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Transitioning Northwest Urban Investment Fund

Low Carbon Fund: 2014-2020
Ex ante Assessment - Update

European Investment Bank

39th assignment contract CC3912/PO63272

October 2016

Final report

pwc

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Contents

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Introduction

Our scope of work

- PricewaterhouseCoopers Société Coopérative (PwC) was appointed on 18 September 2013 by the European Investment Bank (EIB) to undertake an Ex Ante assessment for two Financial Instruments (FIs) proposed by the Greater Manchester (GM) Local Enterprise Partnership (LEP) for the 2014 – 2020 European Structural Investment Fund (ESIF) period, these are:
  a. **North West Evergreen Fund** (Evergreen Fund)**:** to consider the potential allocation of funding to this existing Urban Development Fund (UDF) along with a possible broadening of its investment parameters to meet with the EU thematic objectives of the next funding period. For the purposes of this assessment and to avoid confusion in this report, the existing Evergreen Fund has been referred to as "Evergreen Fund I" and the potential future allocation is referred as "Evergreen Fund II"; and,
  b. **Low Carbon Investment Fund:** to consider the need for a new FI that will invest in 'green' infrastructure that will support GM's low carbon objectives.
- Where FIs such as these are being considered, the EU requires the completion of an Ex Ante assessment (as defined in Article 32 of the EU Regulations[1]) that evidences market failure or sub-optimal investment situations that drive the need for public investment. This report provides the ex-ante assessment as required by the Regulations.
- The focus of this assessment is two-fold:
  – **Part One: Strategic and market needs -** evidencing the strategic need for public funding to be deployed in the proposed sector(s) of the FIs and an assessment of existing funding mechanisms; and,
  – **Part Two: Fund design -** developing the outline investment strategies for the FIs (e.g. fund size, sector focus, form of finance provided), their delivery and governance structures and potential to attract third party leverage and the identification of an indicative project pipeline and the outcomes and financial returns that it could generate.
- This report focuses on the Ex Ante assessment for the Low Carbon Investment Fund only. Ove Arup & Partners International Limited, our subcontractor, has supported us in this work. For the purposes of this report it should be noted that:
  – The assessment will be undertaken for a fund that will support projects in the GM area only;
  – The low carbon sectors forming the key focus of this assessment include non-domestic energy efficiency (NDEE) retrofit, decentralised energy (DE), street lighting and small-scale renewables. Where information is available other sub-sectors, such as low carbon technologies for new builds will be considered;
  – An assessment of the North West Fund, an existing fund which may also utilise public funding for the 2014 – 2020 period, is out of the scope of this assignment.

1 Regulation (EU) No 1303/2013 - Common Provisions Regulation CPR

Basis of our assessment

Scope of work and information sources

- The scope of work which was agreed with EIB and that forms the basis of this paper is included in Appendix A. Our work has been performed over the period from 24 September 2013 to 5 February 2014. This assessment has been prepared from:
  - Ongoing dialogue with the EIB, representatives from GM and other stakeholders engaged with during the market testing undertaken in the development of this paper. A full list of parties engaged with is included in Appendix B; and
  - Review and analysis of a variety of publicly available documents such as Managing Authority board minutes, strategy and policy documents, and a number of documents shared by the EIB, GM and other stakeholders engaged with during the production of this paper. A list of documents provided to us is included in Appendix C.
- The development of this report has been overseen by a Steering Group co-chaired by Deborah McLaughlin of the HCA and Eamonn Boylan Chief Executive of Stockport Council, who have provided the strategic lead for the work.
- In preparing this paper we have assumed that all opinions, beliefs and views expressed in the documents reviewed and by the parties engaged with during the production of this assessment are honestly made, based on reasonable assumptions having made the appropriate and proper enquiries and will continue to be true, accurate, correct and not misleading in any way.

Project pipeline analysis

- In respect of the project pipeline analysis undertaken (see Section 7) the work undertaken has been a function of the level and quality of financial information available. As many of the key contractual arrangements for each project are yet to be fully developed/finalised the investment timescales, quantum, return rate and expected timeframe for returns indicated in the project information available are uncertain and will be subject to change as the projects progress towards financial close. Therefore, the implications of this pipeline analysis should be read with caution.
- The indicative project pipeline has been sourced from business plans, feasibility studies and other information provided by the GM Low Carbon Team and the GM Core Investment Team along with publicly available board papers and project information available in the public domain. This paper has not attempted to verify the existence of the pipeline rather it has looked at how the pipeline could be funded or developed with the aid of a Low Carbon Investment Fund.

State aid

- References to state aid should not be considered as formal advice. State aid is a specialist area and legal advice should be sought.

Structure of this Report

- This report is dedicated to the Low Carbon Investment Fund and is structured in two parts to correspond to the focus of this assessment:

Part one: Strategic and market needs analysis		**Part two: Fund design**	
1	Background to European Structural Investment Fund	7	Project pipeline review
2	Regional strategic priorities	8	Low Carbon Investment Fund investment strategy
3	Overview of complementary funding sources	9	FI design
4	Key findings from existing relevant UK FEIs	10	Project development unit design
5	Market gaps and failures	11	Non-financial outcomes
6	Key findings	12	Key findings

- A separate report has been prepared for the Ex Ante assessment for Evergreen Fund II.

2016 Ex Ante Update

- In response to comments received from the Department for Communities and Local Government (the Managing Authority), PwC was appointed on 10 May 2016 by the EIB to update this Ex Ante assessment which was originally completed in May 2014.
- This report comprises the original assessment together with any necessary updates to address the Managing Authority comments. For ease, any updates to the original 2014 assessment are in grey text.
- Since 2014, the pipeline has been further developed and the revised pipeline is now included in the 2016 Ex Ante Update in section 7.

Part one – Strategic and market needs

1. Background to EU structural funds

2007 – 2013 European structural funds

- The Joint European Support for Sustainable Investment in City Areas (JESSICA) was a policy initiative of the European Commission (EC) supported by the European Investment Bank (EIB) to help the authorities in the Member States of the EU to maximise financial engineering instruments (FEI) to support investment in sustainable urban development.
- JESSICA did not provide new or additional money, but was a tool that could be used to utilise existing European grant funding to invest in regeneration investment vehicles, known as Urban Development Funds (UDFs), in order to accelerate investment in urban areas.
- The JESSICA initiative created the opportunity for European Structural Funds to leverage other public finance and potentially private investment and invested through UDFs into projects, with an expectation that the public funding would be returned and recycled. UDFs could invest in projects by providing loan, equity or guarantees, the returns from which could then be recycled into further projects in the future.
- UDFs were required to make investments into regeneration projects which were part of an Integrated Plan for Sustainable Urban Development (IPSUD) i.e. aligned to a range of existing local plans and strategies.
- In 2009, the North West Regional Development Agency (NW RDA) responded to the opportunity to utilise this FEI through the launch of the NWUIF that utilised European Regional Development Fund (ERDF) together with public sector funding to provide predominately debt finance for commercial property and regeneration projects in the North West of England.
- It should be noted the NW RDA established another FEI during this programming period– the North West Fund. This fund provides debt and equity finance to small and medium sized businesses in the North West of England for start-up and early stage.

2014 – 2020 European structural investment fund

- In the 2007-2013 funding period, the NW RDA was responsible for the establishment and oversight of FIs as part of its wider Structural Funds obligations on behalf of the Department for Communities and Local Government (DCLG). Following the abolition of the RDAs by the Coalition Government responsibility now resides with the Local Enterprise Partnerships (LEPs) in the region for the next programming period.
- LEPs have been required to develop their EU Investment Plans by 31 January 2014 for approval by Government, setting out their approach to the deployment of their European Structural and Investment Funds (ESIF) allocation in accordance with the EU thematic objectives.
- Where FIs are being considered, the EU also requires the completion of an Ex Ante assessment (as defined in Article 32 of the EU Regulations[2]) that evidences market failure or sub-optimal investment situations that drive the need for public investment. This report provides the ex-ante assessment as required by the Regulations.
- Greater Manchester LEP (GM LEP) in conjunction with the Greater Manchester Combined Authority (GMCA) as an authorised recipient of

2 Regulation (EU) No 1303/2013 - Common Provisions Regulation CPR

European Structural Investment Funds in the 2014 – 2020 period has developed its request for funding through the GM EU Investment Plan.

- This Plan is described in more detail in Section 2, however, in summary, it is proposing to deploy up to 50% of its ERDF through FIs (£97m). The allocation between the FIs is:

FI	ERDF Funding	Proposed match funding	
		Private	Public
Evergreen Fund II	£50m	£50m	
North West Fund	£32m		£32m
Low Carbon Investment Fund	£15m	£15m	-
Total	**£97m**	**£65m**	**£32m**

- £25m of ERDF shown above has been allocated to low carbon objectives, including £10 and £15m allocations to Evergreen Fund II and Low Carbon Investment Fund respectively. This report focuses on the £15m allocation to the Low Carbon Investment Fund.

EU regulations underpinning our work

- In undertaking this assessment, it is important to note the key regulatory requirements of the European Structural and Investment Funds that have a bearing on both the investment strategy and the design of FIs:
  - A minimum of 20% of ERDF awarded must support activities that deliver against the EU low carbon thematic objectives;
  - FIs need to be fully 'matched' (i.e. 50:50 basis) with third party financial support at a Fund of Funds, FI or project level which will be lent or invested into projects.
  - ERDF and associated 'match' funding can only be spent on 'eligible activities'. This definition includes land acquisition costs up to a specific percentage of total costs, building acquisitions, site investigation and preparation, building and construction costs and fees up to a specific percentage of total eligible costs.
  - Eligible projects are those that are in development (construction phase) or are considered to be material additions refurbishment to existing infrastructure.
  - FIs can be used alongside grants however they cannot be used to pre-fund grants or pay for working capital requirements of a project. It is therefore typically necessary to have an element of third party finance within a project that is not 'match' funding which can support ineligible expenditure.
  - FIs must be committed to projects in a state aid compliant manner.
  - FIs must be established in accordance with the regulations, which can impact their design (this is considered in Section 9).

2016 Ex Ante update

- Since this report was first written, GM has reduced its request for funding for FIs by £5m. This reduction is solely in relation to the allocation of funding Evergreen Fund II.

FI	ERDF Funding	Proposed match funding	
		Private	Public
Evergreen Fund II	£45m	£45m	
North West Fund	£32m		£32m
Low Carbon Investment Fund	£15m	£15m	-
Total	**£92m**	**£60m**	**£32m**

- £30m of the £92m for FIs has been allocated to low carbon objectives under Priority Axis 4. This compares to £25m which was originally allocated. Of this £30m, £15m has been allocated to Evergreen Fund II under Investment Priority 4b and £15m to the Low Carbon Investment Fund under Investment Priority 4a. The 2016 Ex Ante update focuses on the £15m allocation to the Low Carbon Investment Fund, which will focus on whole place low carbon projects. This update has been undertaken to align with the guidance provided by the Managing Authority on their interpretation of the Investment Priorities.

2. Strategic priorities

Introduction

- The concept of developing a robust low carbon economy permeates all aspects of GM's strategic approach to growth. In the GM regional strategy[3] for the next seven years this is seen as one of the seven key objectives for the region: *'We will be known for our good quality of life, our low carbon economy and our commitment to sustainable development.'*
- This campaign for 'green' growth has been driven by individuals and residents from across the region, but has also been strongly shaped by European, national and local policy. There are strong market drivers that exist to further promote the transition towards a low carbon economy and which suggest the need for further action. This section identifies the key European, national and local policies which aim to improve green growth and which the Low Carbon Investment Fund could help to support.

European strategic priorities

- The EU has made carbon emissions reduction, energy efficiency and renewable energy key priorities from a policy and investment perspective through the Europe 2020 Strategy which was launched in March 2010. It outlines a 10-year strategy for smart, sustainable and inclusive growth in the EU. It aims to create a resource efficient, greener and more competitive economy through objectives focused on climate change and energy. EU targets set in relation to this objective are to:
  - Cut greenhouse gas (GHG) emissions by 20% from 1990 levels (or up to 30% under certain conditions);
  - Deliver at least 20% of Europe's energy from renewable sources; and
  - Increase energy efficiency by 20%.
- Other key policies/schemes intended to support the achievement of these objectives include:
  - Resource Efficient Europe;
  - Directive of the European Parliament and of the Council on energy efficiency; and
  - EU Emissions Trading System (EU ETS).

  See Appendix E for a summary of each policy.
- These strategic policies are having material implications at both a national and local level across all EU Member States. In the UK these policies/schemes, together with commitments that have been made to other international initiatives such as the Kyoto Agreement have resulted in legally binding targets in respect of these priorities.
- The Kyoto Protocol required the UK to reduce greenhouse gas emissions by 12.5% below 1990 levels over the period between 2008 and 2012. According to the Department for Environment and Climate Change (DECC), the UK

[3] The Greater Manchester Strategy 2013 – 2020 available at http://www.agma.gov.uk/cms_media/files/final_consultation_draft_gms_2013_2020.pdf?static=1

achieved that target[4]. Those commitments were then surpassed by new targets set within the Climate Change Act 2008 which is described below.

National strategic priorities

- In the national context, the objectives of the Europe 2020 Strategy have been adopted through the following mechanisms:
  - **The UK Climate Change Act 2008** which requires that the UK reduces its GHG emissions by 80% by 2050 over a 1990 baseline. This includes an interim target for a 34% reduction in GHGs by 2020 over 1990 baseline[5].
  - **UK Renewable Energy Roadmap** which sets a target of 15% renewable energy in the UK by 2020 by laying out a plan for accelerating the use of different renewables technologies.
  - **The Energy Bill (2012/13)** legislation across generation and supply markets aimed at attracting £110 billion of investment in electrify market reform (EMR), renewables investment (including access to FITs for community energy schemes) and nuclear power, reducing impacts on consumers and improving energy security.
- However, in addition to supporting the delivery of the low carbon objectives of the EU, UK Government has a broader low carbon policy agenda which includes:
  - Improving energy security;
  - Reducing fuel poverty;
  - Reducing risks associated with a reduced exposure to energy price rises through on-site renewables and/or energy efficiency measures; and
  - Developing a functioning low carbon market that will support job and wealth creation.
- Collectively this is creating increasing pressure on Government to lead by example in the delivery of these low carbon outcomes and encourage others to do the same. This has resulted in wider fiscal and policy reforms in the UK intended to both mandate and incentivise energy suppliers and energy users to develop programmes that deliver against low carbon strategies.
- Appendix E includes a summary of some of the key 'push' and 'pull' mechanisms that have been employed by UK Government to facilitate these outcomes across the key sub-sectors forming the focus of this assessment.

GM strategic priorities

- Unsurprisingly, GMs strategic priorities for supporting the transition to a low carbon economy are reflective of the above EU and national strategic priorities. There are however two additional drivers of GM's low carbon strategic priorities:
  - **The Coalition Government's** policy of greater decentralisation of decision making in support of local economic growth, which has included:
    - The establishment of 39 LEPs in England to succeed the RDAs to drive local economic growth and prosperity; and
    - Acceptance of Lord Heseltine's proposal[6] to create a Single Local Growth Fund and European Commission Fund, pledging

[4] DECC, (2013) UK Greenhouse gas emissions: performance against emissions reduction targets – 2012 provisional figures, available at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/211907/Progress_towards_targets_2012_provisional_figures.pdf

[5] DECC (2013) Carbon Budget Management, available at http://www.nao.org.uk/wp-content/uploads/2013/07/Briefing-for-the-Environmental-Audit-Committee_Carbon-Budget-Management1.pdf

[6] 'No Stone Unturned in the Pursuit of Growth', Lord Heseltine, October 2012.

to delegate significant Whitehall budgets and European Structural Investment Funds to LEPs to allow decisions on spending to be more informed by the economic needs of a LEP area and to provide LEPs with greater flexibility on how the money is used.

