



Programme Area: Smart Systems and Heat

Project: WP2 Manchester Local Area Energy Strategy

Title: Planning Briefing Notes Informing Stage 0 GM Spatial Energy Plan – Briefing Note 4

Abstract:

This Deliverable comprises one of a series of four briefing notes regarding the planning policy and related information to inform the production of a high level energy evidence base prior to the completion of a detailed EnergyPath modelling study with a local authority in Greater Manchester. It provides advice and recommendations relating to the current and future policy framework in GM which has informed the Catapult high level energy study for Greater Manchester. This Deliverable, Briefing Note 4, considers the possible policy levers and mechanisms that could be adopted and included within the Greater Manchester Spatial Framework to support energy system transformation and carbon reduction ambitions.

Context:

The Spatial Energy Plan for Greater Manchester Combined Authority project was commissioned as part of the Energy Technologies Institute (ETI) Smart Systems and Heat Programme and undertaken through collaboration between the Greater Manchester Combined Authority and the Energy Systems Catapult. The study has consolidated the significant data and existing evidence relating to the local energy system to provide a platform for future energy planning in the region and the development of suitable policies within the emerging spatial planning framework for Greater Manchester.



Briefing Note 4

Potential Policy Mechanisms for the Greater Manchester Spatial Framework

on behalf of

Energy Systems Catapult

August 2016

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1 Introduction

1.1 Background and Scope

- 1.1.1 JLL has been commissioned by Energy Systems Catapult (ESC) to prepare a Briefing Note to consider “*the possible policy levers and mechanisms that could be adopted and included within the Greater Manchester Spatial Framework (GMSF) to support energy system transformation and carbon reduction ambitions.*”

1.2 Approach

- 1.2.1 The Smart Systems and Heat programme is focused on creating future-proof and economic local heating solutions for the UK. Heat accounts for over 40% of the UK’s demand for energy, and almost 20% of the UK’s CO₂ emissions come from domestic heating. There is recognition that the vast majority of the existing 26 million homes in the UK will still be in existence by 2050. The primary focus of the programme is on domestic retrofit across different house types.
- 1.2.2 The approach taken has involved a desk based review of available literature and consideration of the findings of the other Briefing Notes being prepared by JLL. It should be noted that at this stage, no consultation has been undertaken with planning officials within the GMSF planning team.

1.3 Structure of Briefing Note

- 1.3.1 The structure of this Briefing Note is as follows:
- Chapter 2 refers to key points with regard to decentralised energy infrastructure and plan making which were identified in the JLL Planning Policy review of August 2014 undertaken for the Energy Technologies Institute. There are some of the findings which have direct relevance to the evolution of such policy in the GMSF. Reference is also made to policy objectives and key references in the evidence base documents that we have reviewed to date in relation to the GMSF.
 - Chapter 3 provides our preliminary recommendations in relation to the possible policy levers and mechanisms that could be included within the GMSF to support energy system transformation and carbon reduction ambitions.

2 Policy References: Previous Research and the GMSF Evidence Base

2.1 Key Findings from Previous JLL Research

Energy & Heat Policy at the National Level

- 2.1.1 Our Report to the ETI in August 2014 included a review of UK energy and heat policy as well as planning policy. In terms of UK energy and heat policy documents, our finding was that it was clear that the various policy documents recognise the pivotal role that Local Authorities have in enabling the development, deployment and expansion of heat networks. The 'Future of Heating' reports published by DECC made reference to a number of actions required to overcome barriers to the wider deployment of heat networks. These include reference to increasing statutory undertaker powers, to addressing the use of planning powers to support further heat network development. It was notable that actions related to the need to further share good practice, but also as set out in the 'Future of Heating' include that: *"The Government will consider the need for practice guidance to support the implementation of national planning policy and low carbon and renewable heat networks"*.
- 2.1.2 Since we concluded our report in 2014, there have been a number of UK heat and decentralised energy related energy reports produced by DECC. We refer to some key points within these documents in **Appendix 1**. The conclusion however, is that there remains strong support at the national levels for decentralised energy and heat and the contribution such infrastructure can make to carbon reduction targets.

