



Fuel Poverty Social Impact Bonds: Interim Findings

Report to eaga Charitable Trust

January, 2012

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Acknowledgements

With due thanks and acknowledgement to the project steering group for their time and support, including:

Derek Lickorish, Chair of the Fuel Poverty Advisory Group
Jim Metcalfe, Carnegie UK
William Baker, Consumer Focus
Viv Mason, Building Research Establishment
Christine Liddell, University of Belfast
Angela Raffle, Bristol NHS
Andrew Griffiths, Chartered Institute of Environmental Health
James Vaccaro, Triodos Bank
Simon Roberts, Centre for Sustainable Energy
Daniel Miodovnik, Social Finance

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1 Introduction

Social Impact Bonds (SIBs) offer an innovative and powerful new mechanism for leveraging private sector investment into social welfare programmes. Through a Social Impact Bond, private investment is used to pay for prevention and early intervention services, aimed at delivering improved social outcomes that result in public sector savings. It is these expected public sector savings that form the basis for encouraging and rewarding private investors. The public sector pays if (and only if) the intervention is successful. In this way, Social Impact Bonds enable a re-allocation of risk between the two sectors. If improvements in social welfare are not delivered (and thus financial savings not realised), then investors do not recover their investment.

Widespread interest in SIBs has resulted from a government agenda focussed on reducing public spending, reforming public services and growing the social enterprise sector.

The promise of SIBs is that they can deliver on all these counts:

- through stimulating early prevention programmes which cut public sector costs;
- by encouraging innovative performance-based approaches to welfare provision; and
- through creating new opportunities for social enterprise.

As a result, they seem perfectly tuned to ‘Big Society’ and ‘localism’ thinking and consequently look set to take an increasingly prominent role in policy making and planning. A number of pilot projects are already underway: Peterborough prison has set up a 6 year, 4 million pound SIB trial to tackle reoffending in short stay prisoners, whilst the Department for Communities and Local Government (CLG) is working with NHS Leeds to develop plans for using SIBs to reduce health and social care costs among older people.

However, Social Impact Bonds are not an appropriate funding source for all early intervention programmes. This research project seeks to explore the extent to which fuel poverty alleviation programmes may align with SIB requirements.

1.1 Aims

The main aim of this project is therefore to assess the feasibility and desirability of Social Impact Bonds as a significant new source of funding for fuel poverty alleviation, and specifically:

- To identify the financial, technical and institutional arrangements which would make feasible an SIB funded programme of fuel poverty alleviation measures.
- To assess the potential positive and negative implications of using SIBs to fund FPA
- To assist policy makers working in the public health and housing sectors to integrate FPA when designing outcome-based schemes to deliver social welfare programmes.

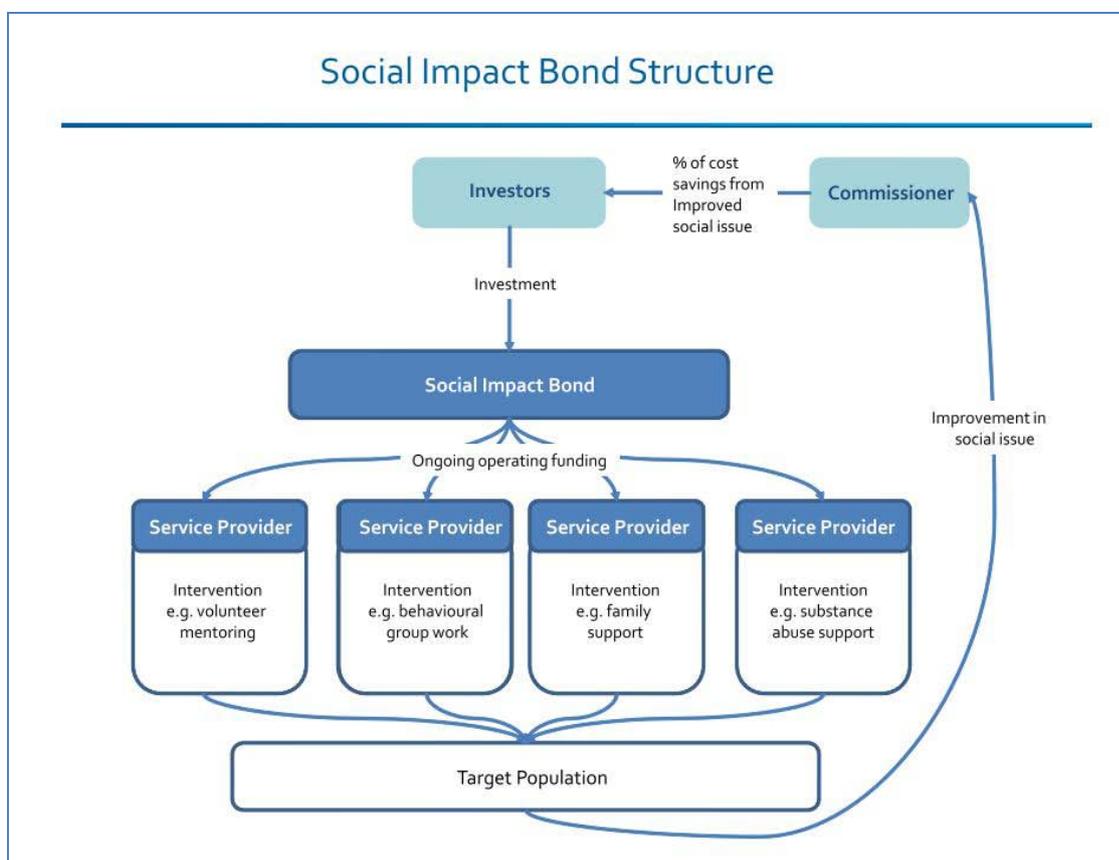
1.2 Objectives

The project’s key objective is to produce a report that provides policy-makers, investors, public sector commissioners and other practitioners with clear guidance on design, implementation and other key considerations for SIB-funded fuel poverty alleviation programmes.

2 Background: the SIB concept

The SIB concept can be defined as: a commitment from a public authority (e.g. an NHS Trust) to use a proportion of the savings that result from improved social outcomes (e.g. reduced hospital admissions) to reward non-government investors (e.g. a charitable trust) that fund early intervention activities (e.g. a fuel poverty alleviation programme). Critically, the savings resulting from the intervention must be sufficiently high that the public authority can repay the investors at a sufficient rate of return whilst still making savings itself. A further feature is that the public authority will only be required to repay the bond if agreed performance targets are met – i.e. improvements in social welfare are delivered. These arrangements ensure that much of the risk is transferred to the investors in the bond: the public authority will either make real savings through the effects of the intervention or, if the intervention is unsuccessful, then no payment is provided. A diagram showing SIB structure is shown below.

Figure 1: Social Impact Bond structure. Source: Social Finance¹



Social Impact Bonds are not an appropriate funding source for all early intervention programmes. Therefore in the context of this research project it is important to first explore whether FPA

¹ See: www.socialfinance.org.uk/work/sibs

programmes have the requisite characteristics to be suited to the SIB model². Criteria for a successful use of SIBs when applied to funding a FPA programme are shown below.

a) Interventions must have high net benefits

There is a growing evidence base indicating that FPA may have high net financial benefits. For example the Building Research Establishment recently reported that HHSRS³ scale Category 1 excess cold hazards resulting from housing with very low energy efficiency ratings (<SAP35) cost the NHS £192 million per annum in admissions and treatment of acute conditions. The report concludes that average paybacks from avoided health costs from investing in energy efficiency in the poorest performing homes can be as low as 5 years⁴. This suggests that an SIB investing in prevention of excess cold at a particular target group and maturing in 5-10 years would be viable. Health benefits are amongst the most exhaustively documented of FPA impacts, though there are many other associated social benefits which could theoretically be allocated to an SIB including educational benefits⁵, community stability benefits and environmental clean-up costs⁶. The key for an SIB is to have a commissioning party which can capture some or all of those benefits (and therefore pay for their achievement).

b) Interventions must be plausibly linked to measurable outcomes

Performance based payment schemes can only work for early intervention programmes having outcomes that can be clearly measured and where the causal linkage between the scheme and the outcome are accepted and contractually documented for both investor and commissioner. Key research questions will be (a) what performance indicators could be acceptable and measurable and (b) the level of certainty in the relationship between cause and effect needed by the various participants in an SIB to be satisfied that contractual obligations have been fulfilled. This might prove to be as simple as measuring GP surgery visits or hospital admittances for members of the treatment population for illnesses linked to cold and damp housing such as strokes and respiratory diseases.

c) The treatment population must be well defined up front

Evaluation of programme impacts is much easier for an SIB if the treatment group is clearly defined and readily targeted by the intervention. In the case of FPA, many GPs maintain lists of 'at risk' patients for cold-related illnesses (though currently typically fail to link this risk status to the energy performance of their housing). These could provide a targetable treatment population which is likely to have a high incidence of fuel poverty.

² These criteria drawn from "Social Impact Bonds: a promising new financing model to accelerate social innovation and improve government performance". J.B. Lieberman. Center for American Progress. February 2011.

³ Housing Health and Safety Rating System

⁴ "The Health Costs of Cold Dwellings". Building Research Establishment report number ED2792, Report to Chartered Institute of Environmental Health, February, 2011. The 5 year payback is found in the private rented sector and derives from a scenario assuming Category 1 health impacts are likely to occur. Depending on assumed likelihood, payback periods range from 5 to 142 years in the private rented sector.

