

# **EVALOC Conference**

## **31<sup>st</sup> March 2015, Oxford**



# Introduction to the EVALOC conference



Evaluating the impacts, effectiveness and success of low carbon communities on localised energy behaviours (EVALOC)



## Final report




Rajat Gupta, Nick Eyre, Sarah Darby, Karen Lucas, Laura Bamfield, Jo Hamilton, Ruth Mayne, Matt Gregg, Chiara Fratter, Bob Irving

**Professor Rajat Gupta**  
31<sup>st</sup> March 2015

# Welcome!...from our project team and partners

## Academic partners

- Oxford Brookes University
- University of Oxford

	<b>Prof Rajat Gupta</b> Principal investigator and project lead		<b>Dr Nick Eyre</b> Co-investigator
	<b>Dr Sarah Darby</b> Co-investigator		<b>Dr Karen Lucas</b> Co-investigator
	<b>Laura Barnfield</b> Researcher		<b>Jo Hamilton</b> Researcher
	<b>Ruth Mayne</b> Researcher		<b>Matt Gregg</b> Researcher
	<b>Chiara Fratter</b> Researcher		<b>Dr Bob Irving</b> Researcher

## Community partners

- Awel Aman Tawe
- Sustainable Blacon Ltd
- Eco Easterside
- Hook Norton Low Carbon
- Kirklees Council
- Low Carbon West Oxford

## International visiting researchers

- Professor Jonathan Fink (USA)
- Trevor Graham (Sweden)
- Dr Michael Ornetzeder (Austria)
- Professor Ashok Lall (India)

## Advisory board members

- University of Chester
- Energy Saving Trust
- Low Carbon Communities Network
- UCL Energy Institute
- David Strong Consulting
- Good Energy
- Department of Energy and Climate Change
- Members of six case study communities

# What is the purpose of today?

- **Share** the research findings and messages from the various elements of investigation of the EVALOC research project.
- **Discussion** of the findings and insights from the low carbon communities involved.

# Overall programme for the day

13.00 Arrival and Lunch		
13.30	Welcome Address	Paul Inman
13.40	Introduction: EVALOC project overview	Prof Rajat Gupta
14.00	Role of community based social learning in stimulating energy and carbon reduction	Jo Hamilton and Ruth Mayne
14.30	Carbon mapping communities Monitoring and evaluation of household energy improvements	Prof Rajat Gupta
15.00	Questions and clarifications	Chair: Prof Roy Alexander
15.15 Afternoon tea/coffee		
15.30	Energy feedback approaches: making energy visible	Dr Sarah Darby and Laura Barnfield
15.40	Social network analysis	Dr Karen Lucas
15.50	EVALOC Energy and Communities Toolkit	Prof Rajat Gupta
16.00	Questions and clarifications	Chair: Prof Roy Alexander
16.15	What was it like? Contributions from EVALOC Low Carbon Communities <ul style="list-style-type: none"><li>• Dr Mark Fishpool</li><li>• Dennis Reeves</li><li>• June Goodchild</li><li>• Ged Edwards</li><li>• Angela Moray</li></ul>	Chair: Chris Church
17.00	Concluding remarks and thanks	Prof Rajat Gupta
17.15-18:00 Drinks and Networking		

# Additional information about today

- **Video-recording and photos**
  - **All presentations will be recorded** (please speak to EVALOC researcher if you do not wish to be seen on video)
  - **Short interviews** to be taken, if you are willing to participate, speak to EVALOC researcher
  - **Photos will be taken** during presentations and breaks (please speak to EVALOC researcher if you do not wish to be photographed)
- **Exhibition**
  - Posters on different study elements, thermal imaging and monitoring kit displays in Room JHB207 (next door)
- **Breaks and drinks**
  - Tea/coffee break and post-conference drinks will be available in Room JHB207 (next door)

