

EVALOC International Energy and Communities Conference

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Conference Report

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EVALOC – EVALuating LOw Carbon communities

EVALOC is a 3.5 year Research Councils UK (RCUK) funded interdisciplinary collaborative research project between Oxford Brookes University and the University of Oxford. The research aims to evaluate the impacts, role, effects and limitations of low carbon communities in motivating energy reduction and renewable investment amongst local residents. It involves active participation from six low carbon communities that had projects funded through the Department of Energy and Climate Change's (DECC) Low Carbon Communities Challenge (LCCC). The evidence generated through the research will be used for community benefit, and to help influence policy. In addition to academic focused outputs, the research aims to produce materials and guidance for community energy projects as well as community monitoring data, materials and map based tools.

www.evaloc.org.uk

Research Councils UK – Energy Programme

The RCUK Energy Programme aims to support UK and international research collaboration to expand the UK's research capacity in energy related areas to ensure the UK meets the objectives and targets set out in the 2007 Energy White Paper. It has several main priorities including low carbon innovation, enhanced understanding of the social, environmental and economic implications of potential energy options, reduction in energy consumption and the building and sustaining of international links.

<http://www.rcuk.ac.uk>

Low Carbon Building Group (LCBG), Oxford Institute for Sustainable Development (OISD), Oxford Brookes University

The Low Carbon Building Group is one of eight research groups of the OISD, based within Oxford Brookes University's Faculty of Technology, Design and Environment. It has an international profile and also holds world-leading expertise in the study of thermal comfort. The six main themes of the research undertaken are: carbon counting and carbon mapping, advanced low carbon refurbishment, building performance feedback and post-occupancy evaluation, evaluating low carbon communities, climate change adaptation of buildings and neighbourhoods, global common carbon metrics.

www.architecture.brookes.ac.uk/research/lowcarbonbuilding/index.html

Environmental Change Institute (ECI), University of Oxford

The Environmental Change Institute is the University of Oxford's interdisciplinary institute for research on the complex processes of global environmental change, the exploration of sustainable solutions and the promotion of change for the better through partnership and education. The ECI has an international track record for research in forests and ecosystems, energy demand and climate impacts and adaptation.

www.eci.ox.ac.uk

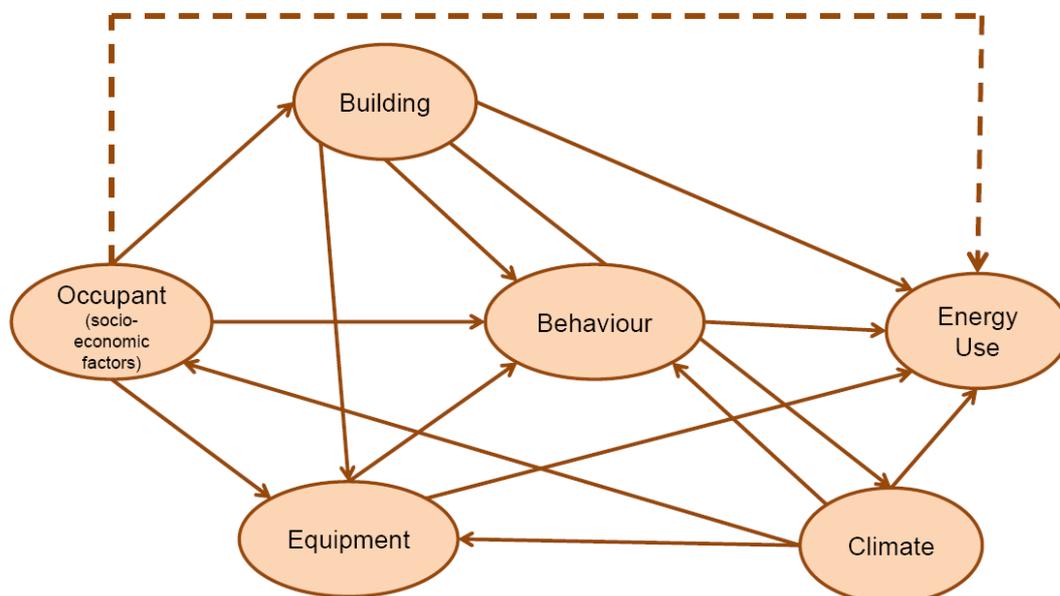
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Introduction

At present, the UK is committed to carbon reduction targets of 80% by 2050, relative to 1990 levels. With energy consumption in the domestic sector accounting for 26% of the UK's total final consumption¹, reducing household energy use is key to meeting such targets. Yet it is not that simple; the problem of reducing energy use in homes is complex and reliant on many elements; the building itself (fabric measures, low carbon technologies) as well as the occupants and their behaviours and habits. Recent research² into the impacts of behaviours on energy consumption has stated that through simple changes to habitual behaviours such as switching off unnecessary lights and turning thermostats down by 1°C could reduce emissions by 4.5MtCO₂ (equivalent to just over 3% of the total CO₂ emissions from residential buildings in 2010).