National Planning Policy

- 2.1.3 The overall conclusion reached on the national planning policy position in our previous research, was that whilst decentralised energy, heat and related infrastructure is referenced in documents such as the National Planning Policy Framework (NPPF) and the more recent Planning Practice Guide (PPG) in England, such policy provisions could be strengthened to accelerate and enable wider deployment of the type of development infrastructure that could come forward under the SSH Programme, across the UK.
- 2.1.4 We identified that the strengthening in recent years of the 'top down' planning of the UK energy system through documents such as the National Infrastructure Plan (HMT 2013) and the National Policy Statements for Energy (EN-1 and EN-3) (DECC, 2011) provide, together with the national planning policy position as expressed in the NPPF (2012) and related online Planning Practice Guidance (PPG, March 2014) an opportunity to further strengthen the policy context for deployment and development district heating and cooling networks, as a means to achieve low carbon sustainable and low cost energy.
- 2.1.5 We considered that establishing a stronger supportive national planning policy framework would be essential for the successful wider deployment of decentralised energy networks. Over the long term (by 2050) district heating is expected by Government to deliver a major proportion of heating to residential and commercial properties. Having a supportive and facilitative policy framework for DHN's as well as other infrastructure that might come forward under the SSH Programme such as ground and air source heat pumps at scale, will be essential to ensure this scaling up of deployment.
- 2.1.6 On this matter our previous Recommendation 6 is relevant. It was as follows:

"Recommendation 6: *Insofar as planning policy is a 'barrier' to the deployment of development and infrastructure that could come forward under the SSH Programme, then we consider that this could be addressed through providing appropriate and strengthened development management planning policy and guidance through existing policy mechanisms, such as the recently introduced online Planning Practice Guidance (covering England and Wales). Therefore, we consider that support from central Government to both alter planning policy provisions and provide guidance on the resolution of objectives competing with deployment could play a major role in accelerating and widening deployment of the SSH Programme throughout the UK. In England, if the NPPF is to*

be amended in the future then this would provide an appropriate medium, however the nature of the current online Planning Practice Guidance provides a practical approach that is likely to present an earlier opportunity to introduce policy change.”

The Position with Development Plans / Plan Making

- 2.1.7 A sound planning policy and guidance basis for the deployment of decentralised energy infrastructure was considered to be of primary importance in supporting the use and wider deployment of tools such as Local Development Orders (LDOs) and in providing a facilitative policy context for planning applications and for the preparation of Development Plans.
- 2.1.8 We acknowledged in our previous research that the deployment of decentralised energy infrastructure may raise issues of impact on viability for refurbishment, regeneration and housing developments (new build and retrofit). This would require resolution between potentially competing objectives such as bringing forward necessary housing supply and the wider deployment of low carbon and decentralised energy. Guidance on the weight to be accorded to these competing objectives would enable a more strategic assessment of the viability of deployment in a particular situation.
- 2.1.9 A key observation from our previous research and in particular arising from our Local Authority engagement exercise was that we observed a significant difference in the scope and nature of Development Plan policy between the specific and enabling London Plan policies towards retrofit and decentralised energy networks, and those of the remaining Local Authorities in England and Wales.
- 2.1.10 In terms of planning policy for use in development management, the results of our engagement with various Local Authorities showed that it existed on a spectrum from the weak simple encouragement for developers to consider decentralised energy and heat networks as part of development proposals, to much stronger compulsion and mandatory obligation, as set out for example in the London Plan policies.
- 2.1.11 It is clear from the review of current national planning policy and guidance (specifically the NPPF and the PPG) that the potential for urban low carbon heat and cooling networks is recognised by policy makers, however it is also clear that the specific wording of policy could be strengthened to ensure more compulsion and obligation is secured, rather than simply encouragement, especially in Development Plans. Such changes would have implications both for forward ‘plan making’ and also for ‘development management’.
- 2.1.12 It was also recognised through our engagement consultation undertaken that the nature of urban energy and decentralised solutions is particular to individual urban areas and very much tied to local contexts and also reflects the level of political enthusiasm and specialism of planning officers within particular organisations and authorities.
- 2.1.13 Strong policy in Development Plans to ensure that policies secure maximum compliance from developers can only occur if in turn, there is a strong policy position at the national level and a robust evidence base.
- 2.1.14 As noted above, the strength of policy will depend on the resolution between potentially competing objectives of bringing forward necessary development (e.g. housing supply) and the wider deployment of low carbon and decentralised energy systems. The deployment of decentralised energy infrastructure could raise issues of impact on viability for housing developments and guidance on the weight to be accorded to these competing objectives will determine the level of compulsion and obligation secured by policy and enable a more strategic assessment of the viability of deployment in a particular situation.

