MANCHESTER 1824
The University of Manchester

Manchester Urban Institute

Governing Urban Transformation

How can alleviating fuel poverty across all tenures in Greater Manchester improve the city-region's economy?

Date of Submission: 12th May 2017

Student ID: 9469829 & 9476858

Word Count: 2,698

Author declaration:

I 9476858 confirm that this report is based on my own work and that I am happy with both my own and my partner 9469829's contribution to the final submitted version.

Executive Statement

This report addresses the relationship between the alleviation of fuel poverty in all tenures in Greater Manchester and economic growth, set by the Greater Manchester Combined Authority (GMCA). In analysing a combination of grey and academic literature, it is claimed that the alleviation of fuel poverty is crucial for the city-region's prosperity. Specific groups vulnerable to fuel poverty alongside the causes and amplifiers of the issue are identified in the context of Greater Manchester. The report draws on a series of comparable schemes from across the UK as models that span major city initiatives to educating individuals. Future schemes have been considered, building on current initiatives such as retrofitting and the implementation of smart technology. The report concludes with recommendations for future methods of governance specific to Greater Manchester and highlight the importance of fundamental, systemic changes that need to be identified in the future.

Key Words: Fuel Poverty, Greater Manchester, Retrofitting, Energy, Smart City

Contents

1. An Opportunity for Innovation: Introducing fuel poverty in Greater Manchester

1.1 A challenge approach

With an increasing desire for energy efficiency and achieving carbon targets, a series of national and local schemes have been formulated in the UK targeting fuel poverty (Moore, 2012; Bouzarovski and Petrova, 2015). An average of 10% of UK households are currently in fuel poverty and consequently, the issue has become a challenge for urban governance (Preston *et al.,* 2008; Bouzarovski and Petrova, 2015). In 2014, 32,000 homes in Manchester, or 16% of the city's dwellings were fuel poor, with the figure rising by 7000 homes in one year (Glendinning, 2014). As a collection of ten councils[1] in the Greater Manchester city-region, the Greater Manchester Combined Authority (GMCA) acts as a collective voice (GMCA, 2016). It is motivated to address prominent issues surrounding economic prosperity by attracting and directing potential investment to develop and regenerate the city-region (GMCA, 2016). There is the prospect for new forms of governance in Greater Manchester and the potential for innovation. With a recently elected mayor offering a new political entity working with the GMCA, an opportunity has arisen to extensively tackle the issue of fuel poverty and achieve the target of sustainable economic growth (GMCA, 2016; Pidd, 2017).

1.2 Report Outline

This report firstly provides context to the issue of fuel poverty and its relevance to Greater Manchester from an economic lens; alternative models are also presented acting on a national, regional and local level; finally these models have been applied to Greater Manchester and recommendations for future developments devised. A range of phenomena are investigated, including drivers of fuel poverty in Greater Manchester, levels of social vulnerability and the challenges faced by the fuel poor (GMCA, 2016).

[1] Greater Manchester Combined Authority councils are Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan

2. Contextualising Fuel Poverty and Economic Growth

2.1 Distinguishing fuel poverty and energy poverty

Energy services are the benefits that 'energy carriers produce for human wellbeing', including heating or lighting (Bouzarovski and Petrova, 2015, 34). Domestic energy deprivation is characterised by an inability to uphold a standard of energy services necessary for adequate social stability (Bouzarovski and Petrova, 2015). It is not the energy itself that is valued but the service using energy (Bouzarovski and Petrova, 2015). Initially, it is important to highlight the ambiguity of the terms fuel poverty and energy poverty. Price *et al.,* (2012) suggest that official definitions could be continually revised because of their subjectivity. Although both terms encapsulate similar debates such as justice, security and technology, they also possess distinct qualities (Li *et al.,* 2014).

Energy poverty is outlined as a lack of access to energy services, covering issues of access, provision of infrastructure and energy service efficiency (Bouzarovski and Petrova, 2015). Alternatively, fuel poverty is the inability to afford energy services to fuel the home (Bouzarovski and Petrova, 2015). Walker and Day (2012) suggest fuel poverty has manifested from issues of social inequality and distributive injustice. It is described as 'state of being' (Middlemiss and Gillard, 2015, 147), with 'systemic drivers of deprivation' leading to issues of wellbeing (Bouzarovski and Petrova, 2015, 32). A commonly cited determining factor of fuel poverty is if more than 10% of the household's income is spent on energy services to remain in a liveable condition (Boardman, 1991). Bouzarovski and Petrova (2015, 32) developed this definition, suggesting households being fuel poor if 'energy costs are higher than a nation-wide median'. Gillard and Middlemiss (2015, 147) defined the 'fuel poverty gap' as the average amount that households are short on their fuel bills. Between 2005 and 2011, this disparity rose from £310 to £438 in England and Wales (Gillard and Middlemiss, 2015). In this case, Moore (2012, 19) highlights how the poorest 30% of households were spending almost twice the median expenditure on fuel, which is 'disproportionate'.