Reducing energy use in homes is a 'wicked' problem



Relationship between key determinants of domestic energy demand.
(Source: Steemers and Yun, 2009)

The importance of community energy action is becoming clear; the 'quiet revolution' is being recognised as a way to catalyse collective change in individual household energy use. Perfectly placed to deal with contextual factors, geographically, socially and economically, communities (of place or interest) can act as agents of change; as trusted members within the community they can encourage localised trials and increased awareness of household energy matters.

The Government appears to be recognising the importance of community energy action in helping to achieve its targets; in both policy (Green Deal and the Heat Strategy) and recent funding schemes such as the Renewable Heat Premium Payment (RHPP) but there are still

¹ <http://www.decc.gov.uk/assets/decc/11/stats/publications/energy-consumption/2324-overall-energy-consumption-in-the-uk-since-1970.pdf>

² <http://www.parliament.uk/briefing-papers/POST-PN-417>

many challenges and there is uncertainty as to the shape, nature and scale of the role community energy action projects can take to successfully navigate the difficult path between individual, local needs and Government, national requirements.

The EVALOC project combines interdisciplinary researchers from Oxford Brookes University and the University of Oxford in collaborative action research into the impacts and role of low carbon communities in motivating energy reduction and renewable investment amongst local residents. The outputs generated through the research will add to the growing evidence base into community energy action and will be used for community benefit as well as help influence policy.

This report details the events and key outcomes of a one-day international conference on energy and communities, held in Oxford on 12th

September 2012 as part of the EVALOC project. The event sought to bring together leading experts, community organisations, practitioners and academic researchers to share, discuss and learn from national and international best practice in energy and communities, both new and existing.

The report summarises each presentation, before discussing the key themes/messages arising from each session.



The conference provided the space and time for group and individual discussion and networking amongst renowned experts in the field of energy and communities

Session 1: Inaugural session

The inaugural session was chaired by Professor Ray Ogden, Associate Dean of the Faculty of Technology, Design and Environment at Oxford Brookes University. Professor John Raftery gave a welcome address focusing on the mutually beneficial alliances to be formed between university and community organisations.



Professor John Raftery, Pro-Vice Chancellor of Oxford Brookes University gave the welcome address of the first EVALOC International Energy and Communities Conference

Professor Rajat Gupta provided the context to the conference, including a brief description of the EVALOC project before Rachel Nunn, of the Strategic Advisory Board of LEAF programme presented on the Local Energy Assessment Fund (LEAF) and the rise of community action in the UK. She spoke of the motivations of various funds to support community action on energy and the scope and main features of each fund. Rachel discussed the unintended consequences of each. She concluded with the features a fund could have, which would bring about more meaningful carbon reduction results, and common traits of experienced and 'successful' community projects.

Session 1: Key Themes and Messages

- 1. Collaborative partnerships between universities and communities can be mutually beneficial*
- 2. Balance between top-down and bottom-up action is critical to long-term success of community energy projects and useful funding*
- 3. Enhanced communication between Government targets and localised community needs and aims is required to ensure funding allows long-term (self-) sustained development of localised community energy action*
- 4. Ongoing and longitudinal evaluative frameworks should ensure actions can be evaluated but also developed and create systemic change*
- 5. Enhanced peer-to-peer learning framework to allow replication of successful models and outputs as well as the acknowledgement of potential limitations through the evaluation of precedents*

Session 2: Global vs community-scale approaches for tackling the climate crisis

The second session of the day was chaired by Professor Rajat Gupta, Director of Oxford Institute for Sustainable Development (OISD) at Oxford Brookes University. He introduced Professor Jon Fink from Portland State University in the USA who discussed the different ways US cities were striving to achieve sustainability goals through the combination of local, state and federal policy in combination with grassroots advocacy. He cited the example of Portland, arguably one of America's 'greenest' cities and its use of a 'Climate Action Plan' – something that most Local Authorities in the UK lack. He then went on to discuss the complementary roles of government, industry, academic, and non-profit sectors and how it will take effort from all sectors to not just adapt cities to environmental changes but also mitigate climate change.