- **The Covenant of Mayors (2009)** with almost three thousand signatories, including Manchester City Council, is a voluntary register committing European cities to reduce their carbon impacts. Cities are estimated to account for 60-80% of energy consumption and 75% of GHG emissions globally[7]. As one of the largest economic centres within the UK, GM is committed to helping Government meet its national low carbon targets.

- This has led to the GM Strategy including transition to a low carbon economy as one of its core objectives in the delivery of sustainable economic growth. This includes a 48% carbon emissions reduction target by 2020 from 1990 levels as one of the strategy's key success measures. The following strategy and planning documents are intended to support GM in the delivery of its low carbon objectives:
  - Greater Manchester Climate Change Strategy (GMCCS);
  - GMCCS Implementation Plan 2011-2015 which is summarised at Appendix F;
  - Greater Manchester Energy Plan; and
  - Low carbon economic area programme.

  A summary of the key objectives of these documents in relation to low carbon are set out in Appendix G.

Greater Manchester EU Investment Plan 2014 – 2020

- Reflective of the EU and national strategic drivers, the GM EU Investment Plan identifies low carbon as one of its six key investment themes.
- Six strategic activities are to be taken forward to facilitate the low carbon theme:
  - Development of a Low Carbon investment vehicle, building on GM's joint work with the GIB;
  - Develop GM's whole place low carbon infrastructure including energy and waste to energy infrastructure;
  - Develop and demonstrate whole building energy efficiency/low carbon energy generation;
  - Support growth in GM's SMEs in the low carbon/environment sector;
  - Support SMEs across all sectors to increase the energy/resource efficiency of their business products/services and reduce environmental risk; and
  - Development of appropriate low carbon skills.
- The table below summarises the current allocation of low carbon monies between the various FIs and grant support. It also indicates proposed sources of 'match' funding in the EU Investment Plan.

Allocations to Low Carbon objectives £m	ERDF	ERDF Grant	Public sector 'match'	Private sector 'match'	Total
Evergreen Fund II	10	0	0	10	**20**

[7] http://www.un.org/en/sustainablefuture/cities.shtml.

Allocations to Low Carbon objectives £m	ERDF	ERDF Grant	Public sector 'match'	Private sector 'match'	Total
Low Carbon Investment Fund	15	0	0	15	**30**
Low Carbon and Transport	0	25	16	9	**50**
Total	**25**	**25**	**16**	**34**	**100**

- The expected outcomes for the low carbon activities forming part of this assessment including their deliverability are set out in Section 11.

Conclusion

- There are clear EU and national regulatory and policy drivers for an increasing focus on the low carbon agenda. This coupled with anticipated rises in energy prices and concerns over continuity of supply is creating increasing pressure on local areas to:
  - Contribute, in particular, to the UK GHG emissions target;
  - Take action to reduce fuel poverty and improve energy security; and
  - Harness the employment and wealth creation that could be realised from the low carbon sector to drive economic growth.
- GM is responding to both this opportunity and challenge through:
  - The development of GM's low carbon strategies and plans to support the delivery of its 48% GHG emissions reduction target by 2020; and
  - The commitment it has made to allocate more than 20% of its Structural Funds allocation to the low carbon agenda.
- Sections 3 and 5 respectively test the funding and project supply of, low carbon projects and programmes to help identify the role the Low Carbon Investment Fund proposed could play in supporting GM deliver against these policy objectives.

2016 Ex Ante update

- Since 2014 when the original Ex Ante was undertaken, England has moved to one national Operational Programme. This programme sets out the strategy for smart, sustainable and inclusive growth and the achievement of economic, social and territorial cohesion.
- The strategy is built around functional economic areas (in the form of Local Enterprise Partnerships) and reflects the main priorities for development across these. It focuses most resources on the core objectives of innovation, SME competitiveness and the low carbon economy but recognises the need for targeted interventions under other objectives where EU funding can unlock barriers that matter strategically to specific areas in England.
- One of the implications of this Operational Programme is that some of the criteria against which this Ex Ante assessment for FIs is assessed have changed. As activities that do not contribute to the Operational Programme are ineligible for ESIF support, the eligibility of the activities proposed in the 2014 Ex Ante need to be tested against these new requirements.
- Within the Operational Programme are 8 Priority Axes. The Programme sets out why public sector intervention is needed in each of these axes and identifies local and national needs and opportunities. It also sets out how ERDF aligned with national spend can address these needs and opportunities. The 8 Priority Axes are:
  1. Promoting Research & Innovation
  2. Enhancing access to and use of quality ICT
  3. Enhancing competitiveness if SMEs
  4. Supporting the shift towards a low carbon economy in all sectors
  5. Promoting climate change adaptation, risk prevention and management.
  6. Preserving and Protecting the Environment and Promoting Resource Efficiency
  7. Sustainable Transport in Cornwall and the Isles of Scilly
  8. Promoting Social Inclusion, Combating Poverty and Discrimination

- In line with the Operational Plan, GM has outlined its proposal for a Low Carbon FI across two of these Priority Axes:
  1. PA 1 - Promoting Research and Innovation
  2. PA 4 - Supporting the Shift Towards a Low Carbon Economy In All Sectors
- The Low Carbon Investment Fund will focus on Investment Priority 4a within Priority Axis 4: Promoting the production and distribution of energy derived from renewable sources.
- There are specific objectives and targets which correspond to this Investment Priority to which any investment made by the proposed Low Carbon Investment Fund is expected to contribute. These objectives are:
  - To increase the number of small scale renewable energy schemes in England. This will be measured by the number of sites generating electricity from renewable sources (excluding PV).
  - A consequence of this target is the reduction in carbon emissions.
  - Activity under Investment Priority 4a must be complementary to and work alongside activity under Investment Priority 4e – promoting low carbon strategies for all types of sustainable multimodal urban mobility and mitigation relevant adaptation measures.
- Examples of actions supported under Investment Priority 4a include:
  - Measures to support increased production of renewable fuels and energy, in particular wind energy, solar and biomass
  - Support to build capability and capacity for supply chains in renewable energy
  - Demonstration and deployment of renewable energy technologies
  - Measures to support the wider deployment of renewable heat, including micro-generation, geothermal, renewable heat networks or district heating, ground source and air source heat pumps, and biomass systems with associated heat off-take and heat distribution networks along with recycling processing reprocessing and remanufacturing facilities, and
  - Anaerobic digestion plants and other biomass or landfill gas schemes.
- The outcomes attributable to the Low Carbon Investment Fund are estimated by GM to be:

Output Targets	
Private sector match funding (£m)	£15m
Number of sites	10
Greenhouse Gas Reduction p.a. (tonnes)	8,300 – 17,250

3. Complementary funding sources

Introduction

- This section outlines the European, national and local funding sources that are currently available to support project development and/or investment or grant into projects within the strategic objectives of the Low Carbon Investment Fund.
- By understanding other sources of funding that are available it will be possible to assess, in respect of the Low Carbon Investment Fund, the:
  - Potential sources of 'match' funding at a fund and project level;
  - Degree of overlap or complementarity with existing sources of funding;
  - Potential sources of project level co-finance; and
  - Potential gaps in financial products offered by these funds that the Low Carbon Investment Fund may be able to support.

EU funding sources

European Commission

- The European Commission has established several funding sources dedicated towards energy efficiency and renewable energy. These include project development grant facilities and debt and equity products to support project investment (see Appendix H for more details):
  - **Project Development Facilities:**
    - European Local Energy Assistance (ELENA) – €15 million annually.
    - European Energy Efficiency Fund (EEEF) – project development costs can be reimbursed in the event that EEEF project funding is secured.
    - Intelligent Energy Europe (IEE) – €730 million[8].
  - **Project Investment Facilities:**
    - European Energy Efficiency Fund (EEEF)– €265 million+
    - North West Europe Interreg VB Programme (environment and economy focus)– €355 million
- The technical and project investment facilities above are available to eligible low carbon UK programmes and projects and therefore to GM. However, as these sources are wholly or in part funded by the European Commission, the majority of them also have their own 'match' funding requirement. As it is not possible for one Structural Funds programme to provide 'match' funding to another, use of these funding sources and a local Low Carbon Investment Fund would need to be undertaken on a complementary basis with other public or private sector funding identified for 'match' funding.
- As these facilities are available for the low carbon sectors being targeted by GM, the additionality of the Low Carbon Investment Fund vis-à-vis these sources will need to be considered carefully. It should be noted that the investment facilities must be committed to projects on commercial terms therefore there may be latitude for the Low Carbon Investment Fund to

[8] It is understood that an AGMA application seeking project development funding for multiple phases of its GM Heat Network programme was unsuccessful.

provide finance where market failures can be identified in the funding market for low carbon. This is considered further in the following sections.

- It is understood that GM has previously considered a submission for ELENA funds and is planning to submit a bid for project development funds for the 2014 – 2020 funding round. Such funding is intended to support project development activities that directly lead to investable projects, and not broader project pipeline activities such as feasibility reports. This requirement is evidenced though its strict leverage requirement – for every £1 spend on project development, £20 of project spend needs to be evidenced. This suggests there may be an opportunity for an allocation to be made to broad project pipeline development which EC project development facilities will not support.
- AGMA has also identified a list of other potential EU funds which the region may apply to:
  - COSME (low carbon SME focus).
  - NER300 (low carbon infrastructure projects).
  - Erasmus Plus (low carbon skills focus).

European Investment Bank

- The promotion of sustainable competitive and secure sources of energy is a key EU policy objective. The EIB plays a major role in providing finance to the renewable energy sector. In the past five years its annual lending to this sector increased more than tenfold to reach €6.2bn in 2010 and since 2007 renewable energy, grid and energy efficiency projects have been the recipient of 90% of the EIB's energy sector lending.
- EIB is considering ways in which it can either commit capital to GM's low carbon agenda either via a FI or as a co-investor into projects. Key criteria that they will require to be met include:
  - Strong project economics that support lending on commercial terms (including credit worthy feedstock and offtake agreements, where relevant);
  - Evidence that 50 % of the capital cost of a project can be met from other funding sources;
  - Evidence that a project can deliver 20% energy savings.
- EIB does not typically invest directly into projects with a capital cost of less than £50 million. For this reason, it is possible that EIB may require any lending facility to be structured as a credit line via a UK financial institution.
- This would likely require evidence of a strong and, where possible, standardised project pipeline of projects that can easily be understood and managed.
- In the case of local authority led projects, another option could include a framework loan from EIB directly to a local authority, which could negate the need for an intermediary. The potential for EIB to act as a lender to low carbon projects in the GM region and the structuring of such a facility is considered in Section 7.

UK and regional funding sources

- In the UK there are many funding sources available to support investment in low carbon infrastructure projects across the sectors being proposed for the Low Carbon Investment Fund. The following are examples of these (see Appendix H for more detail):
  - GIB – £100 million+;
  - SALIX – £149 million; and
  - Green Retrofit Investment Programme (BRE & SDCL) – £100 million.
- While the majority of these funding sources require capital to be committed on commercial terms, they typically have a 'double bottom line' insofar as low carbon outcomes (e.g. GHG emissions, energy efficiency) also play a role in their investment decision making process. The exception to this is SALIX funding for public sector building energy efficiency which can offer zero-interest loans. In the event that the Low Carbon Investment Fund were to invest on fully commercial terms such funds, with the exception of SALIX, may be used as 'match' and/or complementary funding at a project level.

Green Investment Bank

- GIB is mandated by UK Government (as its seed funder) to support the delivery of the UK's 20-20-20 strategy and with £3.8 billion of capital to invest by 2015 into sectors including those being considered for the FI, it offers a source of possible 'match' and complementary project funding.
- GIB invests on a commercial basis in projects with a capital cost of less than £30 million, through two third party fund managers (Equitix and Sustainable Development Capital Limited) and directly for projects in excess of £30 million. Separately the GIB can provide funding alongside Aviva for energy efficiency projects utilising the Carbon Energy Fund (see Appendix H). In each case it typically requires third party project co-finance on the same terms of at least 51%; however it is understood this can be flexed in some cases. Again, such funding could offer project level 'match' or complementary funding.

Public sector

- Where projects are led by local authorities, funding could be secured from the Public Works Loan Board (PWLB)[9]. The PWLB is a readily available, low cost source of funding for local authorities. However, authorities are only able to borrow where they consider it prudential to do so, and with central Government keen to reduce public sector net debt, any additional borrowings for low carbon projects will undoubtedly be weighted up against other calls on capital budgets. This source of funding, together with local authority reserves, could provide direct project finance and/or 'match' or complementary finance to the Low Carbon Investment Fund.
- In addition to this, the recently established DECC Heat Network Delivery Unit provides project development support to local authority led district heating projects with £9 million of development support committed nationally between 2013-2015. It is understood that to date GM has received a funding allocation from DECC to support the development of feasibility studies for three public sector led district heating schemes.

Private sector

- There are a number of private sector commercial funders, such as banks and infrastructure and private equity funds that invest into low carbon projects. However, in the case of banks, their requirements are akin to those of the EIB as set out above. This suggests that to secure such funding as project or fund level 'match' or complementary funding would require:
  - Projects with a capital value of £20 million plus to avoid prohibitive transaction cost;
  - For smaller-scale projects (e.g. sub-£20 million), a pipeline of largely homogeneous projects, for which a standard facility can be entered into;
  - Credit worthy feedstock and offtake agreements (where relevant); and
  - A funding term of sub-10 years, reflective of the fact that very few banks now provide long-term finance.
- In the case of equity funds, projects either need to demonstrate:
  - The potential for a natural exit in a period of 2-5 years through for example, a trade sale or listing (private equity); or,
  - An ability to generate long-term stable returns (infrastructure funds), which requires fund managers to often target operational assets that are relatively low risk.
- In the current market, low carbon projects being supported by banks and/or equity funds include off-shore wind, off-shore transmission

[9] This is a statutory body operating within the United Kingdom Debt Management Office, an Executive Agency of HM Treasury and its function is to lend money from the National Loans Fund to local authorities at rate below commercial rates for (primarily) capital projects.

(OFTOs), waste PFIs and land-based solar PV. Some investment activity is also being seen in:

  - Combined Heat and Power infrastructure, where for example Co-op and Aviva have provided debt facilities to £5-£15 million energy centre projects in the health sector; and
  - On-site renewables, where for example Equitix and Deutsche Bank have provided facilities to support such projects in the UK.

- The nature of the projects targeted by the Low Carbon Investment Fund is considered in subsequent sections. However even if these projects do meet private sector investors requirements, the investment strategy of the Low Carbon Investment Fund will need to be considered carefully to ensure private sector investors are not 'crowded out' and the FI can be seen to be truly additional.

Conclusion

- Broadly speaking, there appears to be significant funding supply to support low carbon project investment, however despite this it is understood that a number of GM low carbon projects are currently not progressing.
- To evidence the 'additionality' of the Low Carbon Investment Fund it will be necessary to consider the possible market failures that are not being addressed by the existing funding provision. The funding market failures section identifies that there are a number of sub-optimal investment situations where the Low Carbon Investment Fund could possibly provide support. These include projects that meet the following characteristics:
  - **Projects with paybacks in excess of 10 years that require long term senior, sub-ordinated or mezzanine debt facilities; and/or**
  - **Projects that require debt and/or equity finance to projects with a capital cost of sub-£20 million; and/or**
  - **Projects that also need to secure guarantees, in the event senior lenders may require additional security from project sponsor for example, in respect of credit worthy counterparty agreements.**
- The above analysis suggests that it may be possible to secure 'match' and/or complementary funding for projects requiring senior debt facilities albeit in some cases senior lenders may require to rank above the funding provided by the FI (e.g. PWLB and EIB). However, in the event that the Low Carbon Investment Fund provides subordinated / mezzanine / equity funding and/or guarantees, the potential sources of private sector 'match' funding may be limited. This suggests that the Low Carbon Investment Fund may be required to secure non-pari passu 'match' funding. These points are further considered in Section 7.
- In addition to this, there appears to be a possible lack of financial support for the resources and skills that may be required to facilitate low carbon project development. ELENA and/or ESIF could be utilised in parallel or as part of the Low Carbon Investment Fund to support project development thereby evidencing further additionality. This is further considered in Sections 5 and 7.
- Section 5 starts to look at the supply of low carbon programmes and projects to assist in identifying if there is sufficient demand for both existing and proposed funding for low carbon projects.