2.2 Identifying Drivers of Fuel Poverty in Greater Manchester and Economic Growth

The drivers of fuel poverty in Greater Manchester are reflective of nationwide challenges surrounding income poverty issues, yet the city-region also possesses unique circumstances. Stockton and Campbell (2011) cite household income, poor heating and insulation standards and high energy prices as contributing factors of fuel poverty (Price *et al.,* 2012). In Greater Manchester, the housing stock is significantly comprised of pre-1918 terraces that are recognised as hard to regenerate and energy inefficient (Rees, 2009). The private-rented sector is also significant across Greater Manchester, with inhabitants vulnerable to fuel poverty if tenants and landlords are reluctant to invest in energy efficiency measures (Ástmarsson *et al.,* 2013). The drivers of fuel poverty can be exacerbated when placed alongside poor tenancy relations, an instable household income, ill health and poor social relations (Stockton and Campbell, 2011; Middlemiss and Gillard, 2015). The reliability of the fuel source, availability, demand and price of infrastructure can influence the cost of fuel (Preston *et al.,* 2008). Experiences of fuel poverty can intensify as UK fuel prices rise, household income decreases or remains low and buildings remain inefficient (Price *et al.,* 2012; Bouzarovski and Petrova, 2015). Consequently, fuel poverty can stem from a lack of resilience and this is a key motivation for future models of governance (Marmot and Bell, 2012; Bouzarovski and Petrova, 2015).

Middlemiss and Gillard (2015) suggest fuel poverty can directly and indirectly affect quality of life. A direct impact is keeping warm and an associated impact a person's health (Liddell and Morris, 2010; Middlemiss and Gillard, 2015). In the UK, social groups vulnerable to fuel poverty include the elderly, families with young children, the ill and disabled (Osbaldeston, 1984). The World Health Organisation (WHO) evidences links between warmth and health (WHO, 2006). Consequentially, a cold dwelling could develop damp, mould and poor air quality leading to respiratory problems (Threlfall, 2011; Norbäck *et al*., 2017). Discomfort in the cold and stress associated with fuel poverty are also linked to mental health and wellbeing (Threlfall, 2011). For the young, this could lead to absence from school,

underachievement and weakened opportunities (Threlfall, 2011). Therefore, investing in infrastructure and retrofit projects can have positive outcomes on sectors including health and education and thus Greater Manchester's economy (GMCA, 2016).

3. Framing the Approach: A methodology

3.1 Textual Analysis of Grey and Academic Literature

This report has been informed by the textual analysis of grey and academic literature. This provided an overview of the economic implications of fuel poverty, with a focus on initiatives on a national and local level (Clark, 2013). Secondary statistical data was used to provide context to those effected by fuel poverty in Manchester whilst analysis of government and local authority policy reports were used to study recent initiatives in Manchester and across the UK. Documents were compared and critically analysed to highlight key differences in Manchester's approach to fuel poverty to elsewhere in the country and recommendations for future amendments and alternative policies to improve the city-region's economy. Specifically, it was possible to answer questions regarding the links of fuel poverty to economic development (Threlfall, 2011).

3.2 The selection of model cities and schemes

The cities and schemes selected in this report were selected as they have the potential to act as model for example for Greater Manchester in the future. The schemes (presented in Table 1) and aim to promote fuel efficiency.

Table 1: Schemes discussed in this report and an outline of their main initiatives