- 2.1.15 In terms of changes to planning policy in Development Plan, we identified that policies could require developers to connect to an existing heat network unless it could not be feasible or viable to do so, and in such circumstances the policy could require an applicant to make provision for developments to connect in the future.
- 2.1.16 If there are existing networks within an urban area, then planning policy could require connections to be made for new development, or in terms of redevelopment of existing property (i.e. retro-fitting). However, in urban areas where there is no network, but where there is potential in the future, then the focus of policy upon relation should be aimed at 'future proofing' development to enable future connections. Our recommendation 7 is of relevance in this regard:

“Recommendation 7: *We consider that there is also an opportunity for statutory Development Plans to identify parts of urban areas / settlements suitable for decentralised energy and related infrastructure and this could be considered in the form of zonings or for example, ‘heat network / smart system opportunity areas’. The use of heat mapping (including through the potential application of EnergyPath™) could provide an evidential basis for such zonings, underpinning plan allocations / policies. Consideration should also be given to policy to support requirements in planning obligations to facilitate on-site deployment of district heating / smart system infrastructure.”*

2.2 Key Planning Policy References in GMSF Evidence Base Documents

- 2.2.1 Briefing Note 1 set out our findings in relation to our review of the evidence based documents that have been prepared to support the GMSF with regard to decentralised and low carbon energy and heat. The Note should be referred to for its detail, however in terms of key points arising from the evidence base documents related to development planning, there are a number of key points which should be recognised as having the potential to underpin detailed policy provisions within the emerging GMSF. These are as follows:

Strategic Options Background Papers - November 2015

- 2.2.2 The Strategic Options Background Paper 4 addressed what was termed ‘critical infrastructure’ and this included all utilities including electricity and heat. We highlighted that section 16 of the document referred to national planning policy requirements and in particular that the GMSF should consider its role in reducing carbon emissions by amongst other matters, *“providing opportunities for renewable and low carbon energy technologies and providing opportunities for decentralised energy and heating”*.
- 2.2.3 We drew out the point that the GMCA has adopted a carbon target to deliver a 48% reduction in carbon dioxide emissions by 2020 and that new targets beyond 2020 are being established.
- 2.2.4 In addition, the ‘Low Carbon Wedges’ work identifies that significant *“catch up will be needed to get back on track”* with regard to carbon emissions. Reference is also made in the document to UK level targets and the 80% reduction in carbon emissions by 2050 and to the public commitment for Greater Manchester to reduce emissions to a maximum of 2 tonnes / CO₂ per capita by 2050.
- 2.2.5 The document also sets out that in terms of spatial planning, the layout, grouping and orientation of employment, housing and amenities will have significant implications for Greater Manchester’s direct and indirect carbon emissions. It adds that *“if GM is to achieve its current targets and delivery on its commitments for the future it will need to ensure that the energy (heat and power) provision for new development is renewable and low carbon”*.
- 2.2.6 This strategic background paper is the most up to date evidence based document that we have reviewed and in our opinion, it clearly provides a strong foundation for the drafting of development management policies in relation to ‘critical infrastructure’ which the document clearly sets out, includes that related to electricity and heat.

