An evaluative framework for social, environmental and economic outcomes from community-based energy efficiency and renewable energy projects for Ashton Hayes, Cheshire

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Summary

Ashton Hayes is a rural village located just outside Chester. Their aim is to become the first carbon neutral village in England, through energy efficiency measures and carbon offsetting; by:

> '…*encouraging everyone in their community to think about how their way of life affects their impact on climate change and to help people to understand how simple actions can make a big impact on CO_2 emissions to the atmosphere*.'[1]

However, from earlier research and discussions with the community over the duration of this project, it is clear that community members are also keen to maximise social (e.g. community connectiveness and mental wellbeing) and economic (e.g. savings from fuel bills and the creation of local employment) outcomes from activities associated with the Going Carbon Neutral project.

The project is run by dedicated volunteers from the village, the Parish council and the University of Chester and is also supported by local businesses, other academic institutions, the council, the Government and Non-Governmental Organisations. Further development of the project relies on key funding; this is provided mainly by DEFRA [Department of Environment, Food and Rural Affairs] and also by DECC [Department of Energy and Climate Change].[2]

nef (the new economics foundation) was commissioned by Ashton Hayes Community Energy to develop a evaluative framework that can be used by the community to demonstrate social, economic and environmental outcomes from energy efficiency and generation projects within the community. Using the principles of measuring what matters and drawing on the Social Return on Investment (SROI) methodology, this report presents our scoping analysis, methodology, analyses of the theories of change, evaluation framework and suggested potential indicators that could be captured by the community of Ashton Hayes for their *Ashton Hayes Going Carbon Neutral* (AHGCN) project.

The development and implementation of this type of outcomes-based measurement generates three benefits.

- First, the quantification of social, environmental and economic outcomes is necessary to demonstrate effectiveness of government support for small-scale, localised, community energy projects.
- Second, the process of measuring and demonstrating impact will help AHGCN improve decision-making, ensuring its activities create the desired outcomes.
- Third, there is currently no standard methodological approach for such evaluation.

A review of the literature both focussing on Ashton Hayes and other similar community initiatives has shown that while environmental indicators are well reported, for example energy savings and reduction in greenhouse gases (specifically carbon dioxide), few studies attempt to quantify additional social and economic benefits. This is particularly true for evaluations of community renewable energy projects. However, the Kirklees

[1] http://www.goingcarbonneutral.co.uk/background/ [author accessed 12th March, 2012]

[2] Alexander R, Hunt T, McAfee L, Fox M, Davey C, Hall A, Lepper J, Robinson M, Brain J, Jones L (2010) *Annual Report 2010: Ashton Hayes Going Carbon Neutral* (Chester: Department of Geography and Development Studies)

Warm Zone project, which aimed to improve the energy efficiency of homes through installation of insulation and more efficient heating systems, is perhaps the most comprehensive evaluation to date, measuring environmental, social and economic benefits. The suite of studies commissioned by Kirklees Council to evaluate the project provides a useful starting point for the design of the AHGCN specific evaluative framework.

Following a local co-design event held on the 17th of February, we have been able to identify a number of social, environmental and economic outcomes both experienced and expected by the Ashton Hayes community.

In this report we develop a journey of change in order to illustrate, how the activities of the AHGCN project create expected outcomes, or change for households and the community. We then suggest a number of potential indicators and methods for collecting this information based on the outcomes the participants at the local co-design event described for further discussion with community members. In the final section, we outline the next steps in the process and provide a guide on how to do this.

AHGCN's impressive track record collecting data on environmental outcomes of the community's progress towards its ultimate goal of becoming carbon neutral through its partnership with the Department of Geography and Development Studies at the University of Chester means that is ideally placed to pilot and develop a methodology which can be shared with other communities attempting achieve the same or similar goals.

Contents

Introduction

Ashton Hayes is a rural village located just outside Chester. Their aim is to become the first carbon neutral village in England, through energy efficiency measures and carbon offsetting;[3] by:

'…*encouraging everyone in their community to think about how their way of life affects their impact on climate change and to help people to understand how simple actions can make a big impact on CO_2 emissions to the atmosphere*.'[4]

The project is run by dedicated volunteers from the village, the Parish council and the University of Chester and is also supported by local businesses, other academic institutions, the council, the Government and Non-Governmental Organisations. Further development of the project relies on key funding; this is provided mainly by DEFRA [Department of Environment, Food and Rural Affairs] and also by DECC [Department of Energy and Climate Change].

Since their commitment to become the first carbon neutral village in England in 2006, the majority of the community in Ashton Hayes has made considerable effort to reduce their carbon footprint, predominantly through behavioural change such as switching off appliances and changing to low energy light bulbs. This has resulted in an impressive reduction in carbon dioxide emissions of approximately 23 per cent relative to 2006 within the community.[5]

In addition Ashton Hayes was selected as one of the 22 communities to receive funding under DECC's Low Carbon Communities Challenge. With their grant of £400,000 the community have built a low carbon sports pavilion complete with Solar PV array. The community have also funded Solar PV arrays for the local primary school.[6]

The initial motivator of the Ashton Hayes Going Carbon Neutral (AHGCN) community is to reduce greenhouse gas emissions. However, there are additional societal and economic motivations and expectations from the project so far, and going forward. Using Ashton Hayes as a case study, an MSc student examining the motivators and barriers to participation in community-based carbon reduction projects found that primary motivations for participation in the project included: moral responsibility, saving money, encouragement from friends and family, inclusion within the community programme and civic pride.[7] This was also supported by discussions with community members at the local co-design event, run as part of this project (see Appendix 7).

In addition to the local needs and aspirations to measure the full impact of the AHGCN project, academics working within the community energy sector have called for holistic

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[3] The definition commonly cited in relation to carbon neutrality within Ashton Hayes is taken from the New Oxford American Dictionary (2006) and cited by Alexander *et al*. (2007). It is defined as, '*calculating total climate damaging emissions, reducing them where possible, and then balancing your remaining emissions often by purchasing a carbon offset' paying to plant new trees or investing in 'green' technologies such as wind or solar power*.'

[4] http://www.goingcarbonneutral.co.uk/

[5] Ibid.

[6] Ibid.

[7] Edwards G (2007) *Ashton Hayes Going Carbon Neutral: Motivators and barriers to successful public participation in community-based carbon reduction programmes*, MSc Dissertation (Leicester: Institute of Energy and Sustainable Development, De Montfort University).

frameworks of project evaluation. This is because a key question, as yet unanswered robustly is, according to Walker *et al* (2007),[8]

"…whether or not the outcomes of government support for small-scale, localised community energy projects can add up to more than the sum of the small parts of renewable energy generation and carbon reduction… There is a need for those involved to both continue to work towards realising the multiple project level outcomes that small scale community energy projects can achieve, an to find ways of strategically demonstrating the accumulative, larger-scale and longer-term significance of national level support for local level activity."

Given this, an evaluation framework to demonstrate additional positive outcomes, beyond carbon reduction is not only necessary to maximise social, environmental and economic benefits in existing and future projects whilst improving decision-making and ensuring its activities create the desired outcomes, but also to demonstrate effectiveness of government support for small-scale, localised, community energy projects.

Funded by Department of Energy and Climate Change (DECC) Local Energy Assessment Fund (LEAF) grant[9] and commissioned by Ashton Hayes Community Energy, the objective of this strand of work is to provide Ashton Hayes with a holistic evaluative framework based on an adapted Social Return on Investment methodology, that can be used by the community to demonstrate social, economic and environmental outcomes from energy efficiency and generation projects within the community of Ashton Hayes. Furthermore, it is hoped that this work will go somewhere towards development of a standardised methodological approach for evaluating the triple-bottom-line of community-based projects.

Our approach to this work comprised three activities:

Scoping research: To establish a long list of possible outcomes, indicators and ways to capture information. It will include both quantitative metrics and qualitative measurement;

Local co-design event: To map impacts reported by community members, and develop the framework elements with the community members;

Brief technical report: detailing literature reviewed, process and frameworks.