Model Scheme	**Years Active**	**Location**	**Main Initiatives**
Affordable Warmth Scheme (Affordable Warmth Scheme, 2017).	2013 to Present	Nationally implemented	- One of three targets of the Energy Companies Obligation (ECO) - State endorsed service - Improve efficiency of low income dwellings by retrofitting (new boilers, loft insulation and cavity wall insulation) - Apply online to assess qualification
Families in Fuel Crisis (Centre for Sustainable Energy, 2016)	2016 to Present	Localised scheme in South West England	- Targets specific areas of deprivation - Offers education and advice on switching energy supplier, fuel budgeting, accessing entitlements and available grants - Provides information on retrofit schemes
Bristol Energy Efficiency Scheme (BEES) (Centre for Sustainable Energy, 2012)	2008 to 2012	Bristol, UK	- Targeted cold and damp homes - Installation and cavity wall insulation for free - Targeted properties: elderly, disabled or fuel poor - Privately owned or rented properties
Warm Up Bristol (Warm Up Bristol, 2017)	2014 to Present	Bristol, UK	- Bristol City Council Scheme (government funding) - Reduce cold homes and families in fuel poverty - Designed to improve the energy efficiency of private homes - Work with local installers
Adactus Housing Group (Adactus Housing Group, 2017)	Adactus Housing Association Ltd. Was renamed in 2005	North West England	- Group of housing associations (co-operative) - Work collectively to build and manage sustainable, efficient dwellings - The group structure is governed by a management board that meet quarterly for decision making
Triangulum (SEED University of Manchester, 2017)	2015 to 2020 (Ongoing)	Manchester, UK	- 'Three Point Project': Manchester, Stavanger, Eindhoven - Horizon 2020 project - European Union funded - University of Manchester is working with 23 European Partners - Targets structured around low energy districts, cohesive infrastructure and sustainable urban mobility - Implementing smart technology

3.3 Research questions

The report is guided by three research questions:

1) What are the drivers of fuel poverty in Greater Manchester and how are these linked to city-region's economy?

2) What schemes have been put in place elsewhere in the UK and how could these be applied to the context of Greater Manchester's economic growth?

3) What are the future prospects for the alleviation of fuel poverty in Greater Manchester?

4. Fuel Efficiency for Economic Advance: Analysing approaches to fuel poverty alleviation

4.1 Eradicating Fuel Poverty for Economic Growth on a National Level

Clearly, there is political ambition to address a series of social and environmental targets throughout the UK (Stockton and Campbell, 2011; Consumer Futures Scotland, 2012). Government targets include the reduction of carbon emissions, growth and reform of habitable space, rebalancing the economy and the provision of robust infrastructure (Healy and Clinch, 2004; DECC, 2016). Funding schemes can alleviate fuel poverty by promoting energy efficiency and retrofitting in vulnerable households (Howard, 2015). The Affordable Warmth Scheme (AWS) replaced The Warm Front Scheme in 2013 that had previously installed heating systems and insulated 900,000 homes for £600 million (DECC, 2011; Threlfall, 2011; Affordable Warmth Scheme, 2017). Grants for the AWS included £1,500 for insulation and heating improvements (Threlfall, 2011). Figure 1 presents an example of the economic costs and savings of cavity wall retrofits. Notably, the ASW highlighted health

benefits associated with increased fuel efficiency, reducing the pressure on state systems (NHS) allowing former fuel poor workers to return to work and how a reduce in fuel demand will decrease excessive levels of new energy infrastructure, lessening government expenditure (Trelfall, 2011; Howard, 2015). However, Howard (2015) also highlights a divide between the government's enthusiasm for combatting fuel poverty and money presented in a time of austerity.

Cavity wall insulation				
Type of property	Installation cost	Savings per year	CO2 savings per year (kg)	Payback time
Detached house (four bedrooms)	£720	£275	1,100	2-3 years
Semi-detached house (three bedrooms)	£475	£160	650	3 years
Mid-terrace house (three bedrooms)	£370	£105	430	3-4 years
Detached bungalow (two bedrooms)	£430	£110	450	4 years
Mid-floor flat (two bedrooms)	£330	£90	360	3-4 years

Figure 1 Table to show an example of retrofitting - cavity wall insulation - costs and savings per property modelled on the Warm from Scheme (2011) Available at: http://www.energysavingtrust.org.uk/Energy-saving-assumptions Accessed: 8th May 2017

4.2 Eradicating Fuel Poverty for Economic Growth on a Local Level

It should be recognised that poverty is not necessarily the fault of an individual and the expectation for them to alleviate their situation is not wholly progressive (Walker and Day, 2012). Fuel poverty is principally the result of systematic injustices throughout the structure of energy provision, regarding the energy market that drives high energy prices, a labour market where households cannot afford to heat a home, improving housing markets and welfare state to alleviate poverty (Walker and Day, 2012; Bouzarovski and Petrova, 2015). However, considering spatial specificity is crucial for future governance. Fuel poverty tends to manifest in pockets of deprivation and local schemes can target community improvement

initiatives, employability prospects and potentially overcome the challenge of engaging individuals (Trelfall, 2011; Howard, 2015). Families in Fuel Crisis is an example of a community liaison group providing an alternative means of governance. Fuel poverty is estimated to affect millions in the UK, but often individuals do not recognise themselves as fuel poor. (O'Niell et al., 2006; Price et al., 2012). Here, the combination of education and a local focus has provided targeted support (Centre for Sustainable Energy, 2016).