⁵ See evaluation of the Beacon Community Regeneration Project in Falmouth at www.energysavingtrust.org.uk/uploads/documents/caf/caf%20case%20study%209.pdf

⁶ See "Good Housing Leads to Good Health". Chartered Institute for Environmental Health. September 2008.

d) Impact assessments must be credible

To evaluate the effects of a FPA programme a means of assessing outcomes in the absence of the programme must be found – i.e. a control. A variety of methods are available to do this which can deliver varying degrees of statistical certainty. For acute health impacts it may be possible to use the Hospital Episode Statistics (HES) database⁷ to create a control group of patients with similar conditions and backgrounds (similar propensity). The course of their treatment, particularly the number and length of hospital stays, can be compared to the participants in the SIB, in order to give a clear idea of cost savings.

e) Unsuccessful performance must not result in excessive harm

Bondholders could have an incentive to shut down operations if it becomes clear that they will not meet performance targets and get paid. Consequently a shutdown in the intervention should not result in excessive harm to the target population. Therefore all FPA funded by an SIB should include contingency planning. This aspect also suggests that the SIB funded interventions should not form part of “core” or acute programmes. However, FPA seems well suited to this criterion: the extended nature of fuel poverty impacts allows time for contingency measures to be developed should support be removed.

This brief review suggests that FPA programmes have the potential to meet these basic SIB feasibility criteria. The next section presents a more detailed review of literature and case studies to date to help inform how FPA programmes might best be designed and implemented in the context of a SIB.

⁷ Hospital Episode Statistics (HES) is the national statistical data warehouse for England of the care provided by NHS hospitals and for NHS hospital patients treated elsewhere. HES is the data source for a wide range of healthcare analysis for the NHS, Government and many other organisations and individuals

3 Evidence Review

In keeping with the aims of this research project - to examine the feasibility and desirability of SIBs as a funding instrument for fuel poverty alleviation (FPA) activities, with particular focus on using savings from improvements to public health (or, more specifically, reduced costs to the health service) as the primary revenue flow - the review of evidence has focussed on the following areas:

1. fuel poverty related health research;
2. the delivery of measures and social impact bonds; and
3. the real impacts of interventions.

The following key publications and schemes have been reviewed:

- Energy Policy: Fuel Poverty and Human Health
- Strabane District Council: Health Impacts of the Heating Conversion Programme
- Marmot review: The health impacts of cold homes and fuel poverty
- Social Finance (2010): Analysis of the potential for a cold-related illness and mortality Social Impact Bond in Leeds
- Social Finance: Peterborough Prison Rehabilitation
- Affordable Warmth Access Referral Mechanism (AWARM) Manchester

3.1 Health and Fuel Poverty

Energy Policy: Fuel Poverty and Human Health

A recent review by Liddell and Morris (2010)⁸ looks at the evidence of the health impacts of major fuel poverty programmes over the last ten years, including: the Warm Front Evaluation; the Scottish Central Heating Programme (CHP); the New Zealand Housing; Insulation and Health Study (HIHS); and Housing, Heating and Health Study (HHHS); a NATCEN longitudinal study of housing conditions and their association with English children's well-being; and the US Children's Sentinel Nutritional Assessment Programme (C-SNAP).

The paper concludes that, despite the risks to physical health from cold homes, improvements to energy efficiency and the reduction of fuel poverty achieved by some of the programmes had a modest measurable impact in improving the physical health of adults. However, the potential for measuring such effects is hampered by methodological limitations in the evaluations, including the sample sizes of the studies. Measuring the health impact of improvements in energy efficiency and reduced fuel poverty is particularly difficult for adults who may have long term health conditions related to cold housing which are the result of lengthy exposure to cold houses.

The impacts are easier to measure in children, who are more readily susceptible to changes, and for the elderly who are at higher risk of mortality or developing life-threatening conditions. The main findings across the studies are summarised in the points below:

⁸ Liddell, C., and Morris, C. (2010). Fuel poverty and human health: A review of recent evidence. *Energy Policy* Energy, 38, pp.2987–2997

- To date studies haven't been sufficiently powered to detect physical health impacts in adults, due to their size and the sample population i.e. the population isn't necessarily tied to a health need and / or outcome.
- Significant effects on the physical health of the young were evident, especially in terms of infants' weight gain, hospital admission rates, and caregiver-rated developmental status, as well as self-reported reduction in the severity and frequency of children's asthmatic symptoms. However, these studies tended to focus on health impacts within the population of study rather than searching for a trend within the wider population. Several of the studies that focussed on adults examined trends in the wider population which may partly explain the more pronounced findings for children.
- Improvements to mental well being are better document, although again study design (not focussing on those with mental health issues) and the survey form used (SF-36⁹ rather than GHQ12¹⁰) may have been an issue.
- Problems with targeting the fuel poor as part of the overall energy efficiency scheme design e.g. CERT priority group has a 35% match rate with fuel poverty, so how can we be sure the subjects of the study are fuel poor
- After improvements have been made to homes, health improvements for adults were measurable, although modest, and mostly related to perceptions of mental well-being and self-assessed general health.
- Large-scale studies suggest that impacts of cold temperatures as a function of poor housing on mortality and morbidity are almost certain across the whole population.

Case Study: Strabane District Council - Health Impacts of the Heating Conversion Programme

Between 2003 and March 2009, residents of Strabane District Council (SDC) participated in a Heating Conversion Programme, in which solid fuel heating systems were replaced with oil-fired central heating systems. These replacements took place in 2,501 homes. The Programme aimed to improve the air quality of the area and alleviate fuel poverty through making homes more energy efficient.

Strabane is categorised by a higher than average unemployment rate, a higher proportion of people who look after a home or family permanently, and more people at home all day because they are permanently sick or disabled. These factors suggest that a greater than average proportion of residents are likely to live for long periods in or very near their home i.e. their risk from fuel poverty is exacerbated.

In accessing council level health benefits the study chose a cost-offset approach based on the Housing Health and Safety Rating System (HHSRS) calculator. The HHSRS is underpinned by a body of statistical evidence¹¹ which examined the medical risk from cold and damp housing. The assessment assumed a 15-year lifespan for measures (consistent with other studies e.g. Warm Front) and allowed for demographic changes by assuming a varied occupancy of 5 years each for a single pensioner, a pensioner couple and a family of 1.5 adults and 1.5 children. This approach was deemed to provide a more representative assessment of health impacts.

⁹ The SF-36 is a multi-purpose, short-form health survey with only 36 questions

¹⁰ 12-item General Health Questionnaire

¹¹ ODPM: Statistical Evidence to Support the Housing Health and Safety Rating System: Volume I, II and III (2003)

The Strabane study calculation of benefit uses Quality Adjusted Life Years (QALYs) as a measure of overall saving. The figure given therefore represents a total saving to the health service rather than a value linked to one specific health outcome¹². The Chartered Institute of Environmental Health (CIEH) toolkit¹³ which supports the HHSRS calculator and gives more detail on the key HHSRS indicators, such as damp and mould, however the results are still generic rather than intervention specific.

Marmot review: The health impacts of cold homes and fuel poverty

The Marmot review (2011) examines the existing evidence of the direct and indirect health impacts suffered by those living in fuel poverty and cold housing. It highlights a range of groups that fuel poverty affects in different ways: children, adolescents, adults and older people.

A case study examines a pilot programme from the UK Public Health Association (UKPHA) Health and Fuel Poverty Forum, which developed the AWARM model (see below). It was found that a model of local area partnerships that linked health, housing and fuel poverty services was the most effective approach for directing services to the vulnerable. The AWARM model was piloted in Manchester and since April 2008 over £600,000 was invested in new and replacement central heating systems and insulation. In the first year over 1,000 referrals were made by frontline professionals from social services, voluntary, local government, housing and health sectors. A key lesson learned was that there are numerous opportunities to share data between local authorities, GPs and PCTs to improve how referrals are targeted.

Describing energy efficiency standards, the review states that the lowest standards (Energy Performance Certificate bands F and G) broadly correlate with those which constitute a category 1 hazard for excess cold, as defined in English and Welsh environmental health legislation. The direct health impacts of living in a cold home can be divided into higher risk of mortality and increased morbidity rates, and the relationship between these and cold temperatures is supported by a longstanding body of evidence^{14,15}.

Many factors contribute to excess winter deaths with increases in respiratory and circulatory diseases as the main cause of excess winter mortality¹⁶. It is reported by the Department of Health that circulatory diseases are believed to cause around 40% of excess winter deaths, while respiratory diseases are responsible for about a third¹⁷. Subsequently, research has shown improvements in circulatory health through improvements in the thermal efficiency of housing, with self reported reductions in medication use and hospital visits¹⁸.

¹² http://www.foe.co.uk/resource/reports/warm_homes_nhs_costs.pdf

¹³ http://www.cieh.org/uploadedFiles/Core/Policy/Housing/Good_Housing_Leads_to_Good_Health_2008.pdf

¹⁴ Guy WA (1857) On the annual fluctuations in the number of deaths from various diseases, compared with like fluctuations in crime and in other events within and beyond the control of human will. *Journal of the Statistical Society*, 21, pp.52-86.

¹⁵ Rudge J and Gilchrist R (2005) Excess winter morbidity among older people at risk of cold homes: a population-based study in a London borough. *Journal of Public Health*, 27(4), pp.353-358.

¹⁶ Office for National Statistics (2010) Winter mortality: excess winter deaths fall.

¹⁷ Department of Health (2007) Health and winter warmth: reducing health inequalities.

¹⁸ Lloyd et al (2008) The effect of improving the thermal quality of cold housing on blood pressure and general health: a research note. *Journal of Epidemiology and Community Health*. 62, pp.793-797.

One study of deaths from cardiovascular disease found ‘strong, although not conclusive, evidence that winter mortality and cold-related mortality are linked to sub-optimal home heating’ with indoor temperatures being associated with 50% of excess winter deaths¹⁹. The recent Interim Report from the Hills Review team identified a lower link with 10%²⁰ of excess winter deaths being attributed to fuel poverty, although the Review itself does not provide the rationale for this reduction.

