperscript{th} January 2010. The second round of applications should be submitted by 17\textsuperscript{th} September 2010.

WHAT ARE THE AWARDS?

The awards are aimed at building relationships between small to medium sized enterprises (SMEs) and higher education institutions (HEIs) and at stimulating collaborative work that will lead to new products and processes for more sustainable building design and refurbishment.

The awards are aimed specifically at funding feasibility studies that will allow the participants (of whom there must be 2 or more, at least one SME and one HEI) to assess both the potential and feasibility of a new product or process. The feasibility studies must focus on opportunities that can either attract follow-on funding from existing sources, demonstrate a clear route to market or indicate a step change in current processes within a company.

The output of the feasibility studies should, preferably, reflect the interdisciplinary nature of the work, the value to be obtained from any partnerships on an ongoing basis and the potential to develop a product or process that can give benefit to the participants and to the Scottish economy.

Applications are requested from any Scottish SME requiring technology transfer from the HEIs.

HOW MUCH IS THE AWARD?

The grants, which are of a value up to £5000, are to be awarded to the HEI(s) to evaluate the feasibility of an interdisciplinary approach to a market led problem. This should be of relevance to a Scottish SME who should be a contributing partner to the study. No restrictions apply to the number of awards that an SME can apply for. There is flexibility in the way in which the funding may be committed. All expenditure, however, must be clearly accounted for in a final report.

HOW MANY AWARDS ARE AVAILABLE?

There are 19 awards available for allocation until January 2012.

RULES AND CONDITIONS APPLICABLE FOR BOTH COMPETITIONS

HOW ARE THE APPLICATIONS ASSESSED?

Applications will be assessed by an independent committee assembled especially for the task, all of whom will have signed appropriate confidentiality statements. Applications should indicate relevance of the proposed innovative product or process to sustainable building design, construction or refurbishment by addressing one or more of the following:

- environmental issues (e.g. reducing CO2 emissions, improving energy conservation and efficiency, using renewable energy sources and building materials, reducing waste, saving water, recycling energy and materials etc.)
- social issues (e.g. reducing fuel poverty, improving indoor health and accessibility, improving the quality of the built environment, improving work conditions, health and safety etc.)
- economic issues (e.g. supporting sustainable economic growth, targeting national and international markets, creating local jobs, improving productivity and profitability, considering whole-life costing etc.).

Proposals will be assessed according to the following criteria:

- A strong opportunity to show the feasibility to research and develop a novel market led product or process
- Opportunity to attract follow-on funding from other sources to research and develop market led products or processes
- HEI track record
- Quality of the work proposed
- Relevance and benefit to SMEs
- Relevance and benefit to the HEIs
- New partnerships that have not jointly received funding from any source
- Relevance to sustainable economic growth
The output of the academic consultancy should be a report that demonstrates the value to be obtained from the advice given through the consultancy and the potential to develop a product or process that can give benefit to the SME and to the Scottish economy. Applications are requested from any Scottish SME requiring technology transfer from the HEIs.

HOW MUCH IS THE AWARD?

The grants, which are of a value up to £3000, represent 75% of the total value of the work undertaken. The in-kind contribution from the companies receiving consultancy should amount to 25% of the total value of the work undertaken. There are no restrictions on the number of times an SME may apply for an award, However, SMEs may only receive one award per year.

HOW MANY AWARDS ARE AVAILABLE?

There are 19 awards available for allocation until January 2012.

FINAL REPORT

The Final Report submitted with the Grant Invoice shall be in two parts. The First Part must detail the work done during the study and outline the outcome of the feasibility study. A summary of the First Part of the Final Report will be available for publication on the CIC Start Online website and by the Scottish Government. The Second Part of the Final Report is NOT for publication. It must include detailed accounting of all expenditure by the HEI and the SME and full details of the SME contribution. If the Final Report includes any confidential material then this should be included in Part 2 which will be available to the Partners and to the CIC Start Online (under appropriate confidentiality agreements if required).

CONFIDENTIALITY AND INTELLECTUAL PROPERTY

The Universities and SMEs applying for the award must consider both confidentiality and intellectual property prior to submitting their application. The university's Research and Innovation Office will be required to approve any application of grant. It is strongly recommended that the applicants make early contact with the university's RIS or equivalent office. The CIC Start Online will, if required, enter into a Non Disclosure Agreement with the applicants. Given the value of the award it is considered unlikely that significant levels of IP will be generated during the study. However the applicants should evaluate the potential for generating intellectual property and consider entering into an appropriate agreement, if necessary. It will be a condition of award that the SME is able to exploit any foreground Intellectual Property within their business sector.

DE MINIMIS RULES

Under EC regulation 69/2001 ("the de minimis aid regulation"), this is a de minimis aid to an SME. There is a ceiling of 100,000 euro for all de minimis aid provided to any one firm over a 3-year period. Any de minimis aid awarded to you under this grant will be relevant if you wish to apply, or have applied, for any other de minimis aid.

PROMOTION OF ACADEMIC/INDUSTRY COLLABORATION

After a consultancy has been completed, the SME and HEI will contribute to a seminar/webinar and a webcast that will showcase different aspects of their collaboration, while taking care of non-disclosure of any IPRs developed through the feasibility study. Where appropriate, academics will write guidelines for application of the product or process in practice. The guidelines will be published on the CIC Start Online website.

For general advice and help send an email to Branka@cicstart.org
As 70 to 80 percent of existing buildings will exist in 2050, the year in which the Scottish Government aims to achieve 80 percent reduction of 1990 levels of carbon emissions, it is clear that sustainable refurbishment of existing buildings is necessary to reduce energy demand for heating, hot water, lighting, ventilation and other fixed services.

The online conference on Sustainable Refurbishment has been prepared in collaboration with seven Scottish universities. The seven webcasts will highlight the barriers to sustainable refurbishment and show how they can be overcome by using existing and developing new technologies and tools.

Please see brief summaries of the webcasts that will be published online on 4th June 2010 and information on how to register to receive the event password.

Towards improving energy efficiency in traditional buildings

Dr Paul Baker, RICH Centre, Glasgow Caledonian University
Mr Roger Curtis, Head of Technical Research, Historic Scotland
Mr Nicholas Heath, Changeworks
Mr Alistair Cant, Lister Housing Co-operative

Dr Paul Baker at Glasgow Caledonian University has collaborated with Historic Scotland in the research on potential interventions on heritage buildings that will reduce carbon emissions in a sensitive manner in order to preserve their architectural values. Roger Curtis, Head of Research at Historic Scotland, explained the Historic Scotland approach in addressing low carbon restoration of listed buildings. Monitoring of a listed building in East Ayrshire before and after the restoration and interventions aimed at reducing energy demand will provide valuable data on the results of the interventions.

Glasgow Caledonian University was also involved in the research on the improvement of air tightness and insulation values of windows in listed buildings. Nicholas Heath of Changeworks talks about the range of interventions that were used for sustainable refurbishment of listed tenament buildings managed by Lister Housing Co-operative in Edinburgh.

Double glazed traditional windows in Edinburgh
Use of solar PV and hot water for buildings

Prof. Tariq Muneer and Hazel Jane Bowmaker, Edinburgh Napier University

Prof. Tariq Muneer at Edinburgh Napier University has been involved in research and demonstration of the use of solar energy for power generation on the campus of the university where he works. Prof Muneer explains how this demonstration project obtained a planning permission, how the photovoltaic panels were installed, what the project costs were and what the monitoring of power generation shows.

Edinburgh Napier University also undertakes research in solar hot water technology. Dr Celine Garnier explains the technology of solar hot water panels, how they can be made and installed, and what temperature of water can be achieved in solar panels installed in Scotland.

The Solar Refurbishment of Scotland

Prof. Susan Roaf, Heriot Watt University
Mr Campbell McLennan and Mr George Goudsmidt, AES Solar
Mr Nicholas Heath, Changeworks
Mr Alistair Cant, Lister Housing Co-operative

Technologies for reducing carbon emissions for heating, hot water and power generation have been successfully used in Findhorn village, near Forres in the North East of Scotland. Forres is also the location of AES, a company that manufactures solar hot water panels. We have visited the AES to film how the panels are manufactured.

Prof. Susan Roaf at the Heriot Watt University collaborates with the AES in testing and using their solar hot water panels. George Goudsmidt, the AES Director, talks about the market for solar hot water panels and future prospects.

The AES solar hot water panels have been installed on the roof of the listed tenement buildings managed by Lister Housing Co-operative in Edinburgh. Edinburgh City Council has approved the installation of solar panels on the listed buildings. The council planner explained how the application for installing the solar hot water panels was provided and the council policies on sustainable refurbishment.
Upgrading Glasgow’s Social Housing Stock—reflections on 1990’s demonstrations and 21st Century reality

Prof Colin Porteous and Ms Rosalie Menon, Glasgow School of Art

Prof. Colin Porteous at the Mackintosh School of Architecture was involved in sustainable refurbishment of social housing since 1990s and used the technologies that were available at the time. More recently, the team of the Mackintosh Environmental Research Unit has collaborated with CUBE housing association in improving energy efficiency of high rise and low rise buildings in Glasgow that they manage.

Rosalie Menon explains how the research undertaken has assisted in decision making on the most effective interventions for reducing energy demand and improving energy efficiency within the budget constraints of the CUBE housing association.

