Institution: University of Chester

Unit of Assessment: 17A Geography, Environmental Studies and Archaeology (GDS)

Title of case study: Community Carbon Reduction

1. Summary of the impact

Roy Alexander's innovative research into climate change awareness and behaviour change has transformed the way the world looks at this issue.

It has enabled a Cheshire village to reduce its domestic carbon footprint by 20% and become an established model for communities across the globe. Dissemination of his research has reached around a billion people worldwide and stimulated the establishment of similar projects across the UK, and as far afield as Canada.

The award-winning initiative has influenced local and national government policy and attracted official visits from the Secretary of State for Defra, the Rural Advocate and Business in the Community.

2. Underpinning research

Professor Alexander joined the University of Chester in 1988 and began his research in the village of Ashton Hayes in 2005 with the development of a domestic carbon footprinting methodology.

The aim was to provide a tool that would yield a reliable indication of a household's carbon footprint without being too onerous for residents to complete. A baseline face-to-face survey, conducted by a team of undergraduate students in May 2006, yielded a response from 45% of village households.

Results were quality checked, analysed and the outcomes published. Findings were fed back to the villagers through the project website, www.goingcarbonneutral.co.uk, poster displays, reports and meetings, and residents were given household-specific feedback, with bespoke recommendations for making reductions.

Examination of the efficacy of these dissemination routes in promoting behavioural change informed follow-up surveys, which were conducted each year from 2007 to 2010 and reached 72% of village households. All results were published on the project website and within the village, and further disseminated via conference and community group presentations.

Close contact with the local authorities was maintained from the outset and a second strand of research sought to explore the nature of this relationship in the context of the Sustainable Communities agenda. Focused interviews were conducted with key figures in the Ashton Hayes project and with a council officer in order to explore the extent to which the community could be seen as empowered and self-sufficient rather than a passive recipient of delivered services.

Annual monitoring revealed a reduction of 20% in average household emissions between 2006 and 2007, which was maintained but changed little in succeeding years. The difficulty in reducing emissions beyond this 20% level through behavioural change alone led to the exploration of renewable energy generation as a means to achieve further cuts. Research, conducted jointly with EA Technology Ltd, focused on developing a renewable energy-powered community microgrid using the existing distribution network.

With funding from Carbon Connections UK, a study of the feasibility of community microgrids in rural areas was carried out, using Ashton Hayes a test-bed. This examined the potential of a range of renewable energy sources to meet load requirements on a low voltage feeder line, as well as options for demand-side management.

Generation potential was assessed by monitoring and modelling wind speed, insolation and biodiesel CHP. Technical issues including monitoring loads on the low voltage feeder and within individual houses and community buildings, and matters of social acceptability and organisational structure, were communicated through a series of meetings and focus groups. The results were published as reports and conference papers and led to the submission of a successful application to the highly competitive Department of Energy & Climate Change (DECC) Low Carbon Communities Challenge (LCCC) in 2010 for £400,000 to develop and implement the first stage of

the village microgrid.

As a result of this research, SP Energy Networks, the local distribution network operator, adopted the village in 2011 as the base for a Low Carbon Networks Fund Tier One project examining the network impact of renewable generation and development of a smarter electrical network.

3. References to the research

Publications

Alexander, R., Hope, M. and Degg, M. Mainstreaming Sustainable Development-A Case Study: Ashton Hayes is Going Carbon Neutral. *Local Economy,* 22:1, 62-74*,* February 2007. Refereed article.

Hope, Max and Alexander, Roy 'Squashing Out the Jelly: Reflections on Trying to Become a Sustainable Community', *Local Economy*, 23:3, 113-120, 2008. Invited article.

Gillie, Mary, Carter, Jen, and Alexander, Roy. *A Generic Model for Community Microgrids*. Confidential report to Carbon Connections. EA Technology Consulting/University of Chester. 56pp, 2009. Consultancy Report. Report of outcomes from a project subject to a competitive bidding process

Gillie, M., Carter, J., Alexander, R. and Charnock, G. Getting the most from Community Generation – an Economic and Technical Model to Control Small Scale Renewable Community Generation and Create a Local Energy Economy. Paper 0190 presented at *CIRED, 20th International Conference on Electricity Distribution*, Prague, June 2009. Convenor-reviewed conference contribution

Gillie, M., Alexander, R. and Roberts,D. Community Energy from policy to practice. Paper 0244 presented at *CIRED 21st International Conference on Electricity Distribution,* Frankfurt, June 2011. Convenor-reviewed conference contribution

Research funding

£86,558 investment by Carbon Connections UK (CC Project 42) for 'Model for the installation and operation of a rural microgrid on the existing power distribution network using Ashton Hayes, Cheshire as a test bed'. 2008.