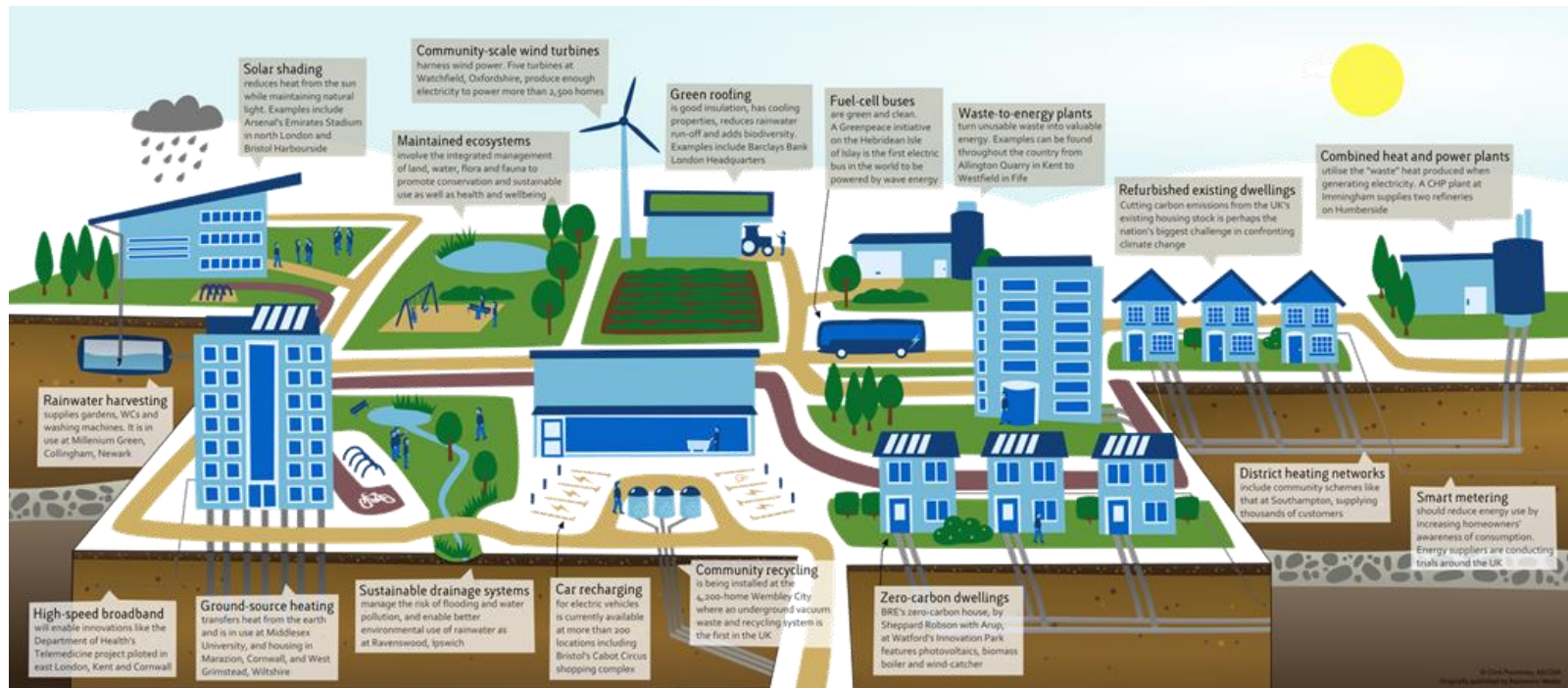
# **Welcome address**

**Paul Inman**

Pro-VC and Dean, Oxford Brookes University



# Overview of EVALOC project



**Professor Rajat Gupta**  
31<sup>st</sup> March 2015

**AECOM**





# What is EVALOC?

- **Four-year** research project funded under the **ESRC-EPSRC Energy and Communities programme**.
  - Project ran from 2011-2015.
  - £1.14million (Total project value: £1.37m)
- **Interdisciplinary evaluation of six selected low carbon communities (LCCs)** funded under the DECC's **Low Carbon Communities Challenge** in terms of their:
  - **IMPACTS** (on changing individual and community energy behaviours)
  - **EFFECTIVENESS** (on achieving real-savings in energy use CO<sub>2</sub> emissions)
  - **SUCCESS** (in bringing about sustained and systemic change).
- Assess changes in energy use in participating LCCs at the **community** and **household** level.