It reported that deaths from cardiovascular disease were 22.9% higher in winter months than the average for the rest of the year, with a statistically significant relationship between excess winter mortality and the age of the property (28.8% in properties built before 1850 compared to 15% in properties built after 1980¹⁹). The elderly are particularly vulnerable to excess winter deaths for a variety of reasons: a 1°C lowering of living room temperature is associated with a rise of 1.3mmHg blood pressure, due to cold extremities and lowered core body temperature²¹. Older people are also more likely to be fuel poor, as they are likely to spend longer in their homes than other people and therefore require their houses to be heated for longer periods²².

The relationship between respiratory problems and cold temperatures is evident in the seasonal level of contact between sufferers and the healthcare services. Increased contact for adults during the winter months has been related to fuel poverty²³, with one study in North Staffordshire finding that respiratory disease admissions increased twofold in the winter months²⁴.

Other health conditions associated with cold housing include mental ill-health, exacerbation of the common flu and cold, arthritis and rheumatism.

Case Study: Impact of heating improvements on the health of children with asthma²⁵

In 1994 each of the six district councils in Cornwall was allocated £50,000 to spend on improving conditions in social housing, with the specific aim of delivering improved health outcomes. A condition of the funding stipulated that impacts on health resulting from the scheme should be evaluated. The study identified asthma in children as its key target group and measure of impact, recognising the link between this childhood disease and damp housing – the latter of which was prevalent in Cornwall at the time – and having concluded that “*an attempt to measure all possible health outcomes relevant to housing conditions was considered impractical*”.

Under this initiative, children living in council housing and suffering from asthma were identified. A health assessment of the child was undertaken, including a questionnaire with the parent to ascertain experience of breathlessness and number of days off school due to asthma in the previous 3 months. An NHER assessment of the home also assessed the level of damp and insulation, and

¹⁹ Wilkinson P et al (2001) *Cold Comfort: The Social and Environmental Determinants of Excess Winter Deaths in England, 1986-96*. Bristol: The Policy Press.

²⁰ Hills J, *Independent Review of Fuel Poverty, Interim Findings, DECC 2011*

²¹ Woodhouse PR, Khaw KT and Plummer M (1993) Seasonal variation of blood pressure and its relationship to ambient temperature in an elderly population. *Journal of Hypertension*, 11 (11), pp.1267-1274.

²² Burholt V and Windle G (2006) Keeping warm? Self-reported housing and home energy efficiency factors impacting on older people heating homes in North Wales. *Energy Policy*, 34 (10), pp.1198-1208.

²³ Rudge J and Gilchrist R (2007) Measuring the health impacts of temperatures in dwellings: investigating excess winter morbidity and cold homes in the London Borough of Newham. *Energy and Buildings*, 39, pp.847-858.

²⁴ Alfa M and Bridgman S (2001) Winter emergency pressures for the NHS: Contribution of respiratory disease, experience in North Staffordshire district. *Journal of Public Health and Medicine*, 23, pp.312-313.

²⁵ Somerville, M., Mackenzie, I., Owen, P. and Miles, D. (2000). Housing and health: does installing heating in their homes improve the health of children with asthma? *Public Health*, 114, 434-439.

identified measures that could be installed to deliver a “warm, dry and energy-efficient” house. The assessment process was repeated between 3 and 22 months after the intervention was delivered.

In total, 98 houses in the county received measures through the scheme; 59 of these (containing 72 children with asthma) had sufficient follow-up data for impact assessment. All households received new heating systems. The follow-up assessment showed significant reductions in respiratory symptoms and time off school due to asthma following the installation of central heating. However, these findings have to be treated with some caution due to key methodological issues highlighted with the study. Principally the lack of a control group to compare changes in health status means that effects of age, season and reporting bias (all particularly pertinent due to the varying time lag between recruitment to the scheme, intervention delivery and follow-up assessment) cannot be adequately accounted for. This study critically “*highlights one of the difficulties of undertaking this type of evaluation*” and makes the case that “the NHS [should not] necessarily be seen as the source of funds for health-related housing improvements” but instead a strategy is needed to make the appropriate link between, and provision of resources for addressing, poor housing and poor health.

3.2 Testing delivery

Add intro about how interventions are evaluated in terms of health impacts (systematic reviews, Cochrane, RCTs etc) – ref to Hilary Thompson’s review of housing interventions for the MRC. Then make point that evidence required for FPSIB won’t need to be so rigorous.

Analysis of the potential for a cold-related illness and mortality Social Impact Bond in Leeds²⁶

Social Finance undertook an initial analysis of the available data to evaluate the feasibility of a Social Impact Bond for reducing cold-related illness and mortality in Leeds. The review examined the potential to target the reduction of excess winter deaths and cold related illnesses. The initial desk based review identified several interesting findings:

- They were unable to find robust data on the costs to the public sector of an excess winter death.
- Many studies have investigated the relationship between housing and health but, because of the number of intervening variables, it is difficult to demonstrate clear ‘cause and effect’ relationships. These variables include poverty; level of disease in the population; and diet and exercise.
- Cold housing is not systematically recorded as a reason for GP and hospital visits so data in this area is very limited.

The Leeds SIB analysis explored the potential to measure health outcomes for a target group of over 69 year olds who were: reporting to A&E with respiratory illnesses; reporting to GPs with cold related illnesses; and ineligible for Warm Front but, suffer or are at risk from cold-related illnesses.

²⁶ Social Finance, (2010). Social Impact Bond Feasibility Study. Health, Social Care and Housing in Leeds: Preliminary findings.

The health metrics, shown below, ranged from area wide metrics to health specific outcomes, namely:

1. Area based: Excess winter deaths among 69 year olds
2. Health specific: Acute hospital admissions among over 69 year olds receiving a housing intervention for respiratory illness between November and March
3. Health specific: Acute hospital admissions among the over 69 year olds receiving a housing intervention for circulatory illness between November and March
4. Health specific: Self-reported improvement in health among the over 69 year olds

The review of the outcome metrics found insufficient evidence to suggest a strong enough link between health outcomes and housing temperature to form the basis of a Social Impact Bond. The following highlights a number of their key findings:

- Excess Winter Deaths are a robust metric that is well recorded.
- It was difficult to quantify cost savings to the health sector for Excess Winter Deaths.
- In terms of measuring the impacts on Excess Winter Deaths the target area (Leeds) was too small for a measureable effect, and other factors such as climate may be responsible for larger variations.
- Both acute admissions for respiratory and circulatory illness were linked to significant cost to the NHS Leeds, with robust data collection and potential for controls and national and local baselines.
- Respiratory disease is more strongly linked to the level of disease in the population than housing condition. Wilkinson et al. (see reference above) found that *'the winter rise in respiratory death is more to do with respiratory infection and other seasonal changes than it is to do with the direct effects of temperature.'*
- Both respiratory and circulatory conditions often impacts on people with existing health problems and as such they may not be significantly improved by living in a warmer home.
- The local health related insulation referral scheme, 'Health Through Warmth', indicated low levels of referrals for both respiratory and circulatory conditions.
- Self reported health improvements were easy to record but could not necessarily be linked to NHS savings.
- Unfortunately due to data protection, information on costs and savings could not be supplied to the team.

Similarly to the area in which the Centre For Sustainable Energy is based, Avon and Somerset, there were a number of energy efficiency schemes (interventions) that aimed to make homes in Leeds warmer. The review highlighted the potential for a FPSIB to provide advice on the use of their heating (as an aftercare service) and / or to top-up existing grants for private home owners i.e.

where householders are ineligible for free measures under the Carbon Emissions Reduction Target (CERT). The provision of advice could have been linked to Warm Front in the past but the current Government is currently phasing out this programme (March 2013 onwards). The forthcoming role out of the Green Deal and the new Energy Company Obligation could be linked to a health programme to provide funding or subsidised support for energy efficiency measures.

Peterborough Prison Rehabilitation

The world's first and most developed SIB was launched at HMP Peterborough in September 2010. Social Finance, a financial intermediary, obtained around £5 million of investment from individuals and charities. The funding is used to finance interventions for offenders serving prison sentences of fewer than 12 months. Independent monitoring determines whether offenders are reconvicted less in the 12 months following release than similar 'matched' offenders from other prisons who have not had access to a SIB-funded intervention.

Lower reconviction rates has benefits for the Ministry of Justice and wider society, in the form of improved outcomes for the offenders and their communities, as well as saving the government money through reduced costs of policing, court cases, prison places, and so on. Under the Peterborough Prison SIB programme the Ministry of Justice and the Big Lottery Fund have undertaken to pay a return on investment to investors, if reoffending is reduced by 7.5% overall, compared to a comparison group. The provisional performance suggests a 7% return on investment.

The Ministry of Justice commissioned an independent evaluation of the Peterborough SIB²⁷. The report presents the findings from interviews with 22 individuals from organisations involved in the development and implementation of the SIB at Peterborough. The following summarises some key findings:

- Interviewees perceived contractual relationships behind the Peterborough SIB to be complex. This is understandable, given the novelty of the SIB at Peterborough, and the need to capture methodologically detailed arrangements for determining outcomes and payments. The nature of the legal relationships between the parties to the Peterborough SIB may provide, in part, a transferable model for future SIBs in offender management or other policy areas.
- There was an appetite for mission-aligned investing among the charitable organisations interviewed. Many of the charitable investors in the Peterborough SIB invested using their endowment capital rather than by giving a grant. Measures which might encourage investment in future SIBs and other payment-by-results (PBR) pilots include clarifying trustees' fiduciary duties as regards social investments and offering tax incentives for investing.
- Interviewees believed that financial risks appeared to have been successfully transferred from both the Ministry of Justice and small providers to the private investors. However, at this early stage the success of assigning risk in the Peterborough SIB contracts is yet to be tested.

²⁷ Disley, E., Rubin, J., Scraggs, E., Burrowes, N. and Culley, D. (2011). Lessons learned from the planning and early implementation of the Social Impact Bond at HMP Peterborough. Report to Ministry of Justice.