The following technical report summaries the scoping research, reports the outcome of the local co-design event and outlines the foundations of an evaluation framework developed for Ashton Hayes Community Energy. First we briefly review the literature exploring the social, environmental and economic impacts of community-based low carbon projects. This is followed by a description of the methodology, a presentation of the impact mapping of the local co-design event and a draft evaluative framework. The final section provides guidance for prioritisation of the long list of indicators identified from the co-design event, Ashton Hayes annual surveys carried out in partnership with the University of Chester[10] and secondary literature for capturing and evaluating the environmental, social and economic impacts from energy efficiency and generation

[8] Walker G, Hunter S, Devine-Wright P, Evans B, Fay H (2007) 'Harnessing community energies: Explaining and evaluating community-based localism in renewable energy policy in the UK" *Global Environmental Politics* **7**: 64-82.

[9] http://www.decc.gov.uk/en/content/cms/news/pn12_002/pn12_002.aspx [author accessed 12th March, 2012]

[10] Over the previous five years, annual surveys have been undertaken by students of the University of Chester to determine carbon footprints of households throughout the village.

projects within the community.

Scoping research

The environmental benefits of retrofitting of domestic dwellings with insulation and micro-generation (e.g. solar PV, solar hot water heating) are well known, [11] and can have significant impacts on carbon emissions per household and therefore reduced impact of greenhouse gases (CO_2, CH_4, N_2O, N and S) that cause world-wide effects on human mortality, morbidity, damage to terrestrial and oceanic ecosystems, agriculture, and a variety of other economic impacts due to temperature change and sea level rise.

While the wider economic benefits of domestic retrofitting and micro generation are increasingly quantified, particularly in the context of direct and indirect job creation or resilience to volatile energy prices[12], the social benefits captured from community-based projects such as well-being, awareness of the relationship between behaviour and environmental impacts, community empowerment and social inclusion are less well known. These social benefits are recognised as being important, in terms of, acceptance of low carbon technologies[13], wellbeing[14] and adaptive capacity / societal resilience[15]. But, the extent to which these social benefits are realised, however, largely depends on the process of decision-making, participation and implementation, and the model of ownership employed.[16] In other words, the process of delivery is critical for the maximisation of social benefits.

In terms of community-based renewable energy, social outcomes are often reported using anecdotal rather than empirical evidence, such as case studies describing learning, and successes of specific projects.[17] While these studies add to the body of

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[11] Wilkinson P, Smith K, Joffe M, Haines A (2007) 'A global perspective on energy: health effects and injustices' *Lancet* DOI:10.1016/S0140-6736(07)61252-5; Markandya A, Wilkinson P (2007) 'Electricity generation and health' *Lancet* **370**: 979-90; Woodcock J, Banister D, Edwards P, Prentice A, Roberts I (2007) 'Energy and transport' *Lancet* **370**: 1078-88; McMichael A, Woodruff R, Hales S (2006) 'Climate change and human health: present and future risks' *Lancet* **367**:859-69; Haines A, Kovats R, Campbell-Lendrum D, Corvalan C (2006) 'Climate change and human health: impacts, vulnerability and mitigation *Lancet* **367**: 2101-2109; Stern N (2006)*The Stern Review: The Economics of Climate Change* (London: HM Treasury).

[12] Kemp *et al* (2010) *Zero Carbon Britain 2030*: A new energy strategy (Powys: Centre for Alternative Technology); Green New Deal Group (2008) *A green new deal: Joined-up policies to solve the triple crunch of the credit crisis, climate change and high oil prices* (London: **nef**).

[13] Walker G (2008) 'What are the barriers and incentives for community-owned means of energy production and use?' *Energy Policy* doi:10.1016/j.enpol.2008.09.032; Walker G, Hunter S, Devine-Wright P, Evans B, Fay H (2007) 'Harnessing community energies: Explaining and evaluating community-based localism in renewable energy policy in the UK' *Global Environmental Politics* **7**: 64-82.

[14] Seyfang G, Haxeltine A (2008) *Growing grassroots innovations: Exploring the role of community-based social movements for sustainable energy transitions CSERGE Working Paper EDM 10-10* (Norwich: University of East Anglia, CSERGE); Seyfang G (2006) 'Ecological citizenship and sustainable consumption: Examining local organic food networks *Journal of Rural Studies* **22**: 383-395.

[15] Adger N, Dessai S, Goulden M, Hulme M, Lorenzoni I, Nelson D, Naess L, Wolf J, Wreford A (2008) 'Are there social limits to adaptation to climate change' *Climatic Change* DOI 10.1007/s10584-008-9520-z

[16] Walker (2008) *op. cit.*

[17] Alexander R, Hope M, Degg M (2007) 'Mainstreaming sustainable development – a case study:

literature supporting the wider benefits of community-energy projects, the extent to which these experiences can be extrapolated to other community-based projects is limited.[18] Furthermore, this lack of empirical data also hinders direct comparison of community-based/ owned projects to more conventional, centralised energy systems or ownership models, which are increasingly under scrutiny in terms of the social, environmental and economic efficacy.[19]

In contrast, in the context of energy efficiency improvements, there is a growing body of literature that has attempted to capture the social, environmental and economic benefits of home retrofitting, particularly in the context of fuel poverty through a social cost-benefit analysis approach. Perhaps the most comprehensive evaluation of social, economic and environmental benefits from fuel poverty interventions to date performed in the UK was commissioned by the Kirklees Warm Zone project. The study aimed to capture the principle learning, experience and history of the award-winning project. Figure 1 summarises the key project activities and the social, economic and environmental impacts measured by the analyses. A more detailed table of the three studies and evaluative indicators employed to are presented in Appendix 1.

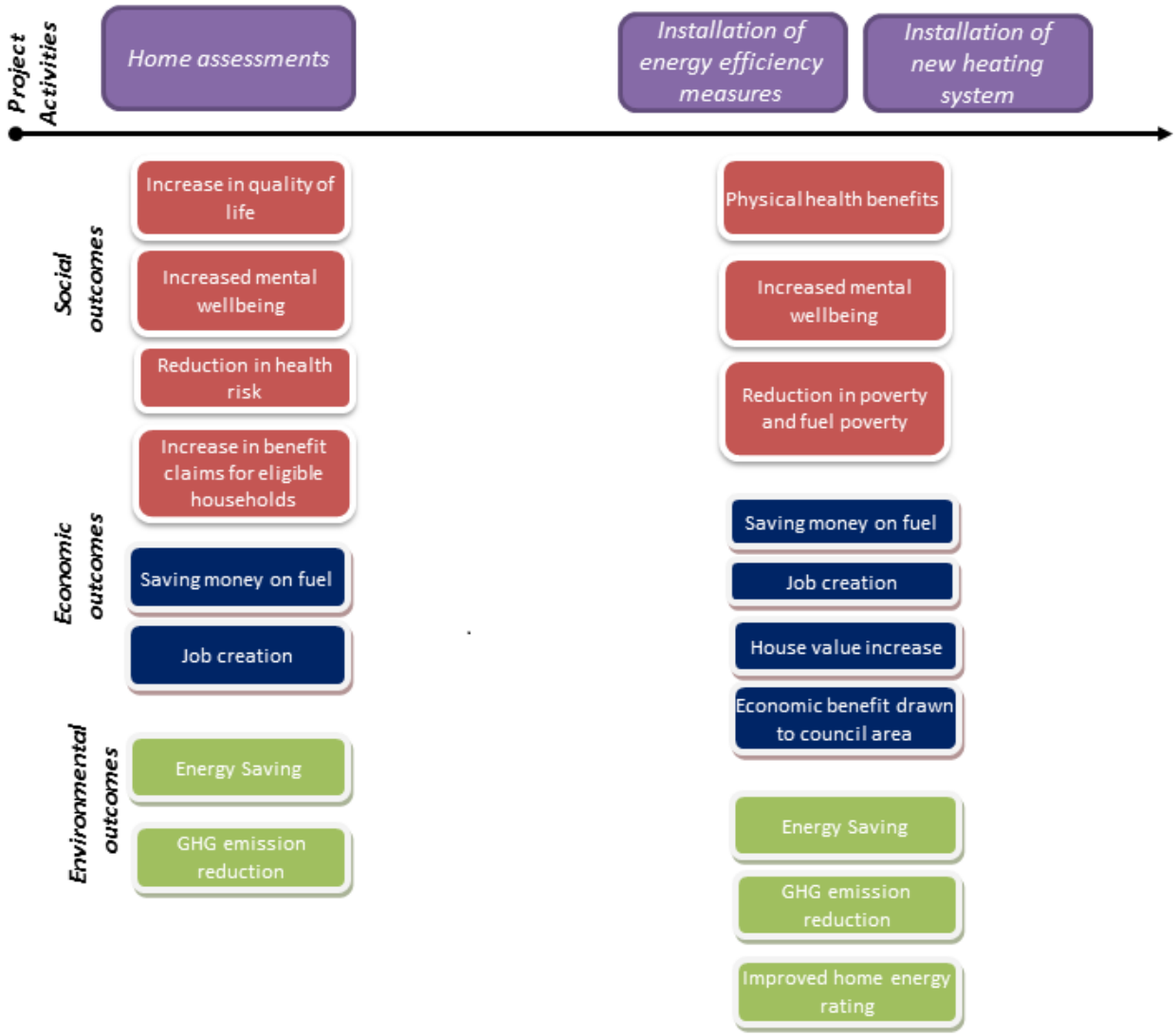
Despite the growing body of literature in measuring multiple outcomes from energy efficiency projects, there is, as yet, no standardised methodological approach. Nevertheless, this literature provides fertile ground for the development of a holistic evaluative framework for community-based carbon reduction projects in order to perform a social cost benefit analysis.

