

GREATER MANCHESTER GREEN CITY REGION PARTNERSHIP

Date: **24 July 2020**

Subject: **ACHIEVING NET ZERO CARBON IN NEW DEVELOPMENT BY 2028, AN OVERVIEW OF THE EMERGING EVIDENCE TO SUPPORT THE GREATER MANCHESTER SPATIAL FRAMEWORK**

Report of: **GMCA Environment Team/Planning and Housing Team**

PURPOSE OF REPORT

To provide a short summary of the research undertaken by Currie & Brown/Centre for Sustainable Energy in support of the draft Greater Manchester Spatial Framework Policy for all new development to achieve 'Net Zero Carbon' by 2028.

RECOMMENDATIONS:

The Partnership is asked to:

- note and comment on the contents of the report.

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1. BACKGROUND

1.1 The draft Greater Manchester Spatial Framework¹ (GMSF) included a policy (GMS-2, Carbon and Energy) that all new development will need to be Net Zero Carbon by 2028. In doing so the policy also stipulated that:

- Development should follow the energy hierarchy
- There should be an interim requirement that all new dwellings seek a 19% carbon reduction against Part L of the 2013 Building Regulations
- a minimum 20% reduction in carbon emissions (based on the dwelling emission or building emissions rates) through the use of on site or nearby renewable and / or low carbon technologies;

1.2 To provide certainty about the progression to net zero from this baseline, the viability of the approach and to inform future GMSF policy, Currie and Brown/Centre for Sustainable Energy were appointed to undertake further research.

2. KEY FINDINGS – POLICY APPROACH

2.1 The policy landscape in relation to Local Planning Authorities (LPAs) being able to set standards above national building regulations is currently confusing for a range of reasons:

- The Primary Legislations under the Planning and Energy Act 2008 which allows LPAs to set higher energy efficiency standards still remains even though Government has previously proposed this was to be removed (via Deregulation Act).
- Government consulted on the Future Homes Standard in 2020 which proposed a ‘ramping’ up of carbon reduction measures from 2020 (31%) and 2025 (80%).
- The supporting National Planning Practice Guidance stipulates that LPAs cannot require any higher than the Code for Sustainable Homes Level 4 (equivalent to 19% reduction on Part L 2013).
- There is evidence from other Local Plans that policies are getting through examination which already exceed national building regulations (E.g. London, Reading)

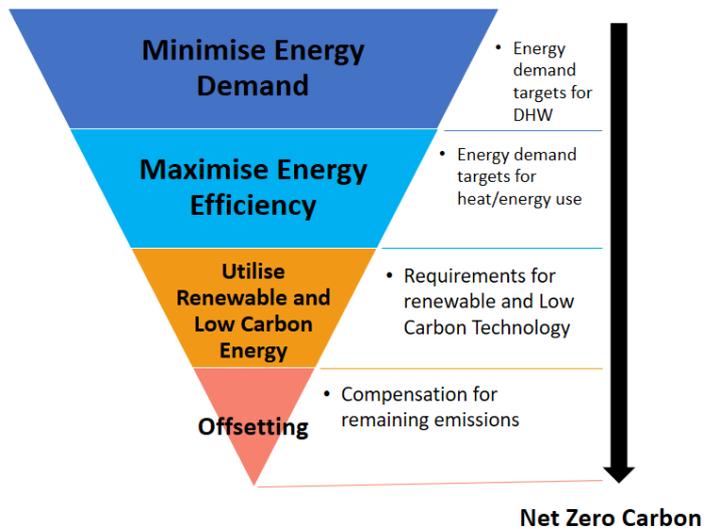
2.2 To ensure the policy approach is ‘future proofed’ it was recommended that this should be in alignment with the Future Homes standard when setting minimum carbon reduction targets.

2.3 The definition of Net Zero Carbon can be applied to ‘in construction’ and ‘operational’ as guided by the UK Green Building Council Framework² document. In both cases net zero is when the amount of carbon emissions associated with that activity are zero or negative. This is achieved by following the energy hierarchy, the utilization of renewables and with any remaining emissions offset. Operational emissions can be further broken down into ‘regulated’ (those covered by building regulations) and ‘unregulated’ (energy utilized by occupants). The scope of the work focused on operational net zero carbon up until 2028.