# What is the context of the research?

- DECC's Low Carbon Transition Plan, 2009  
**Collective action** over **individual action**  
*We often achieve more acting together than as individuals.*
- Now more than **5000 low carbon community groups** in UK
- Community groups as **agents of change**: complementary route to achieving local energy reductions
- **Trusted messengers**
- Combine behaviour initiatives with energy efficiency measures, micro-generation with empowering and enabling change.
- More **familiar** with **contextual factors** that shape individual behaviours

**BUT...lack of robust evidence-based M&E about the outcomes, impacts and added benefits of LCC action**



# Six case study low carbon communities

## Sustainable Blacon

**Community-led, Suburban, Disadvantaged**

- Fabric measures
- Technical measures
- Behaviour change interventions: energy feedback & action and group learning



## Eco-Easterside

**Partnership, Suburban, Disadvantaged**

- Community renewables
- Low/zero carbon technologies & renewables (households)
- Fabric measures
- Behaviour change interventions: energy feedback & action and group learning



## Hook Norton Low Carbon

**Community-led, Rural, Affluent**

- Community renewables
- Low/zero carbon technologies & renewables (households)
- Fabric measures
- Technical measures
- Behaviour change interventions: action and group learning



## Kirklees

**Multi-agency, Urban, Disadvantaged**

- Community renewables
- Low/zero carbon technologies & renewables (households)
- Behaviour change interventions: energy feedback & action and group learning



## Awel Aman Tawe

**Community-led, Rural, Disadvantaged**

- Community renewables
- Behaviour change interventions: action and group learning



## Low Carbon West Oxford

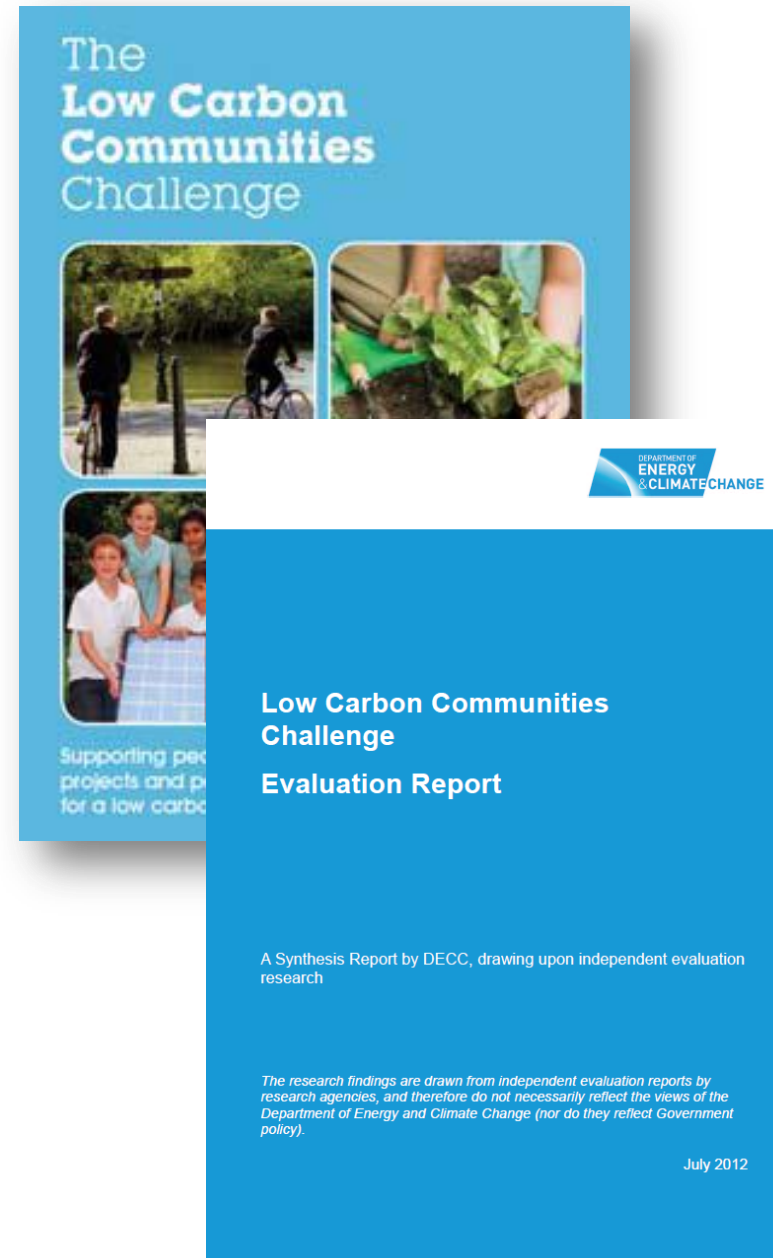
**Community-led, Urban, Middle income**

- Community renewables
- Low/zero carbon technologies & renewables (households)
- Behaviour change interventions: energy feedback & action and group learning