Ashton Hayes is going Carbon Neutral *Local Economy* **22**: 62-74; Middlemiss L. Parrish B (2009) 'Building capacity for low-carbon communities: The role of grassroots initiatives' *Energy Policy* Doi: 10.1016/jenpol.2009.07.003; EST(2011) *Power in numbers: The benefits and potential of distributed energy generation at the small community scale* (London: Energy Saving Trust); Willis R, Willis J (2012) *Cooperative renewable energy in the UK: A guide to this growing sector* (Manchester: Cooperatives UK, The Cooperative).

[18] Walker *et al* (2007) *op. cit.* Devine-Right P (2007) 'Energy citizenship: Psychological aspects of evolution in sustainable energy technologies' In Murphy J (ed.) *Governing Technology for Sustainability* (London: Earthscan).

[19]

Figure 1: Summary of evaluation framework of the Kirklees Warm Zone Project[20]



[20] Based on Edrich B, Beagley K, Webber P, Kelling S (2011) *Kirklees Warm Zone Final Report 2007-2010* (London: Carbon Descent); Liddell C, Morris C, Lagdon S (2011) *Kirklees warm zone: The project and its impact on wellbeing*; Butterworth N, Souterhnwood J, Dunham C (2011) *Kirklees Warm Zone Economic Impact Assessment* (London: Carbon Descent)

Our methodological approach

The approach taken in this report to developing an evaluation framework mirrors the initial stages that would be undertaken in order to apply a social cost benefit analysis to a project - the Social Return on Investment (SROI). Structuring the analysis in this way allows information to be gathered in a format that would allow a full SROI analysis to be applied at a later stage

The Social Return on Investment (SROI) aims to measure all material outcomes that are identified as resulting from an organisation's or programme's activities and attaches an approximate financial value. An adjusted form of cost-benefit analysis (CBA), SROI considers costs and benefits across the triple bottom line: social, economic and environmental. This adjustment of traditional CBA allows a fuller picture of the benefits that flow from the investment of time, money, and other resources, to be presented.

There are four phases to the SROI process. These are described below and summarised in Box 1. A more in-depth description of the methodology can be found in Appendix 3.

We do not perform a full SROI, and specifically focus on the first phase of the SROI process, whilst proposing a set of indicators the AHGCN community could use to begin appraisal of their activities. This is part of the engagement process to involve the community in the decision-making process through prioritising and selecting indicators to measure.

In order to develop the evaluative framework, a local co-design event was conducted to build theories of change with a number of community members. The information provided by the stakeholder engagement process was complemented by identification of reported social, economic and environmental outcomes and indicators used to measure these outcomes from a number of community-based retrofitting and generation projects. The long-list of indicators can be found in Appendix 2.

Box 1: Six-steps of SROI

Phase 1: *Setting parameters and impact map*

Establishing scope and identifying key stakeholders.

Mapping outcomes.

Phase 2: *Data collection*

Evidencing outcomes and giving them a value.

Phase 3: *Model and calculate*

Establishing impact.

Calculating the SROI.

Phase 4: *Report*

Reporting, using and embedding.

The Four Phases of SROI

Phase 1. Setting parameters and impact map

Boundaries

Create the framework for the analysis – what part of the organisation or individual project is to be measured – and prepare background information. In this case, the scope of the analysis is the activities that the AHGCN has undertaken within the community.

Describe how the project or organisation works and decide the time period for measurement.

Stakeholders

Stakeholders
Those people or groups who are either affected by or who can affect the activities.

Identify the stakeholders whose costs and benefits – associated with the investment or organisation – are to be measured.

Prioritise key stakeholders and objectives.
Materiality – the accountancy term for ensuring all the areas of performance needed to judge an organisation's performance are captured – is used in the selection of stakeholders and objectives.

Identify common or overriding

Impact map

Impact map
Demonstrates how an organisation's inputs and activities are connected to its outputs and how these, in turn, may affect stakeholders' outcomes. Impacts can then be derived from the identified outcomes.

Conduct stakeholder engagement to assist in the creation of an impact map that describes how the organisation/investment affects key

Phase 2: Data collection

Indicators

Identify appropriate indicators to capture outcomes.

Valuation

Use findings from stakeholder engagement and existing research to generate proxies to put financial values on outcomes.

Data collection

Use tried and tested sources to gather the data – required by the impacts laid out in the impact map – for accurate measurement of identified costs and benefits.

Decide on an appropriate benefit period for each outcome and the extent to which those outcomes drop off over time.

Phase 3: Model and calculate

Model and calculate

Create a cost-benefit model using gathered data and projections:

Calculate the present value of benefits and investment, and the SROI ratio.

Account for the displacement, attribution, and deadweight of the organisation/investment under review.

Phase 4: Report

Report

Consider and present the SROI produced by the organisation/investment.

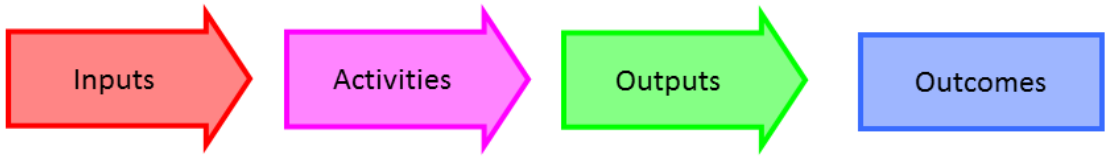
Identify how the benefits are divided between stakeholders.

Identify the key factors that affect the SROI ratio.

Local co-design event – impact mapping

A summary of the results of the co-design event is shown in Figure 3. This illustrates the journey of change (see Figure 2), as described by community members at the stakeholder event. A theory of change has been developed in order to illustrate, and how the activities of AHCGN creates the expected outcomes, or change for the households and community members involved.

Figure 2: Development of a theory of change



Output: Tells you an activity has taken place and is usually quantitative (e.g. number of homes insulated)

Outcome: The change that occurs as a result of an activity (e.g. improved well-being households)

The community defined short-term, medium-term and long-term outcomes as ≤ 12 months, 1-5 years and 5-10years respectively and we have disaggregated impacts according whether they can be categorised as environmental (green boxes), social (red boxes) or economic (blue boxes).

Figure 3 describes the journey of change from the 'need' defined by community members as an increasing awareness of the environmental impact of the community's lifestyle, falling community participation, geographic isolation and an aspiration to conserve and protect the village for future generations (intergenerational justice). The schematic illustrates the journey of change, or steps taken to achieve a defined 'aim', described by the community as an aspiration to become England's first carbon neutral village and increase community self-reliance and resilience in the context of environmental, social and economic challenges.

Table 2 provides a more detailed evaluation framework of the AHGCN project. The table describes anticipated outcomes by stakeholder (households and community), type of outcome (environmental, social and economic) and illustrates how short-term outcomes amplify into long-term outcomes, eventually leading to the overall aims of the project. While Ashton Hayes already has an established methodology for capturing environmental outcomes, there are large gaps in the data relating to social and economic impacts. As such, we have made some suggestions based on our literature review on how these impacts could be measured.

Indicators are ways of knowing that change has happened. In SROI they are applied to outcomes as these are the measures of change that have been identified to be of interest. Indicators are needed to demonstrate (verify) whether the outcome has occurred, and by how much.