The problem of rural SME contractors and sustainable technologies

Dr David R Moore, The Robert Gordon University

Dr David Moore of the Robert Gordon University talks about the barriers and challenges facing the owners of rural buildings when they wish to reduce carbon emissions of their properties. After examining the feasibility of a range of renewable technologies for a remote rural location, the building fabric, the availability of skilled contractors in the proximity of the property and the budget available for the refurbishment, it becomes clear what technologies and interventions provide best value for reducing carbon emissions within the above constraints.

The webcast highlights the barriers encountered and how they have been tackled by explaining the step-by-step decision making that led to the elimination of some technologies and selection of the design solutions and renewable technologies that were most appropriate for this particular property. An overview of the positive and negative experiences during this particular refurbishment project is also provided.
Retrofit and renewables in traditional rural buildings

Mr John Brennan, University of Edinburgh

John Brennan of the University of Edinburgh assisted the clients who purchased four small listed rural cottages in need of refurbishment to improve their energy efficiency and select a sustainable heating system.

The building owners explain the advantages of the biomass heating system that has been installed, including its automatic response to the external temperature variations, the local controls for the regulation of temperature required for different spaces according to their use, the ease of maintenance, and the 50 percent reduction of costs for heating compared to the cost of heating with oil.

Planning considerations and other issues that were addressed for the sustainable refurbishment of this rural property are also explained.

Simulation-based design tools: real time energy systems performance information

Professor Joe Clark, University of Strathclyde Glasgow

Energy Systems Research Unit at the University of Strathclyde Glasgow has been involved in developing software tools that assist engineers to optimise the design of buildings and their energy systems in order to reduce energy demand, improve energy efficiency and reduce carbon emissions.

Professor Joe Clarke will explain the state-of-the-art of Integrated Building Performance Simulation and consider options for evolving simulation-based CAD systems that allow the interactive evolution of a design hypothesis against performance feedback given in real time.
How to register at this FREE event

- If you are a member of CIC Start Online, you will receive a password to access the webcasts ahead of the event date.

- If you are not a member of CIC Start Online, please register to attend the event at our website www.cicstart.org on the Sustainable Refurbishment page or register to become the member of CIC Start Online at this web page Registration.

- The webcasts will be published on 4th June 2010 and remain available for 12 months following the conference.

- As most of the speakers will be available online during the conference, you will be able to ask questions related to their webcasts and get the answers on the day.

- Speakers’ contact details will be provided and you can also contact them after the conference.

9.15 - 10.00
Towards improving energy efficiency in traditional buildings
Glasgow Caledonian University

10.15 - 11.00
Use of solar PV and hot water for buildings
Edinburgh Napier University

11.15 - 12.00
The solar refurbishment of Scotland
Heriot Watt University

12.15 - 13.00
Upgrading Glasgow’s social housing stock: reflections on 1990s demonstrations and 21st century reality
Glasgow School of Art

14.15 - 15.00
The problem of rural SME contractors and sustainable technologies
The Robert Gordon University

15.15 - 16.00
Retrofit and renewables in traditional rural buildings
University of Edinburgh

16.15 - 17.00
Simulation-based Design Tools: delivering detailed energy systems performance information in real time
University of Strathclyde Glasgow

We look forward to meeting you online during the conference and exhibition on Friday, 4th June 2010!

If you have any problems accessing the online event, please contact craig.bishop@cicstart.org or on 0141 273 1401
ONLINE EXHIBITION

- During the 10 minute breaks between the webcasts, you can access the online exhibition of products and services for sustainable refurbishment provided by Scottish businesses.

- Access to the exhibition is also FREE following the registration to attend the event.

- As the exhibition booths will remain available for 12 months, you can return to the exhibition to find information on the products and services offered by Scottish businesses for sustainable refurbishment of buildings.

ONLINE NETWORKING

- In the Networking space, you will be able to learn more on the expertise available at the participating universities at the Steering Group booth.

- You will also be able to network with the speakers in the Speakers' booth in the Networking space.

- You can chat with the exhibitors at their exhibition booths.

- Join the discussions in the three exhibition pavilions: Environment, Economy and Society!
Initiatives to support construction innovation in Scotland
10 June 2010, Glasgow

Venue
Room 505, Buchanan House, Glasgow Caledonian University, Glasgow G4 0BA

Speakers
- Douglas Fergus - SCC
- Sean Smith - Edinburgh Napier University
- David Kelly - BRE Scotland
- Branka Dimitrijevic - Glasgow University
- Laura Birrell - BRE Scotland

Additional information
This workshop accounts for 3 CPD hours.
If you are interested in attending this workshop, please register your details using the online booking form via the SCC events page at www.scocon.org
If you have any problems please call 0845 8630026.
More information on the SCC can be found at www.scocon.org

Fee
£50 + VAT

Multiple booking discounts available please contact Anita Barrie on anita.barrie@scocon.org or 01382 386085 for details.
Student spaces are free

Register and book online at www.scocon.org
Complete payment form and fax to CIRIA on: +44 (0) 20 7253 0523 or post to: CIRIA, Classic House, 174-180 Old Street, London EC1V 9BP

Visit www.scocon.org for further information

Innovation and technical research support
This presentation will outline technical and innovation support for future new timber based homes that architects, developers, material manufacturers and suppliers can access.

BRE Innovation Park @ Ravenscraig – a vision of sustainable development
Once complete, BRE’s Innovation Park will feature innovative products from more than 80 organisations, which will be integrated into the landscape and/or demonstrated in the zero carbon dwellings.

CIC Start Online: support for innovators in sustainable building design and refurbishment
Led by Glasgow Caledonian University, CIC Start Online supports collaboration between academia and Scottish SMEs in developing and testing innovations for sustainable building design and refurbishment. Outcomes are disseminated through seminars and online communication tools.

Using sustainability frameworks to deliver best practice and value for money
This presentation will focus on the process of delivering best practice in setting benchmarks and targets to deliver a sustainable project.

Target audience and benefits
This event is designed for architects, planners, manufacturers and developers who have an interest in sustainable construction. The presentations will describe latest research on the development and use of innovative products and technologies, and how these can be used in high performance buildings and sustainable developments.

Programme
09.30 Registration and coffee
10.00 Welcome and introductions
10.10 Prof Sean Smith
10.40 Dr David Kelly
11.10 Questions and discussion
11.30 Comfort Break
11.45 Dr Branka Dimitrijevic
12.10 Laura Birrell
12.30 Questions and discussion
13.00 Close

Terms and conditions:
All events must be paid in advance. Confirmation of your booking will be sent upon receipt of completed booking form together with payment. Any registration fee paid will not be refunded unless written confirmation of cancellation is received at least five working days before the event. Substitutes delegates are welcome by notifying the SCC. We reserve the right to vary the programme or cancel the event in case of insufficient bookings. In case of cancellation all monies will be refunded to registered delegates. Personal data is gathered in accordance with the Data Protection Act 1998. SCC will contact you about products and services relevant to you and your organisation.

Please register online at: www.scocon.org
For booking queries tel: 0845 8630026
(Calls charged at local rate)
SETN Annual Environmental Technology Conference 2010
June 15th, Glasgow Caledonian University

➤ Get up to speed with developments in the Scottish environmental technology sector
➤ Hear case studies of how companies have benefitted from SETN support
➤ Find out more about what EU environmental legislation means for your business
➤ See the latest technologies in our exhibition
➤ Take the opportunity for networking for new business contacts
➤ Have a 1-2-1 session with an expert and get advice on funding, business development, carbon reduction, intellectual property and regulation.
Book in advance or arrange on the day

This year’s conference will feature an ample networking breakfast from 9:30 - 11:30 with exhibits and technology posters, followed by talks given by the following speakers:

Colin Murchison, CEC  Barry Love, Environmental Law Chambers
Nigel Holmes, Zero Waste Scotland  Glen Bennett, CEO of EAE Ltd
David Van Al styne, Scottish Bioenergy Ventures
John Fergusson, Binn Eco Park

After lunch there will be interactive workshops about R&D tax credits, embedded resources and more, plus 1-1-1 sessions with experts.
The conference will finish around 15:30.
Please register early, especially if you wish to have a free exhibit.

This year's conference is a collaboration between SETN and the Caledonian Environment Centre at Glasgow Caledonian University.

Thanks to funding from the Scottish Government the event is free to attend but please register early by emailing sem@ed.ac.uk as places are limited. Those wishing to have a free exhibit stand, please contact SETN well in advance. 0131 650 7328

The event is being held in the Refectory Extension at Glasgow Caledonian University. The site is in central Glasgow, close to Queen Street rail station and several multi-level parking garages.

For more information, visit: http://www.gcu.ac.uk/student/aboutmaps.html

www.setn.org.uk

The Scottish Government
TECHNOLOGY STRATEGY BOARD

Open Competitions

Building Performance Evaluation

The Technology Strategy Board has committed up to £8m to fund the costs of building performance evaluation studies on domestic and non-domestic buildings.

We will be funding individual companies and other organisations responsible for buildings for the total cost of evaluating the performance of case study buildings they design, build, own and/or operate. This will help builders and developers to deliver more efficient, better performing buildings.

Studies on domestic buildings will cover either the period immediately post construction and into early occupation (Phase 1 studies), or a period of two years in-use for buildings less than 2 years old (Phase 2 studies). Similarly, non-domestic building studies will be either for buildings under construction and nearing completion (Under Construction) or those in use and no more than 3 years old (In-Use). All studies will be required to use specified protocols, tools and techniques to capture data in a comparable form.