2016 Ex Ante update

- In May 2015 GM was awarded €2.68m of ELENA funding, which GM has provided the 10% 'match' funding for.
- The funding has been used to support the activities of the Low Carbon Project Delivery Unit (PDU), which is focused on three specific workstreams:
  - Development of district energy projects;
  - Conversion of street lighting to LED; and
  - The development of a procurement framework to aid the delivery of district energy projects.
- The ELENA funding is for a three year period, 2015-2018, after which the aim is to make the PDU self sustaining.

- The PDU is, and will continue to support the development of the GM low carbon investment programme focusing on energy efficient street lighting projects and district heating projects using combined heat and power plants fuelled by natural gas, biomass or using geothermal sources with district heating network components.

- The ELENA funding was sought from GM in part as a consequence of this 2014 Ex Ante assessment (see Section 10 for further details).

- The pipeline and market failures/funding gaps are provided in sections 5 & 7 and provide further analysis of the requirement for a separate low carbon fund.

- In 2015, the Department for Energy and Climate Change received a £300m allocation to support the development and construction of heat network projects across the UK. Given the pipeline of heat network projects across the country, and the indicative capex value of the GM heat network projects identified in the revised pipeline in section 7, there would still appear to be a need for additional funding in heat networks and therefore a Low Carbon Investment Fund could supply this.

- In conclusion therefore, whilst there is alternative funding available for low carbon schemes, the amount of funding available to projects with sub-optimal investment criteria is limited. Furthermore, the skills and resources available to support development of such schemes are limited such that the Low Carbon Fund, alongside other sources of finance, could be used to facilitate these projects.

4. Key findings from existing relevant UK FEIs

- The only low carbon specific FEI in the UK currently is the London Energy Efficiency Fund (LEEF)[10], an energy efficiency UDF managed by Amber Infrastructure on behalf of the London Green Fund. The London Green Fund (LGF) is a £100 million Holding Fund with commitments from European Structural Investment Funds, the London Waste and Recycling Board and the London Development Agency (the Greater London Authority (GLA) is its successor).
- LEEF is a £50 million privately owned UDF focused on the provision of primary debt finance for energy efficiency retrofit projects between £1-20 million in value within public and voluntary sector non-domestic buildings and infrastructure. It can also fund some private sector development and social housing energy efficiency retrofit, but street lighting was specifically excluded. The non-financial outcomes it targets include a GHG emissions reduction threshold per £ invested and 20% energy savings.
- Despite being privately owned, an Advisory Committee has been established to oversee the progress of the UDF in implementing its investment policy. The Advisory Committee comprises representatives of Amber Infrastructure, EIB, GLA, advisors and an independent representative.
- The interest rate offered by LEEF can be lower than other potential funding sources for public sector led projects such as PWLB. This is due to the strong covenant offered by local authorities in particular coupled with the basis on which state aid compliant debt pricing is determined, which applies the OJEU Market Economy Investor Principle (MEIP).
- LEEF was established in November 2011 and must be fully invested before December 2015. To date it has defrayed £20 million with a further £20 million committed and £9 million pending final commitment within the next six weeks. This would mean full investment of funds within 30 months, 12 months ahead of the December 2015 deadline.
- Key findings include:
  - **Project development costs–** there has been a general lack of 'oven ready' projects. This has resulted in more development support being required than initially anticipated by LEEF. This has included assistance through the application process, energy and carbon calculations, and development of monitoring and verification programmes.
  - **Project scale**– LEEF has been required to target projects with a capital cost in excess of £3 million in order to avoid transaction costs being financially prohibitive.
  - **Amendments to investment principles** – it has been necessary for the LGF to relax the investment principles of LEEF to support capital deployment due in part to the costs in bringing projects to market and even then, the greater breadth of scope to ensure deployment within the funding period timeframe. This has resulted

[10] http://www.leef.co.uk/.

in the inclusion of decentralised energy schemes, an element of energy efficiency retrofit for private sector buildings. While this has required amendments to the fund's Investment Strategy, as the Operational Programme (equivalent to the GM EU Investment Strategy) was sufficiently broad in its low carbon remit, this did not require European Commission approval.

– **Private sector leverage** – despite a willingness from the EIB and a UK bank to co-invest into LEEF backed projects, this has proven difficult in practice. This has been largely the result of a lack of a commercially investable project pipeline to support the structuring and negotiation of a facility. However, as outlined in Section 3 above, where private sector leverage can be achieved, this may have implications on the possible structure of a FI and the requirement (or otherwise) to have a third party fund manager. The design of the Low Carbon Investment Fund is considered in Section 9.

Evergreen Fund I

- Evergreen Fund I was established by a number of Local Authorities in the remainder of the Northwest area. The Evergreen Board is Co-Chaired by the Chief Executive of Manchester City Council and Lancashire County Council. The local authorities and the GM Core Investment Team are responsible for supporting the development of the fund's project pipeline. The fund is managed by CB Richard Ellis (CBRE), a property advisory consultancy that provides a wide range of agency, asset management and property finance services.

- Evergreen Fund I was initially seeded with £30m by the NWUIF, representing the maximum cash 'match' funding available at the time. The NWUIF has subsequently contributed a further £11.6m, to its current size of £41.6m. No additional third party 'match' or complementary finance has been secured at the UDF level, however match and complementary funding has been secured at the project level from commercial banks and Growing Places Funding (GPF).

- Key findings include:

  – The **governance structure of the UDF** is relatively unique and has helped to ensure that Evergreen Fund I is viewed by public sector partners as a key instrument to deliver economic development priorities. The public sector governance structure of the UDF, has also provided advantages in terms of project origination. With the majority of the projects funded by Evergreen Fund I being sourced by the GM core investment team, ensuring that projects are strategically aligned and eligible for Evergreen investment.

- Where needed, public sector partners have worked with CBRE to also secure public match funding and complimentary finance to support the structuring of investment proposals. This has enabled projects to be jointly funded by Evergreen Fund I and GM's Growing Places Fund. In addition to supporting the structuring of investment proposals, the alignment of funding resources in this manner, has clear advantages to potential applicants, resulting in effectively one funding application process and one ensuing on-lending agreement.

SPRUCE

- The £50m privately owned SPRUCE UDF provides debt finance to regeneration and energy efficiency projects within the 13 local authority areas in the Lowlands and the Uplands of Scotland. Eligible and investible projects include the development of office and commercial space, key transport projects and investment in energy efficient projects. This latter activity includes support for innovative approaches to energy efficiency retrofit measures.

- SPRUCE was established by Scottish Government with the support of the EIB. Its funding sources include ERDF and 'match' funding from Scottish Government. It is managed by a specialist fund manager Amber Fund Management Limited (Amber). Similar to LEEF, an Advisory Committee has been established comprising members of Amber, EIB, Scottish Government and independent representatives.

- Key findings include:

- To date SPRUCE has focussed its investment in commercial office development and it is yet to invest in an energy efficiency project, although it is understood a number of projects are currently being developed. It is recognised that there may a need to supplement the low carbon **project development capacity** within the broader public sector and Scottish Government is currently exploring how best to respond this as part of the development process for the 2014-2020 programme.

2016 Ex Ante update

- Since 2014, the NWUIF has contributed a further £10m to Evergreen Fund I bringing the fund size to c. £60m. The Fund is fully invested.
- Further details of Evergreen Fund 1, its history and performance together with the proposed Evergreen II are included in the Evergreen Ex Ante Assessment report.

5. Market gaps and failures

Introduction

- In this section we consider the non-finance related barriers to the demand for, and delivery of, low carbon projects in the UK in spite of the regulatory and policy framework and funding supply set out in Sections 2 and 3 respectively. The analysis is split into two strands:
  - **Macro challenges;** and,
  - **Sub-sector challenges**– For NDEE, decentralised energy, street lighting and small scale renewables.

Macro challenges in the low carbon market

- The key issues identified as impacting on the low carbon market that may be hindering its development in the short-medium term include:
- **Regulatory uncertainty**– The UK has a complex and constantly evolving regulatory regime in respect of supporting its low carbon agenda. This can lead to:
  - Policy risk surrounding possible changes to Government support mechanisms and industry incentives which can lead to concerns over the financial viability of projects in the long-term (e.g. progressive reduction in the Feed In Tariff (FIT) for solar PV following the scheme's unprecedented uptake); and
  - Confusion over the opportunities and requirements of energy suppliers and users.
- **Lack of financial consequences**– while recent Government regulatory changes suggest grandfathering of incentivisation mechanisms are reducing the perceived risks in the renewable energy generation sector, there remains a general apathy towards the sector generally, which in part may be due to the force of the financial consequences of non-compliance not being fully felt yet.
- **Rationalisation of local government** – following the 2010 general election the Coalition Government introduced its localism agenda which has led to fundamental changes to both the organisation and expectations of local government (e.g. greater local responsibility for driving economic growth). Coupled with this local authorities have had to make significant and on-going budget cuts to support the reduction of the UK budget deficit. In some cases this has led to a focus on core services and/or has resulted in the removal of the necessary skills and/or capacity to drive the low carbon agenda.
- **Nature of low carbon projects** - many low carbon projects are perceived as being complex, with long pre-construction periods, significant upfront preparatory costs and lengthy payback periods. This leads to both potentially significant time lags and resource input before projects are investment ready and the associated uncertainty before value can be realised for project promoters/investors.

Sub-sector challenges

Challenges facing NDEE retrofit

- DECC estimates that 37% of UK emissions come from heating and powering homes and buildings and to meet UK emissions targets all

buildings will need a carbon footprint of close to zero. However, while there is increasing international[11] evidence that sustainable buildings can:

  - Offer (in many cases) quick investment payback and long-term energy cost savings;
  - Increase rental yields and property values
  - Future-proof them against possible regulatory requirements; and
  - Improve occupancy rates as corporate social responsibility moves higher up the agenda for many organisations,

  There is still a lack of uptake in building energy efficiency retrofit.

- As DECC anticipate two-thirds of buildings in the UK will still be standing in 2050, this indicates the possible scale of both the funding opportunity and the challenge Government is facing in meeting its GHG emissions reduction target. However, to unlock this funding opportunity requires a number of other challenges to be addressed such as:
  - Contractual mechanisms for retrofit projects that overcome the **split-incentive** between building owners (that may finance the capital works) and building occupiers (that may be the beneficiaries of reduced energy consumption). While 'green leases' are becoming more common place, the complexities of negotiating such arrangements, potentially with multiple occupiers, can lead to prohibitive project development costs and/or act as a disincentive to engage in the first place.
  - The perceived **'hassle' factor** associated with the implementation of energy efficiency measures which can often be seen as disruptive and time-consuming, leading to an unwillingness to undertake or a preference to delay such works until the conclusion of a lease term.
  - **Procurement of contractors** can be financially prohibitive, particularly for public sector bodies, where they have to adhere to formal procurement processes for what can often be low value capital projects. However, the development of contractor frameworks such as RE:FIT[12] whereby public bodies can 'call-off' a contractor, is increasing the ease with which they can be appointed.
  - **A lack of robust baseline data** on energy consumption can make it difficult to assess the energy savings opportunity that may exist within existing building stock, leading to sub-optimal decision making and/or the requirement for additional project development activities.
  - **A lack of communication and understanding** between, for example, the technical department and the financial decision makers within an organisation of both the environmental and financial savings that can be realised through what can be small capital investment in energy efficiency measures.
- All of these challenges point towards a need for greater focus on working through these challenges by public and private sector building owners/occupier alike. However, a combination of the macro challenges identified above, appear to be impacting the desire and/or ability to do so.
- Project development support, rather than project finance support appears to be of greatest need in this sector currently, in particular to facilitate the aggregation of small value projects into sufficient critical mass to merit the development and transaction costs of executing such projects.

Challenges facing decentralised energy

- Decentralised energy projects, such as district heating, can lead to carbon emission reductions support economic development and inward investment and improve energy security. There are also various support mechanisms available including the Renewable Heat Incentive, Renewable Obligation Certificates (ROCs) and Enhanced Capital Allowances for projects that meet good quality CHP criteria and/or offer generation from renewable sources (e.g. biomass, biofuels).

[11] In particular in Australia and the US.

[12] http://www.refit.org.uk/

- Despite these incentives few schemes have come to the market, as evidenced by the recent establishment of the DECC Heat Network Delivery Unit to support project pipeline development. Key challenges for heat related projects include:
  - The **high capital** cost of installing heat infrastructure and networks, particularly as the distance between the source of generation and areas of demand increase.
  - A lack of **long-term credit worthy heat offtakers** which can erode project viability and limit the ability to attract private sector finance.
  - **Pricing risk in relation to feedstock** can hinder project economics however the aggregation of local authority heat load potentially in partnership with private sector developers could act as a catalyst for further investment in this sector.
  - **Multiple stakeholder management** including heat suppliers and users, making it challenging to progress such schemes at any pace, which can ultimately lead to large project development costs and many project risks/uncertainties.
- While the Carbon Energy Fund[13] and the DECC Heat Network Unit are supporting this sub-sector, there may be scope for the Low Carbon Investment Fund to support:
  - Targeted local project development; and
  - Offer long-term affordable debt and/or subordinated debt projects with a capital value of up to £20 million.

Challenges facing street lighting

- Street lighting improvements can lead to energy consumption savings through improved energy efficiency and enhanced lighting control. It can also lead to improved asset life and therefore smaller asset replacement budgets in the future.
- While there is evidence that these schemes are progressing, specific existing challenges include:
  - **Technology risk** (e.g. which LED technology to select) and determining when in an asset replacement cycle to make the upgrade.
  - **Procurement at sufficient scale** to enhance returns on investment. Within GM the timing of different schemes entered into PFIs complicates the economies of scale that are possible with this intervention. For example Manchester City Council and Oldham Council have PFI agreements in place and Salford City Council is using a PPP to deliver its street lighting programme.
  - **Stalled project development** where local authorities are individually tasked with completing and approving business cases with limited skills and resources locally to do so. For example, it is currently understood that with the exception of Wigan Council, five local authority street lighting projects in GM are not progressing at a pace for this reason.
- The Low Carbon Investment Fund could offer support across the GM authorities to bring forward programmes of projects for structuring and procurement, which could then benefit from possible economies of scale. Depending on the commercial structure(s) developed, it may also provide long-term project funding.

Small scale renewables

- Independent developers seeking finance to fund renewable energy projects (onshore wind/solar/biomass) require long term power purchase agreements (PPA), typically with a floor price to underpin the financing.

[13] Provides project development/contractor procurement support to public sector bodies (typically NHS Trusts) to develop commercially viable Combined Heat and Power schemes which can then subsequently access debt finance.

The number of credit-worthy PPA providers (e.g. Big 6 domestic energy suppliers) in the market is extremely limited acting as a barrier to the faster deployment of renewable capacity.

- There are number of reasons why parties have withdrawn from the PPA market including:
  - Providing PPA to small projects is a non-core activity to the large utilities;
  - Potential balance sheet and credit rating implications of providing price floors; and,
  - Change in law risk associated with electricity market reform.
- GM cities (individually or collectively) could offer direct PPA's to projects on either an indexed linked or fixed price basis. This could provide several benefits including:
  - The potential to manage cost risk through offering fixed price PPA's and providing forward visibility over energy prices;
  - Remove a significant barrier to renewable energy investment; and
  - Job creation through investment in local infrastructure.
- However, provision of PPAs are often only one part of unlocking investment in new projects. Another impediment can be that of planning permission and gaining developer rights, and some projects may be reliant on local authority land.
- A strategic assessment of the scope for projects within the GM area, and the combination of land use planning and issuance of PPAs could together identify and provide stronger cases for new renewable energy infrastructure projects and which could help unlock investment. All of which could be facilitated through project development support.
- Where local authority land and public sector power purchase combine, the relevant local authority may even be in a position to directly participate in the project as an investor/seller rather than buyer. This could create a funding opportunity for the Low Carbon Investment Fund for the provision of guarantees and/or debt/equity finance where projects are small in capital value.