Figure 3: Ashton Hayes Going Carbon Neutral, schematic of described theory of Change

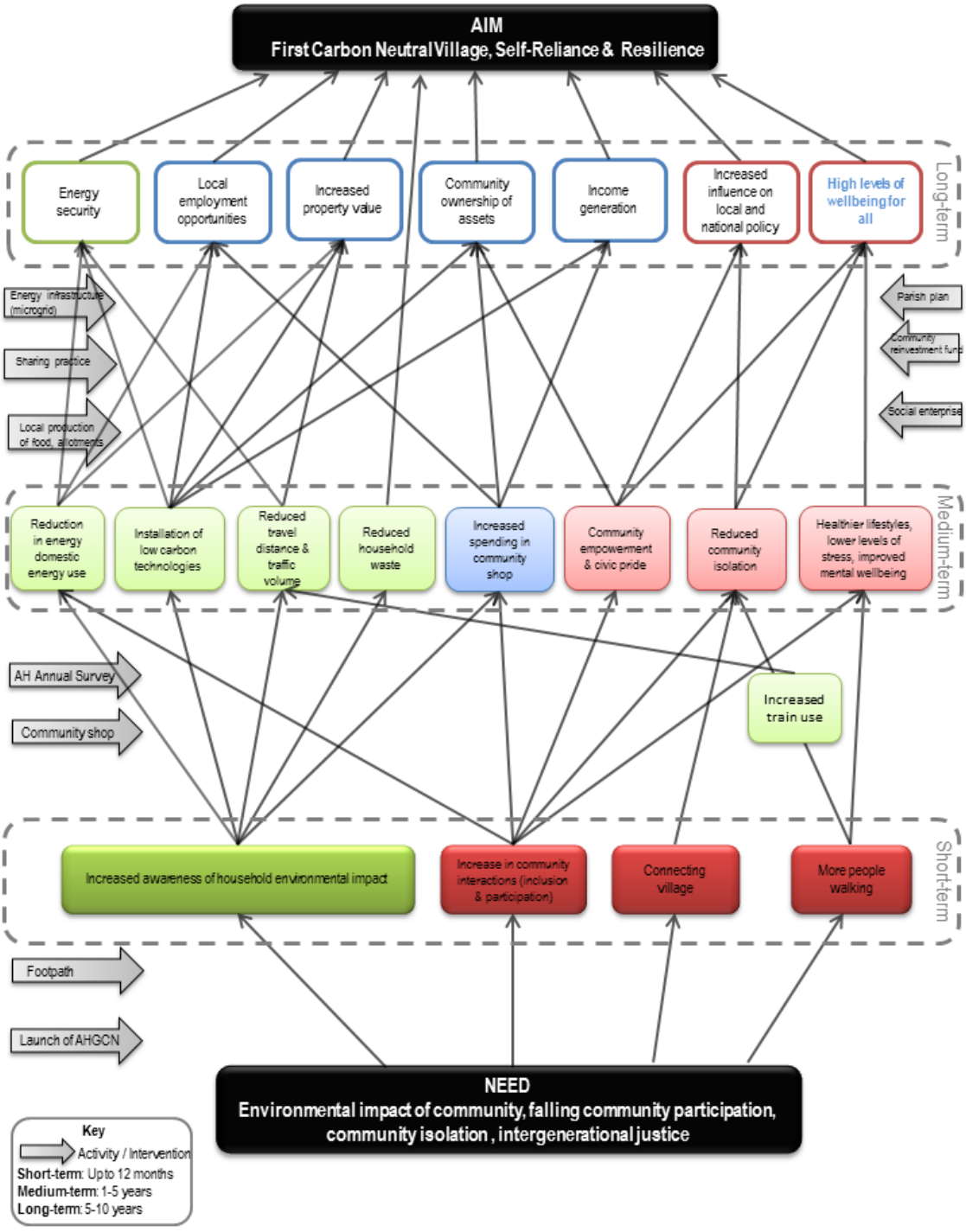


Table 1: Evaluation framework, based on co-design event

Stakeholder	Type of outcome	Short-term outcome (≤12 months)	Medium-term outcome (1-5 years)	Long-term outcome (5-10 years)	Potential indicators that could be used to measure identified outcomes	Data availability
Household	Environmental	Increase awareness of household environmental impact	Longevity of behavioural change		▪ Energy conserving behaviour; ▪ Reduced travel distance; ▪ Increased train use; ▪ Reuse, reduction and recycling of materials; ▪ Baseline and temporal data on average annual energy consumption (gas and electricity), and by house type; and ▪ Reduced expenditure on energy (£). ▪ The 'Green Grin-o-Meter' (specifically children and young adults)	▪ Ashton Hayes Annual Survey (2010). ▪ Potential for primary school to participate in data collection through home or online surveys such as an adapted version of the '*Green-Grin-o-meter*' originally developed for Caerphilly County Borough Council[21]
		-	Reduced household waste		▪ Reuse, reduction and recycling of materials.	▪ Ashton Hayes Annual Survey (2010)

[21]The Green Grin-o-Meter was developed by **nef** for Caerphilly County Borough Council. It is a web based game for children and young adults has been developed to raise awareness and understanding of sustainable development and global citizenship. Children answer eleven questions looking at their life and feelings to calculate their score on the Green Grin o meter. Their score is made up of three parts, health, happiness and ecological footprint. Depending on their score they then receive top tips on how to improve their score and live a more sustainable lifestyle; it also provides helplines for children who need additional support. Additional information: http://www.caerphilly.gov.uk/application.aspx?s=Be1HHt9Zwb+DiQpa/zQaex2AJbLUHVDOYV1MR2rw+7jIy3nOVEI+1O0+E+5CNN1W7A7+mDHJR8A= or http://www.greengrin.co.uk/

Stakeholder	Type of outcome	Short-term outcome (≤12 months)	Medium-term outcome (1-5 years)	Long-term outcome (5-10 years)	Potential indicators that could be used to measure identified outcomes	Data availability
		Increase awareness of low carbon technologies: generation & efficiency measures			▪ Installed/ consider/ not consider for multiple low carbon technologies; ▪ Number of households using a "green energy" tariff or local / domestic generation.	▪ Ashton Hayes Annual Survey (2010)
		-	Increase in domestic energy production	Energy security (household)	▪ Domestic generation in kWhe (electricity), kWht (heat); ▪ Energy dependence factor (ratio of energy consumed to energy generated)	▪ Currently unreported. Additional question could be added to the Ashton Hayes Annual Survey.
		-	Increased installation of low carbon technologies		▪ Installed/ consider/ not consider for multiple low carbon technologies	▪ Baseline data from Ilieva (2010) and Ashton Hayes Annual Survey
	Social	Increase in community (social) interaction/ friends/ acquaintances.			▪ % participation in village activities ▪ Buckner Neighbourhood Cohesion Scale[22]; ▪ Density of neighbourhood acquaintances (% of persons acquainted with other residents).	▪ Edwards (2007) surveyed participation in village activities. ▪ Baseline data held on % participation of village in project launch. ▪ Additional indicators could be captured through the Ashton Hayes Annual Survey.
		-	Increase in healthy lifestyles		▪ Active transport (trips by bike/ walking); ▪ Number of homes with indoor temperature raised to 21 °C above baseline;	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey. ▪ Potential for school to participate in data collection, specifically related to transport

[22] See Appendix 4

Stakeholder	Type of outcome	Short-term outcome (≤12 months)	Medium-term outcome (1-5 years)	Long-term outcome (5-10 years)	Potential indicators that could be used to measure identified outcomes	Data availability
					▪ Self-reported health. ▪ The Green-Grin-o-meter (specifically for children and young adults)	surveys ▪ Adapted version of the *'Green-Grin-o-meter'* online survey
		-	Lower levels of stress, improved mental wellbeing	High levels of wellbeing for all	▪ Warwick and Edinburgh Mental Wellbeing Scale (WEMWBS)[23]: ▪ The Green-Grin-o-meter (specifically for children and young adults)	▪ Currently unreported. Additional data could be collected from from Ashton Hayes Annual Survey. ▪ Adapted version of the *'Green-Grin-o-meter'* online survey
		Reduction in fuel poverty			▪ Annual spend on main heating fuel as a percentage of household income (includes: Housing Benefit, Income Support for Mortgage Interest, and Council Tax Benefit.); ▪ Average annual spend on electricity; ▪ Number of households that went without heating last winter because of cost of heating; ▪ Number of respondents worried about the cost of heating a lot.	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey.
	Economic	Reduced expenditure on energy			▪ Average energy use – electricity (adjusted for degree days); ▪ Average energy use – gas (adjusted for degree days);	▪ Ashton Hayes Annual Survey
					▪ Cost effectiveness (cost of electricity and heat below grid	▪ Currently unreported. Additional data collection from Ashton