¹ <https://www.greatermanchester-ca.gov.uk/what-we-do/housing/greater-manchester-spatial-framework/gmsf-full-plan/>

² <https://www.ukgbc.org/ukgbc-work/net-zero-carbon-buildings-a-framework-definition/>

2.4 To achieve a truly sustainable energy system, the energy hierarchy should followed so that a fabric first approach is maintained. Without this future development would ultimately be over reliant on increased energy use and generation which in turn would produce a home which is expensive to operate. Within this offsetting has to be the last resort otherwise homes would require more expensive retrofit at a later date. This would further add to the challenges set out within the 5 Year Environment Plan which has a target to retrofit 61,000 home every year.



2.5 It is important that energy demand and carbon emissions are treated together. Setting only a carbon target, against Part L can lead to several undesirable knock on effects:

- It is not very clear as to where the carbon emission savings come from (fabric, installed services and/or energy generation).
- Carbon emissions are calculated based on the carbon intensity of the energy type required (gas, electricity or other). The carbon intensity of electricity is ever changing as the electricity grid decarbonises and therefore such targets become a moving target
- The comparison is conducted with a specific version of PartL1 A where minimum requirements also change every 5 years

The use of minimum standards for space heating demand, domestic hot water and renewable energy generation were advised as follows:

	2020	2025
Space Heating Demand	Houses (30kWh/m2), Flats (25kWh/m2)	Houses (20kWh/m2), Flats (15kWh/m2)
DHW	20% Reduction	20% Reduction
Renewable Energy Generation	PV Installation Min 20% ground floor space*	PV Installation Min 40% ground floor space*

**or equivalent through other technology approaches*

2.6 Due to the variability in non-domestic buildings type, size and use, introducing exact thresholds for heating, hot water generation and fixed services was not possible as part of the study. In terms of energy and carbon performances of new non-domestic building energy efficiency performance improvement over standard construction (%) is a common metric of describing improvement so the scope of the study considered the use of BREEAM ratings as a way to set this standard. The outcome being that for all carbon and energy credits that we should be seeking 'Excellent' ratings for that part of the credits, which relate to energy performance and emissions.

- 2.7 Building stock can suffer from a performance gap where the modelled energy performance of a building is lower than the operation of a building in use. This has created a gap in the market where building owners are unaware of this difference. Measures to address this include requirements for developers to produce sustainability assessments to outline how they intend to minimise the potential for this to happen as well as requirements for post occupancy evaluation. The draft London Plan Policy SI2³ requires major developments to monitor and report on energy performance for at least five years via an online portal, a similar approach could be followed across Greater Manchester.
- 2.8 There should be a clear distinction for the requirement to generate renewable energy rather than to require a % of the carbon emissions/demand to be from renewable energy technology. This is due to:
- The carbon intensity of the electrical grid will reduce over time so the policy approach becomes redundant when making it a proportion of the overall carbon reduction.
 - Without specific reference to energy generation, there is a risk that developments would defer to the use of heat pumps to satisfy this requirement. This would increase occupier costs, lead potential network issues and minimise any potential contribution for on-site energy generation.
- 2.9 The study recommended that when all electric solutions are considered, as in the case of heat pumps, special consideration is given to potential impact on running costs and affordability for occupiers. Electricity in comparison to gas currently costs more per unit. As the grid becomes more decarbonised and demand increases for electric it is hoped this will start to balance out. The Spatial Energy Plan⁴ (Energy Systems Catapult 2017) shows that without any intervention, future growth across GM could lead to an increase in 3% energy demand. According to DECC (2012), over 12% of GM householders are in fuel poverty which equates to over 130,000 households. Higher standards of energy efficiency for domestic building have the potential to significantly reduce running costs but carbon reduction requirements alone would not achieve this.
- 2.10 In the modelling of costs, air source heat pumps alone led to higher annual energy bills if no additional solutions were implemented. This was roughly £150-200 per year in houses for regulated energy use and £50-150 in the case of flats. If you then start to look at including the highest fabric standards, loss of gas standing charges, waste heat recovery technology and renewable energy generation, this could potentially lead to a saving of around £150 per year. It was suggested that for regulated energy use, annual running costs estimated in new designs are no higher than that of the same home built to the Part L 2013 standard using gas. The Future Homes Standard is also considering an affordability metric so such a requirement may be superseded or become redundant if appropriate provisions within the new Part L are identified.