Session 2 concluded with a panel discussion with Dr Michael Ornetzeder, Rachel Nunn and Professor Jon Fink and chaired by Professor Rajat Gupta

Following Professor Fink, Dr Michael Ornetzeder of the Austrian Academy of Science, Austria, also discussed the complex process of change involving global, national, regional and local levels. He argued that although innovation was required at all levels, in order to be successful, the systems of production and consumption needed to be contextualised and translated at the community level. Using three examples of local sustainable energy projects in Austria, he discussed different socio-technical options and the impact that they had not only on carbon reduction but also on the community and its residents' sense of belonging and identity with their community.

Session 2: Key Themes and Messages

- 1. Government, industry, academic and non-profit sectors all have roles to play in the long-term success of 'greening' our cities and communities*
- 2. Local Authority 'Action Plans' could create cohesive local messages and thus allow more targeted local funding*
- 3. Different energy projects can have varying degrees of success in terms of carbon reduction, but the social and community cohesion created is often long-term*
- 4. Community energy action should be situated within a wider framework, in the contexts of both now and over time*

Session 3: Innovating at the grassroots level: creating low energy communities

The third session of the day was chaired by Professor Jon Fink, Vice President for Research and Strategic Partnerships at Portland State University, USA. He introduced Trevor Graham, Head of Sustainable Communities in the city of Malmo, Sweden. Trevor discussed several of the sustainable urban regeneration projects in Malmo. He described how varying levels of leadership from local communities were used in different areas of urban regeneration.



Trevor Graham was one of four international speakers at the conference and he presented urban regeneration projects in Malmo, Sweden

Professor Ashok Lall, Principal of Ashok B Lall Architects, India followed with a presentation on the strategies for low energy communities in urban India. He discussed the rapid transition of India into a high energy consuming lifestyle as evidenced in the trends of increasing energy consumption in homes within cities. He used a case study of a new housing development to argue that high density, low rise buildings with good transport and access links as well as a high-performing building fabric designed to reduce the need for air conditioning were critical to creating an energy conserving community, even as they aspire to higher standards of living. He stated that although the design and materials of the development could maintain low energy usage, it was critical that a plan for socialising the new community and instituting management practices toward environmental conservation and energy efficiency was undertaken in conjunction with the low energy design development – a hindsight lesson from more developed countries.

Session 3: Key Themes and Messages

- 1. 'Plant the seed', but then allow local experience and skills to develop and contextualize the project*
- 2. Targeting the 'right' people is critical to creating systemic change – 'a pretty girl tells a 15year old boy not to do something; does he do it?'*
- 3. Provision of adaptive building design provides future flexibility for occupant and climate adaptation*
- 4. Residential schemes should not just focus on buildings; careful planning of transport and services infrastructure as well as common spaces is needed to create a low carbon sustainable community and place*
- 5. International sharing and learning between developed and developing countries can ensure lessons learnt are repeated; or not repeated*

Session 4: Parallel workshops

Three parallel workshops were held in the afternoon, lasting just over one hour. Each had three expert speakers in the workshop themes. They were well attended and were aimed at providing a forum for further learning in the three key themes of the day:

- Monitoring and evaluation of low energy housing refurbishment
- Researching and evaluating low carbon communities
- The challenges and opportunities for communities in the context of the Green Deal

Whilst there was unfortunately a lack of time for in-depth discussion, key themes from each workshop were highlighted and these are discussed further in the workshop sections below.

Workshop 1: Learning from monitoring and evaluation of low energy housing refurbishment



Workshop 1 took place in the David Harvey Room, Merton College and was chaired by Professor Brian Ford of the Department of Architecture and the Built Environment, University of Nottingham

Attended by just over 20 delegates, the workshop was chaired by Professor Brian Ford, Professor of bio-climatic architecture, Department of Architecture and the Built Environment, University of Nottingham. Professor Rajat Gupta, OISD, Oxford Brookes University, led the introductory presentation and discussed the approaches taken in relation to monitoring and evaluation. He highlighted the approach of 'before, during and after' refurbishment to help further knowledge on the credibility and performance gaps between 'designed' and 'actual' performance of refurbished homes and installed low carbon technologies.