[23] See Appendix 5

Stakeholder	Type of outcome	Short-term outcome (≤12 months)	Medium-term outcome (1-5 years)	Long-term outcome (5-10 years)	Potential indicators that could be used to measure identified outcomes	Data availability
					level / conventional boiler cost)	Hayes Annual Survey.
		-	-	Increase value in property	▪ Average value of property compared to counterfactual (£)	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey.
		-	-	Income from domestic generation	▪ Net £ per household	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey.
		-	Increased spending in community shop		▪ Expenditure in the community shop (£)	▪ Baseline data collected from Ashton Hayes Annual Survey (2010)
Community	Environmental		Increase in local food production		▪ Number of community members who grow their food; ▪ Ownership of allotments	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey.
		20 % reduction in carbon emissions			▪ Baseline and temporal data on carbon emissions (kWh emissions; carbon footprint)	▪ Ashton Hayes Annual Survey
		-	Less traffic		▪ Annual village traffic survey, e.g. roadside interviews, automatic traffic count, number plate recognition survey, manual classified count.	▪ Annual survey – data on public transport use since 2008/2009; ▪ Baseline data from Local Area Transport Strategy if available; ▪ Potential collaboration with University of Chester or Ashton Hayes Primary School
		-	Increase in local renewable energy generation		▪ Community generation in kWhe (electricity), kWht (heat)	▪ Ashton Hayes Annual Survey
		-	-	Energy security (community)	▪ Energy independence factor: amount of energy produced in the local area, compared to the overall	▪ Baseline data from Ashton Hayes Annual Survey

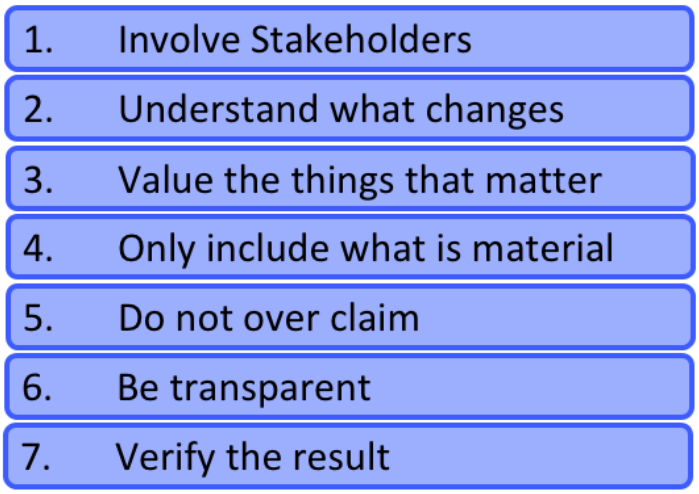
Stakeholder	Type of outcome	Short-term outcome (≤12 months)	Medium-term outcome (1-5 years)	Long-term outcome (5-10 years)	Potential indicators that could be used to measure identified outcomes	Data availability
					energy used per household	
	Social	Increase in community inclusion			▪ Buckner Neighbourhood Cohesion Scale	▪ One off measurement in Edwards (2007)
		Increase in community participation			▪ Percentage community participating in AHGCN	▪ Ashton Hayes Annual Survey
		-	Increased empowerment of the community and civic pride		▪ Civic engagement/ participation; ▪ Voting in local/ national elections; ▪ Awareness of local parish council issues; ▪ % of people who feel that they can influence decisions in their locality; ▪ Buckner Neighbourhood Cohesion Scale.	▪ Empowerment of community in its dealing with various external agencies (Alexander et al., 2007), but anecdotal. Therefore, reported as currently unreported. Additional data collection from Ashton Hayes Annual Survey.
		-	Reduced sense of community isolation		▪ Buckner Neighbourhood Cohesion Scale	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey
		-	-	Increased influence on local and national policy	This has been left blank for further discussion with the community. (see section *Next Steps*)	▪ Currently unreported.
		-	-	Intergenerational justice/ sustainability of the village for future generations	This has been left blank for further discussion with the community. (see section *Next Steps*)	▪ Currently unreported.
	Economic	-	-	Income generation, sustainable funding	▪ Temporal trends of funding generation, type of funding: private, public (central/local government), community generated (£)	▪ AHCE - Funding for AHGCN since start of project.

Stakeholder	Type of outcome	Short-term outcome (≤12 months)	Medium-term outcome (1-5 years)	Long-term outcome (5-10 years)	Potential indicators that could be used to measure identified outcomes	Data availability
		-	-	Increase in community owned assets	▪ Value of community owned assets (£)	▪ AHCE
		-	-	Local employment opportunities	▪ No of jobs created in full time equivalent (FTE)	▪ Currently unreported. Additional data collection from Ashton Hayes Annual Survey
		-	-	Opportunities for local suppliers	▪ £ spent with local suppliers	▪ Alexander et al (2007) used results from household survey on capacity to increase insulation and install local carbon technologies as a proxy for potential local suppliers

Next Steps

The next stage in developing the evaluative framework is to clarify one or more of the indicators to verify each of the outcomes identified in the local co-design event and summarised in Table 2. Given this, the evaluative framework presented in Table 2 should be viewed as a guide. The next step in the process is for the community to review and prioritise outcomes that will reflect the change they want to measure. In this section we provide a process for carrying this out. This is based on the principles of SROI (see Figure 4), which is described in greater detail in Appendix 2 and *A Guide to Social Return on Investment* published in early 2012.[24]

Figure 4: Principles of SROI



Identification of indicators

1: Involve the community

Stakeholders are often the best people to identify indicators. While Table 2 has presented indicators already collected by the Ashton Hayes Annual Survey, and provides a number of additional potential indicators based on secondary literature. However, a further engagement process with the community will allow them to described how they know that a particular outcome has happened to them.

For example, if the outcome was 'an increase in self-confidence', ask the community whose self-confidence is increased what they now do as a result, or ask them to describe what they mean by self-confidence. In this way, it will increase the likelihood of getting something that can be measured. One example is, an individual might say: 'Before [the activity] I would never go out, but now I get the bus into town to meet my friends.' In this example, the indicator of self-confidence could be whether people go out more or spend more time with other people.

2: Balancing subjective and objective indicators

Sometimes you need to use more than one indicator. Try to mix subjective (or self-

[24] The SROI Network (2012) *A guide to social return on investment* (London: nef, Charities Evaluation Services, NCVO, New Philanthropy Capital)

reported) and objective indicators that complement each other. There are risks of reyling on self-reporting measures that can be offset by supporting them with objective indicators. Check your indicators with your stakeholders.

3: **Check your indicators**

Once indicators that are relevant to the AHGCN project, they will need to be checked that they are not only measurable but that you will be able to measure them within the scope and resources you have set.

In an evaluative SROI analysis, check the cost of collecting information about outcomes that have happened, if the information is not already available. This can be expensive (time or money).

Collecting outcomes data and valuation

4: Measure what matters

A common mistake is to misinterpret what is meant by ‘measurable’. A basic principle of SROI is to measure and value the things that matter. Measurability means expressing the outcome indicator in terms that are measurable, rather than finding an indicator that is easy to measure.

Avoid the trap of using inappropriate indicators just because they are readily available. If the outcome is important, you will need to find a way to measure it.

5: Collecting outcomes data

Based on conversations with the community, however, we have recognised that over the past six years of the AHGCN project, the community has been asked to participate in multiple surveys. As such, we have attempted to contain many of the indicators within the Ashton Hayes Annual Survey undertaken by students of the University of Chester. We have also identified indicators that could be collected by students at the Ashton Hayes Primary School as part of a school project. Social media networks such as Facebook could also be used and integrated with the existing AHGCN project website. Additionally, the use of online surveys may be less invasive and time consuming for the community.

6: Establishing how long outcomes last

The effect of some outcomes will last longer than others. Some outcomes depend on the activity continuing and some do not. For example, in helping someone to start a business, it is reasonable to expect the business to last for some time after your intervention. Conversely, providing a service so that people do not visit their doctors so often may depend on the service being available all the time.

Where you believe that the outcome will last after the activity has stopped, the it will also continue to generate value. The timescale used is generally the number of years you expect the benefit to endure after your intervention. This is referred to as the duration of the outcome or the benefit period.