The Greater Manchester Climate Strategy 2011 – 2020

- 2.2.7 The Climate Strategy is set out in Briefing Note 1 as a key evidence base document and it makes it clear that retrofit programmes will need to play a very substantial part in meeting the 80% carbon target for the UK. It refers to the need for a ‘step change’ in the energy efficiency of the existing building stock and that this lies at the heart of the strategy for the conurbation. It also adds that “*climate change adaption measures will be embedded in retro-fitting programmes and will be a key design feature in all regeneration programmes*”.
- 2.2.8 The document also refers to energy distribution and generation and makes specific reference to heating and cooling networks and smart grids – all of which are acknowledged will form part of a process at decentralisation of energy networks.
- 2.2.9 The document sets out various outcomes for 2020 and included in this is, “*to have integrated the development of new heating and cooling networks and the development of locally generated power networks with the development of major retro-fitting programmes and the role out of smart technologies so that networks can expand as heat demand from the retro-fitted property decreases*”.
- 2.2.10 Importantly with regard to planning policy, the Climate Strategy sets out that there are various outcomes that require to be achieved and that delivering a spatial strategy and policy instruments that optimise collaboration between District Core Strategies and the NPPF and local opportunities, and the creation of a robust, transparent and supportive framework that engages communities will be important to securing locations for energy infrastructure.
- 2.2.11 Again, these policy objectives could, we consider, be reflected in planning policy provisions within the emerging GMSF.

The Greater Manchester Energy Plan (2011)

- 2.2.12 The GM Energy Plan, as we have set out in Briefing Note 1, identifies opportunities and locations for new energy generation and distribution infrastructure. It highlights that the energy efficiency of the GM building stock is central to Greater Manchester’s energy future and essential to the delivery of the conurbation’s climate change and energy goals. It states that although there are few regulatory leavers that can be exerted over the mid-term, GM could have a significant influence over its energy system in a number of other ways. Included within this is “*developing and enforcing local authority plans which provide a clear vision of future energy requirements’ and which are sufficiently explicitly robust to rapidly secure new low carbon energy generation and enable the deployment of adequate energy infrastructure*”.
- 2.2.13 We also highlighted that whilst the document is critical in some respects of the provisions of the NPPF, it does highlight that policy matters could be further addressed by means of:
- Inclusion of a ‘infrastructure adequacy’ analysis for the siting of new developments to ensure that they do not have negative indirect implications for amongst other matters, energy infrastructure;
 - A requirement for developers to show that properties will have low occupancy energy consumption.
- 2.2.14 Further documents reviewed such as the Heat Network Masterplan for Greater Manchester (2014) provides a foundation which planning policies could refer to in terms of critical infrastructure policy.