We aim to assemble a substantial body of data for many building types to draw generic conclusions on the performance obtained through various design strategies, building fabric, target performances, construction methods and occupancy patterns, handover and operational practices. These will be shared across the industry with a view to providing reliable information to enable improvements in the performance of new and refurbished buildings through specification, design, delivery and operation.

Funding will be allocated in tranches over two years, with the Initial Project Proposal deadline for the first tranche being 10th June 2010.

Open Date: 10 May 2010

Deadline: 10 June 2010

Website: innovateuk.org

Email: support@innovateuk.org

Call: 0300 321 4357
TECHNOLOGY STRATEGY BOARD

Open Competitions

Integrating smart meters into systems for smart homes

The Technology Strategy Board, in partnership with the Department for Business, Innovation and Skills, is to invest up to £4.5m in innovative collaborative research, development and demonstration projects. The projects will integrate ‘smart’ meters with communications to make a ‘smart’ system that will have an impact on the demand for, and usage of, energy in the home.

This competition aims to accelerate the speed at which innovations are able to enter the market. We are particularly interested in projects which help to understand the way in which consumer demand for energy might change in the light of the integration of smart home technologies.

The competition is open to energy, communications, technology and other companies. Consortia must be business-led and can be science-to-business or business-to-business interactions.

We are particularly interested in projects from those already involved in smart home development.

We expect projects to start in July or August 2010 and all projects must be completed by end of March 2011. We expect to fund projects with a total project value of £400k-2m.

This Technology Strategy Board programme is committed to facilitating business growth and technology-based innovation. It complements other programmes being run by the Technology Strategy Board, in particular those being run as part of the Digital, Low Impact Buildings and Assisted Living programmes.

Open Date: 10 May 2010

Deadline: 8 July 2010

Website: innovateuk.org

Email: support@innovateuk.org

Call: 0300 321 4357
Historic Scotland: Innovative solutions to make traditional buildings more energy efficient

Moses Jenkins, Senior Technical Officer, Historic Scotland

With the drive to reduce CO2 emissions in recent years in response to concerns over climate change, increasing pressure has been brought on traditionally constructed buildings to reduce heat loss and improve energy efficiency. Such buildings have often been termed “hard to treat” and there is a misplaced belief that without costly interventions it is impossible to make any real improvement to such structures. In recent years Historic Scotland has been engaged in research into innovative options for improving the energy efficiency of such buildings. This article will look at two testing programmes which are in the process of completion into improvements to windows and wall insulation and also an examination of some future research work which is planned.

Windows Research

Historic Scotland has been working with Glasgow Caledonian University to test various options for improving the thermal efficiency of single-glazed timber sash and case windows. The results have shown that with appropriate interventions the thermal efficiency of such windows can be significantly improved. The results of the U-value testing have been published by Historic Scotland as part of a suite of Technical Papers.

A standard six-over-six timber sash and case single-glazed window was tested in the laboratory to provide a baseline u-value against which improvements could be measured. The glass (excluding the frame) had a measured U-value of 5.4 which is representative of windows of this type and age. This rating compares poorly to the current Scottish Buildings Standard maximum permitted U-value of 2.0 for new windows.

Firstly simple measures for improvement which did not impact directly on the fabric of the window were examined.

Draught proofing is a common practice to prevent wind from blowing in through traditional windows. The test window was draught proofed, and although the U value of the window was not improved, the air tightness of the window was enhanced considerably, reducing the air leakage by 86%. This will clearly have an impact on heat loss from traditionally constructed windows and is a good starting point when looking to improve on energy efficiency.

1 Technical Paper 1: Thermal Performance of Traditional Windows, prepared for Historic Scotland by Dr Paul Baker of Glasgow Caledonian University, October 2008
The options tested and the improved u-values are summarised in table 1, below. Of the options tested, secondary glazing was the most effective single option, as it reduced heat loss through the window by 63%. Timber shutters are the most effective option of the traditional methods, reducing heat loss by 51% with the other improvements shown below. The greatest reductions in heat loss came from a combination of measures. Using secondary glazing, or combinations of blind and shutters, reduced the U value of the window to below 2 W/m²K, which is the maximum U value allowed by Scottish Building Standards for timber or uPVC windows in new dwellings.

Table 1, results of u-value testing for improvement measures to sash and case windows

<table>
<thead>
<tr>
<th>Improvement method</th>
<th>Reduction in heat loss</th>
<th>U-value W/m²K</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unimproved single glazing (measured at centre of glazing)</td>
<td></td>
<td>5.4</td>
</tr>
<tr>
<td>Heavy curtains fitted to rail on inside of insulated panel above window</td>
<td>14%</td>
<td>3.2</td>
</tr>
<tr>
<td>Shutters</td>
<td>51%</td>
<td>2.2</td>
</tr>
<tr>
<td>Modified shutters, with insulation inserted into panels and covered with 6mm plywood</td>
<td>60%</td>
<td>1.6</td>
</tr>
<tr>
<td>Modern roller blind fitted at the top of the window case inner lining</td>
<td>22%</td>
<td>3.0</td>
</tr>
<tr>
<td>Modern roller blind as option 4, with low emissivity plastic film fixed to the window facing side of the blind</td>
<td>45%</td>
<td>2.2</td>
</tr>
<tr>
<td>Victorian blind fitted to the top of the recess formed by the window case pulley stiles at the side of the upper sash</td>
<td>28%</td>
<td>3.2</td>
</tr>
<tr>
<td>A “thermal” Duette honeycomb blind</td>
<td>36%</td>
<td>2.4</td>
</tr>
<tr>
<td>Victorian Blind &amp; Shutters</td>
<td>58%</td>
<td>1.8</td>
</tr>
<tr>
<td>Victorian Blind, Shutters &amp; Curtains</td>
<td>62%</td>
<td>1.6</td>
</tr>
<tr>
<td>Secondary Glazing System</td>
<td>63%</td>
<td>1.7</td>
</tr>
<tr>
<td>Secondary Glazing and Curtains</td>
<td>66%</td>
<td>1.3</td>
</tr>
<tr>
<td>Secondary Glazing and insulated shutters</td>
<td>77%</td>
<td>1.0</td>
</tr>
<tr>
<td>Secondary Glazing and shutters</td>
<td>75%</td>
<td>1.1</td>
</tr>
</tbody>
</table>

In addition to the measures which were included in this test, Historic Scotland is also looking at other interventions to the fabric of the windows which will improve energy efficiency whilst still retaining their character and where possible their existing fabric. This includes a range of double glazed units which can be fitted into existing sash and case windows to greatly improve energy efficiency but without adversely altering the character of the window. These come in a range of types from fairly simple slimmed down double glazing to more advanced vacuum pane technology. Other options such as acrylic “conservation glazing” which can be inserted against the existing wooden glazing bar are being developed and we will be looking to test these on an ongoing basis.
Solid Wall Insulation Trials

In the spring of 2009 Historic Scotland began trials of 6 different types of internal insulation to assess the improvement they gave in thermal performance and the impact on the health of the building.

The trials are being conducted at a property in Sword Street in the Denistoun area of Glasgow. The building became available as structural repairs and refurbishment were planned and the building owners, Reidvale Housing Association, kindly agreed to allow us access to the building to carry out the insulation trials. The building consists of 6 flats and it was decided to test one product in each. The products chosen were bonded polystyrene bead, wood fibre, hemp board, blown cellulose and two thicknesses of an insulated board. This encompassed the full range of products from natural to more synthetic with the aim that all should be breathable. All internal wall lings had been stripped out during previous refurbishments meaning there were no issues about removing the existing material.

The aim of the trials was to provide information on two measures of performance: improvement in the thermal properties of the wall and the possible level of moisture build up within the wall caused by the installation of the insulation. Clearly the first measure is of great importance when looking at any product to improve energy efficiency. Without significant improvement in thermal performance there is little point in installing the insulation. The second measure is also significant as any build up in moisture within the wall subsequent to insulation being applied could cause long term damage to the building. For this reason it was requested at the outset that the manufacturers of the products aim for an improved U-value of 0.3 and that the product be designed to avoid the creation of a moisture barrier. The baseline measurement of the unimproved wall gave a U-value of 1.1 measured by Strathclyde University before the trials.
The different types of insulation were installed using a variety of methods. The bonded polystyrene bead was injected into the cavity between the existing plasterboard and the wall. The cellulose insulation was sprayed damp directly onto the wall with plasterboard then put over afterwards with the wood fibre material being finished in the same way. The hemp insulation and insulated boards were attached to the wall with a plaster skim coat being applied as a finish. Several of the options required alterations to skirting and other fittings. This would clearly be a consideration where there was a more sensitive interior than existed in Sword Street.