You will need an estimate of the duration of each of your outcomes. Ideally this would be determined by asking people how long an intervention lasted for them – this will give you evidence of the duration. However, if information is not available on the durability of different outcomes, you can use other research for a similar group to predict the benefit

period. Here, it is important to use data that is as close as possible to the intervention in question so as not to inappropriately generalise. This is an area where there can be a tendency to overstate your case.

Sometimes the duration of the outcome is just one year and it only lasts while the intervention is occurring. In other instances, it might be 10 or event 15 years. For example, a parenting intervention with children from deprived areas may potentially have effects that last into adulthood. You will need to have longitudinal data (data collected over a number of years) to support the duration of the outcome and should consider how you might start to collect this (id you are not already doing so). If you don't have this information you will need to make a case based on other research. The longer the duration, the more likely it is that the outcome will be affected by other factors, and the less credible your claim that the outcome is down to you.

7: Putting a value on the outcomes

The purpose of valuation is to reveal the value of outcomes and show how important they are relative to the value of other outcomes. As well as revealing missing value it will help determine how significant an outcome is.

At this stage, we advise the AHGCN community decide how important it is to value or monetise the measured outcomes. If, for example, the focus of the reporting is to maximise social, environmental and economic benefits in existing and future projects whilst improving decision-making and ensuring its activities create the desired outcomes, then it may not be necessary to place a monetary value on the outcomes. If, however, the community wishes to demonstrate monetary value, for, for example advocacy purposes to local and central government and other communities, then an additional step of valuation will be necessary.

Should the community decide to demonstrate monetary value, the next step will be to identify appropriate financial values – these are a way of presenting the relative importance to a stakeholder of they changes they experience. All value is, in the end, subjective. Markets have developed, in large part, to mediate between people's different subjective perceptions of what things are worth. In some cases, this is more obvious than in other. But even where prices are stable and have the semblance of 'objective' or 'true' value, this is not really the case. Take for example a house. How much it is worth depends on who you are referring to. If you are selling a house, you will have a sense of what you are prepared to accept for it – how much value it has for you. However, a buyer will have a different view of what they are prepared to pay – how much value the house has to them. Whatever the market does – in fact, what it is effectively for – is to bring together people whose valuations happen to coincide. This 'coincidence' is called 'price discovery' – but is not uncovering any 'true' or 'fundamental value', rather it is matching people who (broadly) agree on what something is worth.

Arriving at social value is the same as this in almost every way. The difference is that goods are not traded in the market and so there is no process of 'price discovery'. This does not mean, however, that these social 'goods' do not have a value to people.

In SROI, we use financial proxies to estimate the social value of non-traded goods to different stakeholders. Just as two people may disagree on the value of a traded good (and so decide not to trade), different stakeholders will have different perceptions of the value that they get from different things. By estimating this value through the use of

financial proxies, and combining these valuations, we arrive at an estimate of the total social value created by an intervention.

Proxies that are easy to source

Monetisation can be a fairly straightforward process – where it relates to a cost saving, for example. This might be the case where you are interested in the value of improved health from retrofitting a home; you may decide to use the cost of attending a doctor's clinic.

However, sometimes, this will not result in an actual cost saving because the scale of the intervention is too small to affect the cost in a significant way (see section on marginal costs, below), but it still has a value.

Proxies that are more challenging

SROI also gives value to things that are harder to value so are routinely left out of traditional economic appraisal. There are several techniques available to do this:

Stated preference and contingent valuation: People are asked directly how they value things either relative to other things or in terms of how much they would pay to have or avoid something. This approach assesses people's willingness to pay, or accept compensation, for a hypothetical thing. For example, you may ask people to value a decrease in traffic volume in Ashton Hayes village – their willingness to pay for it. Conversely, you may ask them how much compensation they would require to accept an increase in traffic volumes.

Revealed preference: This infers valuation from the prices of related market-traded goods. A common technique for inferring preference is to look at the way in which people spend money. Many governments produce data on average household spending, which includes categories such as 'leisure' and 'health' or 'home improvement'. Although flawed for a number of reasons, not least because it excludes the value of the public services, this can also be useful.

Hedonic pricing: This is another form of revealed preference and builds up a value form the market values of constituent parts of the service or good being considered. This method could be used to value environmental amenities that affect the price of residential properties. For example, it could help us value energy security by estimating the premium placed on house prices in areas with local energy production (or the discount on otherwise identical houses in an area with no local energy production).

Travel cost/ time value method: This approach recognises that people are generally willing to travel some distance, or give up some time to access goods and services on which they place a value. This inconvenience can be translated into money to derive the estimate of the benefits of those goods and services.

When identifying proxies, it is important to remember that we are not interested in whether money actually changes hands. it also doesn't matter whether or not the stakeholders in question could afford to buy something – they can still place a value on it. We assume that health has a similar value to people on any income.

There are problems with each of these techniques, and there are no hard and fast rules as to which you would use in given situations. However, these are offered as a means of support for deriving proxies.

In Table 2, we have suggested a number of indicators that could be used to measure outcomes. In Table 3, a few choice examples of outcomes, indicators and proxies are presented.

Table 3: Examples of possible proxies for valuation

Outcome	Indicator	Possible Proxies
Improved access to local services (e.g. community shop)	Visits to community shop by households	Savings in time and travel costs of being able to access services provided by the community shop locally
Reduction in carbon emissions	Level of carbon emissions	Cost of CO_2 emissions
Less waste	Amount of waste going to landfill Level of carbon emissions from landfill	Cost of landfill charges Reduction in CO_2 emissions from landfill
Improved perception of the local area (e.g. reduction in community isolation, local energy production, increase in community assets)	Residents report improvements in the local area	Change in property prices Income generation from local energy production Amount spent on community assets

Appendices

Appendix 1: Summary of key literature examining social, environmental and economic outcomes from the Kirklees Warm Zone project

Table 4: Summary of evaluation framework of the Kirklees Warm Zone Project

Reference	Study aim	Type of impact	Outcome	Activity	Indicator
Edrich B, Beagley K, Webber P, Kelling S (2011) *Kirklees Warm Zone Final Report 2007-2010* (London: Carbon Descent).	Captures the principle learning, experience and history of Kirklees Warm Zone.	Environmental	Energy saving	Number of assessments	Number of homes assessed
				Installations	Number of homes insulated
					Insulation measures installed
					Central heating installed
					Total energy saved by households (MWh)
			Emissions savings		Total CO_2 reduction in tonnes of CO_2
			SAP[25] grade increase		SAP points
		social impacts	Increase in quality of life	Assessments ((benefit/money check, fire check, carers gateway, CO alarm, advice on water conservation, free low energy CFL)	Households requesting support from other partner agencies
					Additional benefit claims secured by residents
			Households taken out of fuel poverty	Installation of energy efficiency measures	Number of homes

Reference	Study aim	Type of impact	Outcome	Activity	Indicator
			Total household fuel expenditure saving		£/yr
			Health / mental health (see also *Kirklees Warm Zone, the project and its impact on wellbeing*)		Potential health benefits £ (improved mental, physical, reduced injury from CO monitors/ smoke detectors)
		Economic impacts (see also *Kirklees Warm Zone Economic Impact Assessment*).	Direct employment - job creation		FTE jobs
					Freelance jobs
			Economic benefit drawn to council area		Net economic benefit
Liddell C, Morris C, Lagdon S (2011) *Kirklees warm zone: The project and its impact on wellbeing*	Performs a cost benefit analysis of for health and wellbeing (*mental wellbeing*) from warm zone project	Social impacts	Increased mental wellbeing[26]	Installation of loft insulation, cavity wall insulation, fire safety checks, smoke detectors, CO monitors, heating systems through local heating grants	Self-reported measures (common mental disorder, depression in mothers of young children, repeat truancy among children (indirect measure of wellbeing), happiness score, stress, social functioning, role-emotional, mental wellbeing, anxiety and depression,
				Installation of heating system through funds levered in by referrals to Warm Front	
			Physical health impacts	Installation of heating systems	Indoor temperature raised to 21°C above baseline
				Installation of CO/smoke	Value of preventing a statistical

Reference	Study aim	Type of impact	Outcome	Activity	Indicator
				alarm	fatality
			Physical and mental health impacts	Installation of heating systems	Savings from health and wellbeing benefits in (QALY) - the model estimated a return of 42 p in the £ for Warm Homes and other heating interventions
			Mental health impacts	Loft and cavity wall installation	Odds ratios of likely mental health impacts
Butterworth N, Souterhnwood J, Dunham C (2011) *Kirklees Warm Zone Economic Impact Assessment* (London: Carbon Descent)	Explores the economic benefits created from Warm Zone	Social impacts	confirmed benefit claims	Retrofitting homes	£
		Economic impacts	jobs created and economic impact		FTE and £
			saving to NHS		£
		Environmental impacts	lifetime CO_2 saving		ktonnes over 40 year period, £
			lifetime fuel saving		GWh over 40 year period, £
			house value increase		SAP, £

[25] SAP (Standard Assessment Procedure) – The SAP rating of any particular dwelling is derived from a complex algorithm that encompasses measure of a home's heating type, insulation quality, ventilation, and many other measures. The SAP is the UK Government's currently recommended methodology for assigning home energy ratings, and assumes standard use by typical occupants. Scores are represented on a logarithmic scale, which ranges from 1 (poor) to 120 (excellent). SAP ratings were introduced in the 1995 Building Regulations and a value of between 80 and 85 was recommended as being acceptable (BRE, 2005).