Conclusion

- Both nationally and locally there is a lack of an 'investment ready' project pipeline of low carbon projects despite the regulatory and policy drivers, anticipated energy price rises and funding availability.
- The key non-financial market failures causing this at a national level include:
  - **Regulatory uncertainty;**
  - **Difficulty in aggregating projects to achieve sufficient scale to ensure that project development and transactions costs are not financially prohibitive;**
  - **A lack of resource and/or skills within the public sector to develop projects into investable propositions in the face of ongoing budget cuts;**
  - **A lack of robust long-term feedstock and offtake agreement counterparties (i.e. both in terms of parties willing to purchase the energy and those with sufficient credit worthiness) which can limit a project's financial viability.**
  - **The complex nature of projects themselves, dissuades potential promoters, with often significant upfront preparatory costs and lengthy pre-construction and construction periods and uncertainty over value realisation/payback.**
- The key financial market failures (explored in Section 3 of the report) set out a number of sub optimal investment situations, as follows
  - **Projects with paybacks in excess of 10 years that require long term senior, sub-ordinated or mezzanine debt facilities; and/or**
  - **Projects that require debt and/or equity finance to projects with a capital cost of sub-£20 million; and/or**

  - **Projects that also need to secure guarantees, in the event senior lenders may require additional security from project sponsor for example, in respect of credit worthy counterparty agreements.**

- The combination of the financial and non financial market failures suggests that there is an investment case for the Low Carbon Investment Fund. Furthermore, the analysis also suggests that there is a need, and therefore possible role for the fund in providing project development support. In doing so it could:
  - Drive the supply of projects needed to support the deliver GMs low carbon economy; and
  - Provide project investment where gaps are identified in the supply of capital.
- In Section 7 we consider the validity of this proposition in the context of GM and its current low carbon project pipeline.

2016 Ex Ante update

- As outlined in Section 7, the revised project pipeline for the Low Carbon Investment Fund is focused on heat network projects but also includes small scale renewables and NDEE retrofit project.
- Heat networks remain a key policy objective of the Department for Energy and Climate Change with £300m allocated to support their development and construction following the 2015 Compulsory Spending Review. DECC continues to consult on the most catalytic way to channel the funding to the sector. We note that this fund is for up to 200 projects across the UK and is due to be used by 2020/21 which equates to £1.5m per scheme if apportioned equally. This allocation shows Government's recognition of the ongoing the challenges of developing and funding heat networks, which colleactively the Low Carbon PDU and a Low Carbon Investment Fund could, in parallel, support. However, it should be noted that the fund, compared to the total capex of the GM pipeline projects, will not provide the full financing requirement.
- With policy makers keen to see the development of city-wide heat networks, the scale and aspiration of individual projects has evolved too. As is evident from the pipeline in Section 7, the total capital value of around half the schemes is in excess of £20m.
- City-wide schemes bring additional challenges to those cited above such as larger upfront distribution network costs coupled with a slower ramp up of heat offtakers. This is particularly the case where initial pipework is required, for example, to meet the future needs of a regeneration area that could be build out over a 5-10 year period. As such, while the original market gaps and failures still hold, there are additional challenges that could give rise to additional funding gaps. This is further explored in Section 7.
- The revised pipeline currently includes two NDEE retrofit projects, namely solar PV additions to car parks and leisure facilities in Greater Manchester. The projects are currently undergoing feasibility studies and further details are included in section 7. As the overall individual capex for each of these projects is small, there is the need to obtain project development investment to ensure the individual execution costs do not outweigh the benefit of the investment.
- The street lighting projects have been removed from the revised pipeline as it is no longer the intention to use the Low Carbon Investment fund to assist with bringing these projects to market/funding these projects. This is because the public sector feels confident to invest in these projects using PWLB funds.
- The conclusions noted above in the original report are still valid. The heat network projects included within the revised pipeline case studies indicate sub-commercial rate of returns and therefore the potential need for additional security or investment due to the lack of attractiveness to private sector funders.
- Based on the total capex of the pipeline, together with the proportion of projects in the procurement/feasibility stage and even with a share of the DECC funding, this would seem to indicate that there is a gap in funding of upto £70m and therefore £15m could be deployed on low carbon projects in GM up until 2020.

6. Strategic and market needs: Key findings and value added

Strategic alignment

- There is a clear strategic alignment between the GM EU Investment Strategy and policy objectives at European, national and regional levels:
  - From the Europe 2020 Strategy has come a legally binding commitment from UK Government to deliver its share of GHG emissions reduction, and improvements in energy efficiency and renewable energy generation.
  - Concern over rising energy prices and the wider economic benefits that could be derived from a low carbon economy has led to a number of UK-specific regulatory and policy drivers intended to mandate and/or incentivise individuals and organisations alike to address the low carbon agenda.
  - GM has subsequently set out its vision and plan for the role it will play in delivering a low carbon economy through the development of various strategy and policy documents and as outlined in Section 7 has started taking steps to realise its low carbon ambition.

Supply of projects

- Both nationally and locally there is a lack of an 'investment ready' project pipeline of low carbon projects despite the regulatory and policy drivers, anticipated energy price rises and funding availability.
- The key market failures causing this include:
  - Regulatory uncertainty;
  - Difficulty in aggregating projects to achieve sufficient scale to ensure that project development and transactions costs are not financially prohibitive;
  - A lack of resource and/or skills within the public sector to develop projects into investable propositions in the face of ongoing budget cuts;
  - The nature of many low carbon projects, often requiring long term financing arrangements
  - A lack of robust long-term feedstock and offtake agreement counterparties (i.e. both in terms of parties willing to purchase the energy and those with sufficient credit worthiness) which can limit a project's financial viability.
- These market failures appear to point towards a need for greater capacity and skills to develop the project pipeline, which could:
  - Progress stalling project development which may be occurring due to limited public sector resource;
  - Facilitate project aggregation to encourage leverage from existing funding sources;
  - Educate, in particular, public sector stakeholders on the 'quick wins' from low carbon investing;
  - Develop and procure additional frameworks to RE:FIT and CEF that may facilitate low carbon project execution locally; and
  - Provide GM local authorities with the capacity and 'know-how' to maximise the role they can play in addressing some of the challenges

that can hinder project development (e.g. use planning powers to unlock sites and/or work as a collective to provide a robust PPAs to support the commercial viability of schemes).

Possible role of the Low Carbon Investment Fund

- Despite the availability of funding to large capital projects with short-medium term paybacks, there is some evidence to suggest that there are funding market failures that the Low Carbon Investment Fund could support that would ensure it is 'additional' to existing sources:
  - Long term senior, mezzanine or subordinated debt facilities; and/or
  - Debt and/or equity finance to projects with a capital cost of sub-£20 million; and/or
  - Guarantees, in the event senior lenders may require additional security from project sponsor for example, in respect of credit worthy counterparty agreements.
- However, recognising the limited supply of projects, to ensure such project funding can be deployed in the 2014 – 2020 investment period, the Low Carbon Investment Fund (or alternative vehicle) may also need to offer project development support. In doing so it could:
  - Drive the supply of projects needed to support the deliver GMs low carbon economy; and
  - Provide project investment where gaps are identified in the supply of capital.
- There is some evidence that 'match' funding may be available to invest on a pari passu basis alongside a Low Carbon Investment Fund in particular where senior debt is offered. However, despite the funding supply available to the low carbon sector generally, the availability of pari passu 'match' funding for subordinated / mezzanine debt and equity and guarantee products is less clear.
- These propositions are tested for their validity in the context of the GM project pipeline and the possible implications highlighted in Section 7 below.

Value Added of the Low Carbon Investment Fund

- In addressing the market failure and funding gap established earlier in the report, the proposed Low Carbon Investment Fund also offers the following value added:
  - **Leverage, 'Match' and Complementary Funding:** Financial instruments developed to date in the UK, have demonstrated track-records in levering other funding sources, in some instances at fund level and also at project level.
  - **Revolving nature**: The Low Carbon Investment Fund will be investing in projects on a repayable basis. This provides a significant advantage over other public funding streams, which typically operate on a grant basis. Whilst it is envisaged that the typical repayment period of projects funded by the Low Carbon Investment Fund will be longer than those proposed for the Evergreen Fund II, principal repayments and interest generated by Funds investments will be available to be recycled by the Fund and invested into a further round of projects, generating a further series of outputs/outcomes and securing further public and private sector leverage.
  - **Building in success:** The proposed partners of the Low Carbon Investment Fund have developed a strong track record of delivery through their role in Evergreen Fund I. The Evergreen Fund I experience will hopefully provide the team with a strong platform upon which to create the Low Carbon Investment Fund.

2016 Ex Ante update

- In 2014 over 70% of the projects identified were at pre-feasibility stage and covered a breadth of sub-sectors. Over the past two years the position has moved on considerably with the establishment of the Low Carbon PDU with the support of ELENA funding in 2015. This has been the catalyst to develop and refine the project pipeline, with a specific focus on heat network projects.
- Of the 18 projects in the pipeline, 15 are heat network projects. One of these is in procurement with a further 8 at feasibility or business case stage.

- In light of this fundamental change, the role of the proposed Low Carbon Investment Fund is considered in Section 7. However, the value added of such a Fund, irrespective of the products it offers will provide the benefits outlined above.

Part two – Fund design

7. Project pipeline review

Introduction

- This section considers:
  - The low carbon project pipeline of GM to better understand its current status and the amount of the estimated capital requirement; and,
  - On a sub-sector basis, the specific funding needs of individual projects to identify the potential role the Low Carbon Investment Fund could play in their capital structure and/or the need for further project development support.
- This review is intended to:
  - Test whether the market failures identified in Part 1 exist in the GM context and there is, therefore, a need for a Low Carbon Investment Fund and/or project development support funded by Structural Funds;
  - Test whether the proposed allocation to the Low Carbon Investment Fund in the GM EU Investment Strategy could reasonably be deployed during the 2014-2020 investment period;
  - Highlight possible state aid implications of the proposed public sector financial interventions; and
  - Identify possible 'match' and complementary funding sources that could be leveraged.
- This is important to ensure that the proposed Low Carbon Investment Fund is:
  - 'Additional' and complementary to existing sources of finance;
  - There is a sufficient pipeline of projects to justify its creation; and
  - That is sized appropriately to minimise the risk that Structural and Investment Funds are not defrayed on eligible expenditure by the end of 2020.
- Consideration is given to the possible non-financial outcomes of the Low Carbon Investment Fund in Section 11.

Pipeline overview

- In order to assess the quantum and scope of the low carbon investment opportunities AGMA, in conjunction with the GM Low Carbon and Core Investment Teams, potential investors and a number of advisors identified a potential, low carbon project pipeline within GM. This was subsequently reviewed and signed off by GM[14]. The full list of projects can be found in Appendix I.

Asset Class	No of Projects	Pre-feasibility	Feasibility	Business Case onward	Capex (£m)	Financial close date
Heat networks	11	8	3	-	162	2014–2017

[14] Project start dates are estimates provided by the GM Low Carbon Team and the GM Core Investment Team, based on historic data. There is a risk that some of these may be out of date.

Asset Class	No of Projects	Pre-feasibility	Feasibility	Business Case onward	Capex (£m)	Financial close date
Building energy efficiency retrofit	5	12	4	1	94	2014 – 2018
Hydro	4	-	2	2	2	2012 – 2015
Wind	3	-	3	-	31	2015
Total	**30**				**371**	

- As the table indicates, the current known low carbon investment opportunity across GM up to 2018 is estimated at around £370 million.
- Recognising the immaturity of most of the pipeline and the average capital value of £5 million, this suggests that there is a potential role for the Low Carbon Investment Fund to provide project development and investment support akin to that proposed in Part 1.

Sub-sector analysis

- In parallel with this 'top-down' analysis, AGMA continues to commission advisors and possible investors to support the development of individual projects into viable investment propositions. Details of the projects for which feasibility reports and/or business cases either have been or are being developed are included in the table below.

Sub-sector	Stage of development	Geography	Capex (£m)	Financial close	Funding requirement
Building energy efficiency retrofit	Business case	Bury, Manchester, Oldham, Trafford, Wigan	19	2014 – 2017	Not yet addressed
Heat networks	Feasibility report	Manchester, Stockport, Oldham	24	2016 – 2017	Not yet addressed

- The reminder of this section considers each of these sub-sectors in turn. The analysis for each focuses on the specific funding needs of individual programmes/projects to assess the role the Low Carbon Investment Fund could play.

Building energy efficiency retrofit

Overview and programme status

- Reports commissioned by AGMA have identified over 2,000 publicly owned buildings which would benefit from some form of energy efficiency retrofit across the 10 GM local authorities. It is understood that this represents roughly 50% of the public sector building stock. The measures vary from low cost cavity wall insulation to more expensive and extensive measures such as replacement windows.
- Through a series of grouping exercises whereby GM aggregated projects with similar characteristics together, the long list was narrowed to a number of smaller 'waves' which would be tested across five local authorities: Bury, Manchester, Oldham, Trafford and Wigan. The three 'waves' of projects with an estimated capital value of £60 million across these local authorities are shown in the table below.

GM Authority	Identified public buildings	Buildings by wave			Capex (£m) by wave		
		1	2	3	1	2	3
Bolton	240	0	0	0	0	0	0
Bury	181	73	83	71	3.2	3.8	2.8
Manchester	502	103	118	99	7.5	9	7.2

Oldham	276	82	89	82	2.8	4.7	2.8
Trafford	200	8	37	8	o.4	1.1	o.4
Wigan	210	111	111	104	5.2	5.5	4.6
Total	**2,364**	**377**	**438**	**364**	**19.1**	**23.8**	**17.7**

- Building retrofit Wave 1 is a single project applying retrofit energy measures to 377 buildings across the five authorities with an estimated capital cost of £19 million. Wave 1 itself has been subdivided into 4 smaller lots. The capital cost of the first Lot of Wave 1 of the scheme is estimated to be £5 million, reduce CO2 emissions by 17.2% and offer overall financial savings of £8.2 million after capital repayment over a 12 year period. In addition to considerable CO2 reductions, a Survey of the Employment Effects of Investment in Energy Efficiency of Buildings, commissioned by the 'Energy Efficiency Industrial Forum' has analysed the employment benefits of low carbon investment. The survey found that for every €1m invested, 19.3 jobs were created, which could potentially see the wave 1 programme create over 463 new jobs.
- A draft business case for Wave 1 was circulated to each of the five authorities for individual approval in September 2013 and a report to the Council's Executive seeking approval to proceed took place in December 2013. The business case sought approval to procure a contractor through the GLA RE:FIT framework[15].

Funding need

- It is understood that as yet, no decision has been taken on how each of the authorities will fund Wave 1 and subsequent Waves. With a Wave 1 capital cost of £19 million across five authorities, it is possible that this could be met from reserves, with limited/no need for investment. However, in the medium-long term, as the incremental capital requirement to support NDEE increases, this need is likely to grow and may not be met from reserves. The funding requirement for Waves 2 and 3 is over £40 million.
- As the commercial structure of Re:Fit means that any investment requirement will be on a corporate basis, the credit strength of the local authorities in GM suggest that it would be possible to secure 100% senior debt funding for a programme of projects procured in this manner. While these authorities can borrow via the PWLB, to date very few schemes have been funded despite the average NDEE project payback of 7-10 years (depending on the mix of measures installed) and their contribution towards GHG emissions reduction targets.
- This suggests that there is potentially a role for the Low Carbon Investment Fund to provide:
- **Project development support** to, for example:
  - Lead the procurement process, development of business cases to secure funding and ongoing monitoring and verification for public sector led NDEE;
  - Undertake a review and aggregation process for the remaining 50% of the authorities building stock;
  - Commence engagement with private and other public sector building owners and occupiers to develop further NDEE opportunities; and
  - Consider the development of additional frameworks that increase the ease and minimise the cost of procuring contractors and/or offer

[15] Re:Fit is a scheme which uses an Energy Service Company (ESCo) to implement energy efficiency measures that enable organisations to cut running costs, energy consumption and carbon emissions. The ESCo guarantees the level of energy savings, thus offering a secure financial saving over the period of the agreement. Under the Re:Fit contractual arrangement, the building works will be capitalised as an asset on the project sponsor's (i.e. local authority's) balance sheet, with the funding of the works being met from reserves or borrowing of the sponsor. The Re:Fit contract has been used successfully on a number of schemes in Leeds, Nottingham and London with a similar building stock profile to those in GM.

different commercial delivery models to the current Re:Fit contractual mechanism.