- The ability of Social Finance to engage and negotiate with different stakeholders appears to have enabled development of the Peterborough SIB. Interviewees from the Ministry of Justice said it is likely that if there are SIBs in the future, the delivery agency will be appointed by competitive tender.
- The Peterborough SIB potentially involves a new commissioning relationship. In other payment-by-results arrangements, government has tended to maintain some control over the selection of providers. In the Peterborough SIB the government leaves that selection to an intermediary (such as Social Finance in the Peterborough SIB) and has no direct relationship with the service provider.
- Statistical significance and attributing change to the SIB-funded intervention were crucial elements in negotiation of the outcome measure for the Peterborough SIB. These measurement issues are likely to be central in future SIBs and other PBR mechanisms in offender management and other policy areas. There is a balance to be achieved between the robustness of the outcome measure and time, simplicity, resources and data availability.
- The design of the Peterborough SIB aims to reduce incentives to ‘cherry-pick’. A risk in PBR models is that providers focus on members of the target group who are the easiest to help. In Peterborough, outcomes are measured among all offenders discharged from HMP Peterborough, rather than just those who engage with SIB-funded services.
- Development of the payment model demanded considerable analytical resources and relied upon the availability of Ministry of Justice data about the cost of reconviction events. Those developing new SIBs and other payment-by-results mechanisms in new policy areas may wish to consider the extent to which robust cost data are available.
- The Peterborough SIB is likely to provide the first evidence of the performance of SIBs as a new kind of financial product, at least in the area of offender interventions. Developing a track record of investment is crucial to building an investor base and improving understanding of outcome risk.
- Future SIBs may face the challenge of sharing outcome payments across central and local government departments or other agencies. Outcome payments are made by the Ministry of Justice and the Big Lottery Fund in the Peterborough SIB, but potentially a range of local and national government departments could benefit.

Affordable Warmth Access Referral Mechanism (AWARM) Manchester²⁸

The UK Public Health Authority (UK PHA) commissioned the Greater Manchester Public Health Practice Unit to evaluate the Manchester health related fuel poverty pilot, AWARM. The AWARM pilot was developed with support from the UK Public Health Association (UKPHA) and the Health Housing and Fuel Poverty Forum (HHFPF) as an optimal delivery model for identifying those most in need of energy efficiency measures. The programme used a range of sources, including GP referrals to identify and refer householders to the Warm Front scheme. The evaluation seeks to assess the impact of the initiative on recipient quality of life.

²⁸ Threlfall, A. (2011). Understanding the costs and benefits of fuel poverty interventions: A pragmatic economic evaluation from Greater Manchester. Report by Greater Manchester Public Health Practice Unit, commissioned by UK Public Health Association.

The AWARM evaluation combines scheme collated data about the costs of interventions with the available literature to describe the benefits of interventions and to inform the development of an economic model. The final economic model includes a set of transparent assumptions by which the benefits can be explored and justified. The report discusses model findings, limitations, the cost effectiveness and value for money of warm housing interventions and draws a conclusion about whether the interventions are a good use of resource.

The cost benefit analysis considered AWARM interventions in 52 households. The AWARM process ensures that recipients of interventions are those in need. The residents were 82 adults and 12 children. The interventions were mainly insulation (wall and loft) and heating improvements (boiler repair or new central heating). The cost of providing interventions was estimated to be £88,800.

The model analysed benefits of warmer housing in terms of an increase in quality of life and a smaller increase in length of life. The model considered benefits in adults. The gain in quality adjusted life years (QALYs) due to an improvement in quality of life in 82 adults was estimated to range from a minimum 1.67 to a maximum of 31.16 depending on the scenario modelled.

The life years gained from living longer was estimated to be 2.55 years, this was assumed to equal 1.53 QALY, a reduction of 40% because the years gained are towards the end of life.

Using the NHS threshold of £20,000 for a QALY, an intervention costing £88,800 must generate at least 4.44 QALYs. In the scenarios modelled the value of the QALYs gained ranged from £64,000 to £653,800. It is only in one scenario, in which benefits are limited to a small group (those with measurable depression and anxiety), and are short term, that the intervention was not cost effective. When modest benefits are assumed to accrue to half of the recipients or large benefits accrue to those with measurable depression and anxiety the interventions are very cost effective.

In a second analysis the value of benefits needed to reach the total cost of the intervention was considered. It was found that if the whole benefit to a recipient of a warm housing intervention is valued at 50p for each cold day then the benefits would exceed costs after about ten years. If a higher value of £1 is thought to be more reasonable then benefits exceed costs within five years. The value that should be placed on helping to keep a vulnerable member of the population or a child warm in their home are not known but an amount of £1 for each cold day does not seem excessive or unreasonable when placed into the context of expenditure on fuel to keep warm or alternative health interventions. In terms of the opportunity cost the report concluded that, "it was hard to think of alternative interventions that might have a substantial impact on mental wellbeing at a lower cost".

This report states that warm housing interventions in targeted populations are almost certainly cost effective and that they can be considered a good use of public resources. The benefits gained in the UK are likely to be mainly from comfort taking and a consequent improvement in mental wellbeing. If the scale of the project were to be increased to England or UK level then it may be possible to demonstrate impacts on mortality and morbidity.

Liverpool City Council Healthy Homes Programme

Liverpool is the most deprived local authority in England, with high levels of unemployment. Forty-five per cent of children and 29 per cent of people over the age of 60 live in income-deprived households²⁹. The city also has some of the worst health inequalities in the country. Life expectancy for males (73.4 years) is the third lowest in the country and life expectancy for females is the lowest in the country (78.1 years). The percentage of Liverpool's houses that fail the Decent Homes Standard or are classed as unfit is higher than the national average. The Council estimates that one in four houses in Liverpool is 'poor' and one in four households are at risk of fuel poverty.

Improving housing standards, choice and affordability and improving health, well-being and health inequalities are objectives within Liverpool's sustainable community strategy³⁰. The sustainable community strategy and the local strategic partnership's health subgroup (which includes the Primary Care Trust (PCT), the City Council, Environmental Health and the pathfinder's Health Improvement Team) recognise that these objectives are linked and that poor quality housing and living conditions can have an adverse effect on people's health. Based on national estimates, poor housing conditions are believed to be a significant contributor in up to 500 deaths and around 5,000 illnesses needing medical attention in Liverpool each year.

Because of this link between poor quality housing and occupants' health, the Council wanted to target unhealthy and unsafe housing conditions to reduce preventable deaths and illness. Following a pilot housing market renewal project that aimed to inspect properties and identify the most serious hazards, the Council decided to implement a larger project to help improve housing standards and health and well-being across Liverpool. The Council applied to the PCT for funding to assess the health needs of households with a particular focus on privately rented properties in the most deprived areas (using the HHSRS to assess the condition of homes at high risk).

Over an 18-month period (April 2009 – September 2010), the Healthy Homes Programme aimed to assess the individual health needs of the occupants of 15,000 properties. Where there are health needs (for example smokers who want to give up or inadequately heated homes) referrals are made to correct partner agencies. The worst 2,750 properties are also identified for HHSRS inspection, which Environmental Health officers, funded by the programme, carry out.

Up to July 2009, 1,105 homes had been visited and 223 vacant properties had been identified in the target areas. Surveys have been conducted at 523 of these properties and 919 referrals to partner agencies have been made (including 178 to Environmental Health officers). Including the pilot exercise, 598 properties have received an HHSRS inspection and hazards are either being, or have been, removed. In one case an elderly resident suffering from emphysema was living in an inadequately heated home which was contributing to his condition worsening. With the help of the Healthy Homes team, Environmental Health and the Council's energy efficiency team an application for central heating through Warm Front was fast tracked.

The Council and primary care trust recognise the difference between outputs and outcomes. While outputs, such as number of homes visited and improvements made, are fairly straightforward to

²⁹ Audit Commission, (2010). Liverpool – Building better lives case study. available at: www.liverpoolpct.nhs.uk/Library/Your_Health/Audit%20Commission%20case%20study.pdf

³⁰ Liverpool 2024: A thriving international city

measure, the drop in the number of hospital admissions and deaths due to the programme is more difficult to measure. The Council and primary care trust are confident the approach will deliver positive outcomes as the HHSRS is based on the premise that hazards in the home have a negative effect on health and well-being. By understanding people's health and well-being needs and signposting to suitable services the programme can also tackle health and well-being needs that do not relate to the quality of the home. The Council and primary care trust have commissioned John Moores University to conduct an evaluation of the Healthy Homes Programme, as part of wider evaluation of health programmes taking place in the area over the coming years.

3.3 Real impacts of interventions

Despite an overall 30% reduction in domestic heat loss and a 30% improvement in the efficiency of domestic heating systems, energy delivered to UK dwellings has increased by 30% over the last 30 years³¹ (N.B. this is an aggregate figure and as such includes trends for smaller households). This is because the demand for heat, light and other electricity in dwellings has doubled over the same time period. Whereas the average temperature maintained in dwellings 30 years ago is thought to have been 13°C it is now 18°C and could easily rise to 21°C over the next decade³². It is important to note that this increase in energy demand relates to heating behaviours, but it has been included here as the overall improvement in efficiency sets the context for this change.

It is now recognised that the *theoretical* energy savings resulting from the installation of measures very rarely materialise as a result of improved comfort and other changes in occupant behaviour. This is often called the "comfort factor" or "take back effect". Energy economists refer to the phenomenon, first recognised by Jevons in the late 19th Century, as the Brookes-Khazzoom effect³³.

The relative impact of the take-back effect and householder behaviours has not been quantified accurately. The 1996 English House Condition Survey (EHCS) was the last survey to record internal and external temperatures. In its quantification of CO₂ savings from the Warm Front Programme, the BRE applies both a comfort factor and underperformance factor in estimating CO₂ reductions achieved by measures. The former accounts for the element of theoretical energy savings that are taken as improved comfort (i.e. warmth) by the householder. BRE applies a factor of 40% in calculating savings from all measures (heating and insulation). The latter allows for other factors which could impact on the energy savings realised in practice (e.g. inadequate installation of measures), which BRE applies at 41% for insulation measures. Combining the two therefore gives a total reduction factor of approximately 65% for insulation³⁴.