[26] Authors define mental wellbeing as: "*a dynamic state that refers to individuals' ability to develop their potential, work productively and creatively, build storng and positive relationships with others and contribute to their community*".

Appendix 2: Full SROI Methodology

SROI is informed by a set of principles that are designed to ensure that process is robust, transparent, and informed by stakeholders. The principles inform a six-step methodology which is summarised in Box 2. The SROI also encompasses a number of conceptual and modelling steps, which are indicatively deepened below:

First, defining a theory of change in order to illustrate, and eventually demonstrate, how the activities of an organization creates the expected outcomes, or change for the stakeholders involved. There is no 'one best' theory of change that can be selected, it is driven by the change an organization or programme seeks to trigger, and the logical link between activities and intended change. Once this is specified, unintended consequences are identified, both positive and negative. It is when building a theory of change that stakeholder groups are defined, i.e. those groups which are affected by the initiative. Different theories of change can be defined for different stakeholder groups, if this is judged to be necessary. It is worth noting that the terminology can differ between projects, and organizations when developing a theory of change.

Second, measuring the outcome incidence in order to understand how much change occurs for each stakeholder, and how this is calculated. Two steps are followed: the first consists of defining indicators to represent and measure outcomes. The second consists of collecting two types of data: how many stakeholders are affected, i.e. experiencing change, as a consequence of the programme; and how large that change is. Generally, evidencing outcome incidence is an empirical exercise requiring data collection rather than secondary research.

Third, defining proxy values. This is a process of understanding the value of the change created by a programme by assigning (a) appropriate economic (rather than strictly financial) values to components that have a market price, and (b) monetary values to things that do not have a market price using financial approximations i.e. "proxy values". This process is generally referred to as "social valuation" or "environmental valuation" respectively for "monetizing" social or environmental wealth/capital. It is worth noting that while environmental valuation (e.g. of greenhouse gas emissions, ecosystem services, or other natural resources) is a relatively robust exercise, and has been mainstreamed throughout the past decade, monetizing social goods can be more challenging given a relative lack of robust studies to guide that valuation process.

The overall value creation observed is calculated by the combining outcome incidence with the monetary values of respective outcomes, outputs or indicators. How this is done in practice is influenced by the context in which the analysis is applied, as well as the available information. The value calculation obtained represents a gross figure of which, it can be deducted (a) which part can be attributed to other projects/organizations (attribution); (b) the change that would have happened even in the absence of project (deadweight) or even, and (c) those benefits which are offset by unintended adverse impacts.

As such, the attribution process consists in defining which percentage of overall change can be considered to be triggered directly by the project. This requires the potential identification of other organizations, actors (e.g. local government or other NGOs) and projects which could have influenced the outcome incidence. Attribution thus assesses the proportion of credit that a programme can take for the change that has occurred -

taking account of other actors involved.

A second adjustment to the overall value thought to be created by the initiative can occur when considering deadweight, defined as an assessment of the amount of change that would have happened anyway in a “no intervention” scenario. This requires the definition, conceptually and statistically, of a “business-as-usual” scenario. Three scenarios can be depicted: (a) a “status quo” situation whereby no significant change occurs in the absence of intervention; (b) an improvement even in the absence of intervention, which is synonym of a lower net benefit compared to initially computed aggregate outcome incidence; (c) a decrease of the social, economic and environmental capital if there is no intervention (i.e. the situation worsens for the people and place). The latter scenario can be particularly challenging, since net benefits cannot be compared solely to initial baseline, but may avert the decline of the existing context within which the initiative is working, for example a worsening of food insecurity levels. As such, the third scenario requires a measurement of “avoided development costs” brought about by a project. These avoided costs are included in the overall benefits calculation.

A final adjustment to the overall value calculation needs to be made when considering displacement. This is an assessment of how much of the change (remaining after considering attribution and deadweight) can be considered as a net benefit (i.e. a new change), or is it the result of a movement or change from one place to another. In employment, for instance, if a group of individuals get jobs, it could be at the expense of others – i.e. these are not new positions being created, but rather different people in these jobs. In development projects, a recurrent example concerns adverse environmental impacts: an agricultural development project, for example, can trigger adverse environmental impacts on, or reduce resource availability for, other communities or stakeholder groups – if the project is not designed in a such a way as to avoid adverse impacts. In this case net benefits are the benefits accruing to the targeted community minus costs incurred on other communities. In a sense, displacement can be defined, in a more traditional economic vocabulary, as an accounting process of “negative externalities”.

After an analysis of displacement, attribution and deadweight the benefit period is defined i.e. the length of time that a change lasts and the benefits associated with that change. This may be influenced by the duration of the activity or by other changes that occur. Similarly, the effects might last for a long period but be decreasing over time. A decreasing trend is defined as “drop off”.

Last but not least, benefits – and costs – are discounted to represent their present value. In the UK, the social discount rate (as opposed to financial/market discount rate, which is generally higher) is provided by the treasury at a 3.5% level. This rate represents time preferences: the higher the discount rate, the greater the assumed preference for the present is assumed, and conversely the less a future stream of benefits ifs preferred. Whilst a high discount rate tends to favour projects which have high returns in the short run. Discount rate choice is a statement in itself of how a society values returns. As such, it is generally good practice to consider a range of discount rates, say for e.g. 1%, 3.5% and 8%. For projects in developing countries, upper bound discount rates (6% to 8%) are generally used: put simply, economists broadly assume a higher preference for the present in developing countries given poor socio-economic conditions and immediate short-term livelihood concerns.

Cost benefit ratios, or SROI ratios, are finally obtained by dividing aggregate net present value of benefits by aggregate net present value of costs. If a project's ratio is above 1, then the project is considered efficient from a socio-economic perspective, i.e. the wealth it creates surpasses the costs it implies: net social value creation is thus ensured.

Indicators need to be assessed before and after the intervention, or by comparing an indicator to the counterfactual to quantify the benefit. Once this has been evidenced, a model can be constructed to value the outcome. Where there is missing information data could be collected through, for example, target groups by applying a questionnaire. This will also be complemented through secondary data / extant literature to identify models of valuation. These will also differentiate between value accruing to (a) the individuals, (b) the community as a whole, (c) to the State.

Further details of how to conduct a full Social Return on Investment can be found in The SROI Network guide to Social Return on investment.[27]

[27] The SROI Network (2012) *A guide to social return on investment* (London: nef, Charities Evaluation Services, NCVO, New Philanthropy Capital)

Appendix 4: Buckner Neighbourhood Cohesion Scale

The Buckner Neighbourhood Cohesion Scale is a 19-item index of respondent's sense of belonging and cohesion with neighbours, interaction with neighbours, and degree of collective action.[28]

Table 5: Buckner Neighbourhood Cohesion Scale[29]

	Strongly disagree	Disagree	Not sure / neither agree nor disagree	Agree	Strongly agree
I feel like I belong to this neighbourhood.					
I visit with my neighbours in their homes.					
The friendships and associations I have with other people in my neighbourhood mean a lot to me.					
I would like to move out of this neighbourhood.					
If the people in my neighbourhood were planning something I'd think of it as something "we" were doing rather than what "they" were doing.					
If I needed advice about something I could go to someone in my neighbourhood.					
I think I agree with most people in my neighbourhood about what is important in life.					
I believe my neighbours would help me in an emergency.					
I think I agree with most people in my neighbourhood about what is important in life.					
I feel loyal to the people in my neighbourhood.					
I borrow things and exchange favours with my neighbours.					
I would be willing to work together with others on something to improve my neighbourhood.					
I plan to remain a resident of this neighbourhood for					

[28] http://tarc.aecf.org/initiatives/mc/mcid/measures_one_measure.php?m_id=200159210

[29] Ibid.

a number of years.					
I like to think of myself as similar to the people who live in this neighbourhood.					
I rarely have neighbours over to my house to visit.					
A feeling of fellowship runs deep between me and other people who live in this neighbourhood. I regularly stop and talk with people in my neighbourhood					
Living in this neighbourhood gives me a sense of community.					
People in my neighbourhood work together to keep children safe.					