Fig. 7 Finishing blown cellulose insulation applied wet directly onto wall

Fig. 8 Application of bonded polystyrene bead insulation into cavity between plasterboard and wall

The initial results in terms of improved u-values were as follows:

Table 2, improvements in u-value of solid wall property at Sword Street, Glasgow following the application of various insulation measures

<table>
<thead>
<tr>
<th>Flat number</th>
<th>Insulation Type</th>
<th>Unimproved u-value</th>
<th>Improved u-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flat 1/1</td>
<td>100mm Hemp board between timber straps</td>
<td>1.1</td>
<td>0.21</td>
</tr>
<tr>
<td>Flat 1/2</td>
<td>90mm Wood Fibre fitted between timber straps</td>
<td>1.1</td>
<td>0.19</td>
</tr>
<tr>
<td>Flat 2/1</td>
<td>30mm insulated board onto timber straps</td>
<td>1.1</td>
<td>0.36</td>
</tr>
<tr>
<td>Flat 2/2</td>
<td>50mm Cellulose fibre damp sprayed between timber straps</td>
<td>1.1</td>
<td>0.28</td>
</tr>
<tr>
<td>Flat 3/1</td>
<td>40mm insulated board onto timber straps</td>
<td>1.1</td>
<td>0.22</td>
</tr>
<tr>
<td>Flat 3/2</td>
<td>50mm Bonded Polystyrene Bead</td>
<td>1.1</td>
<td>0.31</td>
</tr>
</tbody>
</table>

These results are significant as it can be seen that in all but one example the standard of a u-value of 0.33 or below was attained. Whilst in some cases, notably the hemp board and wood fibre insulation, significant thickness of material was required and the injected polystyrene bead required some re-wiring work prior to use, these tests show that a traditionally constructed mass masonry wall can be brought up to a high standard of thermal performance using materials which will hopefully also prove to be vapour permeable. Historic Scotland tests are still ongoing in this area and it is hoped that in the future, options which can be used to improve in situ lath and plaster can be developed to show that traditionally constructed walls can be significantly improved in terms of thermal performance.
Future Research Work

Historic Scotland has plans for significant ongoing research in this area with a number of projects continuing or starting in the coming months. The trust who run Dumfries House Estate have kindly allowed us access to the Garden Bothy where we are planning to test a wide range of materials. The measures which we are likely to look at testing include the following:

- Leca clay pellets behind in-situ lath and plaster
- Insulated lime concrete floor
- Sheep’s wool insulation in loft and under timber flooring
- Double glazed units installed in existing sashes
- Biomass heating system

Similarly, we are working with Strathclyde Building Preservation Trust at the refurbishment of the old school building in Campbeltown incorporating many measures to improve the energy performance of the building. By looking at measures to improve the entire fabric of these two buildings it is hoped that a template can be developed for improving energy efficiency in traditionally built structures and that this can be developed into an electronic learning tool similar to the Inform House which Historic Scotland launched in 2009. Moses – do you want to explain a little about Inform House to explain what it does? Why it was developed etc?

In addition to this we are looking at continuing to test various specific building elements, in particular floors. We are currently testing an insulated lime concrete floor at Blackburn House. This is to measure its u-value as it seems it could be an effective way of improving the insulation of traditional floors and will provide the basis for other tests and ways of improving their energy efficiency. Finally, also on the Dumfries House estate, we are hopefully going to test 1 or possibly 2 types of insulated external lime based render. This will most likely take the form of render incorporating hemp fibre or clay pellets although this has not been finalised. The aim is to provide a solution which will allow damaging cement render to be removed from traditionally constructed buildings and replaced with a material that both improves the thermal performance of the building and the longevity of the structure.

Conclusion

It is hoped that what is discussed here provides a useful introduction to the research work which Historic Scotland are carrying out to identify the best solutions for improving energy efficiency in traditionally constructed buildings. The research already carried out into measures to improve the thermal performance of windows and walls has identified measures which can be taken to bring these elements up to or approaching modern standards. The future research work is very much designed to build upon these past projects and ensure that new and innovative solutions continue to be identified. This research will hopefully ensure that such traditional buildings can have good energy performance whilst ensuring that measures taken are sympathetic to the structures.
Innovation Review publishes in-depth articles on innovative practice in sustainable building design, construction and refurbishment in Scotland. Images, short videos and/or 3D animations (3-5 minutes) can be submitted with the articles. Please see two articles on innovative practice in the pages that follow.

To discuss the article that you would like to submit, please send an email to Branka@cicstart.org or call on 0141 273 1408.
The Glasgow House: A 'low-tech' approach to the problem of fuel poverty

By Stuart Carr, PRP Architects

In this brief video, Jim Sneddon, Executive Director of Regeneration, of Glasgow Housing Association (GHA) talks about the aims of GHA in commissioning this low carbon housing project that also aims to reduce the energy consumption costs of the GHA tenants and alleviate fuel poverty.

The Context

The Climate Change agenda continues to gather momentum around the world with Brussels, Westminster and Holyrood alike responding with a raft of legislative requirements to reduce the environmental impact of our housing stock. As evidence for global warming due to the increasing presence in the atmosphere of greenhouse gasses, particularly CO₂, becomes part of our scientific orthodoxy the task of addressing the issue for those involved in the provision of housing can seem daunting.

There has been an underlying emphasis on renewable technologies with the Scottish Government's SPP6 guidelines of 2007 establishing a planning framework for renewable technologies. This set a target of 40% of Scotland’s electricity demand to be obtained from renewable sources by 2020. The Sullivan Report of the same year also contained recommendations for the Scottish Building Standards Agency urging a reduction in carbon emissions and the possibility of zero carbon status for all buildings by 2030. In June 2009 the Scottish parliament voted to cut the nation's CO₂ emissions by 42% by 2020 thus setting itself the world's most ambitious greenhouse gas reduction targets.

Whilst these are laudable objectives for the nation the specific problems which Glasgow Housing Association is facing are of a more prosaic and pressing nature. Almost one in four people who live in Glasgow are either GHA tenants or have their house factored by GHA.

Eighty percent of GHA’s tenants are economically inactive but of these some thirty percent are retired elderly. Nevertheless, unemployment among the young is rife leading to a sense of social injustice and antisocial behaviour statistics, which are three times worse than the average for the rest of Scotland. In some areas of Glasgow life expectancy is 56 years compared with the national average of 79 years. GHA initiatives are starting to have a positive impact on these figures but the problems of unemployment and fuel poverty are an ever-present reality. The typical unimproved three-bedroom house in Glasgow costs an astronomical £1100 a year to heat.

The Concept

Having won a limited competition set by GHA with our idea of a house which would have a target cost of £100 a year for heating and hot water we were conscious of the problems of fuel poverty and youth unemployment. We were keen to introduce a new construction method which could be easily understood and implemented by young trainees under supervision, but we took the view that renewable technologies should be restricted to a reasonable minimum to keep the concept simple, easy to build and relatively inexpensive. Experience we had gained with other exemplar projects such as the Sigma House, which we had developed with Stewart Milne at the BRE’s Watford site, urged us to take a 'low-tech' approach in this instance.
We knew instinctively that finding the optimum arrangement for the plan shape and form, ensuring the best standards of insulation and airtightness in relation to available funding and installing the most efficient solar-thermal and heating systems, could help us towards achieving our objective. In addition to these measures we were also keen to build in a degree of flexibility in the design to allow expansion into the roof space. This allows flexibility as an additional bedroom or home office can be created if required.

At PRP we embrace new technologies and are actively engaged in a number of exciting initiatives. As founding members of the Green Building Council we have been contributing to the climate change debate and the need for sustainable buildings and communities for many years. We are currently building 10 zero-carbon homes at Chalvey in Berkshire with Scottish and Southern Energy and believe that these will help to set the standard in the future.

We are certain that new housing will move in this direction driven by government legislation. We are also clear that the fundamental design of the houses must be well considered to avoid the recurring problems of building standards which quickly become obsolete.

For this project we are deliberately avoiding the PassivHaus standards used in neighbouring European countries which aim to achieve net zero annual cost for heating and hot water. We have not sought to meet the German PassivHaus maximum of 15 kWh/m² for space heating or the 30 kWh/m² Swiss ‘Minergie-P’ standard (harmonised with PassivHaus) for maximum total thermal demand for heating and hot water. Whilst we are aware that the BRE is promoting the uptake of these standards we have taken the view that there is much to be gained in the context of this project by looking at the issue from a slightly different point of view.
Realistic Approach

In taking a modest approach to renewable technology in our design for what has become known as The Glasgow House we are anticipating a process of incremental improvement in the coming years where new technologies can be added as they become less expensive and more reliable and maintenance free. We don’t want to saddle GHA and their tenants with a house which has an array of eco-friendly gadgets requiring constant maintenance and replacement and which are difficult for the tenants to control unsupervised. Such systems can arouse academic curiosity but may be wholly impractical where a robust commitment from the residents towards ensuring their success is lacking.

Is it realistic, for instance, to expect an elderly person with no computer skills to show enthusiasm for on-line energy monitoring. The reality for many is that if it is too hot you open the windows, if it is too cold you turn up the heating. When you do both at the same time you blow the budget. The controls we intend to install will therefore be easy to read and understand. Coloured lights in a conspicuous location will indicate energy usage encouraging the occupants to be more regularly aware of the need for energy conservation.

Individual room temperature monitoring and a low carbon mechanical ventilation and heat recovery system will help to maintain a fresh atmosphere and comfortable temperature in each room reducing the need for window opening in the winter.

GHA’s Executive Director of Regeneration, Jim Sneddon, and ultimately the Executive Committee, responded very positively to this suggestion as it chimed with the discussions which they had been having and their aspirations for the living environment of their tenants. The house itself is only a part of a broader objective to enhance or recreate sustainable communities with a sense of neighbourhood, community spirit and civic pride. The larger context is therefore as important as the house itself but every good idea needs a starting point and we anticipate that a community based approach to sustainability and energy efficiency looking at all available opportunities will be undertaken as the concept gathers momentum.