# Low Carbon Communities Challenge

- To test the effectiveness of **community-scale approaches** that combine **low carbon technologies** with **engagement** and **behavioural change activities**.
- **Twenty two** communities (England, Wales and Northern Ireland) received grant of about **£450k each (2010-2011)**
- **Diverse projects**, but **three characteristics** intended to be common to all:
  - **Geographically targeted**, area-based initiatives
  - Involve **integrated packages** of measures
  - Draw upon **sociological models** of **behaviour** that emphasise the **potential** for **social norms** to **'nudge'** and **trigger community-wide change**





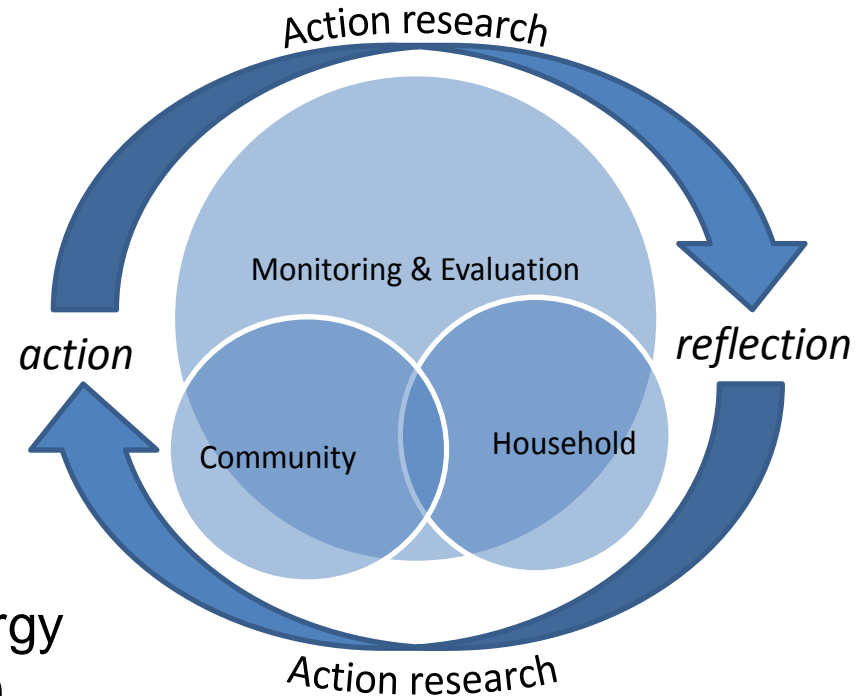
# What were we trying to find out?

- **Roles, capabilities** and **limits** of LCCs
- Influence of **community-based learning** for stimulating energy and carbon reductions
- **Effects** and **impacts** of community-based **household energy improvements** and **behaviour change initiatives**
- **Visualisation** and **communication** of energy feedback to communities and householders
- Role of **social networks** in **promoting or suppressing communication** and **take-up** of energy technologies
- How LCCs can **monitor** and **communicate** their own **effectiveness** at **energy demand reduction** and **learn** from their work

# How did we research this?

## Collaborative action research based approach:

- **Community level action research**
  - Community events
  - Focus groups
- **Household level action research**
  - Energy display libraries
  - Energy display trials
  - Environmental display trials
  - Remote monitoring systems (energy use and environmental conditions)



## Monitoring and evaluation approach

- Community and household level
- Mixed methods approach using **qualitative** and **quantitative** methods



# Research methods and techniques

- Community-based themed events (10)
- Shared learning events (7)
- Focus group sessions (three rounds) (17)
- Interviews with key members of LCC
- Longitudinal LSOA energy data (2008-2012)
- Community carbon mapping (1,659 dwellings)
- Longitudinal meter-point energy data (88)
- Thermal imaging surveys (88)
- Household interviews, two rounds (88)
- Physical monitoring of energy use, environmental conditions and low/zero carbon technologies (30)
- Monitoring of window opening behaviours
- Energy display library and trials
- Social network analysis (86)



