

**LOW CARBON HUB BOARD**

Date: **7<sup>th</sup> October 2016**

Subject: **GM HEAT AND ENERGY EVIDENCE BASE**

Report of: **Mark Atherton, GM Environment Director**

**PURPOSE OF REPORT**

The purpose of this report is to outline the findings of the GM Heat and Energy Evidence base which has been undertaken by the Energy System Catapult (ESC) as part of GM's involvement in the Smart System and Heat (SSH) project. The report has been produced to inform the development of low carbon policies for the Greater Manchester Spatial Framework. A presentation on the key findings of the report will be provided to the Board.

**RECOMMENDATIONS:**

The Board are recommended to:

- Note and comment upon the report and presentation,
- Consider how the findings of the Evidence base can support low carbon development/infrastructure in Greater Manchester.

**CONTACT OFFICERS:**

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**BACKGROUND PAPERS:**

Annex 1: GM Heat and Energy Evidence Base (Presentation)

<b>TRACKING/PROCESS</b>		[All sections to be completed]
Does this report relate to a Key Decision, as set out in the GMCA Constitution or in the process agreed by the AGMA Executive Board		No
<b>EXEMPTION FROM CALL IN</b>		
Are there any aspects in this report which means it should be considered to be exempt from call in by the AGMA Scrutiny Pool on the grounds of urgency?		[Please state any reasons here]
AGMA Commission	TfGMC	Scrutiny Pool
7 <sup>th</sup> October 2016	[Date considered at TfGMC; if appropriate]	[Date considered/or to be considered at Scrutiny Pool; if appropriate]

## 1. INTRODUCTION

1.1 Work has been undertaken to bring together GM's low carbon evidence base to support the development of the Greater Manchester Spatial Framework (GMSF). The Energy Technology Institute (Eti) agreed to support GM in this work as part of Phase 1 of the Smart Systems and Heat Programme (see separate paper) and has developed a high level Heat and Energy Evidence Base (Masterplan) which can be used to inform emerging low carbon/energy policy of the GMSF.

## 2. GM HEAT & ENERGY EVIDENCE BASE

- 2.1 The Evidence base (presentational slides of the Summary Report are attached at Annex 1) has been created using national data sets and local information provided from a range of GM stakeholders including ENWL, TfGM, LCPDU and the GM Environment Team. It provides an indication of GM's current and future Heat and Energy load (based on GMSF growth projections), as well as the GM's technical potential to generate renewable energy from established technologies. The evidence base provides a baseline to help identify where attention should be focused in the future.
- 2.2 GM's total annual carbon emissions are 13.5MtCO<sub>2</sub> (in 2014) which is the equivalent to 5.0ktCO<sub>2</sub> per capita. As comparison, this is 79% of the UK's national average of 6.3ktCO<sub>2</sub> per capita. GM's annual energy demand is 51.6 TWh/yr, with homes accounting for approx. 37% of energy demand and non-domestic buildings 35%. Within the domestic sector, gas is the primary heating source and is predominately used for space heating and hot water (77% of domestic energy demand). Approximately 5% of homes in GM do not have a gas connection and are considered 'off grid'.
- 2.3 Roughly 87% of GM's existing domestic stock will still be in use by 2050. The evidence base suggests that scoping of cost effective retrofit measures and energy efficiency upgrades will be required in order to meet GM's local, national and international commitments.
- 2.4 The Evidence base has identified that GM has the technical potential to generate significant amounts of renewable energy, which will be invaluable in achieving GM's carbon reduction targets. Headline findings are detailed below:
- Up to 1030 GWh/yr, 9% of existing electricity consumption could technically be generated by renewable energy sources within GM, delivering annual CO<sub>2</sub> reductions of 2.6 million tonnes (19%) from 2014 levels.
  - Solar PV has the technical potential to provide 834 GWh/yr (7.3%) of current GM electricity consumption. In 2014, PV provided 51.6 GWh.
  - Ground Source and Air Source Heat Pumps have the technical potential to contribute to 12.4 TWh/yr (50%) of current GM heat consumption.
  - GM Wind power generation currently delivers 2.2GWh (1% of renewable generation) and has the technical potential to increase and provide a further 140 GWh/yr, focused principally in Bury and Oldham.
  - Hydro has the potential to provide 622 kWe (0.6 MWe) new capacity in Bury and Stockport, with additional unconfirmed potential in Bolton, Rochdale and Oldham and Ashton.

- Potential heat pump capacity in GM could increase electricity consumption by 30%. Uptake of electric vehicles could add 500kWh per year to the electricity consumption of each GM household by 2035.
- Mine water heat extraction in GM has the technical potential to provide 176MWh/yr.
- District heating could supply as much as 10-30% of UK space heat generation by 2050 compared to 1-2% currently. This shift across GM would be equivalent to between 110,000 and 330,000 homes connected to District Heating by 2050.

2.2 It should be noted that whilst the evidence base identifies GM as having sizeable technical potential to generate significant amounts of its energy requirements within the conurbation, this is the technical capacity and does not take into account political, legal and financial implications; further detailed feasibility studies will be needed at the appropriate scale.

### **3. GREATER MANCHESTER SPATIAL FRAMEWORK**

3.1 The Greater Manchester Spatial Framework (GMSF) is currently under development and will shape the conurbation over the next 20 years. The Evidence base provides an opportunity to support the development of robust housing, transport, low carbon, jobs, skills and growth policies to support GM's ambition to become a world class city region.

### **4. NEXT STEPS**

4.1 The GM Environment Team will continue to liaise and support the development of the GMSF where required.

4.2 The Board is invited to comment on the presentation as well as identify any areas of interest/opportunities that could be explored further. Following comments received, the final ESC Energy and Heat report will be published.