Appendix 5: Warwick and Edinburgh Mental Wellbeing Scale (WEMWBS)

The WEMWBS comprises 14 items, each with five response categories.[30] The scale has been fully validated for use in the UK and is psychometrically robust and highly reliable.[31]

Table 6: The Warwick and Edinburgh Mental Wellbeing Scale (WEMWBS) [32]

	None of the time	Rarely	Some of the time	Often	All of the time
Optimistic about the future					
Feeling useful					
Feeling relaxed					
Interested in other people					
Energy to spare					
Dealing with problems well					
Thinking clearly					
Feeling good about myself					
Close to others					
Feeling confident					
Can make up my mind					
Feeling loved					
Interested in new things					
Feeling cheerful					

[30] http://www.healthscotland.com/documents/1467.aspx

[31] Liddell C (2011) *Hard to treat homes in Northern Ireland: Evaluation Report* (Newtownabbey, Co. Antrim: University of Ulster).

[32] Ibid.

Appendix 6: Selection of indicators sourced from secondary literature

Outcome *What has changed?*	Definition	Examples of a outcome from an AHCE project	Example Measures / indicators
Environmental	An environmental outcome is one that affects the *natural environment*. Positive environmental outcomes could include: supporting local wildlife, reducing local air pollution, reducing water consumption, reducing greenhouse gas emissions, reducing energy use (e.g. electricity, petrol/diesel, and gas)	▪ Reduction in CO_2 ▪ Reduction in energy consumption ▪ Improved biodiversity ▪ Reduction in waste production	▪ Estimated CO_2 reductions over the first year of the project ▪ Total expected CO_2 reductions for the duration of the project lifetime ▪ Cost of CO_2 saving per tonne ▪ Change in electricity and gas consumption compared to baseline ▪ Change in water consumption compared to baseline ▪ Change in personal motorised vehicle mileage ▪ Lifetime fuel saving for measure ▪ Change in SAP rating ▪ Active management of local sites ▪ Residual household waste per head; at least two types of recyclable waste collected from household.
Social	A social outcome is one that *affects individuals, households or communities.* Positive social outcomes could include a reduction in the number of households worried about fuel bills, an increase in local democratic participation, people making more sustainable choices, an increase in self-reported wellbeing and physical health, or an increase in energy security (the amount of energy produced in the local area, compared to the overall energy used per household).	▪ Increase in social connectedness ▪ Strengthen communities and improve community interaction ▪ Increased energy/environmental literacy ▪ Increase in well-being	▪ Change in self-reported attitude to area ▪ Percentage of people that fell they can influence decisions in their locality ▪ Change in attitude to home using Buckner Neighbourhood Cohesion Scale ▪ % of people who feel they can influence decisions in their locality ▪ Civic participation ▪ Based on qualitative survey record changes in levels of awareness compared to baseline ▪ Average mental wellbeing score using the Warwick and Edinburgh Mental Wellbeing

		▪ Health improvements ▪ Reduced levels of fuel poverty ▪ Reduction in poverty ▪ Increase in energy security	Scale ▪ Improvement in self-reported health of householders and their families (may relate to specific groups) ▪ Change in the number of houses that went without heating last winter due to cost of heating (qualitative survey) ▪ Number of respondents worried about the cost of heating ▪ Energy efficiency improvements on social housing ▪ Annual spend on main heating fuel ▪ Satisfaction survey on thermal comfort before and after retrofitting ▪ Average annual spend on electricity ▪ Proportion of children in poverty; ▪ Benefits advice requested/ change in benefits uptake ▪ Energy independence factor: amount of energy produced in the local area, compared to the overall energy used per household
Economic	An economic outcome is on that affects the local economy. Positive local economic outcomes include: investment opportunities, employment opportunities, and local business potential.	▪ Local job creation ▪ Increasing local economic resilience ▪ Local wealth creation ▪ Skills	▪ Reducing unemployment level ▪ Working age of people on out of work benefits ▪ Business diversity ▪ Local multiplier measure ▪ Change in property value ▪ Institutions supported/ opened (e.g. opening of training centres to address skills gap); ▪ Local skills developed

Appendix 7: Event notes

Table 7: Flip Chart Write Up of Impact Mapping: Session 17 February 2012

Need	▪ Climate change ▪ Empowerment ▪ Taking action, not talk ▪ Saving money, households (energy) ▪ Reducing isolation of village with footpath, people could walk to school / station and use train ▪ Community inclusion (outcome: was not a lack though – or at least did not realise there was a lack at the outset of project) ▪ Demonstrate what could be done ▪ Increase in some people's spare time – number of people retired at the same time
Aim	▪ England's first carbon neutral village – defined – adapted for rural area – emissions balanced with sequestration – local off set. Focused on the net impact of activities on carbon emissions. ▪ Have fun while doing it ▪ Financially independent ▪ Sustainability ▪ Sharing ▪ Future generations (intergenerational justice)
Activities	▪ Energy conservation: awareness raising ad behaviour change ▪ Monitoring energy use – baseline and repeating annually ▪ Sharing / communication outside of the community ▪ Footpath ▪ Working together- integrating / knitting together community – community owned assets / institutions ▪ Creating an energy efficient infrastructure in the village (shop, pavilion, pub, community groups) ▪ Locally sourced goods ▪ Parish council participation ▪ Electric car ▪ Future: influencing policy makers (has increased overtime), sustainable building
Initial results/ Short term outcomes (12	▪ Behavioural ▪ Timebank (predated carbon project)

months)	▪ Energy conservation ▪ More fun ▪ Healthy lifestyle ▪ Saving money ▪ Growing food - allotments ▪ Awareness ▪ Using alternative transport ▪ Local facilities – sports pavilion, shop, scouts ▪ Infrastructure ▪ Footpath (influenced use of trains – walking to the train station now safe 20 mins) ▪ Level of participation (high) ▪ 20% reduction in carbon through behaviour change ▪ Conference attracts 150 people ▪ Monitoring data on energy use ▪ Benefits to different groups e.g. ages ▪ Taking influence out of the village boundaries e.g. into work environment
Medium term (5-10 years)	▪ Behaviour ▪ Healthier lifestyles ▪ Quality of life (and time with children) ▪ Less stress ▪ More friends / involvement ▪ Village allotments ▪ Less hectic ▪ Village cohesion on energy ▪ Place for children to play ▪ Infrastructure ▪ Bringing companies on board ▪ Saves others starting form scratch ▪ Give confidence to government to act ▪ Facilitating other governments ▪ Influencing finance form national government ▪ Influencing development to take climate change into account – normalisation improvement, pride, empowerment

	▪ New sports pavilion ▪ Energy company ▪ Influence enables nest step to the community ▪ Linking community and individual actions. How community can help individual actions ▪ Mental health
	▪ Self-sufficiency in energy (& other services) ▪ Develop social enterprise to generate income for community benefit ▪ Become carbon neutral ▪ Greater influence on local and national policy ▪ Create employment opportunities locally ▪ Normalising renewables – people accept new technology ▪ Power source (energy independence) ▪ Village transport ▪ Coppicing ▪ Sustainable funding mechanism ▪ Major purchases (green deal) community owned
Enablers	▪ Community Finance mechanism e.g. credit union ▪ Legislation ▪ Legal / market frameworks ▪ Keeping people involved ▪ Balance between professional an community action ▪ Trusted sources of information ▪ Deliberation ▪ Knowledge sharing
Preventers	▪ Negative publicity ▪ Fatigue ▪ Key players leaving ▪ Adverse policy shifts