# Knowledge exchange activities

- International researcher week (September 2012)
- International energy and communities conference (September 2012)
- Part of public exhibitions on *Sense of Energy* (London and Cardiff, 2014)
- Dedicated project website - [www.evaloc.org.uk](http://www.evaloc.org.uk)
- Newsletters
- *EVALOC energy and communities toolkit (ENACT)*



# Community Energy Strategy and EVALOC



Department  
of Energy &  
Climate Change

## Community Energy Strategy: Full Report

### Case study 13: Evaluating Low Carbon Communities (EVALOC)

The EVALOC research project is led by Oxford Brookes University in collaboration with the University of Oxford. The work is funded by Research Councils UK's Energy and Communities Programme and brings together building science and social science based researchers. The researchers worked in partnership with six communities who took part in DECC's LCCC.

EVALOC has assessed and explained changes in energy use in the participating communities due to their LCCC activities, looking at both the household and community level. At community level, 14 focus groups and community events have increased understanding of the role of community groups in changing energy behaviours and reducing energy use. Emerging findings show that community events are important in facilitating knowledge exchange, promoting learning and increasing motivation. The focus groups have reviewed the impacts of the LCCC capital grants on community engagement and social networks as well as the roles of the community energy groups.

The researchers have developed a robust approach to evaluating the impacts and effectiveness of community-led renovations of homes and behaviour change initiatives on household energy use. They have used methods including smart energy metering data, thermal imaging surveys, semi-structured interviews, occupant diaries and social network analysis. To help community groups reduce energy use a carbon mapping tool called DECoRuM is also being used to measure, visualise and communicate house-by-house energy use and the potential for carbon savings. Emerging findings suggest that behavioural interventions can reduce gas consumption but have less effect on reducing electricity consumption. Despite this, behavioural interventions appear to positively influence attitudes, knowledge and capacity in individuals.

The EVALOC project is developing a Community Energy Toolkit that includes materials and guidance for community energy projects to capture what they have learnt from the project. The toolkit also includes methods for monitoring and evaluation of household energy use as well as carbon mapping tools to help groups identify, action and monitor energy projects in their communities.

Further information is available from Prof Rajat Gupta, [rgupta@brookes.ac.uk](mailto:rgupta@brookes.ac.uk) or [www.evaloc.org.uk](http://www.evaloc.org.uk)

27 January 2014

# Key findings

# 1. What are the roles, capabilities and limits of LCCs in reducing local energy use?

- Wide range of roles at *downstream*, *midstream* and *upstream* levels.
- Most LCC effort spent at *downstream* and *midstream* levels.
- Lack of **resources** and **time** for upstream roles, despite having valuable intelligence about what policies work/don't work on ground.
- **Capabilities** and **limits** depended in part on type of organisations involved and resources they can draw on.
- **Partnership** and **multi-agency** approaches increased **scale** and **reach** of energy efficiency and renewable programmes.
- **Ability** of LCC influenced by **structural influences** beyond their control.

## Upstream roles

Influencing government and policy-makers

## Midstream roles

With other local organisations, partnerships and low carbon communities

## Downstream roles

With local community members and beneficiaries of activities such as householders



## 2. What is the role and influence of community-based learning for stimulating energy-related change?

- Increased know-how, motivation, ability and intentions to act.
- Enabled learning through informal interaction in social setting.
- Created space and permission for energy conversations.
- Most effective method was participatory and interactive activities (shared experiences and demonstrations).
- Shared learning events between LCCs helped to strengthen understanding of complex challenges and change strategies.