In the meantime funding for the construction of two prototypes and their shell form mirror images at the Skills Academy in Norfolk Street has been agreed between City Building (Glasgow) LLP and Glasgow Housing Association and work is well advanced on the superstructures of two alternative construction types: a cellular clay block system and a timber frame system.
Our remit has been to ensure that the two forms of construction are built to the same standards of insulation and airtightness based on identical floor plans. This particular phase has the limited objective of testing any problems implicit in the different types of construction and establishing the areas of on-site construction work and factory fabrication which can best be carried out by Skills Academy apprentices under supervision.

It will also be possible to assess the performance characteristics of the building fabric in relation to heat loss or overheating and compare running costs for the MVHR systems and whether these are necessary in either or both of the prototypes. The prototypes will not be inhabited so there will be no real data based on actual family occupation available until the next phase of habitable houses at another site in Glasgow gets underway. This prototype phase gives us the luxury of being able to test the thermal and acoustic properties of the construction and to iron out any glitches in the detailing. We can also introduce and test new systems in the coming months and years while the shell houses provide an ideal environment for the trainees to experiment with kitchen and bathroom installations and other trade skills.

The key features of the design are:

- Linking of the houses in semi-detached or terraced arrangements
- A simple square plan shape to achieve a cube shaped external envelope
- Two-storey construction to reduce footprint and roof size
- Lounge and kitchen layout which can be flipped to achieve best orientation
- Room in the roof potential without structural alterations
- An east, west or south facing sun space to capture passive solar energy
- The best available locally manufactured double glazed windows
- High levels of insulation to floor, roof and walls in both construction systems
- Simple forms of construction to minimise on-site construction complications
- Off-site prefabricated roof and floor panels craned into position
- Timber kits and kitchens from Royal Strathclyde Blindcraft Industries (RSBi)
- Highly efficient heating system and easy to use controls
- Solar -thermal roof panels with integrated twin coil cylinder for hot water
- Educational programme for residents in use of systems and ongoing support
- Eco-friendly easily maintained gardens with fruit trees and berry bushes
- Garden features constructed from reclaimed construction
- Homezone neighbourhood layouts to increase security in street play areas.

In setting out these criteria the objective has been to find the ideal mix of components. It is self-evident that families living in these houses will use the available hot water to a greater or lesser extent so the size and type of solar panels and the size of the hot water cylinder has been the subject of some debate. Too big and the energy will not be used, too small and we don’t get the full benefit of the solar gain available. Evacuated tube panels are the most efficient but these are expensive, quite unsightly and likely to attract unwanted attention from children. We have settled on two flat plate solar panels with one on the west facing roof and the other on the east. These look a little like large rooflights and are set into the roof tiling rather than raised above it. They feed into the bottom coil of a highly insulated 210 litre HWC located in a coomb cupboard.

We are aiming for a level of airtightness of 4 m3/m2hr at 50 Pascals. This means that mechanical ventilation and heat recovery is not strictly necessary since these generally apply to airtightness levels below 3. However, we are conducting an experiment with a state-of-the-art MVHR system to see if this enhances air quality further. We have detailed the buildings to ensure good airtightness but we will not be certain of the outcome until we can test the buildings on completion. These measurements will enable us to make appropriate adjustments in future projects. We anticipate that the timber frame construction will be more dependent on MVHR than the block house where humidity levels are better controlled by the clay walls.

In the prototype we will obtain heat from the sunspace by opening the French doors at ground and first floor levels. Overheating of the sunspace can be controlled by opening two integrated roof lights in the glass roof section. If this natural method of using the passive solar gain proves to be ineffective we shall consider delivering the heat to the hallway of the house by means of a ducted fan linked to a temperature sensor.

In opting for a single skin of ‘Thermoplan Ziegel’ multiple-void clay blocks, rendered externally and plastered with an in-situ concrete floor slab, we are providing thermal mass as an integral element of the construction system rather than adding it in the form of dense blocks between timber studs as we see in PassivHaus construction. The blocks will accept passive solar gains with their high thermal capacity. Energy is stored in the walls and floors to even out temperature fluctuations throughout the day. The blocks are used extensively in other European countries and have been shown to reduce the risk of overheating through solar gain in summer. By adding 100mm of wood fibre insulation to the external face of the block we achieve a U-value of 0.15Wm/2K. The timber frame wall panel has also been insulated to this level.
At this stage we are dependent on our SAP and NHER calculations which indicate that we can come close to our target but we are awaiting a final conclusion to our discussions with Scottish and Southern Energy regarding the energy tariff which is to be used in the calculations before we can be certain about the figures. Even then the calculations are based on the best available methods of assessment but can not be confirmed until the follow-on project when the houses will be inhabited and monitored.

Having carried out a proper assessment of the likely additional costs of energy for running appliances and lighting etc. we are confident that total energy bills will fall outside of the danger zone for fuel poverty. We can reasonably expect additional electricity use to add 37 kWh/m².

This would add 3,596 kWh (37 x 97.2 m²) to the house. Looking at tariffs and standing charges already available we can assume electricity costs including standing charges of around £510. If we conservatively assume a gas bill for heating and hot water of £140 we would have a total annual energy cost of around £650 or £12:50 per week. Provided household income exceeds £125 per week fuel poverty is avoided where this is defined as higher expenditure on total energy costs of more than 10% of household income.

In keeping with the low-tech ethos locally sourced windows are hybrid aluminium and timber composite frames with double-glazing at 1.2 W/m²K, rather than PassivHaus triple at 0.8 W/m²K. The U-value is ‘whole of window’ rather than the more misleading ‘centre pane’ calculation.
This takes account of the thermal performance of the frame and any air leakage. Differential movement between the fully recycled and recyclable aluminium exterior facing and the timber frame is overcome by allowing a gap between the different materials with sliding fixings.

Frames are jointed by a proprietary method using nano technology, which prevents joints opening in future, conceals all end grain cuts and seals end grain against the possibility of moisture absorption. The frame is manufactured from engineered timber with knots, and other weaknesses removed. Sitka Spruce is the timber used due to its excellent thermal properties and ability to take any type of finish. All timber is sourced from PEFC approved forests owned and managed by the manufacturer. All engineered timber is designed to reduce wastage to a minimum. Wastage goes into multiple particle boards or biomass pellets. Local fabrication reduces transportation.

Heating is by standard radiators fuelled by gas, rather than low-temperature and low-energy alternatives such as heat pumps serving warm-floor serpentines although we may wish to look at such alternatives in the future. We are installing a condensing gas boiler with a SEDBUK efficiency rating of 90.3% which is the highest efficiency level we could achieve for an A-rated wall-mounted boiler.

Slightly higher efficiencies are possible with floor mounted boilers but these would be difficult to accommodate and wasteful of space. The system allows for the water to be separately timed with the option to programme the space heating for three periods throughout the day and the hot water for two periods.

The low carbon mechanical ventilation and heat recovery unit is about the size of a medium suitcase and is located in the top loft space. The unit costs between £15 - £18 per year to run for a family of four and has a coefficient of performance rating of 1.35, i.e. for every watt used to run the unit it delivers back the equivalent in heat of 35 watts. The fan runs at quite low speeds but can be boosted automatically to cope with increased moisture. The unit is the quietest available in today’s market with no evidence of sound transference between rooms. Baffles are fitted to the pipes to diminish fan noise transmittance. The kitchen extract point is located a short distance away from the cooker to avoid grease entering the system and a recycling cooker hood to catch grease and steam is fitted separately. The duct sizes can be either 125mm diameter or 204 x 60 rectangular. These can pass through the webs of the TJi floor joist to ensure complete concealment. The system is SAP Appendix Q certified with 90% heat transfer efficiency and achieves 0.81 watts per litre per second specific fan power.
Lighting throughout the house is 100% low energy with lamps delivering at least 40 lumens per circuit watt. Proprietary recessed fittings have been selected which protect the fire and acoustic integrity of the ceilings in which they are mounted. Scottish and Southern Energy have designed the electrical systems to ensure an attractive and user-friendly installation with socket located at 450mm above floor levels for ease of access for the elderly and disabled residents.

We are currently designing different types of sustainable garden as exemplars to give an appropriate setting for the prototype houses and to encourage biodiversity. The four back garden designs, Grow & Play, Outdoor Living room, Cottage Garden and Sensory Garden are each designed for different life stages and the changing needs that come with those stages. Front gardens are to be of a more formal and less diverse nature with factored maintenance. This will ensure that all of those living within a homezone can benefit from a sense of care and respect for the streetscape leading to the approach to their homes.

By these measures we seek to improve the quality of life for many of GHA’s tenants. We are aware that the house itself is only one aspect of the process of creating sustainable communities but we believe that good quality attractive low-energy housing is a reasonable starting point. The way in which the permutations of the design are thought through for larger and smaller houses based on the same principles will be just as important. The context in which these are assembled to create attractive secure places to live will determine the quality of the built environment. Above all, the attitude of the residents is paramount. Support will be given to those who are looking for opportunities - Glasgow Housing Association is quite clear on this point - and lifestyle changes will be encouraged which seek to improve the health and the quality of life for the people who will live in these communities.
A Scottish Passive ‘Hoose’

By Ross Barrett, Associate, HLM Architects

Look back 10-15 years and there was little or no mention of the term sustainability or zero carbon amid the architectural or construction press. In 2010 we cannot now escape the concept of low energy or sustainability and it seems that the industry has come a long way in a relatively short time. Arguably, however, it needs to do a lot more to meet the increasing regulations and expectations being forced upon us all.