£400,000 award to Ashton Hayes Parish Council from the Low Carbon Investment Fund as part of DECC's Low Carbon Communities Challenge Phase 2, 2010. Ashton Hayes was one of 12 projects funded under Phase 2, which received 239 applications. The terms of the award required 90% of funding to be spent on equipment. Of the remainder, the University of Chester received £8,000 from Ashton Hayes Parish Council for research and facilitation work. Roy Alexander co-authored the application on behalf of Ashton Hayes Parish Council.

4. Details of the impact

This project has been recognised because of the way it has mobilised a community to take concerted action, and the fact that it has been rigorously and independently monitored by the University of Chester. The research input has been vital both to its success and to its endurance.

The beneficiaries of this research have been many and various. The village of Ashton Hayes has benefited most directly through the energy savings and improvements to lifestyle made by many of its 1,000 residents. It has also received extensive recognition and tangible assets have been acquired as a result of the project. In 2008, lobbying led to Cheshire County Council developing a

safe access footpath to the railway station in the next village and the DECC LCCC project in the village provided a sustainable, low carbon sports pavilion and electric car for community use, as well as 25kWp of solar photovoltaic generation capacity on the pavilion and the village school.

Invited presentations to more than 150 UK communities (http://www.goingcarbonneutral.co.uk/diary-of-events/) and distribution of a Toolkit DVD to 1,000 more in the UK and abroad have stimulated many to follow the Ashton Hayes example. Eden Mills in Canada set up a very similar scheme in 2007 following a visit to Ashton Hayes. Eden Mills has adopted the logo and methods used in Ashton Hayes and has linked with the University of Guelph. Nøtterøy in Norway also established a similar project and is now twinned with Ashton Hayes on a carbon neutral basis.

Government organisations and policy makers have also been influenced. The project has regularly featured as an exemplar on the Energy Saving Trust's website (http://www.energysavingtrust.org.uk/), particularly for the methodology used for community carbon footprinting. In September 2008, The Rt Hon Hilary Benn made a ministerial visit to the village to learn more about the Going Carbon Neutral project and our research for the microgrid study. The project featured as a case study in the White Paper, *The UK Low Carbon Transition Plan*, published on 15 July 2009, when the BBC spent the whole day in the village making hourly national and international broadcasts about the research activities. It also features as an example of community energy in the White Paper, *Local growth: realising every place's potential,* presented to Parliament by the Secretary of State for Business, Industry and Skills on 28 October 2010. From 2010 to 2012, Roy Alexander served as an invited member of the DECC LCCC Working Group.

In addition, businesses have been influenced by the project. At the outset, start-up funding of £3,600 was provided by local companies and the international environmental consultant RSK Group was stimulated, in part, to set up its carbon monitoring unit as a result of the project. In 2009, Business in the Community made a *Seeing is Believing* visit to Ashton Hayes to learn more, particularly about the ways businesses could interface with community projects. Also in 2009, the project was one of the first to be adopted for support by newly-established charity, Carbon Leapfrog (now Pure Leapfrog), which channels *pro bono* professional services to carbon saving projects in the UK and abroad (carbonleapfrog.org). In 2010, Roy Alexander was invited to become a member of Carbon Leapfrog's Project Steering Group, which selects projects for support at its monthly Dragon's Den–style meetings in London. He has also been invited to speak at its national and regional events for communities.

Productive links have been established with energy technology experts EA Technology Ltd and ScottishPower Energy Networks. These began with work on the microgrid feasibility study and have led on to further collaborations on projects concerned with demand-side management and smart appliances.