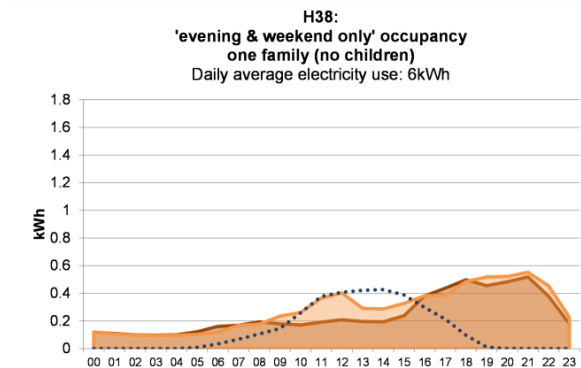
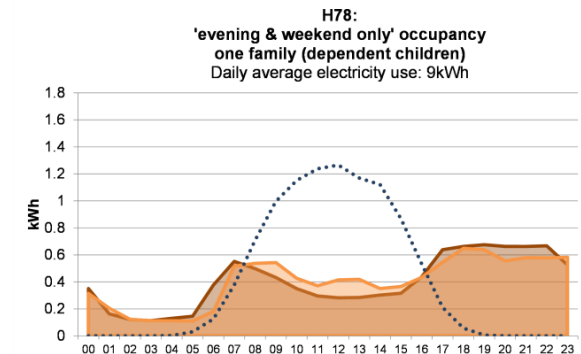
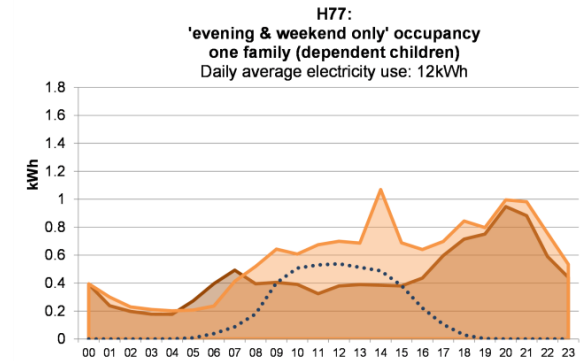
### 3. How useful is carbon mapping in baselining, predicting, visualising and communicating domestic energy use and carbon savings to communities?

- Helped to rapidly and visually **measure, model and map** energy use and carbon emissions on a dwelling-by-dwelling level, and community scale.
- Estimated **baseline, current and future** domestic energy use and carbon emissions in six communities.
- **Carbon mapping workshops** engaged householders through **visual presentations** combined with **individual discussions** and advice.
- Helps organisations involved in LCCs to prepare for policy mechanisms, target high energy areas and **identify measures for 'scaling-up'**.



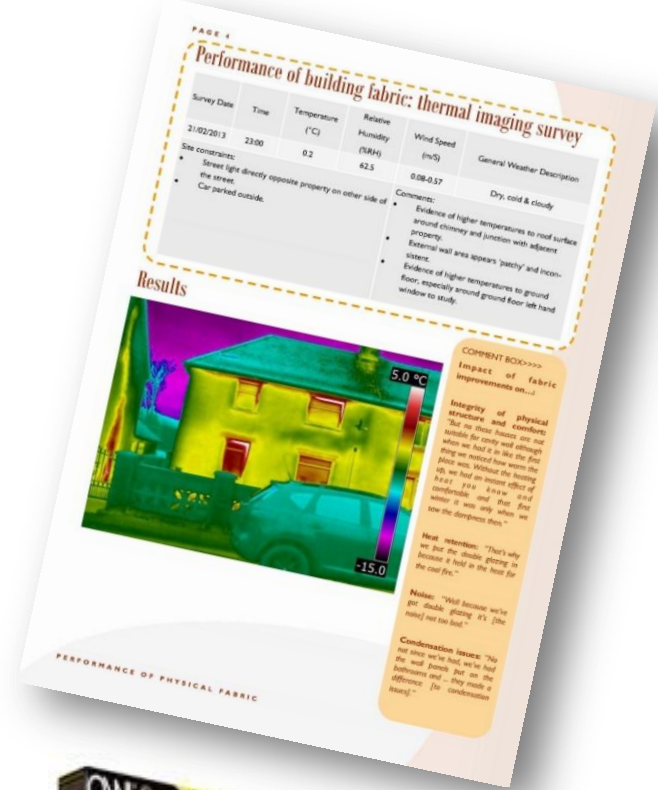
# 4. What are effects of community-based home energy improvements on household energy use, environmental conditions and energy behaviours ?

- **Energy use:** majority of households with physical and behaviour change interventions experienced long-term reductions in energy use.
  - Impact of LZTs particularly clear on electricity use
- **Environmental conditions:** increased comfort levels, with **warmer** and **more stable indoor temperatures** experienced in dwellings with fabric improvements
- **Behaviours:** Signs of '**demand shifting**' in **households with PVs** to increase self-consumption, although in some instances, previously *unused* appliances started getting *used*.
- **Behaviour change initiatives** increased **knowledge** and **agency** in terms of **purchasing behaviours** as well as **reinforcing** and/or **changing habitual behaviours**.