- **Competitively priced debt funding** to authorities for NDEE which may offer an immediate incentive to finance directors to prioritise capital investment in the early schemes, **which is not currently happening**.
  - For example, if an authority were to borrow from the PWLB over a 10 year period to fund an NDEE project, the rate of interest they would currently be charged is 2.81%[16]. While lending to the public sector is likely to sit outside state aid rules, if reference rates were to be applied to provide a possible 'floor' to the interest rate the Low Carbon Investment Fund could offer this gives an interest rate of between 1.59% and 1.99% assuming a strong authority credit rating[17]. If we were to assume PWLB was used to 'match' fund the Low Carbon Investment Fund on a 50:50 basis, a blended rate of 2.2% could be achieved.
  - However, this analysis should be treated with caution. The objective of the Low Carbon Investment Fund is not to displace other existing sources of capital, nor is it intended to offer the cheapest cost of finance. Furthermore, as evidence by the lack of GM schemes being taken forward with PWLB funding, there is no assurance that an authority would opt to borrow from the PWLB for this type of activity, with PWLB borrowing capabilities often priorised for other activities.
  - What this does illustrate though, is that the Low Carbon Investment Fund could, together with 'match' funding, be used to create a senior debt product that could act as an added incentive to kick-start the delivery of GMs public sector led NDEE projects.
  - In the future, when it is anticipated that more private sector led projects will come forward there is likely to be a greater need for the Low Carbon Investment Fund due to:
    - Small capital value, even with aggregation, where the transaction costs could preclude the use of private sector finance; and
    - Possible changes to commercial delivery structures that may offer project, rather than corporate investment opportunities (debt and/or equity), where funding sources may be more limited due to counterparty risk and/or project scale.

District heating

Overview and project status

- A review of the technical feasibility study for the Manchester Civic Quarter Heat Network (MCQHN) has been undertaken (one of the three cited in the table above). The network is intended to incorporate the Town Hall, the Town Hall Extension, Central Library, the Midland Hotel, Manchester Central and Number One St Peter's Square. Construction commencement is anticipated in 2016 and the scheme is estimated to deliver carbon savings of 1,070tCO2/yr.
- The four technical options for the scheme have a capital cost of between £6 - 10.5 million with an Internal Rate of Return (IRR) of between 13.7 – 6.2% respectively. The base case, which has a capital cost of £10.5 million and IRR of 6.2%, is intended to offer flexibility for the future by sizing for peak load provision and centralisation of energy generation.
- The feasibility study considers possible commercial delivery structures for the scheme:

[16] http://www.dmo.gov.uk/reportView.aspx?rptCode=D7A.2&rptName=d68ab0fb-f12a-40e9-b423-25020ae48d50||PWLB%20(2)&reportpage=Current_PWLB_Fixed

[17] Base rate is currently 0.99% (See http://ec.europa.eu/competition/state_aid/legislation/base_rates_eu28_en.pdf. This assumes normal collateral and a strong credit rating). The range reflects the additional margin applied to reflect the level of collateral offered (i.e. low, normal or high). See http://europa.eu/rapid/press-release_MEMO-09-87_en.htm?locale=en

  - Fully private sector model – selecting an Energy Services Company (ESCo) to deliver the scheme;
  - Fully public sector model – local authority to deliver the project;
  - A hybrid (joint venture) scheme where an ESCo is set up as a special purpose vehicle (SPV) with the local authority as one of the shareholders together with other public and private sector partners.
- Key factors that will impact the ultimate delivery model include the:
  - Risk/reward structure driving the ability to raise private finance;
  - Level of control sought by the local authority; and
  - Long term resilience and flexibility sought by the local authority.
- It is understood that while the study considers different heat sources and possible heat offtakers, no formal engagement with these parties has been undertaken. Manchester City Council is understood to have engaged the Carbon and Energy Fund to support the development and potentially the ultimate procurement of the scheme.

Funding need

- The MCQHN scheme is one of the more developed schemes yet is only moving to business case stage. The lack of developed schemes highlights the role the Low Carbon Investment Fund could play in providing dedicated project development support across the authorities to bring forward the pipeline. The required support, depending on the current status of the projects, appears to include:
  - Financial modelling of technical options and the implications on these of the various revenue support grants and environmental taxes and levies;
  - Commercial delivery structure options appraisal;
  - Financial structuring, based on the commercial delivery structure options;
  - Business case development;
  - Commercial and/or legal advice to negotiate heat offtake agreements with building owners that will connect with the scheme; and
  - Procurement of delivery partners (e.g. construction contractor, ESCo).
- By providing such support, the Low Carbon Investment Fund could bring forward projects that require its investment. For example, the feasibility study for the MCQHN suggests that three of the four technical solutions may not be attractive to private sector project sponsors and investors with an IRR of less than 10%. However, the local authority may have wider strategic reasons for developing such projects. Examples include:
  - Resilience to ensure ongoing supply to key buildings;
  - Sizing the project such that additional buildings or new developments can come online in the future; or
  - Allowing flexibility in respect of the long term nature of heat offtake agreements where key private sector building owners are unable / unwilling to sign a 15 year plus contract.
- A Low Carbon Investment Fund may be able to offer more flexible long-term debt funding, possibly on a sub-commercial basis, to mitigate excessive risk taking by the local authority and to enable such projects to attract third part commercial funding. For example:
  - As a cornerstone offtaker, entering into onerous long-term guaranteed usage commitments; and/or
  - Acting as the developer and/or operator of the scheme in the short-term where the risk/reward structure is unattractive to the private sector.

Other project opportunities

- Examples of other projects that are currently being developed with a funding need that the Low Carbon Investment Fund may be able to support include:
- **Northward housing hydro-electricity scheme:** Northward's housing, part of Irk Valley regeneration steering group, commissioned a Hydro

feasibility scoping study to look at how a hydro-electricity scheme could fit into a wider vision of redevelopment of the riverside area. This study has found that there are potentially three viable schemes that could be developed along the River Irk, an overview of which is provided in the table below.

Option	Installed Capacity	Potential cost (£'000)	Simple payback (yrs)	% ROI over 20 years	Number of homes powered	CO2 saved, tonnes
Option 1	19	75	7.5	166	17	38
Option2	24	100	8	144	22	48
Option3	71	230	4	389	73	162

- This project evidences the potential need for:
  - **Project development support:** to progress this opportunity beyond feasibility stage, and potentially seek to aggregate this with other hydro-electricity schemes in the pipeline to create sufficient critical mass to merit project development and financial due diligence costs; and
  - **Investment**: there could be a potential funding market failure arising from the small capital value of the scheme and the payback term, which is likely to be in excess of 10 years (in the case of Options 1 and 2) when commercial funding rates are incorporated into the project financial model.
- **Smithfield Market:** A business plan has been developed by a private sector sponsor for an anaerobic digestion facility processing waste food and generating electricity and heat near Smithfield Market in Manchester. The estimated capital expenditure for the project is £4.5 million, with the facility anticipated to be operational by Q4 2015. However, the business plan does not address fully how:
  - It will secure sufficient long-term feedstock contracts;
  - The capital cost of the heat network required to distribute the heat by-product, or how it will be financed; and
  - Heat offtake agreements will be secured with the proposed Smithfield Market tenants, the owner of which is the Council.
- It is understood that Manchester City Council is working with the private sector developer to address these issues to help progress the scheme. However this is another example of a project that in the short term may benefit from project development support and in the long term financial support from the Low Carbon Investment Fund – especially where fully credit worthy feedstock and offtake contracts cannot be secured at the outset of the project.
- **Noma CHP Development:** This project involves the development of a gas fired CHP plant in support of the NOMA development in Manchester city centre. It is understood that the project will cost circa £21m and is estimated to start on site in Q2 2016. The initial modelling undertaken to date suggests that the project will generate a relatively small operating surplus, with a payback period in excess of 15 years. The project is also further complicated by the presence of multiple commercial end users. The project may be unlikely to secure commercial finance over the period proposed and with the uncertainty and risk around potential end users. It is therefore considered a potential candidate for the Low Carbon Investment Fund.
- **Oxford Road Corridor** – This project is a proposed new heat network, involving a number of potential large end users (Manchester Metropolitan University, Manchester University, Manchester Science Park etc). Whilst there are a relatively limited number of end users proposed, the project involves the use of a geothermal technology therefore adding a layer of potential technological risk of the scheme. The project has an estimated capital cost in the region of £33m and is currently planned to start on site in 2017. In addition, to the technological risk, the project has a payback period of 25 years, meaning it is unlikel y to secure commercial finance and is a possible candidate for the Low Carbon Investment Fund.
- **MediaCity** – This project involves the development of a new CHP plant to support the expansion of an existing heat network at MediaCity. The project

will cost circa £10m and similar to the NOMA example will generate a small operating surplus with a payback period in excess of 15 years. There is also a degree of uncertainty surround end user demand, which is unlikely to be resolved prior to the intended start of the project. Again this project is a potential candidate for the Low Carbon Investment Fund.

Potential role of Structural Funds

Grant-fund project development support

- Section 3, the project pipeline review and sub-sector analysis all suggest that a key barrier to the delivery of low carbon projects is a lack of coordinated project development support. The scale of the pipeline and the recurring delivery challenges identified suggest that there is a need for grant support to fund the activities required to bring 'investment ready' projects to market.
- AGMA has already identified that greater capacity is required in order to develop projects to an investible stage in a timely manner and to date has been utilising its own internal resources, external consultants and potential lenders to try to better understand the current pipeline of projects and progress their development. It is understood that the internal team dedicated to these activities has an annual budget of £290,000 from AGMA, and includes a core staff of less than 10 full time equivalents. The team is led by the Director of Environment for GM.
- Given this limited capacity and skillset within GM currently it may want to consider putting in place further project development resource, possibly as part of the Low Carbon Investment Fund, to bring forward the project pipeline identified.
- GM may want, or indeed need to consider allocating a small proportion of its ESIF to finance these activities on an annual basis. While such a grant cannot be recycled and will require to be 50% 'match' funded by GM, the potential outcomes from coordinated project development could support include:
  - **Leverage**: on the grant commitment as measured by the quantum of project investment resulting from the development of 'investment ready' projects. Such leverage could come from other sources of complementary funding as outlined in Section 3.
  - **CO2 reduction and energy savings:** from projects that progress through to construction and completion; and
  - **Job creation:** both from the establishment of a dedicated project development team/unit and construction and operational activities of the underlying projects.
- This need will be a function of the funding requirement to set-up and run such support. It is understood that the only alternative funding sources are:
  - **GM Structural Funds Technical Assistance budget:** GM has a budget of approximately £1m per annum to support the establishment and ongoing operation of the 2014 – 2020 programme. However, this budget is already largely accounted for, and is unlikely to have sufficient capacity to meet the potential funding requirement for the support envisaged;
  - **ELENA grant funding:** GM is currently preparing an ELENA application for grant funding to support project development activities, some key conditions of which are set out in Appendix H. However, even if successful it may not be sufficient to meet the full cost of the possible resource requirement; and
  - **Local authorities:** the ten authorities may be willing to allocate funding to support project development on a city region basis. However, recognising increasing budgetary pressures, a combination of Structural Funds grant and ELENA funding, with the required 'match' funding for both being provided by the authorities would keep the quantum of such a commitment to a minimum.

FI funding products

- The sub-sector analysis suggests that there may be a need to combine the proposed project level investment from the Low Carbon Investment Fund with project development capability either as part of, or sitting alongside the FI to help aggregate and bring forward projects in the medium-long term.

- The most developed projects in the pipeline are currently local authority led, which could utilise reserves or borrowing from the PWLB to fund their construction. Although, it should be noted that even with such funding sources theoretically available, projects are not been taken forward on this basis. The Low Carbon Investment Funds potential role in such projects, will need to be carefully structured so as to unlock and maximise the leverage from other funding sources and avoid simply displacing existing funding sources. However, there may also be a value added role for the Low Carbon Investment Fund in these early projects, if:
  - The opportunity to secure a competitive funding product specifically for low carbon projects acts as an added incentive for authorities to prioritise low carbon projects within their wider capital programmes; or,
  - Projects are quickly developed into public-private or private sector led propositions, whereby long-term debt for sub-£20m projects may be sought by the project sponsor / SPV.
- If such a strategy were to be pursued, the immediate funding need for the Low Carbon Investment Fund is likely to be **senior debt products** for NDEE projects. Key points to note in respect of the fund's potential performance are:
  - **Returns:** As illustrated in the NDEE programme example above, a FI offers the potential to provide lending to authorities on a corporate basis at a blended interest rate (assuming PWLB 'match') of as little as between 1.59 – 1.99%. However, this should be viewed as a floor only, not a recommendation.
  - **Recycling:** due to the debt tenor (which could be up to 15 years) the potential for short-term recycling of returns to further GMs low carbon objectives is likely to be limited to the regular capital and interest receipts generated by underling projects. Refinancing of such lending is unlikely as the cost of borrowing could be very low as noted above.
- If the recommended project development support is put in place, in the medium-long term (i.e. 2-5 years) there is likely to be a greater need from public-private joint ventures and/or private sector project vehicles for the Low Carbon Investment Fund to provide for example:
  - **Senior debt:** on a commercial basis for projects with a capital value of sub-£20m; and/or
  - **Subordinated and/or mezzanine debt:** above which third party senior debt can be secured; and/or
  - **Guarantees:** in the event senior lenders may require additional security from project sponsor for example, in respect of credit worthy counterparty agreements (e.g. heat offtake in the case of district heating). In such circumstances the fund could provide a guarantee to the project sponsor. However, it should be noted that while such products are permissible, we are not aware of any FEI having provided a guarantee in the past and challenges may exist in pricing such guarantees and evidencing that this has been achieved in a state aid compliant manner. However SDCL (one of the GIB sub-fund managers) has recently invested into a low carbon project with NCP, where a government guarantee has been utilised evidencing that it is possible[18].

Complementarity with other proposed FIs

- In addition to the Low Carbon Investment Fund, the Evergreen Fund and the proposed Evergreen Fund II have the capacity to fund low carbon real estate projects. As their strategies target primarily the private sector, were private sector led building energy efficiency and/or low carbon new build to come forward, these FIs may be capable of supporting them. This demonstrates the:
  - Complementarity between the existing and prospective FIs in respect of low carbon investing as set out in the respective Ex Ante Assessments; and

[18] http://www.sdcl-ib.com/fileadmin/user_upload/EE_Section/SDCL_NCP_Press_Release.pdf

  - Possible need to have flexibility between the allocations between the two FIs to ensure resources can be moved to the area of greatest need. This is considered in Section 9 below.