Bristol's local authority has implemented area specific fuel poverty interventions. With 11% of its population identified as fuel poor, initiatives like The Bristol Energy Efficiency Scheme (BEES) or the ongoing Warm Up Bristol (WUB) scheme have considered fuel poverty in a plight for economic prosperity and environmental sustainability (Bristol City Council, 2015; Sims, 2016). The BEES initiative included the installation of loft and cavity wall insulation in over 10,000 cold or damp homes, with the elderly, disabled and fuel poor targeted (Watson, 2016; Sims, 2016). Although 'ambitious', WUB aimed to carry out 30,000 home improvement measures over the course of four years to improve the energy efficiency of the city's housing (Bristol City Council, 2015). Sims' (2016, 4) Bristol City Council report cites how the WUB initiative has reduced heating costs for 'thousands of families' and consequently, 'secondary benefits to the local economy'. The report states the local authority will continue to provide 'social and economic benefits to the vulnerable and fuel poor' who may not 'otherwise be able afford energy efficiency works' (Sims, 2016, 42). It is imperative that the difference in demographic and economic composition of Greater Manchester and Bristol are considered when valuing the potential success of similar programs in Greater Manchester. With this, the obdurate nature of Greater Manchester's housing stock should also be considered (Rees, 2009; Hodson and Marvin, 2010).

4.3 Locally Specific North West England Initiatives and Future Prospects

Adactus Housing Group is comprised of a series of housing associations as presented in Figure 2, in the North West of England employing over 500 people (Carbon Trust, 2017). Following the group's participation in the Carbon Trust's Public Sector Carbon Management

Programme, Adactus was successful in reducing the carbon emissions of its social housing by 25% in four years, a year sooner than scheduled (Carbon Trust, 2017). Smart technology and retrofitting was applied to social housing, including communal lighting and energy conservation practices were advertised within the offices, raising staff awareness to reduce annual energy bills (Carbon Trust, 2017). A new energy efficient office in Manchester in 2012 reduced the annual energy bill by £9100 (Carbon Trust, 2017). This was achieved with smart systems including 'air source heat pumps and solar photovoltaic technology' (Carbon Trust, 2017). In March 2014 Adactus had cut its carbon emissions by 25% and reduced its collective annual energy bill by £250,000 (Carbon Trust, 2017). The economic success of smaller projects occurring within Manchester like Adactus provide an insight into future schemes on larger scale across the city-region.