3 Policy Mechanisms: Preliminary Recommendations

3.1 Preliminary Recommendations

- 3.1.1 As we highlighted in Briefing Note 2 (Planning Policy Framework) an important policy provision in the NPPF to inform policy in a Development Plan is Paragraph 94 which states *“In determining planning applications, local planning authorities should expect new development to comply with adopted Local Plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable”*. Furthermore, Paragraph 97 requires planning authorities to *“have a positive strategy to promote energy from renewable and low carbon sources”*.
- 3.1.2 Insofar as Paragraph 94 of the NPPF raises the matter of feasibility and viability, these are important ‘tests’ on which the GMSF / local authorities should prepare associated guidance to ensure that this does not become a common ‘get out clause’ diluting the policy ambition.
- 3.1.3 There is a need therefore for a conurbation wide decentralised energy policy, followed through into respective Local Plans and other planning documents to enhance the growth and deployment of decentralised energy and effective implementation of planning policies by means of development management.
- 3.1.4 In setting out our recommendations, it should be noted that we have not yet seen draft development management policies for the GMSF. We assume the preparation of such policies are underway given the public consultation on a draft GMSF is set to run from October – November 2016.
- 3.1.5 Our recommendations at this stage include the following:-
- As we have set out above, the evidence base documents reviewed do contain objectives and outcomes for Greater Manchester which are rooted in achieving national targets for carbon reduction and the delivery of low carbon and decentralised energy and heat infrastructure. The various documents reviewed are of varying age and the level of detail of each is also highly varied. The substantive content of the documents should be referred to appropriately in supporting text to policy provisions within the GMSF. Each element of the GMSF will need to be supported by a robust and up to date evidence base.
 - Our recommendations arising from our previous research concluded in 2014 for the ETI still remain valid insofar as we consider further beneficial changes could be undertaken to planning policy and guidance provisions at the national level in England which could accelerate and widen the deployment of the SSH Programme. With particular regard to the context of the emerging GMSF we have set these out above in section 2.1.
 - It is considered that there should be policy in the GMSF to provide support for the deployment of local decentralised energy systems, which could make a significant contribution to meeting CO2 reduction targets. It should be an objective of the GMSF that GM becomes more self-sufficient in relation to energy needs. In the light of this, we suggest that policy support and encouragement should be included to identify and establish decentralised energy network opportunities, implemented through Local Plans and further supported by necessary Supplementary Planning Documents. Such a policy should require Boroughs to develop Energy Strategies for their areas and including specific decentralised energy opportunities. Consideration should also be given to prioritising connections to existing or planned decentralised energy networks where feasible.
 - In terms of plan making, the role of the GMSF has a strong parallel to that of the London Plan in that the London plan functions as the top level of the Development Plan Documents for all the London Boroughs. This ‘conurbation level’ of the statutory Development Plan remains a legacy from the Regional Spatial Strategy / regional planning approach to plan making. We consider that this level of Development Plan has particular

advantages when dealing with multi-authority conurbations / metropolitan areas. Clearly this point has been recognised by the GMCA given the role and function of the emerging GMSF.

- We highlighted in our previous research the successful remit and function of Policy 5.6 in the London Plan¹ which is entitled 'Decentralised Energy in Development Proposals'. This policy contains an energy systems 'hierarchy' and cross refers to the London Heat Map Tool with regard to enabling particular opportunities.
- In addition, London plan Policy 5.4 entitled 'Retrofitting' is highly relevant and makes reference to the objective of reducing the environmental impact of existing urban areas through policies and programmes that can bring existing buildings up to particular sustainable design and construction standards with the objective of reducing carbon dioxide emissions. Policy 5.4 also contains particular guidance for the various London Boroughs with regard to developing their own policies and proposals on the sustainable retrofitting of existing buildings. In addition policy 5.5 in the London Plan deals with 'Decentralised Energy Networks'. We consider that a suite of policy along the lines of policies 5.4, 5.5 and 5.6 as set out within the London Plan would be beneficial to consider for the GMSF.
- Such a policy approach would allow the 10 authorities that make up the GMCA to prepare their own bespoke and relevant policies in their respective updated Local Plans according to the specific opportunities and constraints of their own local authority areas. There would be a need to have accordance with the overarching policies within the GMSF, however, it will be important to have the flexibility of recognising that some authorities are generally much more extensively built up (such as Manchester and Salford) whereas in other authorities where there are more opportunities for greenfield development (such as Bury, Bolton, Oldham and Rochdale) there could be different policy provisions or targets reflecting the particular constraints and opportunities for built development and regeneration and tackling retrofit.
- Relevant policies within updated Local Plans can also be supported and amplified by use of appropriate Supplementary Planning Documents and other Local Development Documents. In this regard there is an important role for appropriate technical guidance (e.g. the GLA has prepared the 'District Heating Manual for London' and in March 2016 issued detailed technical guidance entitled 'Energy Planning' with regard to the preparation of energy Statements and Assessments to support planning applications).
- It important that early consideration be given to actual *implementation* of planning policies such that they are robustly carried forward.
- Consideration should also be given to ensuring that planning officers have the professional capacity for dealing with the technical aspects of applications, and with questions of feasibility and viability (as noted above) in terms of what the NPPF says on this matter. In the alternative, consideration may be given to use of suitably qualified specialist 'alternative service' providers

¹ The London Plan is the strategic plan for London which sets out an integrated economic, environmental, transport and social framework for the development of the capital to 2031. London Boroughs' Local Plans need to be in general conformity with this plan and its policies guide decisions on planning applications by councils and the Mayor.