Match and complementary finance

- As the funding need of the local authority owned and operated projects identified is primarily senior debt, 'match' funding options include the:
  - PWLB (as considered in the sub-sector analysis above); and
  - EIB.
- It is understood that the EIB is currently in discussions with Manchester City Council in respect of the possible provision of a senior debt Framework Loan that all 10 authorities in GM can then call upon. While the terms and conditions underpinning what the facility could be used for are still to be fully developed, the proposal is that it will include the ability for the authorities to draw down funds for low carbon projects. Key provisions are likely to include:
  - Loans up to 50% of project capital costs;
  - Loans will be offered on a corporate basis, therefore benefiting from the credit strength of the local authority;
  - Capital value triggers for EIB and EC approval (e.g. £25m-£50m requires EIB approval, with the additional approval of the EC required for £50m plus).
- In the medium-long term, as the investment needs of the project pipeline evolve, the various funding sources identified in Section 3 may offer potential 'match' and/or complementary funding, in particular for standardised projects or those with a capital value of £20m plus. However, depending on this risk profile of these projects, 'match' funders such as GM (through PWLB borrowing) and/or EIB (via any framework loan) may seek their lending position to be senior to that of the FI contribution.
- Moreover, particularly in the case of district heating projects, where the need for sub-ordinated / mezzanine debt and/or guarantees may be required to enable projects to progress, securing private sector 'match' funding is likely to prove challenging. In such circumstances the Low Carbon Investment Fund may be required to offer non-pari passu 'match' funding whereby a preferential return is earned by the third party investor.
- Where such approaches are taken, the Low Carbon Investment Fund will need to ensure that it is compliant with ESIF and State Aid Regulations.

State aid

- Investment by the Low Carbon Investment Fund into projects will be required to be undertaken in a state aid compliant manner. However, in the short-term, as the most developed projects in the pipeline are public sector led, they may not fall within the state aid regulatory requirements.
- For those projects that do fall within the state aid rules Reference Rates can be applied for senior debt or where available, private sector funding could be secured on a pari passu basis for mezzanine and subordinated debt and equity . This, together with the Evergreen Fund I already having a state aid notification that would cover any possible private sector real estate low carbon project investing to the end of 2015 and from recycled returns, suggests there is not an immediate need to apply for a state aid notification.
- However, recognising the extended timescales often encountered in securing such a notification, GM may wish to progress a new one that could permit mezzanine and subordinated debt and equity investing or provision of guarantees by the Low Carbon Investment Fund without private sector 'match' on a pari passu basis, in conjunction with any requirements of Evergreen Fund II.
- Alternatively, as the new General Block Exemption Regulation (GBER), which is due to be made later this year is expected to provide a framework for sub-commercial investments, GM may consider these provide sufficient flexibility for the Low Carbon Investment Fund. However, GBER only applies to assisted areas and while the recipient of the 'aid' can be small, medium and large sized enterprises, the smaller the enterprise the higher the percentage of aid that is permissible.

2016 Ex Ante update

- The project pipeline has been refined and now contains 16 heat network projects, 1 hydro and two solar photovoltaic projects:

Heat Network Project name	Stage of development	Geography	Capex (£m)	IRR (%)	Payback
St Johns	Procurement	Manchester	25		
Corridor Manchester	Detailed development	Manchester	25		25 years
Piccadilly station	Pre feasibility	Manchester	20		
Civic quarter 2 NOMA	Feasibility	Manchester	21		15 years
Smithfield AD	On hold	Manchester	TBA		
Regional Centre Masterplan	Pre feasibility	Manchester	TBA		
Town Centre	Feasibilty	Oldham	8.6		
Town Centre	Feasibility	Stockport	2-8		
Media City Expansion	Feasibility	Salford	19.3	6.8	16 years
Pendleton Development	Feasibilty	Salford	10.8		
Salford Central	Pre-feasibility	Salford	30		
Town Centre	Pre feasibility	Bury	4.6		
Ashton Town Centre	Feasibility	Tameside	5.8		
Trafford Park	Pre Feasibility	Trafford	52.5		
Raikes Lane	Feasibility	Bolton	11.4		
Total			**236 +**		

Project name	Stage of development	Geography	Capex (£m)	IRR (%)	Payback
Charlestown	Pre-feasibility	Salford	5.8		
Multistorey PV car park canopies	Feasibility underway	Manchester	1.5-2		
Regional leisure	Feasibility underway	Manchester	2-2.5		
Total			**9.9+**		

- The current known heat network pipeline across GM up to 2020 is estimated to have a capital value of around £236m. Almost half of this is at pre-feasibility stage and will therefore benefit from the PDU and DECCs Heat Network Delivery Unit to help bring the projects forward. However, the St Johns project in Manchester with a £25m capital value is currently at the procurement stage and could be early beneficiaries of the Low Carbon Investment Fund.
- Additionally, there are c. £10m of capital value retrofit and hydro projects in the 2016-2020 pipeline across GM and two of these projects are due to complete the feasibility studies in the next couple of months.

- The street lighting projects included in the 2014 pipeline have been removed from the revised pipeline as it is no longer the intention to use the Low Carbon Investment fund to assist with bringing these projects to market/funding these projects.

Case Study – Media City

Overview and project status

- The expansion to the existing heat network at Media City in Salford is at feasibility stage with Arup having undertaken the report.
- The existing network is jointly owned by Peel Utilities and Peel Media and provides energy direct to customers at the Media City UK site. The systems include a gas-fired CHP engine, heat network, private wire network and an absorption chiller to provide cooling to one building.
- A techno-economic feasibility study was commissioned by Salford City Council and the Low Carbon PDU supported by the DECC Heat Network Delivery Unit and completed by Arup.
- Seven different scenarios were considered with the local expansion of the existing network being the most viable. This proposed scheme uses the existing Media City UK energy centre plant plus an additional 2.7MWe engine installed in the existing energy centre plus around 750m of buried pipework.
- This scheme has a capital cost of £13.1m which includes £1.5m for an additional CHP engine, £1.3m for buried pipework and £6.1m for internal building pipework. It will provide heat to 12 commercial buildings and 3,320 high-rise apartment residential dwellings. The cost of heat substations and heat meters has been calculated at £9.7m with an allowance for avoided dwelling boiler costs of £6.1m.
- The scheme is expected to be delivered in 2018/19 and will achieve carbon savings of 3,000 tonnes per annum.

Funding need

- The feasibility study shows the scheme having an Internal Rate of Return (IRR) of 6.8% and a positive net present value of £35.1m at 3.5% discount rate. The simple payback is estimated to be 16 years and the discounted payback 20 years. The current IRR and payback imply that private sector financing may be limited for this heat network and therefore the Low Carbon Fund could be used to assist in financing this project.

Case study – St Johns

Overview and project status

- The proposed project will include a site wide district heating network, onsite CHP with private wire and onsite heat infrastructure to be capable of integration with the emerging plans for district heating in the local area.
- It is the intention that the district heating network and plant will supply The Factory, which is a development of 2,400 residential units, workspace, three new hotels, arts culture and entertainment buildings.
- The project has a capital cost of £25m and will lead to CO2 savings of 2,600 tonnes per year. Allied London is leading this work and is now in procurement for a delivery partner.

Funding need

- The scheme is being developed by Allied London who are due to finalise the funding analysis shortly. However, as noted in the market gaps analysis, few schemes have come to the market, as evidenced by the recent establishment of the DECC Heat Network Delivery Unit to support project pipeline development due to wide range of issues in relation to obtaining funding. It should also be noted that this scheme is not being undertaken via the CEF framework.

Case study – Corridor Manchester heat network

Overview and project status

The Corridor Manchester is a 243- hectare area which is home to knowledge intensive organisations and businesses including universities, creative industries, low carbon specialists, digital experts and financial services. It generates 20% (c. £3bn) of Manchester's GVA. The feasibility study shows the scheme having an IRR of 5.07% and therefore, given the sub-commercial rate of return, this would indicate the project will require financial assistance.

This scheme has now been split into two elements, namely the Northern Crescent network and the Southern Crescent network.

The Northern Crescent network

- The project is at feasibility stage with Arup having completed the report in January 2016.
- The proposed project includes heat network plans to service a number of key entities along the northern section of the Oxford Road Corridor in Manchester including a campus wide energy network at Manchester Metropolitan University and connection to the Circle Square development (Bruntwood) which will be a mixed use development of commercial and residential buildings.
- The proposed project will also include a new modular boiler plant with connecting pipework to the new Arts and Media Building, a CHP connecting to University buildings and a separate energy centre including CHP and gas boilers.
- The Northern Crescent network has a capital cost of £10m, and is expected to be operational in late 2018.

The Southern Crescent network

- The project is at feasibility stage with Arup having completed the report in January 2016.
- The proposed project is for the development of a heat network to service the buildings surrounding the Octagon House redevelopment project. The Octagon House project is a regeneration propert development which is owned by Sustainable Energy Supplies Ltd and will include an energy centre (CHP plant with private wire and capability to export heat to a heat network).
- The heat network is planned to service Nuffield Hospital and Whitworth Park Halls (student residential accommodation) and Grove Village with the potential to include further buildings such as St Chrysostom's & Webster schools.
- The Southern Crescent has a capital cost of £15m and is expected to be operational in late 2017.

Funding need

- The current IRR and payback imply that private sector financing may be limited for these heat networks and therefore the Low Carbon Fund could be used to assist in financing this project.

Case study – Manchester Piccadilly Heat Network

Overview and project status

- Following the successful award of Round 4 Heat Network Delivery Unit (HNDU) funding from DECC, a masterplanning study was commissioned by MCC with support from the GMCA Low Carbon Project Delivery Unit (PDU). This is due for completion this month.
- The area around Manchester Piccadilly Station includes a diverse and dense mix of commercial and mixed-use buildings, and significant regeneration proposals at Mayfield, Piccadilly Basin, and the University of Manchester's North Campus.
- This scheme has a capital cost of between £3.7m and £4.3m. The base scheme includes supplying heat and electricity to Piccadilly Station and heat only to Network Rail Square One Building, the MacDonald Hotel, Gateway House and London Road Fire Station. The extended scheme would also include connecting the heat network with two student residential buildings and the KAMPUS development.

Funding need

- The initial high level model shows the scheme having an Internal Rate of Return (IRR) of between 15 and 18% at this stage. Whilst this is a commercial rate of return, GM notes that, from their experience, all projects typically suffer a decrease in IRRs as the project scoping is extended and the project is developed further.

Case study – National and Regional Leisure Facilities

Overview and project status

- The project is currently undergoing the feasibility study having completed a desk-top feasibility study in July 2016. Forrest Energy completed this work.

- The proposed project is for the installation of solar PV totalling 1-1.5MW across the leisure complexes within Greater Manchester which are currently managed by Greenwich Leisure Ltd and the Manchester Leisure Trust. The leisure facilities include both national and regional complexes such as the former Commonwealth games facilities.
- The proposed project has a capital cost of £2-£2.5m and is expected to start procurement in 2017. It is anticipated to achieve carbon savings of between 1000 and 1300 tonnes p.a.

Funding need

- The desk-top feasibility study shows the scheme having rate of return of c. 9%. However, if management and finance costs are included within the return calculation, the return drops to 3-4% which would indicate a limited attractiveness to a private sector investor but potentially an attractive investmenr for the public sector.

Case study – Multi storey solar PV car park canopies

Overview and project status

- The project is currently undergoing the feasibility study having completed a desk-top feasibility study in July 2016. Forrest Energy completed this work.
- The proposed project is for the installation of solar NCP managed and jointly owned car park facilities across Greater Manchester.
- The proposed project has a capital cost of £1.5-£2m and is expected to start procurement in 2017. It is anticipated to achieve carbon savings of between 1000 tonnes p.a.

Funding need

- The desk-top feasibility study shows the scheme having rate of return of c. 9%. However, if management and finance costs are included within the return calculation, the return drops to 4% which would indicate a limited attractiveness to a private sector investor but potentially an attractive investment for the public sector.

Use of GBER

- GM has decided not to seek a State Aid notification for the Low Carbon Investment Fund as it will make investments in accordance with the Market Economy Investor Principle, or utilise the General Block Exemption Regulations (GBER)[19] if required and applicable. Advice received from the internal legal team states that:
  - In the majority of cases funds will be invested alongside private sector match and such investments will be on similar terms of investment as a commercially driven comparator, therefore no advantage will accrue to the beneficiary. Where no market comparators are available it is GM's intention that the majority (if not all) loans will be made to end recipients at commercial rates of interest based on the European Reference Rates, therefore no unfair benefit will accrue to the beneficiaries; and
  - Where investments are made to end recipients which may be capable of conferring a benefit to the end recipient, such investments will be made within the framework of a block exemption, in particular, the General Block Exemption Regulation, in particular, section 1 (Regional Aid), section 2 (Aid to SMEs), section 3 (Aid for access to finance for SMEs), section 4 (Aid for Research, Development and Innovation), section 7 (Aid for Environmental Protection), section 8 (Aid to make good the damage caused by certain natural disasters) and section 13 (Aid for Local Infrastructure) of Regulation 651/2014

Overall funding need

- Based on the above case studies and pipeline of projects together with the funding market gaps and existing complimentary funding sources, there does still appear to be a need for additional funding to support low carbon projects which would otherwise, (e.g. through sub-optimal returns etc), be unattractive to private sector funders.

[19] http://ec.europa.eu/competition/state_aid/legislation/practical_guide_gber_en.pdf

- The total capex of the pipeline, together with the proportion of projects in the procurement/feasibility stage would seem to indicate that there is a gap in funding of upto £70m and therefore £15m could be deployed on low carbon projects in Greater Manchester up until 2020.

8. Low Carbon Investment Fund investment strategy

- If GM decides to proceed with the establishment of the Low Carbon Investment Fund, based on the assessment undertaken in Section 7, the investment selection criteria for low carbon projects should include a number of factors that are outlined in this section. The investment strategy will be subject to revision following any subsequent Ex Ante Assessment updates and will be informed by the prospective project pipeline at that point.

Strategic alignment

- Investments should align with national and regional strategic priorities in respect of transitioning to a low carbon economy. For example, investments should be consistent with the:
  - Low Carbon theme of the draft GM EU Investment Plan; and/or
  - Greater Manchester Climate Change Strategy.

Permitted investments

- Based on the work undertaken as part of this assessment, this may include:
  - **Sector focus:** non-domestic energy efficiency which may include interventions by organisations that:
    - Reduce energy consumed arising from existing and/or future supply, transmission, distribution or consumption of energy; and/or
    - Reduce GHG emissions from energy sources they own/control or purchase from; and/or
    - Increase the supply of renewable energy generated on their premises or at a site directly connected to the premises of the organisation.
  - **Investment products:** senior, mezzanine and subordinated debt with a tenor of up to 15 years.
  - **Investment recipients:** this may include public and quasi-public sector bodies / project vehicles and private sector bodies.
- In the medium-long term where there is an identifiable project pipeline with funding market failures as outlined in Section 7, GM may want to consider extending the permitted investment parameters to include:
  - Equity/ungeared investments; and/or
  - Guarantees; and/or
  - Provision of funding to public-private joint ventures, private sector organisations / project vehicles; and/or
  - Other low carbon sub-sectors such as on-shore wind.

Geography

- For the purposes of this assessment, it is assumed that the geographic focus will be Greater Manchester only. However, GM may elect to broaden the geographic to include other LEP areas with a similar low carbon agenda in the future.

Investment returns

- The pipeline suggests early opportunities could exist to lend to project seeking debt finance. While the commercial delivery of the majority of the projects is still to be determined, it is anticipated such senior lending may

be provided on a corporate basis. The lending rates achievable will be a function of:

- The credit strength of the borrower;
- The amount of collateral offered, relative to loan value;
- An appraisal of the risk profile of the proposed transaction (where corporate lending is not proposed);
- The tenor of the debt;
- Whether the project falls within the State Aid rules (see below) and the application of such rules (if required).

Target outcomes

- Each investment will be required to contribute to some or all of the low carbon non-financial outcome measures included in the GM EU Investment Strategy. This will include a contribution to GHG emissions and energy efficiency savings. See Section 11 for a review of the outcome measures included in the GM EU Investment strategy and areas for further consideration.

Other considerations

- In addition to these sector specific parameters, based on experience from other UK FEIs, the investment strategy will also need to include the following.