However, it is important to remember the overall goal of Warm Front in the context of the savings i.e. the scheme is targeted at fuel poor households and aims to make them warmer and reduce fuel bills. Indeed, the analysis of Warm Front data has shown that more rather than less comfort-taking

³¹ Shorrock, L.D. and Utey, J.I., (2003). Domestic energy fact file 2003. BRE Housing Centre. Available at: <http://projects.bre.co.uk/factfile/BR457prtnew.pdf>

³² Select Committee on Science and Technology Minutes of Evidence, UCL 2008

³³ Saunders, H., (1992). The Khazzoom-Brookes Postulate and Neoclassical Growth. *Energy Journal*, Vol 13, No 4, pp 131-148

³⁴ Hulme, J. (2008)., Carbon dioxide emissions savings from the Warm Front programme. Report by BRE to DECC.

would often be needed to ensure householders reached the WHO levels of thermal safety after intervention.

The AWARM study³⁵ and CSE's recent evaluation of the 'Freedom from Fuel Poverty' solid wall insulation scheme³⁶ found that many householders took virtually all of the savings as comfort. The householder's propensity to take savings as comfort is crucial for economic models as the assumed benefits from lower fuel use (lower carbon emissions and fuel bills) are replaced with the benefits of living in a warmer house. This is particularly important for policies such as the Green Deal that use the savings from measures to repay the costs of a loan. The affordable warmth aspect of the Energy Company Obligation is meant to compliment the Green Deal for low income household; therefore any subsidy will need to account for the householder's initial under-consumption³⁷.

³⁵ Threlfall, A. (2011). Understanding the costs and benefits of fuel poverty interventions: A pragmatic economic evaluation from Greater Manchester. Report by Greater Manchester Public Health Practice Unit, commissioned by UK Public Health Association

³⁶ Banks, N. and White, V. (2011). Evaluation of solid wall insulation in fuel poor households in the private sector. Interim report by the Centre for Sustainable Energy to eaga Charitable Trust. Available at: <http://www.cse.org.uk/downloads/file/solid-wall-insulation-in-fuel-poor-households-in-the-private-sector.pdf>

³⁷ Hirsh, D., Preston, I., and White, V. (2011). Fuel poverty and understanding energy consumption, Consumer Focus

4 Scoping the Fuel Poverty Social Impact Bond

The Social Finance Technical Guide to Developing Social Impact Bonds³⁸ provides a useful structure which can be used to assess the opportunities for health linked fuel poverty alleviation programmes. The guide identifies four key stages in assessing the feasibility of a Social Impact Bond idea, FPSIB namely:

1. Defining the social issue
2. Development of the social intervention strategy
3. Building the business case
4. Developing the financial case

In this section we apply Social Finance’s overall assessment process to the concept of a Fuel Poverty Social Impact Bond (FPSIB).

4.1 Defining the social issue

The social issue has been defined as:

To reduce fuel poverty and the associated health impacts of living in a cold damp home.

However, many fuel poor households may be adequately warm, choosing to prioritise heating their home but as a result putting pressures on other areas of their household budget. The SIB could choose to focus on cold homes and low incomes rather than the precise current definition of fuel poverty, thus targeting those whose experience of actual fuel expenditure relative to their income results in a cold home.

In terms of the target audience:

The programme of work associated with a FPSIB would need to target ‘households’ or ‘areas of households’ with specific health needs.

There are two issues for consideration here: the first relates to *how* a programme associated with a FPSIB would be targeted: household vs. area-based approach; and the second relates to *at who* the programme would be targeted – i.e. a specific population group, and/or specific health issue.

4.1.1 Household vs. area-based approach

The household specific approach would overcome a number of the issues identified by Liddell and Morris (2010)³⁹ whereby health outcomes resulting from improvements in energy efficiency and a reduction in fuel poverty were difficult to detect in schemes that targeted low income households without specific health needs. However, the targeting of individual households would require the FPSIB programme to gain access to relatively sensitive health data. Hospital Episode Statistics (HES) is the national statistical data warehouse for England of the care provided by NHS hospitals and for NHS hospital patients treated elsewhere. Use of the HES dataset is governed by both the Data

³⁸ Social Finance, (2011). A Technical Guide to Developing Social Impact Bonds.

³⁹ Liddell, C., and Morris, C. (2010). Fuel poverty and human health: A review of recent evidence. Energy Policy Energy, 38, pp.2987–2997

Protection Act and guidelines decided by the Department of Health, both of which are designed to protect not only the individual patient but also the individual practitioner or care provider.

The area based approach could overcome the data protection issues associated with targeting individual households. For example, to identify an area of interest the programme manager could choose to work with a specific GP practice, should the GP practice be amenable. The online Association of Public Health Observatories (APHO) General Practice Profiles tool provides practice level indicators to enable effective commissioning and appropriate healthcare services for the local population.

Northern Ireland's Fuel Poverty Review⁴⁰ argues that an areas-based approach to delivering strategy will best fulfil the four key objectives, namely: targeting of resources; improving energy efficiency; affordable energy; and building strong partnerships.

The Liverpool City Council Healthy Homes Programme successfully identified target areas by working with the Council's regeneration team to examine maps of deprivation indices, distribution of private rented properties, health inequalities and accident statistics by neighbourhood to pinpoint the areas in greatest need of intervention. Once the areas were identified, neighbourhood managers, community leaders and local resident groups were contacted to identify needs and potential barriers in the area.

There may also be 'economies of scale' and benefits of improved take-up rates in implementing an area-based approach, as recognised by a number of fuel poverty schemes, such as the Community Energy Saving Programme (CESP). CESP imposed strict criteria to target only the areas of lowest income in Great Britain – defined as the poorest 10% Lower Super Output Areas according to the Income Domain of the Index of Multiple Deprivation in England and the lowest 15% of Data Zones in Wales and Scotland. CESP also strongly promoted a "whole house" approach to the installation of measures and a community-based partnership delivery mechanism, involving Local Authorities (LAs), community groups and energy companies, via a house-by-house, street-by-street approach. The aim of the partnership working and strictly-defined area-based targeting was to drive engagement with every household in the area. DECC expected take-up rates of up to 65% of households in a CESP area⁴¹.

The evaluation of CESP showed that many stakeholders concurred that the area-based approach was cost-effective, led to economies of scale and efficiency of delivery, and also offered potential wider benefits for the area, for example: regeneration and aesthetic improvements; local economic benefits through local employment and training, the use of local trades of other businesses, as well as knock-on benefits for local shops in the areas concerned. However, in practice, take-up rates were not always on a par with those first envisaged by DECC and some encountered significant challenges in adhering to the very tightly defined area-based approach of using LSOA's and Data Zones, the boundaries of which did not necessarily align with natural 'community' boundaries (e.g. housing estates). To overcome this, stakeholders suggested up to 10% of properties in the CESP scheme should be allowed to lie within a neighbouring area, or local authorities or HAs should be permitted

⁴⁰ University of Ulster, Defining Fuel Poverty in Northern Ireland: Preliminary Review, 2011

⁴¹ CAG Consultants, Ipsos Mori and BRE, (2011). Evaluation of the Community Energy Saving Programme. Report to DECC.

to self-certify CESP-eligible areas (e.g. through demonstrating that a certain percentage of households are housing benefit claimants).

4.1.2 Targeted population and health needs

Table 1 below outlines the health outcomes which previous research suggests a FPSIB may be able to influence i.e. a linkage or statistically robust relationship has been identified between improvements in energy efficiency and reductions in fuel poverty and a positive health outcome.

Table 1: Example FPSIB population profiles and health outcomes

Population	Health outcome
Elderly	Reduced admissions associated with slips and fall
Elderly	Reduced admissions or reduced repeat admissions for stroke
Elderly	Reduced admissions or reduced repeat admissions for cardio vascular disease
Adults	Improved symptoms for depression e.g. using the PHQ-9 ⁴² form
Children 0 to 3 years	Nutritional issues i.e. reduction in depressed growth rates
Children 0 to 16 years	Improved respiratory function and reduced impacts of asthma e.g. improved peak flow and reported symptoms
Children 8 to 16 years	Improved symptoms for depression e.g. using the PHQ-9 form

In terms of drivers for fuel poverty interventions, the Government has a national target to eradicate fuel poverty, where reasonably practicable, in all homes by 2016⁴³. The local indicator to target fuel poverty, National Indicator 187 (NI 187), has been removed by the current Government. NI 187 was designed to tackle fuel poverty by reducing the proportion of people receiving income based benefits living in homes with a low energy efficiency rating. Critics felt the NI 187 survey didn't measure fuel poverty accurately and "*imposed a significant burden on local authorities*". As such the indicator was discontinued, and the Government has instead "*developed a methodology that more accurately measures fuel poverty at a local authority level, and which doesn't impose any burden on local authorities*"⁴⁴.

However, from April 2013, Local Authorities are to take on new public health responsibilities, including a proposed action to deliver "*local initiatives to reduce excess deaths as a result of seasonal mortality*"⁴⁵.

Health and Wellbeing Boards (see Box 1 below) will also be a statutory requirement in every upper-tier local authority. Health and wellbeing boards will be made up of consortia to include, as a minimum, a representative of: an elected representative; each of the relevant GP Consortia (those within the local authority area); Directors of public health, adult social services, children's services; local HealthWatch; and the NHS Commissioning Board. Other representatives can be appointed by the local authority and/or the health and wellbeing board.

⁴² The PHQ-9 is the nine item depression scale of the Patient Health Questionnaire.

⁴³ The Government's original target of eradicating fuel poverty in all vulnerable households by 2010, where reasonably practical, was not achieved.