The question really is, do we as an industry have a long term workable solution to respond to the likes of the Code for Sustainable Homes in England and Wales or the Low Carbon Building Standards Strategy for Scotland (‘the Sullivan Report’)?

The Sullivan Report makes some sensible suggestions that increasing thermal insulation and air tightness – i.e. the old adage “build tight and ventilate right” is achievable within the realms of developer house building but the full zero carbon ambition (or net zero carbon as it more likely will be) may not be readily achievable without expensive renewable add ons likely to be entirely unaffordable to the mass market housing industry.

Here we aim to fuel some further discussion on that low carbon housing strategy and look at how we might learn from Germany and adapt their standards to the Scottish climate. Our work on the Passive House project at Scotland’s Housing Expo might inform or even inspire the industry towards a workable and realistic solution for future low energy housing.
It is perhaps a well timed endeavour, following Colin Porteous’ article on his low energy housing study tour to Switzerland and Germany in the previous CIC Innovation Review (March 2010), Peter Wilson’s ‘Actively Passive’ Article in Timber and Sustainable Building (March 2010) and Stef Bell’s ‘The Passive House Standard: an Introduction’ from AT (April 2010).
Scotland’s Housing Expo

Scotland’s Housing Expo will be a unique event, based upon similar models found in mainland Europe, particularly Finland where historically the housing fair concept has proven very successful in stimulating quality design and innovation in Finnish housing. The Expo aspires to be a catalyst to prompt a similar kind of change within the Highlands and throughout the UK.

The Expo itself will showcase over 50 architect-designed houses, set in four unique zones, featuring innovative construction and cutting edge sustainable systems plus the very latest in product design, landscaping and interiors. The homes, which have a strong focus upon high quality design, innovative technology and the use of sustainable systems and features, will be available for sale on the open market with 40% available for rent through two local housing associations after the event.

By creating an exemplar community to a fantastic masterplan by Johnny Caddell at Caddell2, the expo will act as a model for future housing design and development. The legacy of the Expo will be a living, breathing, contemporary village which hopes to significantly influence the standards of housing in Scotland and the UK in years to come.

HLM Architects designed the competition winning scheme for Plots 11/12 within the masterplan and are working with O’Brien Properties and Buro Happold Engineers to deliver the units ahead of the event. The Scottish Passive House Centre (SPHC) also played a key role in the project, supporting the design team through the detail design stages with energy efficiency consultancy and Passive House Planning Package (PHPP) Calculations. They will also carry out the air pressure testing to confirm the buildings as some of the most air-tight in the UK and will supply vital Passive House components for the construction of the units including the MVHR System and Triple Glazed Passive House Certified Windows.

Passive Journey

Our Passive House journey began in early 2007 when presented with the opportunity to look at the Highland Housing Fair competition (as it was then known). The competition organised by the RIAS and initiated by the Highland Council and the Highland Housing Alliance, set out to look for innovative, low energy housing which would look to raise the bar for Scottish and UK housing.

The competition gave our practice the opportunity to continue our exploration of a low energy approach to our buildings and in the context of previous work we had done on the Inverurie sustainable housing competition and a number of larger built projects, we embarked upon an investigation of European approaches to low energy housing design.

Eventually we looked towards the model of the Passive House, which refers to the rigorous standard for energy efficiency in buildings pioneered in Germany in the 1990s. Translated to Scottish Housing it results in ultra low-energy buildings, dispensing with conventional heating systems altogether. The units will be some of the first Passive House schemes to be constructed in Scotland (and the UK) after Gokay Deveci’s Passive House at Dunoon was completed and subsequently certified by the SPHC recently.
Passive House Design

Taking the competition zone theme of solar design, our terrace exploits the climate and in particular solar energy to significantly reduce energy consumption as part of the Passive House philosophy. The main living spaces are orientated to the southern climate-inclusive side of the house using the elements and climate – to reduce reliance on energy; the utility spaces to the north inhabit what appears to be a thick, heavily insulated north wall – excluding the cold climate and closing out the elements. Small openings are provided in the north wall creating the effect of a quiet demeanour to North Street while minimising overlooking. The rear of the house, however, is intended to be much more private and, in a sense, more dramatic and is therefore treated with a more modern approach embracing the climate. Large expanses of south facing glazing help to create an open feeling towards the garden and to the woodland and trees beyond. At night the glazed living spaces can glow beacon like into the dark reaches of the garden.

HLM’s terrace is one of the first Passive House Schemes in the UK, and will achieve an 80% reduction in energy consumption (heating, domestic hot water (DHW) and electricity). For example, a typical three bedroom new build in Scotland of similar floor area, would consume approximately 15,000 kWh/a for heating energy. The heating demand estimated for our Passive House is 1,430kWh/a (less than 1/10th of a conventional new build house).

The maximum power output for the heating has also been calculated at 9W/m² (or 963W for the whole house) just below the maximum Passive House threshold of 10 W/m². The household appliances and occupants of the house will produce enough heat to cover this demand – with one person producing 60-100w heat. We also calculated that a hairdryer could heat the house on a cold day!

This achievement is made possible by careful orientation, shape and a compact form taking advantage of the climate and solar gains and using a closed panel timber frame system to achieve a Super Insulated Building Fabric with the U-Values for walls, roof and floor of 0.1 W/m²K and windows a U-Value of 0.71W/m²K.

The units also utilise a balanced mechanical ventilation system with heat recovery system (MVHR) with 88% efficient heat recovery – this helps reduce heating bills but just as importantly provides cleaner, fresher excellent quality of indoor air, free from pollutants. This makes the internal environment ideal for allergy or even asthma sufferers and we are aware of some ongoing research into the benefits of the Passive House concept and asthma sufferers. It is also important to say, however, that home owners can still open windows if they want to – the MVHR will still recover heat from the exhaust air.

Careful attention has been paid to achieving air-tight design in close conjunction with the timber frame manufacturers, RTC in Elgin, and window suppliers, Dynamight Internorm in Rosyth, to achieve a significant reduction for ventilation heat loss with a target of at least 10 times better than current Scottish building regulations. This will be guaranteed by on-site air tightness testing as soon as the envelope is complete with a further test at completion.

A heat pump to produce DHW helps reduce the primary energy value and therefore, together with the measures above, lowers the CO2-emissions for space heating, DHW and electricity (i.e. the overall energy consumption) to about a fifth of a comparable house from the existing stock (i.e. an 80% overall reduction).
Materials, such as the FSC-certified larch timber cladding for the external walls, are being sourced locally (within 60 miles), and off-site closed panel timber frame prefabrication by RTC (using predominantly Scottish Timber with 80% recycled content insulation) will reduce pollution, waste and transport significantly.

The gardens are being landscaped with local species to enhance wildlife habitats and encourage biodiversity, while allotting space for composting and garden agriculture.

Some technical information about Plot 11+12:

| Type of building: | Private Residential |
| Client: | Highland Housing Alliance/ O’Brien Properties |
| Description: | A terrace of 3 family houses |
| Town: | Milton of Leys, Inverness |
| Treated floor area: | 107m² ea (321m² total – 3 units) |

Construction:

| Construction method: | Prefabricated Closed Panel Timber Frame System (RTC PassivWall) with prefabricated floor, wall and roof cassettes pre-insulated with 80% recycled content glasswool insulation |
| External walls: | Locally Sourced Larch Timber Cladding from FSC sources |
| Floor slab: | Ground Bearing Concrete Slab with 200mm rigid insulation below |
| Roof: | Fibre Cement Profiled Sheet with Fakro Rooflights |
| Windows: | Internorm Edition PassivHaus Aluminium Timber Composite Windows, U-value: 0.71 |
| Doors: | Internorm Edition PassivHaus Aluminium Timber Composite Doors |
| Ventilation: | Balanced mechanical ventilation system utilising Passivhaus certified heat recovery unit with 88% efficiency (according to PH test methodology) (PAUL atmos 175 DC), distributed using 100-125mm diameter ducting within first floor and loft floor cassettes |
| Heating: | Predominantly through Solar Gains, Internal gains and Recovered Heat with a back up consisting of Wet towel Rails in bathrooms and supply air duct heater batteries |
| DHW: | Un-vented hot water cylinder served by an air source heat pump system as the primary source of heating and a backup electric immersion heater |
| Other ecological aspects: | Locally sourced materials, off-site prefabrication, enriching of biodiversity through garden landscape design – enhancing wildlife habitats, composting and providing opportunities for food production |

Key figures:

| Air tightness: | target: n50 <= 1m³/h |
| Heating demand: | 14 kWh/(m²a) |
| Heat load: | 9 W/(m²) |
| Primary energy demand: | 109 kWh/(m²a) |

Designers:

| Completion: | August 2010 for the Housing Expo |
| Architect: | HLM Architects |
| Passivhaus planner: | HLM Architects / SPHC |
| M+E Engineer: | Buro Happold - Glasgow |
| Structural Engineer: | Buro Happold - Glasgow |
| PH Certification: | Through SPHC |
PH Costs

It’s generally accepted that a low energy building whether a house or a multi-storey office will have a greater capital cost and Passive House is no different. Although, as yet, we lack specific cost data on any completed Passive House projects in the UK, it’s generally acknowledged that a Passive House construction could cost between 10-20% more than a conventional new build house. Predominantly the additional capital expenditure is invested in an upgraded building envelope including additional insulation, higher performing windows and a greater attention to air tightness as well as a basic MVHR with small diameter supply and extract ducting throughout the house.