The Ashton Hayes Going Carbon Neutral initiative is now recognised nationally and internationally as a pioneering flagship community project. Articles have appeared in local, regional and national press, including the Observer and Financial Times, and in publications such as Dagens Nyheter, Tønsbergs Blad and Berliner Zeitung in the international press. Broadcast media coverage in the UK has involved local and national radio on BBC4 and 5Live, plus international radio coverage on the BBC World Service, German World Service and CBC. Television cover has BBC 1, CBBC and Sky News in the UK, with the BBC News and BBC World channels, New Zealand TV and SBS TV South Korea providing international coverage. Together with a short film about the project, *The Village Green*, commissioned for and broadcast worldwide during the *Live Earth* concerts on 7 July, 2007, the total reach by these media outlets is estimated at up to one billion people.

5. Sources to corroborate the impact

Reports, documents, websites

Dr Stuart Burgess, *Report of the Rural Advocate 2007.* Commission for Rural Communities, CRC58. September 2008. (pp2, 24, 29 refer to the Rural Advocate's learning from his visit to

Ashton Hayes)

The UK Low Carbon Transition Plan: National strategy for climate and energy. The Stationery Office Ltd. July 2009. (p93 provides a case study of Ashton Hayes)

Local growth: realising every place's potential. The Stationery Office Ltd. October 2010. (p25 makes reference to the example of Ashton Hayes)

Low Carbon Communities Challenge Interim Report 2010/11. Department of Energy and Climate Change. July 2011. (pp 11, 12, 30 refer to the LCCC project in Ashton Hayes)

Low Carbon Communities Challenge Evaluation Report. Department of Energy and Climate Change. July 2012. (pp 22, 25, 44, 48-53 refer to the LCCC project in Ashton Hayes)

Barker T., Mageean A., Tweed J., Gillie M., Edwards G., Alexander R. and Bulmer P. (2009) *Vision 2050: A Sustainable future for Cheshire West and Chester.* Document produced for Cheshire West and Chester Borough Council on its inauguration in 2009 and which forms the basis for its Sustainability Commission of Inquiry, see http://www.cheshirewestandchester.gov.uk/your_council/policies_and_performance/sustainability_commission_of_i.aspx for Commission reports. (These items contain frequent references to Ashton Hayes and corroborate the influence of Alexander's research on policy development in the Borough).

http://news.bbc.co.uk/1/hi/sci/tech/8150913.stm *http://news.bbc.co.uk/1/hi/sci/tech/8152365.stm* Example broadcasts from Ashton Hayes, 15 July 2009 (Corroborate the national reach of the Ashton Hayes Going Carbon Neutral project and its influence within the village. Other broadcasts on the day were transmitted internationally).

http://www.youtube.com/watch?v=AGKHEbMrhXc Film*: The Village Green.* (Corroborates the international reach of the exemplar Ashton Hayes Going Carbon Neutral project).

www.goingcarbonneutral.co.uk (Ashton Hayes project website, which typically receives 500+ visits per month and has had up to 1,000 unique user visits per month. The diary pages, http://www.goingcarbonneutral.co.uk/diary-of-events/ corroborate its reach to many communities in the UK and abroad and also the numerous presentations given by Alexander).

http://www.spenergynetworks.com/innovation/ashton_hayes.asp (Corroborates the selection by SPEN of Ashton Hayes as a base for a Low Carbon Networks Fund project)

http://www.goingcarbonneutral.ca/docs/Media_Release_Eden_Mills_Aiming_First_CN_Community.pdf (Corroborates the role of Ashton Hayes in inspiring the Eden Mills Going Carbon Neutral project. Note that their logo duplicates, with permission, that of Ashton Hayes)

http://www.notteroy.kommune.no/artikkel.aspx?MId1=668&AId=1955&back=1&sok=true (Corroborates the influence of the Ashton Hayes project on Nøtterøy, Norway)

Selected beneficiaries of research

Member of Ashton Hayes Parish Council and Director of RSK Group)
(Can corroborate the impact of Alexander's work on the village of Ashton Hayes and more widely)

Project Manager, Climate Change/Sustainability, Cheshire West and Chester Council
(Can corroborate the contribution of Alexander's work to policy development at Cheshire West and Chester Council)

Senior Representatives, Pure Leapfrog
(Can corroborate the impact of Alexander's work on low carbon communities across the UK and his input to the work of Pure Leapfrog)