⁴⁴ DECC, 2011. http://www.decc.gov.uk/en/content/cms/statistics/fuelpov_stats/archive/ni187/ni187.aspx

⁴⁵ HM Government, 2011. Healthy Lives, Healthy People: Update and way forward.

They will be tasked with preparing a new joint health and wellbeing strategy and promoting an integrated approach to working between local government and NHS, and other service providers and commissioners.

The introduction of health and wellbeing boards represents a significant change in how health and public services are structured and delivered, and thus, an important opportunity to influence local decision-making in tackling fuel poverty. However, demands on funding are likely to be even more competitive and hence the need to make the economic case for action will be all the more important.

Health and Wellbeing Boards (H&WB)

The Health and Social Care Bill has introduced the concept of Health and Wellbeing Boards as a route for establishing local targets and aims. H&WB will be a forum for local commissioners across the NHS, public health and social care, elected representatives, and representatives of Health Watch to discuss how to work together to better the health and wellbeing outcomes of people in their area⁴⁶. In doing so, the aim is to create a more democratic approach in commissioning decisions and provide opportunity for open discussion involving local people.

The NHS Future Forum⁴⁷'s report on patient involvement and public accountability⁴⁸ fully supports the principles and development of health and wellbeing boards. These are viewed as fundamental to delivering improved services, by ensuring patients are “at the heart of decision-making” and local commissioners are taken to task on this. The report calls for the Health and Social Care Bill to be strengthened in this regard, to ensure health and wellbeing boards are truly the focal point for collaborative decision-making about health and wellbeing, with agreed commissioning consortia tasked with setting the priorities for health and care for a community, in line with the joint health and wellbeing strategy.

The level of take-up in the early implementer network – 138 of 152 top-tier authorities – shows the appetite in local government to take on the strengthened leadership role which is at the heart of the Government’s vision for health and care.

⁴⁶ Department for Health, 2011. <http://www.dh.gov.uk/health/2011/10/health-and-wellbeing-boards/>

⁴⁷ The NHS Future Forum was launched on 6 April 2011 as part of the Government’s “listening” exercise on the current Health and Social Care Bill. Following much consultation and significant responses, the Forum has made a number of recommendations to Government through a series of reports, available at: http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_127443

⁴⁸ NHS Future Forum, Patient Involvement and Public Accountability, 2011. Available at: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalasset/dh_127544.pdf

4.2 Development of the social intervention strategy

4.2.1 Population needs and intervention points

The needs of the primary objectives of the FPSIB and the needs of the target population are derivable from the outcomes shown in table 1, i.e. higher internal temperatures via the improved thermal performance of the building and / or heating system. However, the scheme design may vary subtly depending on the area- or household-based approach, namely:

- **Area-based** – the targeting of areas with high prevalence of a target condition represents a form of early intervention in itself, i.e. a form of strategic health planning that focuses on a General Practice (GP) or a geographical area
- **Household-based** – the identification of patients with a specific condition at an early stage of their diagnosis represents a intervention that’s complimentary to their treatment
- **Area-based with household focus** – the two ideas could of course be blended whereby specific areas of high incidence are targeted and then the intervention is focussed on identified households. The non-health targeted households could be referred to local schemes or offered funded measures (where funding exists) i.e. combining prevention and treatment.

Table 2 below focuses on the identification of patients with specific conditions. The three overall approaches shown above would need access to data relating to these intervention points to help with targeting and / or reporting.

The initial desk based review and preliminary discussions with the steering group suggest the need for a condition targeted FPSIB. If the SIB were to fund an area-based intervention whereby 1,000s of homes are insulated then this would suggest the prevention of a small number of hospital admissions i.e. the savings would not be significant enough to make the SIB viable. The SIB could potentially focus on the low cost interventions shown in table 3, i.e. administration of referrals, but the scheme would only be health related as a result of the tracking of health outcomes.

Table 2: Example health outcomes and intervention points

Health outcome	Intervention points	Secondary needs
Slips and fall	<ul style="list-style-type: none"> • Visits to GP for mobility related symptoms • Visits to home at high risk of cold by community practitioners e.g. poor thermal efficiency or lack of heating • Admission to hospital 	<ul style="list-style-type: none"> • Installation of rails • Levelling of steps
Stroke & Cardio vascular disease	<ul style="list-style-type: none"> • Visits to GP for early intervention related symptoms i.e. blood pressure, diabetes and high cholesterol (depending on stroke type) • Visits to home at high risk of cold by community practitioners e.g. poor thermal efficiency or lack of heating • Diagnoses of obesity • Application for a quick kit for smoking addiction 	<ul style="list-style-type: none"> • Dietary advice • Support for smoking cessation

Depression	<ul style="list-style-type: none"> • Visits to GP for depression related symptoms • Early diagnoses of perinatal depression by community health practitioners • Self referral for bullying with schools • Persistent exclusion or suspension from school 	<ul style="list-style-type: none"> • Cognitive behavioural therapy (CBT)
Asthma	<ul style="list-style-type: none"> • Visits to GP for more than one of the following symptoms: wheeze, cough, difficulty breathing and chest tightness (particularly if they are frequent and recurrent and are worse at night and in the early morning) • Visits to GP for difficulty breathing in response to exercise, exposure to pets and / or cold damp air • Family history of atopic disorder and/or asthma 	<ul style="list-style-type: none"> • Advice on avoiding allergens

NB. The secondary needs shown above are purely for illustration and need further refinement

The most viable option would therefore seem to be a targeted intervention of identifying individuals either at-risk of cold related health impacts or already presenting to GPs or hospitals with cold related illnesses. However, in order to manage the scheme and ensure NHS opt-in, this needs to be within a pre-defined area i.e. to correspond with a local NHS Trust management area. The choice of areas in this way also lends itself to building political capital for a scheme. Poor quality, thermally inefficient housing, social deprivation and attendant health issues are often found in the same geographical areas. It therefore seems sensible to focus a FPSIB on identifying at risk households within specific areas.

The example of the Manchester AWARM is instructive in this respect. Through various disparate agencies working together thousands of referrals to a fuel poverty alleviation scheme were generated. The FPSIB could therefore construct the necessary referral networks if the correct partnerships and data sharing agreements can be established.

4.2.2 Integrating services and meeting secondary objectives

Fuel poverty alleviation programmes often seek to integrate the provision of services to ensure vulnerable householders receive a holistic set of measures. For example, the Somerset-based Warm Streets scheme offers householders energy efficiency measures whilst cross-referring them to other services via the Home Safety Action Group (HSAG). HSAG is managed by Age UK and allows partners to cross-refer to other necessary services e.g. to the fire service for smoke alarms or Care and Repair for hand rails. The secondary needs in table 2 therefore highlight the potential ‘dashboard’ activities that a cross-referral network would need to link to as part of the FPSIB.

The FPSIB will also need to track the interventions success in terms of a discernable trend in improved health outcomes. The Social Finance feasibility study in Leeds has demonstrated the availability of health data at both area and condition level. However, the health outcomes typically associated with fuel poverty are often associated with: longer term health conditions that may not

be influenced by improving thermal comfort; and / or a variety of contributory factors, e.g. diet, smoking, alcohol consumption, levels of exercise etc.

The Building Research Establishment (BRE) has costed health outcomes associated with the Liverpool City Council Healthy Homes programme using HHSRS published evidence based data (see ODPM: Statistical Evidence to Support the Housing Health and Safety Rating System: Volume I, II and III). The estimates themselves are relatively conservative and the PCT were prepared to use this as a rationale for funding i.e. without the additional need for evidence.

4.2.3 Ethical considerations

The FPSIB could be developed to accrue the highest financial savings from a particular cohort i.e. focussing on areas with optimal conditions. For example, targeting the SIB on vulnerable households within an area could conceivably lead to a situation where the SIB cherry-picks households at risk of developing cold related conditions which are the most expensive to treat in hospital.

On the other hand, area-based approaches risk overlooking some of the most vulnerable households, if these happen to fall out with areas identified for targeting. The Northern Ireland Preliminary Fuel Poverty Review⁴⁹ recommends combining an area- and household-based approach, in order to maximise cost-effectiveness (through the former) whilst ensuring measures reach those most in need (through the latter. It thus proposes developing an area-based index for the purpose of guiding targeting of fuel poverty schemes, avoiding the complexities and costs associated with household-level indices, but overlaying this with additional targeting tools to identify individual households within an area that are most likely to be low income and low SAP. Area-based interventions to address fuel poverty should be focused specifically on these households. However, to ensure the full potential of the area-based approach is maximised and households beyond those identified as the most in need may also benefit from measures, the Review suggests an integrated package of areas-based assistance could be developed, through a range of additional policies, such as Green New Deal, stamp duty rebates, and rate rebates.

There could also be an argument for a regional dimension to a FPSIB, with these FPSIB being more viable in colder climates, e.g. focusing on the North East rather than the South West. Consequently, there may be a mismatch between the activities encouraged by the financial logic of the SIB in maximising return and the actual needs of the community it is supposedly serving e.g. preventing the most expensive illnesses and / or running the intervention as cost-effectively as possible.

The scheme may no longer be called preventative if we are only selecting people for the SIB scheme once they have contracted some form of cold-related illness (and therefore present themselves to the GP and are subsequently referred to the scheme). In this instance the scheme will only prevent *further* deterioration in the client's health and therefore prevent *further* cost to NHS rather than avoiding costs altogether. If financially viable, the scheme should aim to identify vulnerable households as early as possible (perhaps using the non-health related proxy indicators) thereby capturing as many savings as possible through preventing illness developing in the first place.

⁴⁹ Liddell, C., Morris, C., McKenzie, P. and Rae, G., (2011). Defining Fuel Poverty in Northern Ireland. A Preliminary Review. Report by the University of Ulster for the Department For Social Development Northern Ireland.