To consider that this investment reaps an 80-90% reduction in energy consumption and in the context of rising energy bills (the average household bill recently cited as £1,000 per annum) the capital costs are eclipsed by the potential energy savings over the lifetime of the house.

To combine this with increased comfort levels and a dramatically improved indoor air quality it is clear that there are a number of significant benefits to Passive House which you can’t necessarily ‘put a price on’ or calculate the benefits directly through life cycle analysis.
In Germany, however, we are aware of initiatives whereby a potential home builder can apply for a Government grant to cover the additional 20% expenditure thus making Passive House Building virtually the norm. We also know of schemes whereby ‘first time’ Passive House architects can have some or all of their fees paid in order to cover the additional time and resource spent getting to grips with the Passive House model.

With most Passive House projects to date seemingly restricted to one-off self build projects (other than at Dunoon built by Fyne Homes Housing Association), it appears that the model is not yet attractive enough to the developer driven residential market in Scotland or indeed the UK.

We believe, however, that with increased understanding and potential larger scale Passive House developments (where repetitive elements may be increased), it may be possible to reduce the costs of passive house construction within the affordability envelope of developer housing, of course perhaps relying on an increased market value for a better quality housing product.

As a result we have begun speaking to local councils, housing associations, care home providers and even forward-looking developers who want to know more and who want to be well placed to deliver Passive House on a bigger scale, perhaps when the market or legislation demands it.
Going Forward

Despite a number of challenges for the client group over the past two years, not least the world financial crisis, the Expo event will take place later this year, as Scotland’s first ever housing fair and will be open to the public for the entire month of August 2010.

We recently started on site with our terrace of three family houses and construction progress is swift with the whole timber frame erection sequence for the three units taking only nine days. We aim to complete the works in early July ready for final Passive House Certification by the Scottish Passive House Centre.

We have also taken some key steps to involve national and international expertise in the form of the Centre for Timber Engineering and the Scottish Energy Centre at Napier University in Edinburgh, with whom we have set out plans for a series of Post Occupancy Evaluation and Energy Monitoring measures in order to help us all understand the successes and issues associated with building a Passive House in the Scottish and UK climate. We are currently trying to secure additional funding from our client and through Scottish Government to enable this to happen. Our intention is to evaluate and compare the results from the 3 different families which make up our Passivhaus terrace over the course of 12 – 18 months following occupation.

You can follow the progress of our plot construction via our online blogs on both the Urban Realm website; www.urbanrealm.co.uk (formerly Architecture Scotland) and Inside Housing magazine’s website www.insidehousing.co.uk as well as the main Housing Expo website.

Over 30,000 visitors are expected to the event in August 2010 which is being billed as “The single most important architecture and design event to take place in Scotland over the past decade”. While the individual houses will be the core of the Expo event, there will be a series of supporting exhibitions, talks, seminars, street markets, performances and themed events, some of which HLM Architects will be taking a key role in. We look forward to seeing you there.

Zero Carbon may be the new black, but can Passive House be the new green?
Exploring the link between Lighting, Regeneration and Sustainable Place Making

By C. Houston and G. Hogan of Collective Architecture Ltd, Glasgow

Sustainability is a broad term which embraces a spectrum of issues: social, economic, cultural and physical, all of which are anchored on the principle of creating a future for all which is healthy and positive. Sustainable places are recognised as those with the right conditions to allow a community to grow and flourish.

For Architects, environmental impact is no longer the sole measure of sustainability. Our role has expanded. Our clients, particularly those in the housing sector, are now looking to adopt a people-led approach: building places that people want to live in and be part of. Educating communities, changing habits and encouraging respect for the environment through the design process is integral to this.

For many years now, Collective Architecture has promoted artificial lighting as a valuable tool in regeneration and sustainable place making. It is considered to be hand in hand with the wider regeneration objectives and is often used as a means to engage local people in the design process.

These benefits are now being recognised by policy makers and funders who are seeking to redirect the funds usually reserved for city centre lighting: for example public buildings and prestigious monuments.

This article sets out to demonstrate that lighting is a valuable tool in regeneration.

**How is artificial lighting used in regeneration?**

Lighting is a hugely creative medium. It allows a designer to explore colour, texture, intensity, volume and shade. It is not constrained. It can be permanent or static, fleeting or animated. It can transform, enhance, obscure, draw attention to or tell a story about an object or place.

For a local person or resident, the language of lighting is easy to understand. Lighting can facilitate a people led approach by inviting creative input at the consultation stage. The time taken from concept to installation can be very quick and once installed, the effects are immediate. It is the positive effect of community led lighting that facilitates place making. Inherent issues such as identity and the sense of belonging can be investigated and strengthened. This article looks at examples of lighting which have been successful in promoting the regeneration of an area.

(i) **CASE STUDY - CRANHILL WATER TOWER, GLASGOW**

1. Cranhill was an area of renowned crime and vandalism. The local water towers were regularly broken into, windows broken and in extreme circumstances, water supplies contaminated by vandals depositing dead pigeons in the main tanks. The problems were so profound that the towers became an icon of all the problems suffered by the area. Resented by many, the residents would have been happy to see the water towers demolished.

Collective Architecture Ltd (formally Chris Stewart Architects), was approached to look at ways of regenerating the tower and its immediate surroundings. Community meetings were held and it was through these that the worst of the problems became apparent. However, the community were determined to turn a new leaf. The design process was opened out to the local people with workshops held and schools invited to produce sketch ideas.
3. Cranhill Water Tower
A sculptor joined the team and was able to interpret these ideas into the design of fencing and feature artworks. The themes focused on water as the basis for the lighting intervention. A canvas was created by painting the towers white and replacing windows with durable glass block. Lighting trials experimented with cool shades of blue against green and red.

A launch event was organised as a festival of light. Steering group members stood proudly next to the towers and the sculptures knowing that it was their hard work that had made this possible. School children and participants in the workshops looked on as they could see their ideas and themes manifested in the show of light. Suddenly Cranhill was back on the map as the transformed object became the focal point for further regeneration in the area.

Collective Architecture (formerly Chris Stewart Architects) was approached to look at another water tower this time at the opposite end of Glasgow in Drumchapel. Once again, this was a community led initiative with steering groups and workshops.

“The water tower has brought many benefits to the community of Drumchapel, with the most noticeable being the positive attitude that it brings to many of our residents.” Steering Group Chairperson

Further water towers in Garthamlock and the B-listed Titan Crane in Clydebank have been transformed through lighting.
Castlemilk is an area of Glasgow that has undergone significant regeneration in the last 15 years. Huge areas of flatted developments and council schemes built in the 1960s to counter the tenement clearances have been overhauled with new facades or re-masterplanned to make way for new housing. Some of the Glasgow's most successful regeneration projects can be found here, for example the master planning in and around Castlemilk Stables which now incorporates new housing and a range of facilities for local people.

Collective Architecture Ltd was approached by a local housing trust to look at a group of 20 storey blocks of flats due for renovation. Prominently positioned on the skyline and visible from distances, these had become a substantial feature in both Castlemilk and the wider southside community.

Mostly elderly people lived here and the blocks were well looked after, however the facades and windows were beginning to fail and in were now in need of desperate replacement. Proposals were in place to overhaul these facades, removing the tired looking corrugated metal and replacing this with a fresh new facade system incorporating added insulation to improve heat loss problems.

Collective Architecture’s involvement came about through the Trust’s wider role responsibilities and a desire amongst committee members to complement the regeneration in some form. Collective Architecture had previously delivered a number of small scale lighting interventions to neighbouring 3 storey blocks in the area. These were successful and provided the starting point for new proposals. Collective Architecture Ltd working closely with the client, developed three broad aims for the new proposals:

- To reinforce the tower block’s identity as an important landmark through lighting.
- To minimise the ecological impact of the development.
- To raise environmental awareness through consultation and education.

From this emerged the idea that the lighting installation should do more. In effect, the lighting should justify its own existence by providing added value for the community. The idea that the lighting should communicate evolved. With the committee members on board, it was decided that the lighting should convey the weather outlook. This tied into the theme of raising environmental awareness and climate change.
Contact was made with the Energy Savings Trust to discuss opportunities for renewable energy in an attempt to make the installation as self-sufficient as possible in energy use. This seemed sensible at the time as the towers were well positioned to capture prevailing winds for wind power and the rear facade was perfectly south facing with no overshadowing for solar technologies. In order to assess the suitability of this combined approach the EST suggested we make contact with the ESRU unit at Strathclyde University.

A feasibility study was carried out to test the ratios of wind power to solar power to determine the ideal balance in meeting the electricity demands of the lighting installation. Two options were investigated for the PV system: facade mounted and roof mounted, both integrated into the building fabric to drawings produced by Collective Architecture Ltd. Likewise, two options for turbine positioning were investigated: roof mounted and ground mounted. To predict electricity generation from the wind turbine, standard Glasgow weather data was used and the typology of the surrounding building was taken into account for the simulation.
The demand/supply matching analysis tool “MERIT” was used as the software programme which would assess the balance. A total of 17 scenarios were investigated and from this the following conclusions were made:

- The wind turbines would produce between 9 and 20 MWh during the course of the year.
- Roof mounted wind turbines would perform 3 times better than ground mounted turbines.
- Consideration was needed on turbulence issues and how this could affect the efficiency of the turbines.
- Photovoltaic arrays would produce between 8 and 13 MWh.
- There was no significant difference in energy production between roof and façade mounted PV.