It should be noted that Supplementary Planning Documents (SPDs) provide further detail on policies in The London Plan where detailed guidance is required to support implementation. The London Plan SPD that is most relevant to planning for decentralised energy is the Sustainable Design and Construction SPD (April 2014).

It should also be noted that The London Mayor has a duty to prepare and publish a Climate Change Mitigation and Energy Strategy which after consultation was published in 2011. The document sets a target to reduce carbon emissions by 60% of 1990 levels by 2025 by retrofitting homes and public sector buildings with energy efficiency measures, and aiming to supply 25% of London's energy from decentralised energy sources.

Furthermore, The Mayor's Decentralised Energy Programme has produced the London Heat Map and a District Heating Manual for London to support the initiatives provided by City Hall to promote the Mayor's decentralised energy target.

- Consideration should also be given to ensuring that policy consistency runs right through from the GMSF to inform the drafting of respective authorities' Development Management Policies DPDs, Site allocations DPDs, and specific Area Action Plans.
- The policy provisions must be well written and must be sufficiently clear and transparent to be implementable without high risk of challenge to interpretation and to ensure continuity of policy application.
- All elements of the GMSF, including strategic energy policy will need to be the subject of Strategic Environmental Assessment

3.1.6 The following additional planning policy actions should be considered:

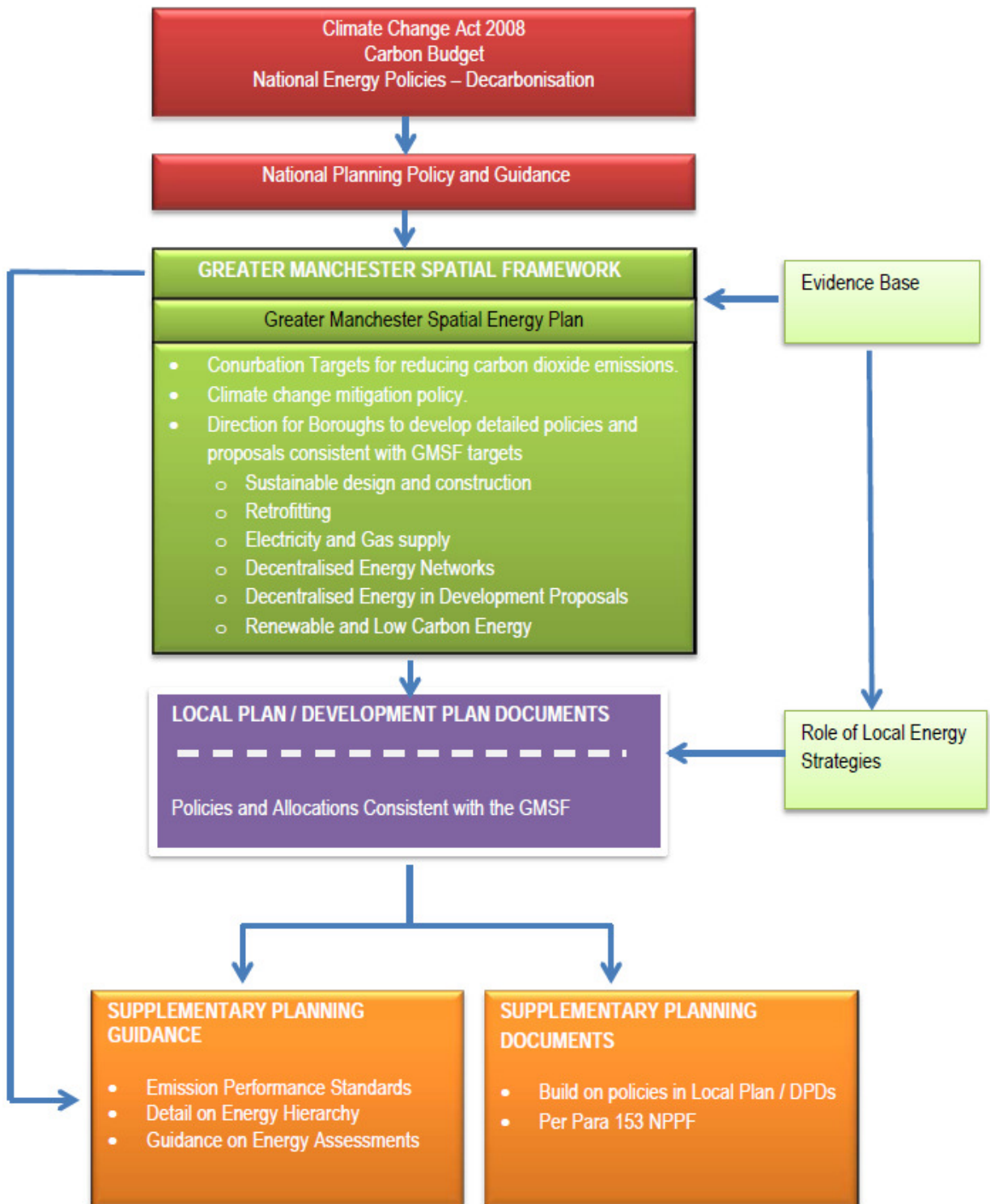
- Identify geographic zones within the GMSF area in which there is a clear expectation / requirement on developers to connect to decentralised energy systems;
- Identify a threshold distance(s) to decentralised networks for different scales /types of development where there is a clear expectation / requirement for connection;
- Clarifying the expectations on developers for interim periods in which networks are expected to emerge.