Once a client has presented themselves to a GP with a cold-related illness and been referred to the SIB scheme there is a further question of how quickly and effectively a program of work (e.g. installing insulation) can improve their health and thereby generate financial savings. For example, once an individual has already contracted bronchitis or suffered a stroke, the primary health incident has already happened. Whilst the FPSIB intervention may conceivably prevent re-occurrences over a long period of time, the initial illness may still require treatment and therefore incur costs.

4.3 Building the business case

4.3.1 Profiling SIB investors

The FPSIB will need to attract a significant amount of initial investment to facilitate its operation. In the next stage of a FPSIB's development there is likely to be a pilot phase whereby the concept is tested in practice. The concept will still carry a significant amount of risk as the findings of the feasibility study will be further refined and tested. The FPSIB may therefore need to be served by a range of different investors e.g. private sector (both equitable and non equitable), Trust funders etc. Different types of investors are likely to have different rationale for their involvement and the study must try to capture these e.g. a private sector investor may be able to use the FPSIB to reduce their tax liability.

Despite the uncertainty around the FPSIB's ability to deliver financial savings the concept is well timed as the UK and USA stock markets are currently in decline. The FTSE 100 lost 10 per cent of its value in August 2011 with significant ongoing volatility i.e. dipping below 5,000 points at a low of 4,944. Many of the potential investors for a FPSIB project have investments in stocks, currencies and/or commodities which may currently be devaluing. Ideally a FPSIB would make a 7% return on investment (similar to the Peterborough Prison Project); however, investors may be prepared to accept a slightly lower rate of return given the current market conditions.

Charitable Trust funders could prove to be ideal investors in the early stages of a SIB's deployment, as they may be able to match the investment with a socially progressive mission statement. However, investing in SIBs represents a new form of investment and may require them to undergo a review of their own criteria for investment of their endowment. Despite their charitable aims the ultimate priority of the charitable funders' Trustees will be ensuring the charities endowment doesn't devalue i.e. meaning the SIB will still need to prove it is a financially credible investment.

Charitable Trusts typically have a portfolio of investments with a range of risks and potential returns. The investment in the next phase of the FPSIB could therefore be positioned as requiring a relatively small amount of money from a large number of investors i.e. spreading the risk and aligning the investment with mission-related investment rather than core financial activity. As an indication of scale, a medium-size charitable trust with an annual turnover of approximately £2.5 million is unlikely to invest more than 4% of revenue in a single project (i.e. £100k).

The FPSIB delivery agent will also need to consider the amount of involvement investor's desire and/or expect. If the FPSIB project becomes an important source of revenue and the liability associated with the investment increases, then they could potentially want more influence on the delivery of the programme e.g. a role on the board.

The delivery agent may therefore want to develop a barrier between potential funders and the operation of their own business. For example, a social philanthropy vehicle that coordinates crowd funding, such as 'Inspiring Scotland', could be used to fund a SIB. In this instance the funders would be one step removed from the projects delivery, leaving the delivery partner to operate without too much intervention from funders.

The study will need to explore the locus for financial risk within the FPSIB. Where does the overall financial liability rest, i.e. with the delivery agent, the health care provider or the funder? If the liability rests solely with a delivery agent, such as CSE, then the organisation may need to establish a separate body to provide the services, e.g. a new company limited by guarantee.

4.3.2 Fuel Poverty Programmes

There are a number of different 'actions and interventions' (referred to as 'activities' in the remainder of this document) that could be funded as part of a FPSIB. Fuel poverty alleviation programmes tend to fund a number of activities to help provide an holistic service. Table 3 and 4 below show the typical costs associated with the delivery of these activities (based on the delivery and experience of CSE's own schemes).

Table 3: Typical fuel poverty scheme costs (simple measures)

Activity	Cost per year	Cost per measure installed*
Administration of scheme (lead partner)	£120,000	£40
Surveying properties	£60,000	£20
Installing loft insulation	£450,000	£300
Installing cavity wall insulation	£600,000	£400
Providing in home advice on energy efficiency	£240,000	£80
Providing a benefits check	5% customers = £6000	£40
Remediating debt with a fuel supplier	1% customers = £3500	£120

* - Please note that administration and survey costs include the burden of unsuccessful installs

Table 4: Typical fuel poverty scheme costs hard to treat (HTT)

Activity	Cost per year	Cost per measure installed*
Administration of scheme (lead partner)	£35,000 - £100,000	£700 - £2000
Surveying properties	£15,000 - £100,000	£300- £2000
Installing solid wall insulation	£350,000 - £1,000,000	£7,000 - £20,000
Providing in home advice on energy efficiency	£2,000	£40
Providing a benefits check	5% customers = £120	£40
Remediating debt with a fuel supplier	1% customers = £120	£120

* - Please note that administration and survey costs include the burden of unsuccessful installs

Table 3 shows the typical costs associated with low cost energy efficiency measures, such as cavity wall insulation and loft insulation. The complexity of these measures and their delivery is significantly lower than those for so called 'hard to treat' measures i.e. for solid wall insulation, as shown in table 4. The cost of administration and surveying properties may be an activity that a FPSIB

could support for a loft and cavity scheme, where as such costs for solid wall insulation are comparable to cavity wall insulation itself.

The FPSIB will also need to rank the interventions in order of their ability to improve affordable warmth. The External Evaluation of the Warm Zones Pilot (2005)⁵⁰ found that benefits advice work was recognised as increasingly important in lifting households out of fuel poverty, and much more cost effective than most energy efficiency (i.e. physical measures) with an estimated cost of £250 per household removed from fuel poverty for the former, compared to £1,110 for energy efficiency.

The FPSIB could also help reduce fuel costs by helping householders to switch tariffs and/or change payment methods. The Hills Fuel Poverty Review (2011) found that the difference between prepayment meter and standard credit costs had narrowed since 2004, but those on low incomes remain least likely to be on the cheapest, direct debit, tariffs. In theory, there are opportunities to switch payment method, tariff or supplier but in practice only a small proportion of consumers are taking advantage of this opportunity. Difficulties in accessing the best deals (e.g. because of lack of internet access) are exacerbated by the complexity of the market which can make it difficult to navigate. The evidence suggests that these barriers disproportionately affect those on the lowest incomes. Where customers on prepayment meters have switched supplier as a result of a doorstep sale, almost as many have switched to a worse as to a better tariff.

Programmes do exist to promote public understanding of the energy market and the potential to switch supplier/tariff (e.g. CABx 'Energy Best Deal' programme⁵¹). The existence of such schemes and assistance is a further consideration for a Fuel Poverty SIB scheme. Consideration needs to be given to which measures and forms of assistance are funded by the SIB, such that these complement but avoid duplicating existing support available through current energy policy. A Fuel Poverty SIB could, for example, be ring-fenced to specifically target households not currently eligible for support under existing schemes; or offer a form of top-up funding for measures not fully funded; or focus on funding measures for which no financial support is currently available.

At the time of writing, the main gaps in funding for fuel poverty alleviation lie in the provision of free insulation measures to fuel poor households on marginal incomes i.e. they do not qualify for means tested benefits. However, the end to the Warm Front programme in 2013 (as discussed in section 3.2) means there will be no grant assistance for central heating. The Green Deal and the Energy Company Obligation will replace the current energy efficiency programmes, although the extent to which low income households will receive support through subsidised measures is unclear.

4.4 Developing the financial case

4.4.1 Health Sector Funding

The FPSIB will need to reduce costs within the health sector to help fund all or part of the interventions. However, it is worth noting that the costs associated with delivering health care continue to rise each year with new treatments and an aging population. The FPSIB therefore faces the key challenge that the savings to efficiency will generally be needed elsewhere.

⁵⁰ <http://www.warmzones.co.uk/050301%20-%20Warm%20Zones%20Evaluation%20Final%20Report.pdf>

⁵¹ http://www.citizensadvice.org.uk/fsfl_projects_energybestdeal

Following preliminary discussions with NHS procurement the team has an overview of the structure for NHS funding. Figures 1 to 3 illustrate the differing approaches to funding core services. Figure 1 shows the allocation of funding from HM Treasury to NHS Trust by 'per head of population' basis, with some additional top ups. The funding is then allocated to services based on the provision of wider health services or hospital care, i.e. block contracts or activity contracts.

Figure 1: NHS contract types

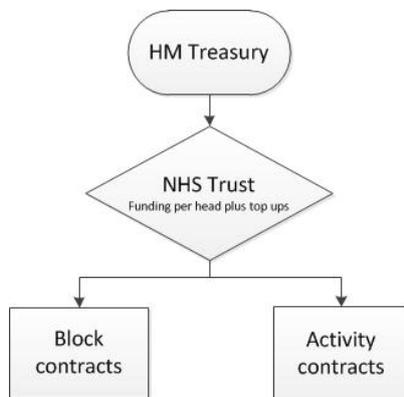
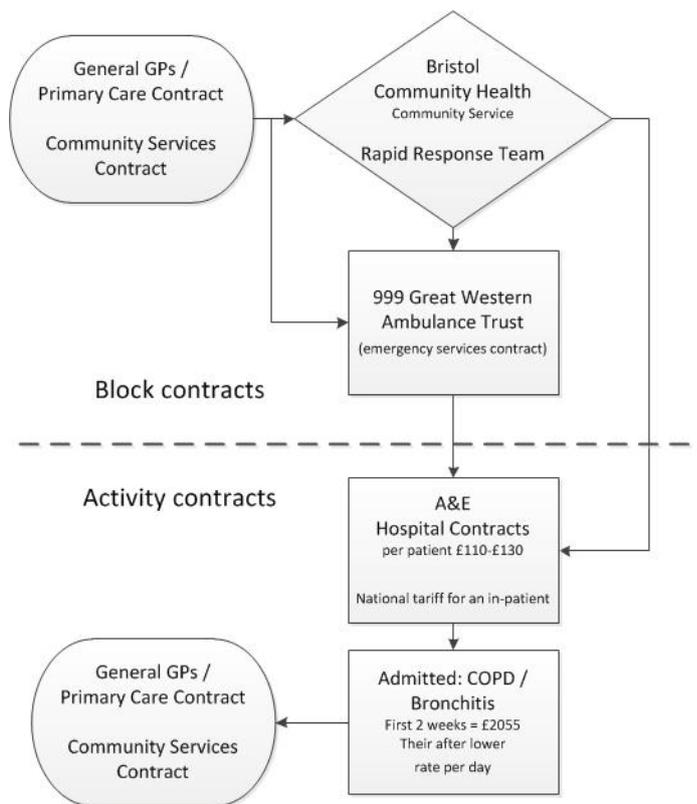


Figure 2 can be used to envisage the typical journey through the system for a patient with Chronic Obstructive Pulmonary Disease (COPD) or Bronchitis. The dashed line shows the broad division between those services that are covered by blocks contracts (above the line) or activity contracts (below the line).