A final proposal was developed based on the findings from the feasibility and budget costs calculated as follows:

<table>
<thead>
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<th>Budget Costs</th>
<th>Wind turbines</th>
<th>Photovoltaics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>£82,500</td>
<td>£239,400</td>
<td>£321,900</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>£321,900</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>£450,311</strong> (including approvals, fees and VAT)</td>
</tr>
</tbody>
</table>
Unfortunately this device led approach was prohibitively expensive and it was not possible to demonstrate that the payback would be worthwhile. The solar costs were based on actual quotes from suppliers and included full PV installation for each of the south stairwells. In the course of feasibility, the specified PV panels were discontinued to be replaced by new, more expensive PV panels. The lack of grant funding compounded the problem.

It was at this point that the energy proposal shifted emphasis. The proposals moved from investigating onsite micro generation to looking at securing energy from offsite large scale generation. With extensive wind farms proposed in Glasgow, it seemed sensible to adopt green energy agreements for powering the installation. The large scale installations at sites such as the Cathkin Braes were much more efficient and ideally placed to avoid many of the turbulence issues that we had tried to overcome in our proposals.

Returning to the focus on consultation and raising awareness in environmental issues, a community workshop was held with residents and the wider community. Collective Architecture Ltd presented the proposals and the vision developed through working with the steering group.

It was an opportunity to engage local people on the principles of what had been proposed. How did they view the three towers as an important landmark in Castlemilk? What was their view on climate change? How should the consultation continue, particularly in relation to raising environmental awareness?

The feedback was positive. Questionnaires were returned and further interviews took place. It was recognised that young people had an important role to play in the development of the proposals.

The Wise Group’s Community Action team and Clean Glasgow coordinated a series of workshops with each of the 5 primary schools in the immediate vicinity of the high rise blocks.

The workshops were divided into two sessions: the first focussing on energy use and recycling followed by an interactive session with energy games, litter picks and graffiti removal. The workshops were well received.

Creative input was also sought through the consultation process. A palette of colours was developed to represent each tower with each of the climatic conditions being displayed. Community involvement continued at the trials and testing stage. A mobile film and theatre bus was hired to facilitate remote testing in a car park opposite. Each of the towers was lit up with the spectrum of colours and animated sequences displayed.

The sequences were designed to communicate through animation and a climatic forecast. For example, rapidly falling bands of blue would represent a heavy rain forecast and flashing white streaks would represent lighting.

The technology allowed the design team to tailor the sequences real time. With local people also in attendance, the team could ensure that the sequences remained meaningful.
18.a

North wind = Rising bands of colour
South wind = Falling bands of colour
West wind = Bands of colour moving Left
East wind = Bands of colour moving Right
North West wind = Bands of colour moving upwards and Left
South West wind = Bands of colour moving downwards and Left

18.b

Cloudy = Static blue colour
Sunny intervals = Static blue colour with yellow band
Drizzle = Slowly falling bands of colour
Light rain shower = Slowly falling bands of blue with yellow
Heavy rain = Rapid falling bands of blue
Heavy rain = Falling bands of white
Lightning = Purple background with flashes of white
A public launch followed which was coordinated by the GHA. This was a fun event with music and choreographed lighting. All of the local news channels featured the event and press coverage promoted this further.

For the people living in the high rises, it was an opportunity to be proud of where they lived. Not only did the towers look great, but they also provided a public function by communicating a weather forecast to Glasgow's south side and beyond.

**SUMMARY OF LIGHTING SEQUENCES**

- The first of the three blocks displays the weather outlook via a range of patterns representing sun, cloud, rain, snow, fog, lighting and everything in between.
- Wind direction is represented on the second high rise with ripples of light passing over the front of the block in the corresponding compass direction.
- The final block displays the forecast temperature in figures, with the LED colour scheme moving through the spectrum from blue to warm orangey red, dependent on how high or low the temperature forecast is.

"This is an exciting day for Castlemilk. Our tenants were involved from the start in the system's design, and they have responded very positively because it is so different. Nothing like this has ever been done before."

*Kate Willis, Tenant Chair of Castlemilk Tenants Housing Association and a resident of Dougrie Place.*

**Further Examples of Community Based Lighting**

**HIGH RISE LIGHTING IN SPRINGBURN, GLASGOW**

The aim of the lighting was to augment the re-cladding of these two high-rise blocks to help create a landmark at both a local and wider area scale. Low level lighting has been introduced to create a sense of arrival and place at a local scale and the large blank south facing elevations have been ‘decorated’ with a dynamic vertical pattern to create a landmark at a wider area scale. The scrolling decorative pattern on the main facades seeks to make a connection to the area's past drawing inspiration from former industries in the area from decorative metal work of Walter McFarlane’s world famous foundry to decorative fretwork associated with the railways and locally made steam locomotives.

At the same time the pattern looks to the future and regeneration of the area using modern technology to produce a flourishing organic pattern that grows and blossoms on the facade. Glasgow's motto is "Let Glasgow Flourish" a positive and encouraging message that the project aligns itself with in creating positive change in an area undergoing regeneration.
MARYHILL LOCKS AND WHITE HOUSE BAR, GLASGOW

The regeneration of the Maryhill Locks area is a catalyst and precursor to the wider physical regeneration of Maryhill. The derelict Whitehouse Bar was identified as an important building by local people and one that they would like to provide a public use. Members of three local youth groups worked alongside Collective Architecture and Impact Arts to create and perform a piece of music that reflected their feelings about living, playing and growing up near the canal. The music was then used to inform the lighting design to the street elevation of the Whitehouse Bar.

MAIN STREET MOSEND, ARTIST LED LIGHTING PROPOSALS

The mixed-use development at Main Street Mossend required a sensitively designed public realm proposal to complement the new retail frontages relocated here as part of the wider regeneration proposals in the area. Working closely with a local artist, proposals were developed to illuminate this area with purpose built solar powered LED columns. The limits of technology were pushed in what proved to be a highly complex but unique proposal.

"Good lighting helps to increase vitality and improve ambience. It contributes to a sense of identity and place, makes for a safer, friendlier environment and also supports and complements other regeneration initiatives."

Statement from Glasgow’s Lighting Strategy team(www.glasgow.gov.uk).

Conclusion

Collective Architecture’s early lighting projects were developed primarily as an aesthetic intervention, although it was through these that positive community benefit was realised. Subsequent projects such as the high rise lighting in Springburn grew from a narrative picking up on history and metaphorical representation. Castlemilk lighting is different again as it has developed primarily as a functional medium but also serves as a permanent feature in the wider regeneration of the area.

All of our lighting projects contain an element of public funding and these have offered good value for relatively small input. This benefit is recognised by the policy makers in local government:

Image credits

3, 21, 23 and 24 Andrew Lee Photography
19 and 20 Young Media commissioned by GHA
8, 9, 10 and 11 Castlemilk Tenants’ Housing Partnership
All other images- Collective Architecture
An interview with Simon Smith of Glasgow's Lighting Strategy follows and discusses the future for public lighting in Glasgow.

How is Glasgow's Lighting Strategy changing?

Glasgow believes that as a commissioning body and policy maker now is the time to be plotting a different course, away from what can sometimes be considered as decorative or aesthetic focused activities. Glasgow has taken the step to reinforce the lighting strategy's position in the city's cultural regeneration context. An example of this is understanding that prior to each of the city's key recovery milestones (1988 garden festival, 1990 year of culture, 1999 year of architecture and design) there was a new lighting initiative. This, of course, is not to say that any lighting initiative can claim to have reversed the decline of a city but we wish to explore the link between light and regeneration; can it be used to signal that things were about to improve?

Glasgow is seeking to develop this argument; for lighting to be recognised as a signal for positive change at the start of any regeneration process, either social or urban.

What Are Your Aims For 2010 Onwards?

This reconfiguration changes the way we commission and take part in projects and requires the building of project partnerships with departments and agencies working in the community planning and policy structures. Core is a change in the method of engagement; focusing on areas which are undergoing significant regeneration and building on that process of change to empower people to lead and direct how their local environment is shaped.

For 2010-2011 we have already fully allocated our budgets and will be working with partners across Glasgow developing projects which range from small scale local projects through to lighting plans for regeneration areas. Each is linked by desire to ensure that lighting projects offer an increased opportunity to participate in cultural activities; and asks if projects be developed which provide clear pathways for individuals and groups to access and develop cultural activity?

Do You Have A Policy On Sustainability In Lighting?

Glasgow's Architectural lighting Guidelines offer policy guidance and best practice to ensure that projects are well designed and efficient, reducing the number of fittings and minimising light pollution. In practice the Lighting Strategy has championed the use of LED technology and has been able to offer up to a 50% reduction in energy consumption in certain projects. As Vice President of Lighting Urban Communities International (LUCI) Glasgow has also supported the development of a Sustainable Lighting Charter. The Charter seeks to inform the 60 cities that form LUCI offering a vision to develop efficient, appropriate and well designed lighting projects.
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Articles

Submission deadline for the articles for the third issue of Innovation Review is 15th May 2010. To discuss the article that you would like to submit, please contact us by email or telephone on the contact details provided below.
We look forward to meeting you online on Friday, 4th June 2010!

If you are not able to attend the conference and the exhibition on the day, you can watch the webcasts and visit the exhibition booths on any day during the 12 months following the event by obtaining the access with a password issued after the registration at www.cicstart.org, Events page.