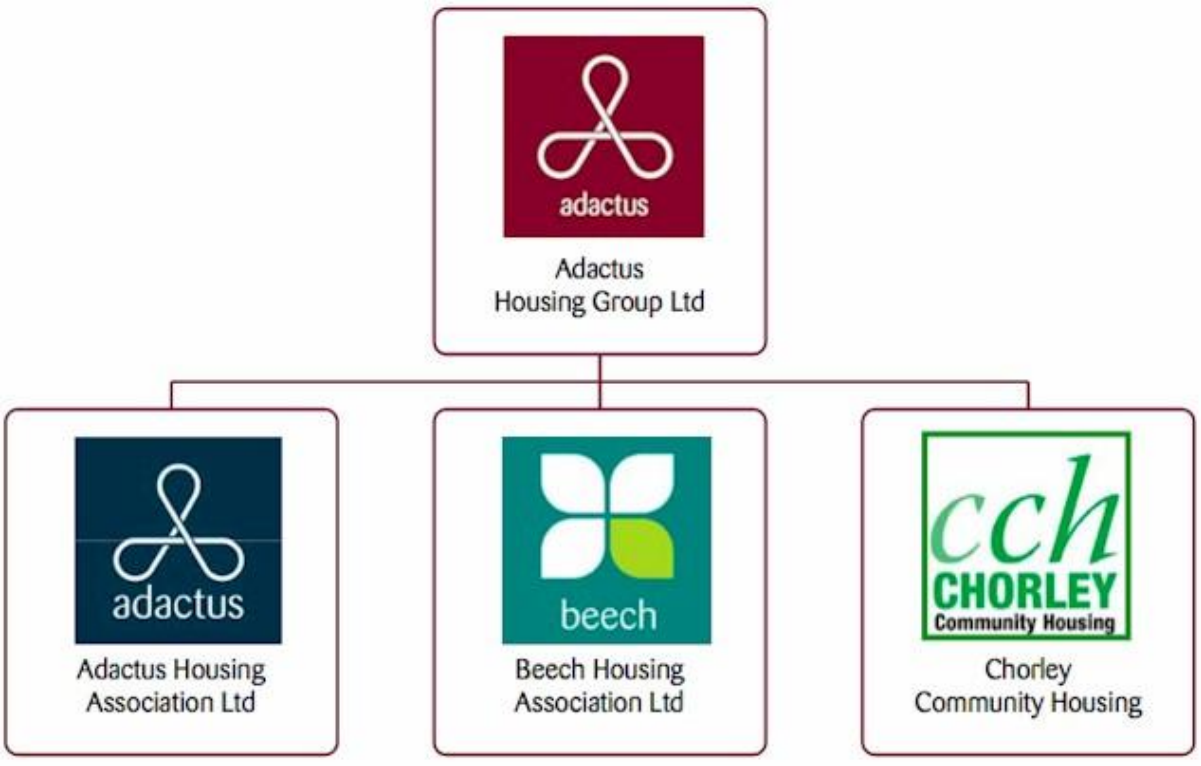

Figure 2 A diagram to show the current members of the Adactus Housing Group. Available at: https://www.adactushousing.co.uk/images/upload/chapterImage/groupstructure.jpg Accessed: 9th May 2017

Finally, starting in 2015 and estimated to finish in 2020, the Triangulum scheme costing €25 million is set to position smart energy solutions and technologies to Greater Manchester,

increasing fuel efficiency and inevitably playing a part in alleviating fuel poverty (SEED University of Manchester, 2017). Manchester is one of three cities to first experience this scheme (SEED University of Manchester, 2017). Concepts will be passed to the follower cities Leipzig, Prague and Sabadell (Triangulum, 2015). The European Union (EU) funded project focuses on low energy districts, integrated infrastructure and sustainable urban mobility (SEED University of Manchester, 2017). Triangulum is set to transform the Manchester's student-based district, using smart technology in renovating buildings to create an autonomous energy grid (Evans *et al.* 2015). With cross-level stakeholder investment, this scheme acknowledges the need to address to fuel poverty and sustainability. Although this scheme will maintain its funding, it is questionable whether, despite their apparent importance, similar schemes could be impacted in the future (Triangulum, 2015). With funding potentially reduced as the result of austerity comes uncertainty in urban areas like Greater Manchester where numerous inhabitants are reliant on state support and EU funding (Howard, 2015; Parkes, 2016). Transferring this project onto a larger scale or to other areas of Greater Manchester should be thoroughly considered because although the implementation of technology allows flexibility in urban life, these systems also require extensive engineering that could take considerable amounts of time (Triangulum, 2015). This supports the idea of working on a smaller scale throughout the city to reap the benefits of smart technology.

5. Conclusions

This report has reasoned the importance of alleviating fuel poverty in the plight for economic growth in Greater Manchester. To thoroughly address the issue, the report has discussed the drivers of the issue, such as rise in fuel costs and ineffective thermal efficiency of residential housing alternative UK fuel poverty schemes that could be of influence, examples taking place on a smaller scale in Greater Manchester and its future prospects(Price *et al.,* 2012; Bouzarovski and Petrova, 2015). Acting on a national or local level, it is clear that many of the presented schemes have contributed to economic growth, providing vulnerable groups with the means to improve their economic prospects that will

eventually benefit the region as a whole (Howard, 2015). Thus the report has highlighted the strong links that the elimination of fuel poverty and economic growth possess, both directly and indirectly, so such fundamental issues should be addressed extensively in future governance.

6. Future Recommendations

Table 2 clearly presents a series devised recommendations for Greater Manchester and their desired effects:

Table 2: Recommendations

Recommendation	Effect(s)
To identify those in fuel poverty, healthcare professionals could link the symptoms including respiratory problems with fuel poverty and recommend locally specific funding opportunities or further guidance (Threlfall, 2011)	• Provide assistance to the fuel poor • Prevent further state spending
Marketing plans should be devised to advertise available state funding and local projects to alleviate the issue	• Raise awareness • Connect residents and local authority members
The relevance of smart technology in the city should continue to be recognised	• Promote economic, environmental and social sustainability within the city region • Decrease fuel spending • Promote experimentation
Models inspired from schemes elsewhere should be constantly investigated and tested within Greater Manchester	• Progressive decision making • Increase economic growth
A range of stakeholders should be involved to invest in strategies of governance	• Provides locally relevant, targeted support for fuel poor • Improve links with Greater Manchester Population

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