3.1.7 There is we consider, a clear mandate from the evidence base for policy provisions to reflect the objective in which developments can be steered in order to promote the development of Smart Energy Systems in Manchester. The Greater Manchester Spatial Framework provides a relatively unique opportunity, in the aftermath of the revocation of Regional Spatial Strategies, to influence larger scale spatial planning on a multi-borough scale. The GMSF will provide the structure to support and influence the location, scale, form and use of the built environment, including critical infrastructure. The Framework will also influence the subsequent Local Plans to be prepared by the constituent ten authorities which will provide the bespoke policies to govern specific development in each authority area.

3.1.8 Finally, it should be noted that at present, the GMSF does not have full statutory status as it is unique and will fall within the remit of the Elected Mayor following the relevant election in 2017. Given recent developments (EU Referendum result) it would not be beyond the realms of possibility that the requisite legislation is delayed, along swathes of domestic legislation in the wake of current and prolonged political turbulence, the potential 'purdah' period in advance of a General Election. Then, depending on the outcome, delay, revocation or alteration to the devolution agenda remains a risk. A reasonable assumption is that the devolution agenda will continue under all parties, however it may slip down the list of priorities.

3.1.9 We have set out in Figure 1 below, an overview of how the policy framework might be structured, with regard to GM responsibility and policy objectives at the strategic level, informing the policy direction of Local Plans and related Supplementary planning and guidance documents. The Local level of policy could be further supplemented by local energy strategies and energy systems analysis.

Figure 1: Overview of Potential Greater Manchester Policy Framework



4 Appendix 1

4.1 National Energy & Planning Policy-UK Energy Policy Documents: Additional since August 2014

National Comprehensive Assessment of the Potential for Combined Heat and Power and District Heating and Cooling in the UK (2016), Ricardo-AEA on behalf of DECC