Saving Trust again emphasised the importance of pre- and post-testing of both building and occupant behaviour. Stephen spoke about the monitoring and evaluation of the Technology Strategy Boards Retrofit for the Future programme and the challenges facing them with regards to the amount of data on existing household energy use coming forth (around 500 households). He particularly highlighted the issue of curating the data and different monitoring strategies used.

Kirsten Burrows of PRP Architects who have undertaken several whole house retrofit projects continued the discussions on the challenges facing both building and occupant monitoring, highlighting the need for customer acceptance of low carbon technologies/energy saving measures and the emphasis this places on monitoring before retrofitting.

During the presentations and subsequent discussion, a number of points were highlighted including 'need to know' data vs 'nice to know' data: what implications does this have on the monitoring strategies and systems used as well as data collection techniques and subsequent

analysis? A complex issue surrounding data privacy and ethical considerations was also raised: energy data and its context go hand-in-hand, therefore how is the privacy of the home and its occupants protected when using the data in comparative studies and understanding of the retrofitting measures and occupancy interaction with these?

Workshop 1: Key Points

- 1. The challenge of the 'credibility' gap between 'predicted' and 'actual' performance*
- 2. Evidence base for existing household energy use rapidly expanding – what to do with the data?*
- 3. The challenge of privacy and ethics when energy data cannot be understood without context*
- 4. The importance of pre-retrofitting monitoring of households to engage with customer acceptance and reassurance*
- 5. The importance of feedback, not only upstream but to the supply chain also; transfer of knowledge and understanding of measures*

Workshop 2: Researching and evaluating low carbon communities

Over 20 delegates attended this workshop which centred its discussions around the role of community and the translation of results to local residents. Chaired by Dr Sarah Darby, deputy programme leader of Lower Carbon Futures at the Environmental Change Institute, University of Oxford, she first introduced Nigel Ingram of the Joseph Rowntree Foundation who spoke of their work on new low carbon residential developments in particular Derwenthorpe. He also discussed the importance of monitoring and evaluating the success and demonstrated the Foundation's partnership with universities researching their refurbishment and new residential developments. He emphasised the importance of recognising 'what went wrong' and learning from this as well as taking the positives.



Workshop 2 took place in the Ian Taylor Room, Merton College and was chaired by Dr Sarah Darby of the Environmental Change Institute, University of Oxford who led discussions on low carbon community research and evaluation

Professor Roy Alexander, University of Chester, presented interesting results from the Blacon Energy Saving Programme (part of the LCCC funding scheme) that seemed to suggest that whilst simple behaviour and awareness programmes did align with reductions in household energy use, the households that were given complex home monitoring systems did not experience the same level of reductions as those with none. Whilst it was pointed out that other external factors obviously came into play, this is a significant finding in terms of smart

metering and the translation of energy use to occupants. The importance of understanding whether this behaviour change is long-term is continuing to be investigated and monitored.

Richard Hauxwell-Baldwin, University of East Anglia presented his research into three other communities given funding by DECC's LCCC initiative. He emphasised the often contradicting 'quantifiable measures' of DECC and the more elastic nature of community goals and requirements. The different types of community were also discussed, with the need for 'identity' identified as a key motivator for community involvement. Finally, the need for effective evaluation of community energy projects was debated particularly in relation to combining government targets and community requirements; it was clear that communication and engagement with community organisations is vital to creating a usable evidence base and sustainable learning tool for low carbon communities.

Workshop 2: Key Points

- 1. The need for translation of results and best practice across all sectors, including occupants and builders*
 - 2. Accessibility of information is key to behaviour change; household monitoring equipment needs to allow direct engagement from occupants*
 - 3. The power of events alongside technology and the impacts of this on household energy behaviours and can often spill-over into other community issues such as transport and environment*
 - 4. Effective recognition of the local social identity and values, and managing this in line government targets*
 - 5. Communication and engagement of communities in terms of evaluation of existing community energy action*
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Workshop 3: Communities and Green Deal: Challenges and opportunities



Dr David Strong was one of three speakers in the Parallel Workshop 3 and specifically looked at the opportunities and challenges of Green Deal