Regulatory compliance

- Investment of FIs into projects will be required to be undertaken in a state aid compliant manner (as applicable).
- Structural Funds regulations require that investments adhere to EU Rules, which includes, for example, ensuring each project has 'eligible expenditure' that is greater than, or equal to, the FI project commitment plus associated 'match' funding.

Investment exclusions

- Based on experience from other UK FEIs, exclusions that GM may wish to adopt within the investment strategy may include:
  - Activities which are wholly a statutory duty on public bodies;
  - Specific technologies and/or counterparties that are not permitted by 'match' and/or complementary funding providers;
  - Investment commitments of less than £[1]m[20];
  - Projects where the site is not within the permitted area covered by the GM EU Investment Strategy;
  - Concentration limits in respect of cumulative value of loans to particular counterparties;
  - Funding of the creation and development of financial instruments such as venture capital, loan and guarantee funds. FIs must finance the development, construction and/or operation of projects.

2016 Ex Ante update

- Following the revision of the pipeline of projects in 2016, the focus of the low carbon investment fund will be predominantly targeted towards investment in the heat network sector, although other, non-heat network projects will also be considered for investment e.g. solar PV retrofit.
- Since 2014 when the original Ex Ante was undertaken, England has moved to one national Operational Programme, and the Low Carbon Investment Fund will focus on Investment Priority 4a within Priority Axis 4 as previously noted in section 2.

[20] While this proposed figure is lower than the minimum set by LEEF (FEI), this was proposed by GM. Where project development activities are largely undertaken outside of the FI, transaction costs should be lower therefore increasing the possibility of achieving this minimum investment amount.

- There are specific objectives and targets which correspond to this Investment Priority to which any investment made by the proposed Low Carbon Investment Fund is expected to contribute. These objectives are:
  - To increase the number of small scale renewable energy schemes in England.
  - Activity under Investment Priority 4a must be complementary to and work alongside activity under Investment Priority 4e – promoting low carbon strategies for all types of sustainable multimodal urban mobility and mitigation relevant adaptation measures.
  - Measures to support increased production of renewable fuels and energy, in particular wind energy, solar and biomass.
  - Measures to support the wider deployment of renewable heat, including micro-generation, geothermal, renewable heat networks or district heating, ground source and air source heat pumps, and biomass systems with associated heat off-take and heat distribution networks along with recycling processing reprocessing and remanufacturing facilities.
- The outcomes attributable to the Low Carbon Investment Fund are estimated by GM to be:

Output Targets	
Number of sites	10
Greenhouse Gas Reduction p.a. (tonnes)	8,300 – 17,250

- The pipeline includes a number of projects which are at various stages of development from feasibility study through to actual procurement. The latest date when the first heat customers are expected is 2020.
- As can be seen from the case studies included in Section 7, the St Johns, Media City and the two solar PV projects have a total Greenhouse Gas Reduction of between 7,600 and 7,900 tonnes p.a. and this is just from 4 of the total 18 projects in the current pipeline.
- Given the overall number of projects within the pipeline, this would seem to indicate that the total site target of 10 and consequently the minimum Greenhouse Gas Reduction target of 8,300 tonnes p.a. could be achievable by 2020.
- Furthermore, the projects included within the pipeline are in line with the low carbon/renewable objectives stated above.
- Additionally, a number of the projects included in the pipeline are achieving sub-commercial IRRs which reduces the ability to attract external funding sources and therefore this indicates the need for an alternative funding source to those already available.

9. Low Carbon Investment Fund design

Introduction

- In addition to developing the investment strategy for the Low Carbon Investment Fund it is important to consider the following when selecting the possible structure for the Low Carbon Investment Fund:
  - The range of options available and the preferences expressed of GM; and,
  - Permissible structural options in respect of the set-up and operation of a FI, or alternative vehicles capable of undertaking the role of a FI, as defined by Article 33 of the Common Provisions Regulations[21] (CPR).
- In addition to these points it is necessary to consider the existing Evergreen Fund structure and governance arrangements and the proposed Evergreen Fund II investment strategy and governance structure to understand possible alignment or complementarity with the proposals. This will inform whether there is a need for one or more funds to address the investment strategies proposed for the Evergreen Fund II and Low Carbon Investment Funds.
- The aim of this section is therefore to provide an initial recommendation of the possible structure for the Low Carbon Investment Fund, assuming its short-term focus is as described at the end of Section 7.
- It should be noted that this recommendation is subject to possible changes resulting from:
  - GM securing legal advice to test regulatory compliance; and/or
  - Testing the proposal with the Department of Communities and Local Government (CLG) for acceptability; and/or
  - The ongoing development of the low carbon project pipeline and its funding needs, which may in the long-term require alternative (possibly external) investment management expertise/capability.
- As agreed with EIB and the Steering Group, this section excludes consideration of the potential need for a Holding Fund (or fund of funds structure) that may oversee the Low Carbon Investment Fund. This will be addressed in an Addendum to this assessment.
- The implications of the fund's design as proposed in this section on the structure and governance of the project development support required, as identified in the preceding sections is considered in the next section.

Fund structure options and GM preferences

- The three high level structure options identified for the Low Carbon Investment Fund are:

No.	Option	Description
1	GM investment decision making and management	GM authority-led staffing and expertise to consider and process applications for funding,

[21] http://ec.europa.eu/regional_policy/what/future/pdf/preparation/262709_ia_1_financial_instruments_implementig_act.pdf

No.	Option	Description
		make investment decisions and undertake ongoing reporting and monitoring.
2	GM investment decision making with external management support	GM authority-led investment decision making, but could include external support from advisors, a financial institution (which may also act as a potential investor) and/or private sector fund managers, in respect of the investment decision making process and/or ongoing reporting and monitoring.
3	External investment decision making and management	Fund would be fully outsourced to a third party (e.g. a financial institution or private sector fund manager), with no public sector oversight of the activities beyond that typically afforded to any investor in a fund (e.g. in an English Limited Partnership structure this may include periodic reporting and possibly a seat on the Advisory Board).

- At the Steering Group on 10 December 2013 the following criteria were agreed as the basis upon which to assess possible FI structures:
  - Deliverability of the proposed investment strategy, as outlined in the section above,
  - Ability for GM to make the ultimate investment decisions;
  - Fund and associated cost minimisation (e.g. Fund establishment, project due diligence, investment decision making, reporting and monitoring costs);
  - Speed of implementation; and
  - Ability to attract private sector 'match'/complementary funding.
- Based on these criteria, Option 3 has been discounted for the following reasons:
  - It offers no control over investment decision making to GM authorities.
  - The majority of the project origination work will be undertaken internally within GM, negating the need to 'buy in' origination from a fund manager as is the case in usual external fund management mandates. Furthermore, a number of the projects identified in the project pipeline appear to require relatively straightforward senior debt products. Such financial support lacks the complexity that may necessitate full third party fund management expertise and justifies their management fees[22].
  - As outlined in Section 7, the EIB is in discussions with GM in respect of providing a framework loan that will offer the potential for up to 50% 'match' or co-financing into low carbon projects led by public sector sponsors. As such a facility is likely sit alongside, rather than as a component part of the fund, there is no current evidence that indicates a need for independent/private sector involvement in the fund to secure third party support.

[22] The CPR permits management fees of up to 3% per annum of FI commitments to be charged, although competitive procurement can reduce the actual quantum payable.

Recommended fund structure option

- To aid the decision making on whether Option 1 or Option 2 could offer GM the best structure for the Low Carbon Investment Fund, a qualitative analysis has been undertaken. Appendix J sets out this analysis where each option is assessed against the evaluation criteria above.
- From this analysis, Option 1 (a wholly in-house investment decision making and management solution) appears to be most closely aligned to the key priorities for the Low Carbon Investment Fund. The key reasons for the selection of this option over Option 2 are:
  - **Simplicity of the financial product:** the structuring of debt products to public sector bodies can be relatively straightforward. It is likely to be offered on a corporate basis and is unlikely to be bound by state aid rules. If it is, state aid reference rates can be applied. This may negate the need for external advisory or financial institution support in the short-term, while the project pipeline is further developed.
  - **GMCA experience:** through its investment structuring, decision making and ongoing oversight of the GM Investment Funds applications, which include allocations of Growing Places and Regional Growth Funding, GMCA has already established a dedicated Core Investment Team that should be capable of undertaking the investment activities proposed for the Low Carbon Investment Fund. It is understood this team will deal with the structuring and financing of projects and use the continued support of external advisers KPMG who provide an independent review / due diligence process.
  - **Cost:** in the short-term it may be possible for GMCA to commence the required activities of the Low Carbon Investment Fund with limited additional resource (assuming project development support proposed in Section 10 is additional to the investment structuring and decision making), which could help to minimise the costs of the structure.
  - **Flexibility:** recognising that the needs of the low carbon project pipeline are anticipated to evolve over time, keeping the fund in-house in the short-term may offer greater flexibility to adapt the structure in the long-term. This may be more achievable with a lean investment management team and no tie-ins to third party advisory mandates.
- This recommendation was approved at the Steering Group on 10 December 2013, but remains subject to GM:
  - Agreeing strategically that it wishes to establish a Low Carbon Investment Fund in the short term; and
  - Seeking legal advice on the development and governance of the proposed fund.

Permissible regulatory options

- The permissible regulatory compliant structure for the Low Carbon Investment Fund structure is a separate legal entity (either new or existing).
- It is recommended that GM engages with CLG/BIS to test the acceptability of the proposed fund structure from a regulatory perspective, recognising that some of the regulations governing ESIF are still under consultation.

Interface with the Evergreen Fund(s)

- The design of Evergreen Fund II is considered in the Evergreen Fund Ex Ante Assessment. However, it is important to consider the existing Evergreen Fund I structure and governance arrangements and the proposed Evergreen Fund II investment strategy and governance structure to understand possible alignment or complementarity with the Low Carbon Investment Fund proposal.
- In the short-term, with the current public sector focus of the Low Carbon Investment Fund and the following investment strategy for the existing and new Evergreen Funds, the funds appear complementary:
  - **Sector focus:**

- Commercial property and regeneration projects
- Low carbon projects linked to new development or regeneration that support the delivery of GM's greenhouse gas emissions target and/or demonstrate energy efficiency improvements.

– **Investment recipients**: predominantly private sector organisations.

– **Investment Products:** Predominantly senior, mezzanine and subordinated debt with a tenor of up to five years. Equity investments will be permissible subject to investment committee approval.

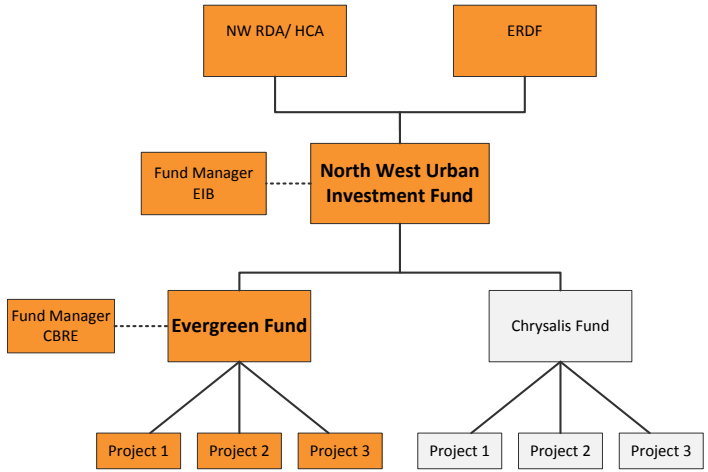
- If in the short term private sector led low carbon projects come forward that require investment, subject to meeting the strategy of either the Evergreen Fund or Evergreen Fund II, they may be able to source finance from either of these funds. On this basis, in the short-term having a separate Low Carbon Investment Fund appears complementary.
- In the medium to long term, the low carbon strategy may evolve to include private sector low carbon projects, adding further value over time once a track record is established and the Project Development Unit work is underway to drive the pipeline forward. However, it will be necessary for GM to review this position regularly to ensure the currently proposed Low Carbon Investment Fund remain fit-for-purpose and is aligned with the Evergreen Fund II investment strategy.
- While the need for a Holding Fund will be considered as an addendum to this report, such a structure may offer greater flexibility to move funding allocations between each fund and facilitate greater alignment between these and other funds managed by GM (e.g. RGF and GPF).

Holding Fund Considerations

- The potential need for a Fund of Funds structure (holding fund) that may oversee the Evergreen Fund II and the Low Carbon Investment Fund is now considered below.

Existing Holding Fund and Evergreen Fund I arrangements

- The structure of the existing arrangements is set out in the following diagram:



- Evergreen Fund I received commitments of £60m from the NWUIF, which are anticipated to be fully invested by 31 December 2015. Assuming no bad debts or investment write-off's, Evergreen Fund I anticipates all investments will be repaid by 2020. Of the £60m, £10m must be geographically allocated to projects in Cheshire, Cumbria and Lancashire.
- It is understood that Evergreen Fund I is responsible for reinvesting recycled capital from the fund until 2022.

– **Use of recycled capital:** under EU Regulations, the investment strategy for recycled monies must focus on Small and Medium Enterprises, Urban Development or Energy Efficiency. Under the existing arrangements, Evergreen Fund I will need to propose an investment strategy for the recycled capital, which then will need to be approved by the NWUIF board.

- **Co-investment of recycled capital:** it is understood that recycled funds can be used as complementary funding to investments made by the two new UDFs proposed for the 2014-2020 funding round. However it remains unclear if it can be used as 'match' funding. EIB is querying this with the European Commission.
- **EU procurement regulatory requirements:** Evergreen Fund I does not need to be re-procured to invest recycled capital. However it is the preference of GM to have the same fund manager for both Evergreen Fund I and Evergreen Fund II and therefore a re-procurement exercise is expected.
- **Receipt of recycled capital returns:** Post 2022, as and when they are received, Evergreen Fund I receipts are required to be returned to the NWUIF and ultimately the HCA and CLG.

- The possible implications these existing arrangements have on the design of both the GM UDFs and any proposed Holding Fund are:
  - The potential inability to use recycled capital as 'match' funding for the 2014 – 2020 funding round, which may place more pressure on other funding sources;
  - The potential for up to two Fund of Fund structures (the existing NWUIF and a new GM-focused one) with different geographic remits and governance arrangements and potential duplication of function;
  - The lack of ability of GM to retain recycled capital from the 2007-2014 funding period post-2022 when the funds are currently required to be returned to HCA.

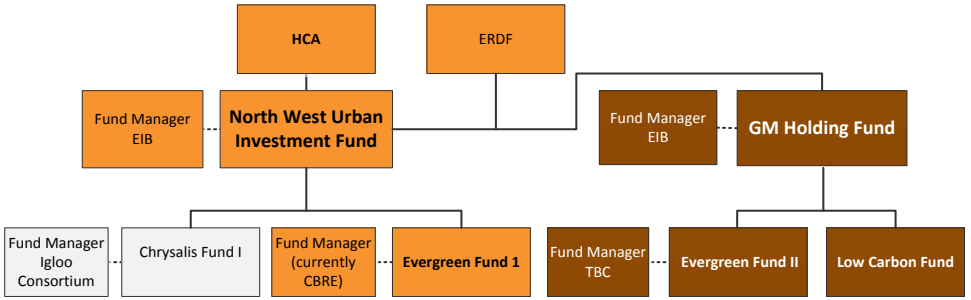
Proposed Holding Fund arrangements

- It is understood that EIB is in discussions with the NWUIF and other stakeholders on the potential for a Holding Fund for the 2014 – 2020 GM UDFs and the form this may take. Reflecting the role of the current NWUIF across GM and Liverpool City Region (LCR), three high level options are currently being considered:

1. **Do Nothing:** retain the NWUIF as the Holding Fund for GM UDFs established for the 2014 – 2020 funding round;
2. **Retain NWUIF and establish two city region focused Fund of Funds**: the former will continue Holding Fund activities in support of Evergreen Fund I and Chrysalis Fund I, while the latter will support GM and LCR UDFs respectively established for the 2014 – 2020 funding round;
3. **Retain NWUIF and establish a GM-focused Fund of Funds**: the former will continue Holding Fund activities in support of Evergreen Fund I and Chrysalis Fund I, while the latter will support GM UDFs established for the 2014 – 2020 funding round.
4. **Novate HCA's interest:** in NWUIF to the GM Holding Fund (if established).