## 5. How useful are techniques such as *thermography*, *web-based feedback*, *energy display monitors* and *home energy reports* in providing feedback to householders and raising awareness?

- Majority of feedback approaches used were able, to some extent **engage**, **raise awareness** and **motivate** households.
- Different **techniques** appealed to different households; no 'one size fits all'.
- EDMs created 'lightbulb' moments, became talking points (social learning), prompted changes in everyday energy use.
- But feedback does not work in **isolation**; **knowledge** and **practical know-how** need to be **transferred** along with **new technology**.
- Some degree of personal contact is needed to make most of feedback technique and information: '**sense-making**' **conversation** and **discussion**.





## 6. What is the role of social networks in promoting or suppressing communication and take-up of energy-related technologies?

- 'Energy messages' were transmitted through personal social networks, mainly close friends and family.
- Mostly took form of discussions on:
  - General energy efficiency
  - Energy prices and bills
  - Low/zero carbon technologies
- Energy not a 'neutral' subject which influenced if, who and when energy messages communicated:
  - Novel issue - *LZTs*
  - Practical issue – *Boiler upgrade*
  - Judgement issue – *not being green*
- LCCs used social networks to promote energy messages. e.g. by holding community events, training community champions, by word of mouth and by demonstration projects.



## 7. How can LCCs best monitor and communicate their own effectiveness at energy demand reduction and learn from their work?

- Annual reflection (focus groups) on LCC processes aided group cohesion.
- Participative and visual materials helped with evaluation.
- Dissemination of findings in understandable format was essential for communicating effectiveness.
- LCCs need to be able to contribute to design of M&E, with opportunities to learn and reflect.
- Action research is a useful approach but LCC participation can be constrained by lack of time and resources.
- Support from academics, skilled M&E mentors or peer mentoring would help LCCs design and implement M&E programmes, and build more comprehensive picture of impacts and outcomes from LCC projects across the UK.



## 8. What are the implications of our findings for policy and practice?

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- Our **results support** the underlying **ideas** behind the **Community Energy Strategy**.
- LCCs can be **more effective** than other **actors** (such as national government, energy suppliers and private sector organisations) in **engaging** and **motivating** local communities. (from school play to carbon mapping)
- However LCCs should be viewed as an **important complement** to business and government, **not a substitute** for them.
- **Future energy** and **carbon reduction policies** need to do more to harness the **power** of **more locally engaged actors**.
- A **more consistent approach** to funding LCCs would be helpful.
  - A new **cadre of 'community energy workers'** are needed who are competent across the relevant range of **technical, legal and commercial issues**.
- **Effective support** from **local government** is always helpful and probably essential to the operation of LCCs in **disadvantaged communities**.
  - This needs further **support** in **national public policy**, both from **DECC and DCLG**, and also BIS and Health.
- More widely, government needs to ensure there is a **strong, consistent policy framework** in place that **supports, enables and incentivises** both the needed physical improvements to people's homes and changes to energy behaviours.



## 8. What are the implications of our findings for policy and practice? (continued)

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- Since majority of LCCs focus their efforts *midstream* and *downstream*, their experiences, even where relevant to policy-formation, may *not naturally filter* its way through to *policymakers*.
  - *Understanding* the *achievements* and *problems* of LCCs will require increased policymaker effort.
- *Quantifiable metrics* focussing *entirely* on *energy* and *carbon* are important, but not the *whole story* for *evaluating impacts* of LCCs.
- Most LCCs are interested in using evaluation to improve their activities (*formative evaluation*) rather than purely to *measure past performance*.
  - *Evaluation goals* and *processes* therefore need careful consideration.
- LCC activities tend to include *multiple measures* (physical and behavioural) and occur over *long periods of time* and with *imprecisely defined groups* of people.
  - *Very precise evaluation techniques* using carefully *defined control groups* are therefore *neither feasible* nor even desirable.
  - *Action research based M&E approach* is likely to be more useful, with better access to *longitudinal data* at a more *granular level*.

# Thank you!

[www.evaloc.org.uk](http://www.evaloc.org.uk)