The patient may report to the General Practitioner's (GP) surgery or, if with chronic symptoms, call out their GP, who then refers them to hospital. The patient is then picked up by an ambulance and taken to hospital. The health sector funding for general services such as GPs, community care and ambulances etc. are currently covered by block contracts. Block contracts are negotiated on a fixed sum basis for the provision of an ongoing population-wide service. These contracts are negotiated centrally by NHS procurement under the Quality, Innovation, Productivity and Prevention (QIPP) process (discussed below and illustrated by figure 3).

Figure 2: Patient journey through services and contract types



Once a patient enters hospital their care is covered by activity contracts. The costs of the services delivered within hospital are set out in the NHS National Tariff Framework. This research study will review the tariffs to establish a set of costs for each health outcome of interest. It will be important to understand the extent to which these costs vary by age and condition.

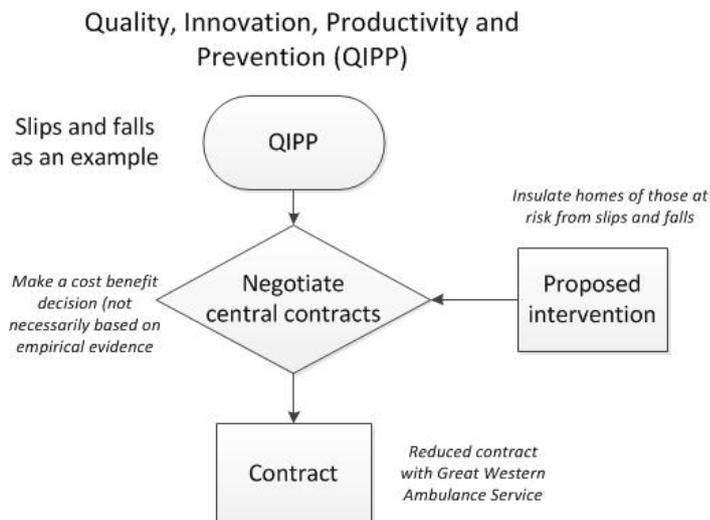
For the patient with COPD they may be admitted to Accident and Emergency at a cost to the NHS of ~£120 per patient. Once admitted to the ward the funding the hospital can accrue for the patient is set at a fixed amount for the first 14 days (£2,055 for COPD). The amount of funds paid to the hospital per night of stay then decreases beyond 14 days i.e. incentivising the hospital to increase efficiency by generating throughput. The FPSIB related intervention will therefore need to reduce the number of days a patient is required to spend on the ward, and thus increase efficiency in order to lever any activity contract related funds from the NHS Trust.

Figure 3 below shows the process for negotiating block contracts and how this process may interact with the FPSIB concept:

The NHS Trust may decide to re-negotiate their contract for the provision of ambulance services. As part of these negotiations a third party may propose a series of interventions that reduce slips and falls for elderly vulnerable householders. The NHS Trust would then make a risk assessment based on the best evidence in-hand to determine the likely success of the intervention (i.e. they do not always rely on data from empirical studies as it typically does not exist for many non clinical processes). In this instance the Trust could then reduce the level of the contracted service for

ambulances from Great Western Ambulance Service. based on the anticipated number of reduced falls, and therefore reduced demand.

Figure 3: Negotiating block contracts for core services



CSE will meet with NHS and Primary Care Trust procurement staff to identify the potential cost savings to the health service for particular health outcomes. The study will try to map out the typical patient journey for these outcomes. In particular the study will attempt to develop a clear rationale for capturing the financial savings with a focus on the split between block and activity contracted services. However, as described above, the initial discussions with NHS procurement suggest that the savings themselves, either block or activity contract, seem to go back to HM Treasury rather than NHS Trusts or hospitals. It may therefore be difficult to quantify any real saving without demonstrating the rationale for a higher level benefit to the UK's public purse. In terms of structure of the bond, the savings will need to accrue over a significant time scale i.e. once the relative performance of the intervention has been identified.

4.4.2 Additional Sources of SIB funding (social security and community care)

Community care funding for wider public health issues, such as mental health, may also be an important source of finance for the FPSIB. For example, Bristol City Council has recently used funds from its Community Health budget to fund insulation measures previously funded by the housing renewal team (i.e. replacing cut housing funding).

The FPSIB may need to focus on a broader set of health outcomes that encompass community care and social security. Improvements in general health and wellbeing could have a measureable impact on the need for community care and uptake of benefits. Rather than just focussing on narrow health outcomes it may be worth considering a measure of reducing health inequalities. The project team plans to contact Sheffield Hallam University who are currently quantifying comfort and monetising the health impact of energy efficiency improvements for the Department of Energy and Climate Change.

Reducing Excess Winter Death mortality in an area could potentially be linked to a reduced social security burden, or the costs of community care could be measured locally as a result of focussed intervention activity. However, this would require a significant sample size and programme of investment.

4.4.3 Additional Sources of SIB funding (energy related)

The preliminary review of NHS funding has identified two primary funding opportunities that may not lend themselves directly to a FPSIB. The programme may therefore need to attract additional funding to deliver secondary targets. The expansion of the programmes activities will also provide additional opportunities for funding i.e. from investors aligned or delivering these secondary outcomes.

Energy suppliers currently write off a significant amount of funds for customer fuel debt. The funds to do this are currently held in large trust funds and could be invested in a SIB to instigate a debt management or debt reduction strategy. In this instance an early intervention in debt management (alongside energy efficiency advice and/or measures) could reduce the energy supplier's long-term loss, i.e. when writing the debt off and in chasing the debt. There could also be tax advantages to the energy supplier in SIB investment rather than holding the funds in a trust; however, the timing of this investment would need to be aligned with the broader SIB funding model.

District Network Operators (DNOs) manage investment to the electricity system (the grid). DNOs need to prioritise large sums of investment to those areas of the grid that need replacing or upgrading first. In some instances improving the energy efficiency of homes and their heating systems may be a more cost effective solution than replacing large scale equipment. If the FPSIB focussed on an area where the investment offset a large scale capital cost then it may be able to draw down funding for the intervention itself e.g. changes to electrically heated systems or insulation.

Other proposed and largely un-quantified social benefits from fuel poverty interventions include improvements in educational performance and reductions in anti-social behaviour and vandalism. If these are to be serious contenders as desired outcomes in a SIB there is a need to attach an economic benefit to them that someone is willing to pay for.

4.4.4 Measuring success and reporting to funders

As discussed in section 4.2.2 the FPSIB could need a range of indicators (referred to as a dashboard) to monitor its performance against several target outcomes. The SIB's interaction with a range of health outcomes and secondary outcomes could potentially spread the risk of investment and maximise the potential return on investment. The initial review of health research presented in this report would indicate a rationale for focussing on a narrow set of health outcomes i.e. those that most readily respond to the interventions; however, investors may prefer to target a basket of health and social improvement outcomes.

The dashboard of indicators that focuses on a set of wider outcomes may facilitate investment from a broader cohort. For example, the inclusion of school performance and attainment may open the FPSIB up to additional funders whose mission aligns with this secondary goal. A list of example dashboard indicators is included here:

1. Health outcomes (condition related morbidity)
2. Health outcomes (condition related treatment dependency)
3. Health outcomes (patient need for wider block contracted services e.g. ambulances etc.)
4. Wider health benefits i.e. obesity, smoking rates
5. Wider societal benefits such as wellbeing and happiness and potential reductions in social security payments
6. Child school performance
7. Levels of fuel debt

This feasibility study is unlikely to remove the need for a FPSIB pilot where by the costs and dashboard measurements themselves are further assessed. The study needs to be clear about the stages in this journey and the next steps needed. The indicators of success will be key to the SIB's operation and it is therefore crucial to test them in a real world situation. The indicators themselves could also play a role in developing referral mechanisms and identifying opportunities for early interventions. The pilot phase is likely to need the involvement of a health economist to help deliver a full need assessment i.e. to understand the complexity of investor risk links to the different measurements presented.

5 Next steps

The project team will consult with the steering group and use the structured interviews to clarify the following key issues and questions:

- Can we demonstrate the benefits of the proposed activity?
 - What does the dashboard of indicators look like?
 - Where does the FPSIB fit in the context of already funded interventions and schemes and in respect of the Green Deal/ECO?
 - What is its niche? What is it trying to achieve?
- How does the approach to NHS funding impact on intervention?
- Which activities / interventions will the SIB fund?
 - What secondary interventions are required, if any?
 - What partnerships are needed to facilitate this?
 - In the knowledge that packages of measures are more effective than single measures (i.e. insulation should come with controls and advice) what packages of measures should the SIB fund and are there differences in health outcomes for different packages?
 - What health, community care and wider social outcomes does the SIB seek to influence?
- How will funds flow between the interested parties?
 - What level of assurance do the investors need?
 - Where does the risk lie?
 - Should a crowd funder manage the coordination of investment to maintain a barrier between the delivery vehicle and the funder?
 - What level of assurance do public authorities need?
- What are the stages to the FPSIB delivery, from research, to pilot to bond?
 - Can we set up a trial pitch to an investor group?