- 4.1.1 In October 2012 the European Union adopted the Directive 2012/27/EU on energy efficiency (EED or the Directive). This established a common framework of measures for the promotion of energy efficiency within the EU as part of the strategy to meet the 2020 energy efficiency target of a 20% reduction in primary energy consumption compared to projections.
- 4.1.2 Article 14 of the Directive concerns the Promotion of efficiency in heating and cooling, with Article 14(1) requiring that Member States undertake a National Comprehensive Assessment (NCA) to establish the potential for high-efficiency cogeneration (combined heat and power (CHP)) and efficient district heating and cooling (DHC), both of which have specific meanings set out in the EED.
- 4.1.3 The report's assessment of technical potential indicates that up to 85% of the UK's heat demand could be met by individual building-level solutions, such as heat pumps, solar thermal and biomass boilers. Separately, as much as 60% could be met by efficient district heating.
- 4.1.4 DECC are committed to £300m of additional funding to heat networks and this report shows the potential in district heating.
- 4.1.5 The report includes heating and cooling maps of the UK, which show the location of existing combined heat and power plants and district heating, as well as potential sources of recoverable heat.

Heat Pumps in District Heating (2016) Study, Element Energy and Carbon Alternatives on behalf of DECC

- 4.1.6 The overall purpose of the research is to investigate the scenarios to which heat pumps can be integrated in to heat networks and to determine performance in terms of cost, energy and CO₂ emissions.
- 4.1.7 The work collected data from existing relevant systems, detailing case studies from the UK and Europe, developing a numerical heat network model to run different scenarios in which heat pumps can be utilised and analysing the results of these simulations.
- 4.1.8 The government's Strategic Framework for Low Carbon Heating in the UK identifies heat networks as an important element of the decarbonisation of heat in buildings. However, to realise significant emissions reduction using district heating, the heat in the networks must be provided from low carbon sources. As the electricity grid also decarbonises, this presents a potential opportunity to use heat pumps to deliver heat from sources to networks and from networks to buildings.
- 4.1.9 A common setup involves the retrofit of a large-capacity heat pump into an existing network, either alongside existing conventional heating plant or integrated with the conventional plant to provide heat recovery..

Investing in the UK's heat infrastructure: Heat Networks (2015) Research undertaken by DECC

- 4.1.10 UK heat infrastructure is seen as a significant and growing investment opportunity.
- 4.1.11 Delivering the current pipeline of heat infrastructure projects will require up to £2 billion of capital investment over the next 10 years. It will require investment from a range of funding sources.
- 4.1.12 For the supply chain this pipeline also represents £3.2 to 6.4 billion of operations and maintenance contracts across the 40 year lifetime of these low-carbon energy infrastructure assets.

4.1.13 'Investing in the UK's heat infrastructure: Heat Networks' guide introduces the heat infrastructure investment pipeline. The guide has been developed for investors and supply chain companies with a potential interest in the opportunities presented by the fast developing UK heat network market.

Towards a Smart Energy System (2015) Policy Paper published by DECC

4.1.14 Published in December 2015, this outlines the Government's commitment to ensure that every home and small business in the country is offered a smart meter by the end of 2020.

4.1.15 DECC notes that a smart energy system, based around new forms of flexibility, could help the UK deliver objectives more cost effectively.

4.1.16 DECC are looking to remove regulatory barriers to storage and demand side response, deliver clear pricing signals to allow more flexibility from consumers and catalyse innovation so that new solutions can emerge.

4.1.17 Over the period to 2050, this could help the UK to build less power generation, turn off generation less when it exceeds demand, and avoid significantly reinforcing energy networks.

Annual Energy Statement (2014) Published by DECC as an update to 2013 statement

4.1.18 The statement builds on research from 2013 regarding the importance of heat network development for the UK. There are currently around 2,000 heat networks in the UK. At present heat networks only meet 2% of UK heat demand however DECC is supporting industry and local authorities to develop new networks. It is estimated that by 2030 14% of UK heat demand could be met from these networks.

4.1.19 The statement further notes the potential to unlock real investment from heat. The Renewable Heat Incentive could feasibly unlock around £13 billion of investment in lower-carbon heating systems by 2020. Furthermore the statement notes that investment in combined heat and power systems could be expected to reach £5 billion by 2020.

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