³ <https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/planning-guidance/be-seen-energy-monitoring-guidance-pre-consultation-draft>

⁴ https://www.greatermanchester-ca.gov.uk/media/1363/spatial_energy_plan_exec_summary.pdf

- 2.11 To understand potential costs of following the pathway to net zero carbon for new development, a range of domestic archetypes were identified and then modelling of various approaches were considered. This included natural and mechanical heat ventilation (MVHR), wastewater heat recycling, air source heat pumps and Photovoltaics (PV) leading all the way up to the 'very high' standard (Passivhaus equivalent). In all models when meeting the highest fabric standard and including all modelled technology, construction costs do not increase by any more than 6%. The most expensive uplift was in the detached house model which showed construction costs around £9k (excluding PV installation).
- 2.12 The most significant costs associated with achieving higher BREEAM ratings are often associated with meeting minimum energy requirements. The research undertaken suggests most existing non-domestic buildings can achieve 10-15% energy efficiency improvements on current regulations, but there are some buildings that might find this standard more difficult due to the energy associated with their type and operational demand, for example hotels. As technology improves and the market becomes more confident, it is estimated that energy efficient standards may fall by around 20-30% between 2020 and 2030. In addition, it is likely that there will be further reductions in the costs of PV with costs falling by a further 35% on 2020 levels by 2030.