Attended by approximately 35 delegates, the third workshop centred itself around 'what is the Green Deal?'; the challenges in launching it and the uncertainty felt around it. It was chaired by Dr Nick Eyre, programme leader of the Low Carbon Futures Group in the Environmental Change Institute, University of Oxford. The first speaker was Dr David Strong, previously the MD of BRE Environment and now director of David Strong Consulting Ltd. He outlined the principles of the Green Deal as well as the framework

of the scheme. He highlighted the deep uncertainty surrounding it particularly in relation to the funding, the viability of the Golden Rule and the skill base and the new accreditation and standards to be attained. Bridget Newbery from the Centre for Sustainable Energy was the second speaker. She discussed the role of communities in preparing and encouraging Green Deal take-up in their local areas. The different roles community groups could play were also debated; as catalysts of change within their communities they are perfectly placed to help create awareness, and even perhaps deliver Green Deal packages. Yet they are uncertain as to what it entails, and where they would stand in terms of finances.

The session was concluded by Rohini Cherian from the Low Carbon Building Group, Oxford Brookes University who shared her experience of the role of carbon mapping in helping communities realise their potential for improving the energy efficiency of their housing stock. The LEAF funded Grassroots Leads Energy Efficiency (GLEE) project in Highfield, Bicester is used as an example of this. The results of carbon mapping community-wide estimates of current carbon emissions, and an evaluation of potential improvement and retrofitting using incremental packages increased community awareness into its energy use and helped inform community-scale decisions on retrofit schemes. The need for packages, rather than individual measures was emphasised.

Workshop 3: Key Points

- 1. Uncertainty surrounding Green Deal, in particular regarding the providers and the viability of the Golden Rule*
 - 2. The potential role/s of community groups and the requirement of support due to the complexities of the framework*
 - 3. Assessment of local building stock is crucial to a successful delivery of Green Deal measures and can include community-scale carbon estimates*
 - 4. Delivery of measures in 'packages' rather than individual measures will increase the energy efficiency of the properties*
 - 5. Continuous monitoring and evaluation (a closed loop approach) of refurbishment to ensure both effectiveness of packages and actual energy savings to households*
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Session 5: Closing Plenary

The closing plenary saw all delegates return to the main theatre to hear Dr Paul Rouse from the Economic and Social Research Council (ESRC) and Chris Church of the Low Carbon



A closing panel discussion chaired by Dr Nick Eyre with Dr Paul Rouse, Chris Church and Professor Rajat Gupta taking questions

Communities Network present on research on energy and communities and future opportunities of engagement with community energy action. The session was chaired by Dr Nick Eyre, Environmental Change Institute, University of Oxford who ensured an interesting panel discussion was undertaken with both guest speakers on the importance of collaborative partnerships between academia and communities as well as the need for interdisciplinary approaches to community energy action research – the complexities and challenges of research into energy and communities means that no one approach (whether it be building or social science) will lead to in-depth and accurate evaluation of their success and impacts.

Poster Displays

Throughout out the refreshment breaks, the delegates were asked to peruse the poster displays. The posters reflected a variety of research projects covering energy and communities, but also contained posters and leaflets from the case study community groups involved in the EVALOC project.

The posters were split into three sections:

- RCUK funded research projects under the Energy Programme including the EVALOC project (Oxford Brookes University and University of Oxford); Smart Communities (Kingston University); Reducing Energy Consumption through Community Knowledge Networks (RECKKN) project (Keele University); and Energy Biographies: Understanding the dynamics of energy use for energy demand reduction (Cardiff University).
- Other research projects on energy and communities such as the UNLOC project on understanding local and community governance of energy
- Current and past research projects of the Low Carbon Building Group, Oxford Brookes University



Poster and leaflet display in the Sir Howard Stringer Room of the TS Eliot Theatre to promote awareness of research projects on energy and communities as well as promote the case study community groups of the EVALOC project

Final comments

The number and quality of speakers on the day provided the delegates with much to reflect upon. However, a number of key points to be taken from the overall conference are summarised below:

- Partnerships needed a) between researchers, to bring out the emerging themes from the current energy and community research, and b) between researchers and communities to identify more strategic research and evaluation
- Communication and translation of research results and data needs to be provided not only to communities but also industry and other sectors involved in provision of energy
- Understanding the impact of community energy action on individual energy behaviour is difficult to evaluate and quantify, thus requiring an interdisciplinary approach to succeed
- National Government targets for energy and communities currently often misaligned with local context and values required to achieve balanced 'bottom-up/top-down' framework
- There is a need to tell a coherent story about community action on energy and climate change to the wider public, and to policy makers such as DECC
- Lessons to be learned from international experiences should be used, but within a localised framework

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