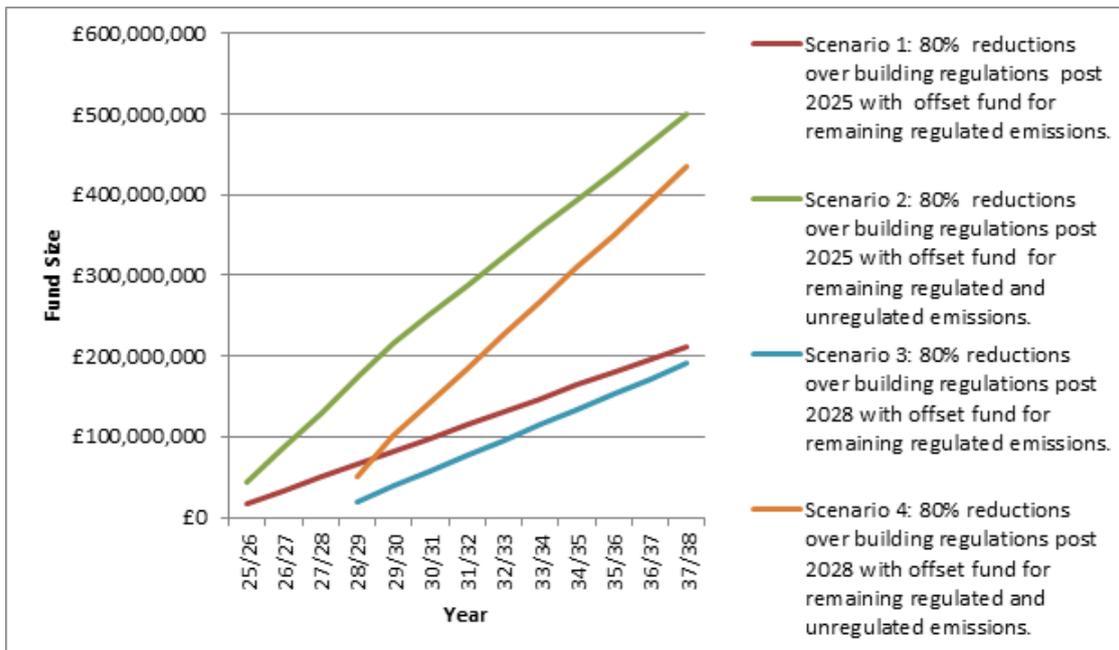
3. KEY FINDINGS – CARBON OFFSETTING

- 3.1 The second part of the research, completed by the Centre for Sustainable Energy (CSE), considered the role of carbon offsetting within the emerging policy approach and a potential carbon price for Greater Manchester. As noted earlier in the report, carbon offsetting is the last resort as part of the net zero policy approach to avoid sub optimal building standard. Therefore, it is important that policies are designed in such a manner as to ensure that all viable on site methods of reducing carbon emissions are exhausted first.
- 3.2 Carbon offset payments will fund carbon saving projects elsewhere, to make up for the savings not achieved within a particular development. Carbon offsets are collected through "Section 106" legal agreements attached to planning consents, and off-site carbon abatement is assumed to take place over a 30 year period. Projects which could be funded include domestic and community energy projects, energy efficiency retrofit for domestic and community buildings and also carbon sequestration.
- 3.3 This study considered the carbon price for Greater Manchester offsetting in accordance with the supplementary documentation to the HM Treasury's Green Book, a nationally recognised carbon pricing mechanism. This reflected the approach taken for the London Plan and outlined a price of £113 or £118 per tonne (dependant on whether the scheme came into force in 2025 or 2028). However, CSE does not consider this approach consistent with Greater Manchester's Climate Emergency Declaration.
- 3.4 The climate emergency, the UK wide 2050 zero carbon target and the Greater Manchester 2038 net zero carbon target fundamentally challenge the conventionally accepted approach to additionality and carbon offsetting, in that within these timescales, effectively all carbon emissions will need to be avoided or sequestered in carbon sinks. Therefore, the rate at which emission reductions are achieved is critical, in that if Greater Manchester

were to meet its commitment to become carbon neutral by 2038, the residual emissions from new development would also need to be offset by the 2038 deadline rather than over the lifespan of the measure funded – which has typically been used in the past. This logic would support higher charges being levied on developers to achieve the carbon savings within the 2038 timeframe, increasing further as the length of time to the deadline (2038) within which carbon savings can be accrued reduces.

3.5 A justifiable approach to operationalise this would be to base the carbon price for Greater Manchester on the Treasury figures but adjust the figures to reflect that Manchester’s aim to be achieved 12 years earlier, resulting in a carbon price of £234 in the case of a 2028 start date. Given that Policy GM-S2’s stated intent is to already be delivering net zero carbon development by 2028, CSE strongly recommend that GMCA begin collecting carbon offset payments prior to 2028. A logical point to bring in this measure would be 2025 – to align with expected changes in the 2019 Future Homes Standard Consultation. With this in mind, the study also considered scenarios where the carbon offset regime is brought into force in 2025 at a lower carbon price of £200.

3.6 The baseline growth estimates from the Greater Manchester Spatial Framework was applied to the policy recommendations from Part 1 of the study to determine (in theory) the amount of offsetting income that could be expected. The graph here shows the potential revenue from carbon offsetting dependant on whether the approach is implemented from 2025 or 2028 and if the fund is to cover regulated emissions only or unregulated and regulated. The optimum recommendation from the research was to consider offsetting from 2025 and apply this to both regulated and unregulated emissions. In this scenario which is scenario 2, you can see the conceptual size of the fund is around £500million.



Carbon Offset Fund Generation

- 3.7 Contributions from any offset will need to be directed into a ring-fenced carbon offset fund to provide maximum flexibility and minimise administrative costs, rather than having to specify actual projects funded within individual legal agreements.
- 3.8 In parallel to this piece of work the Mayor announced that a Greater Manchester Environment Fund (GMEF) would be launched at the Green Summit in 2018. The aim of the GMEF is to improve the quality of the environment within Greater Manchester by providing grant funding to non-statutory initiatives that are currently underfunded through existing mechanisms. Initially this is to include habitat banking and carbon trading. Environment Finance have been commissioned to explore the setting up of this fund and clearly, there is an opportunity here to align with any carbon offsetting from the development planning system. This does not preclude districts exploring alternative options.

4 . CONCLUSIONS AND NEXT STEPS

- 4.1 The evidence prepared by Currie and Brown/CSE will be used to inform the next iteration of the Carbon and Energy Policy for the Greater Manchester Spatial Framework. However, it has also raised a number of important issues that will need to be considered:
- Amendments to national planning guidance and changes from any emerging Future Homes Standard
 - The role of supplementary technical guidance
 - Skills in districts and availability of resources
 - Further work required to set up carbon offsetting
 - Post occupancy monitoring and evaluation (developer responsibility vs online reporting)

5. RECOMMENDATIONS

- 5.1 The Partnership is asked to:
- o note and comment on the contents of the report.