- The options of most relevance to GM are Options 1 and 3 and following discussions between GM and EIB, Option 3 (retain NWUIF and establish a GM focused Holding Fund) was identified as the preferred option.

- The diagram below outlines how the new holding fund could operate alongside the existing holding fund.



Key parties and roles

- The GM Holding Fund would sit above the Evergreen II and the Low Carbon Fund, enabling flexibility to allocate and reallocate monies between the two funds as the respective pipelines develop further.
- It is envisaged that the role of the GM Holding Fund will be to:
  - Oversee and enlist project development capacity;
  - Provide common reporting and monitoring processes and capacity;
  - Refine and amend the investment strategy;
  - Procure additional funds and fund managers;
  - Ensure complementarity funding streams are appropriately aligned; and
  - Develop state aid solutions.
- It is intended that the GM Holding Fund would be distinct from the NWUIF Fund, although Evergreen Fund II may have the same limited partners as Evergreen Fund I, allowing for a potential merger of the two funds in the longer term.
- Whilst the GM Holding Fund would be regulated by the partnership and constitutional documents, it is proposed that EIB would be engaged to provide long term technical assistance to Greater Manchester to support the development and implementation of the two new proposed funds.
- Unlike NWUIF, it is not envisaged that EIB would take the role of a full EIB managed holding fund, rather it will provide support to structure the new funds, expand the investment strategies, procure fund managers and support GM in contracting arrangements.
- While subject to legal advice, it is understood that Evergreen Fund II may utilise the same legal and governance structure as Evergreen Fund I. Evergreen Fund I does not need to be re-procured, however it is understood that GM may re-procure the external fund manager support it requires in parallel or jointly with the external fund manager appointment for Evergreen Fund II. The benefit of this is that it would help mitigate the potential for competing / conflicting investment strategies of the two UDFs.
- The separate Low Carbon Fund is to be managed internally by GM in the short-term with oversight and input from the Evergreen fund manager. There may be a need to procure broader external fund management support in the medium-long term.

Transitional arrangements

- The stakeholders have a long term ambition to transition the HCA's interest in the existing NWUIF Fund to ultimately enable the GM Holding Fund and the GM share of NWUIF to be merged together. This could facilitate:
  - alignment of the regional management and governance structure of NWUIF with the new LEP based structures;
  - management efficiencies and avoid duplication of resources;
  - greater clarity to the market; and
  - GM to take strategic decisions in respect of the performance of Evergreen Fund I, to maximise synergies and the impact of the two Evergreen funds.
- Whilst any such transition is unlikely to take place prior to 1 January 2016 due to the need to ensure full defrayment of the existing NWUIF allocation, further thinking will also be required to understand how it might impact the Chrysalis Fund and whether a similar solution can be developed for Liverpool City Region.

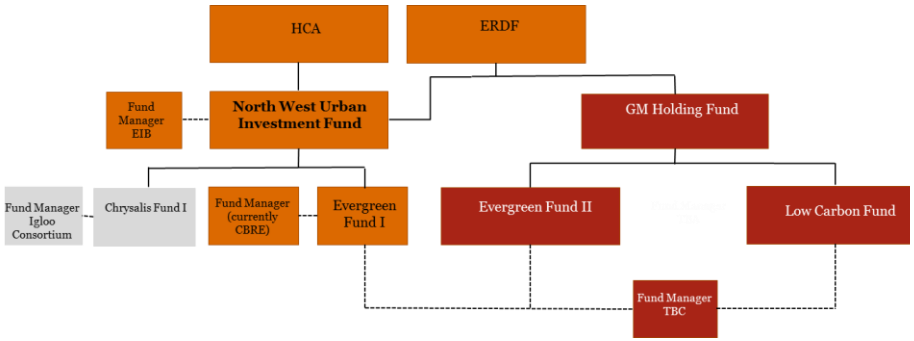
Conclusion

Due to the complexities of novation, in the short term Option 3 is preferred however in the longer term it is Option 4 which is favoured.

2016 Ex Ante update

- Since this report was first written, GM has decided to seek assistance from an external fund manager and is to commence a procurement exercise alongside Evergreen Fund II. Therefore Fund Structure Option 2 – a combination of internal and external decision making has been selected. This option offers flexibility to draw on the external fund manager's expertise for more complex projects whilst still allowing GM to undertake more simple projects themselves. The interface with Evergreen Fund II has also changed with the sector focus now:
  - Research and Innovation infrastructure projects
  - Low carbon projects linked to new development or regeneration that support the delivery of GM's greenhouse gas emissions target and/or demonstrate energy efficiency improvements.

  However, the Holding Fund arrangements is retained as per the original proposal (i.e. option 3), but with the removal of EIB as a fund manager to the GM Holding Fund and only one fund manager advising all three investment funds (as per the diagram below:



- Whilst this is a change from the original options appraisal outcome undertaken several years ago, it is understood that the benefit of having the required expertise from an external fund manager would now outweigh the major disadvantages of options 2, namely the costs incurred in procuring and using fund managers, particularly as GM is now planning to procure a single fund manager for all three funds; Evergreen I, Evergreen II and the Low Carbon Fund.

10. Low Carbon Project Development Unit

Introduction

- Sections 5 and 7 of this assessment clearly identify a number of market failures that are hindering low carbon development within GM, most of which could be addressed through the establishment of dedicated project development support, possibly in the form of a Project Development Unit (PDU), that would be responsible for bringing 'investment ready' projects to market.
- Reflecting on the current status of project development within GM and the proposed design of the Low Carbon Investment Fund (as set out in the section above), in this section we consider:
  - The various activities and skills required to develop low carbon projects;
  - As an example, the low carbon project development and investment activities that have been undertaken by the Greater London Authority (GLA), including possible lessons learnt;
  - The form such project development capacity may take and its associated cost; and
  - The possible allocation GM may wish to consider making to low carbon project development from its ESIF allocation.

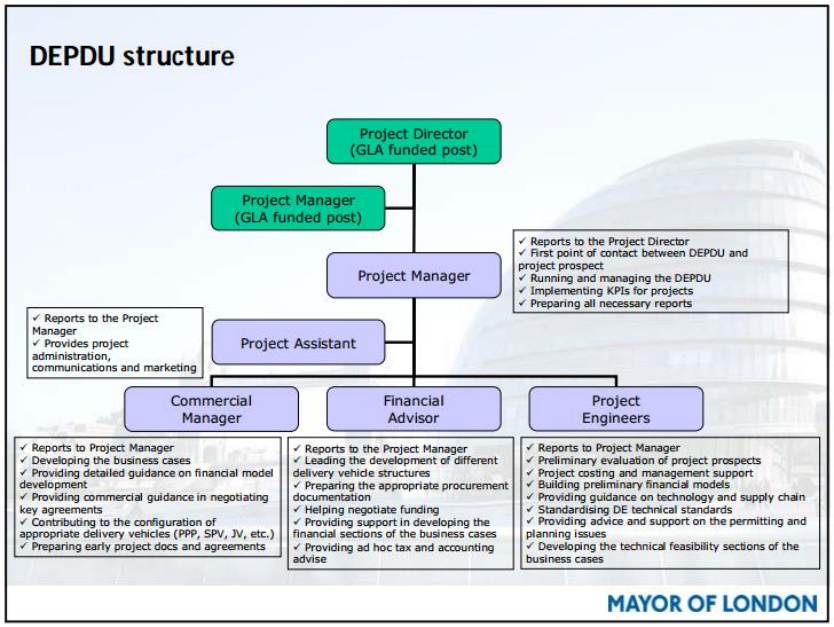
Project development activities and skills

- The activities required to bring projects forward from concept through to an 'investment ready' state include: policy development and political support, pre-feasibility studies, feasibility studies, commercialisation, financial structuring, business case development, contract negotiation, procurement and monitoring and outcome verification. Descriptions of these activities are included in Appendix K.
- While not all projects will require support at each of these stages, reflecting on the sub-sector examples included in Section 7, most of them are only at the early stages of development (e.g. pre-feasibility or feasibility stage). However, the depth of the development requirement and the timing thereof will differ across sub-sectors. For example, district heating projects can take two to three years to bring to market driven by challenges resulting from planning through to multiple stakeholders and securing credit worthy heat offtake agreements, while street lighting and NDEE could be developed and procured inside a 12 month period.
- The combination of skills required to support project development within the low carbon sector includes technical, financial/commercial, legal, planning, procurement and project management. A description of the required skillsets is also included in Appendix K.
- It is understood that the skillset of the current AGMA low carbon team is strategically and policy focussed and lacks any real technical and financial capability. However, it is understood that AGMA is addressing the latter through recent external recruits.

Case study: Greater London Authority

- The diagram below sets out how a PDU can be structured based on the one established by the GLA to support the development of its Decentralised Energy (DE) project pipeline[23]:

[23] http://www.london.gov.uk/sites/default/files/energy-20110906-07-Peter%20North.pdf



- It is understood that all posts from project manager and below are filled by a combination of external advisors that are funded through an ELENA grant secured by the GLA. They report to the Project Director, who is a GLA employee. Their role is to provide London boroughs and other project sponsors with technical, financial and commercial assistance to bring decentralised energy projects to market.
- DEPDU was set-up with €3.3 million of funding over a three year period, 90% of which was secured from an ELENA grant. DEPDU has to achieve a ratio of roughly 1:20 (or 5%) of project development grant to project funding (i.e. conversion rate of project development into live projects)[24]. To date, we understand that seven projects have been taken to market representing roughly 64% of the total project funding target[25].
- In addition to this, GLA has two other initiatives supporting the delivery of its low carbon agenda:
- **RE:FIT:** GLA operates the RE:FIT framework outlined in Section 5, where it utilises the support of Tower & Townsend in partnership with PA Consulting to support public sector bodies in London to develop and aggregate their building stock for the application of energy efficiency measures procured through the framework. Their role focuses on supporting public sector bodies to:
  - Understand the contractual mechanism of RE:FIT;
  - Undertake energy benchmarking;
  - Develop business cases to securing project funding; and,
  - Support the procurement process for a contractor.
- The RE:FIT PDU is also 90% funded by ELENA, with £2.7 million secured to deliver 25 times cost leverage into project investment over three years. Since Q4 2011, the PDU has supported the retrofit of 245 building in London, generating 28,000 tonnes of CO2 savings at a capital cost of £38 million[26].
- **London Green Fund:** GLA is one of the 'match' funders alongside EU Structural Funds into the £100m London Green Fund (LGF) holding fund, which is managed by the EIB. The LGF has two sub-funds (UDFs) that are managed on a discretionary basis by two private sector fund managers: Amber Infrastructure (with project development support provided by Arup) and Foresight Group. These funds focus on non-domestic energy efficiency and waste-to-energy projects respectively. As outlined in Section 4, the level of project development required of LEEF (the Amber managed fund) has

[24] Calculated based on project delivery ratio to funding figure.

[25] http://www.london.gov.uk/moderngiv/documents/s24068/07%20ELENA%20DEPDU%20-%20Cover%20Report.pdf

[26] http://www.refit.org.uk/what-refit/refit-achievements/

been significant and resulted in minimum project commitments of £3 million reflective of potentially prohibitive development and transaction costs.

- This case study illustrates some key lessons learnt that GM can benefit from if and when it further develops its own low carbon team, including the:
  - Cost of undertaking the necessary activities to develop an 'investment ready' pipeline of projects and the timing thereof;
  - Need for project aggregation to mitigate against potentially prohibitive project development and transaction costs; and
  - Possible merits of securing project development capability on a pan-sector basis to improve the cross fertilisation between the various sub-sectors each initiative is targeting. It is understood that the GLA programmes, at a project level, largely operate in isolation from each other.

Key factors driving PDU scale and price

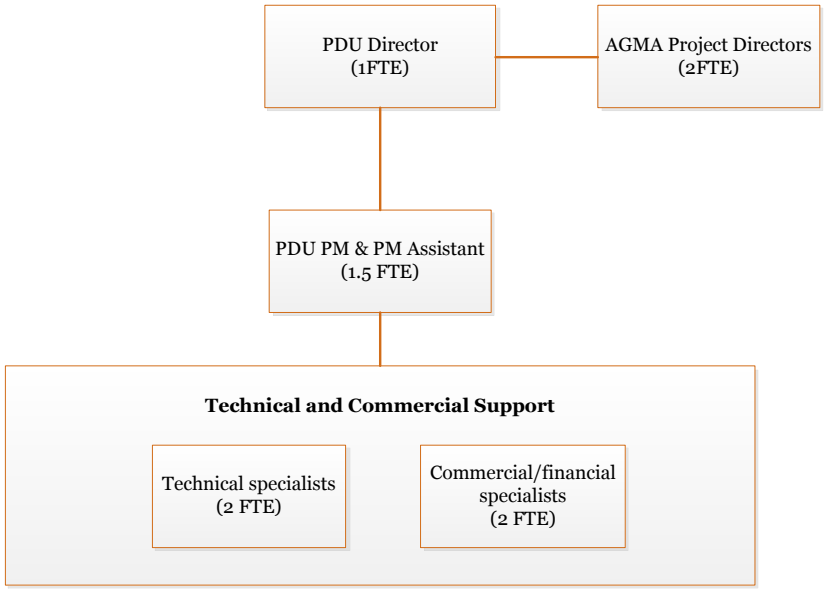
- The key factors that GM will need to consider further in developing a proposition for low carbon project development support include the following:
  - **Status of GM pipeline:** For some of GM's low carbon initiatives feasibility studies have been completed. This suggests that a PDU may only be required to undertake or facilitate such studies for future projects identified. However, much of the rest of the project development work is still outstanding for most of the pipeline, suggesting that the majority of the activities proposed will require resource.
  - **Role of fund manager(s):** PDU requirements should be considered in conjunction with the proposed structure and role of the Low Carbon Investment Fund. For example, a PDU could lead many of the activities listed above, but then hand over to a fund manager for more specific financial structuring arrangements, and monitoring and verification. Alternatively, the PDU could be a composite part of the fund itself.
  - **Breath of remit:** GM will need to decide whether the role of the PDU is to develop a project pipeline for the Low Carbon Investment Fund only or more generally to bring forward 'investment ready' projects irrespective of the funding source.
  - **Other project development activities:** GM has existing project development resource to support the pipeline for Evergreen Fund I and Regional Growth Fund and Growing Places funding. Consideration should be given to how best a low carbon PDU, for example, would align with these existing arrangements and whether it would be beneficial to expand the existing team and governance structure and/or simply ensure alignment between the different project development teams.
  - **Procurement of external advisory support:** Where external advisory support is sought to support the PDU, running a competitive procurement can offer the potential to:
    - Buy-in, in particular, knowledge and experience of private sector led low carbon projects, which is currently lacking in the pipeline;
    - Require the various specialists to come together to bid for such an opportunity as a consortium, allowing them to establish how they will work collaboratively together;
    - Give GM access to a wide breath of specialist skills that may be needed to deliver its diverse pipeline.
    - Have a dedicated team that, through their payment mechanism could be incentivised to develop projects in support of GMs low carbon objectives;
    - Have price certainty over project development costs driven by a competitive environment and the potential to seek either a fixed price contract or payment by results.

Indicative PDU structure, governance and cost

- The indicative team structure and governance of the PDU set out in this section has been developed to align with the proposed design of the Low

Carbon Investment Fund (which includes full in-house investment decision making and management). This will allow the PDU to either be an integrated part of the Low Carbon Investment Fund or separately developed but be party to the same GM oversight.

- The PDU requires a combination of technical and commercial capability, strong knowledge and ties with the current GM Low Carbon Team and an in-depth understanding of the low carbon project pipeline. It is important to ensure that the PDU staff have the appropriate sector knowledge and technical expertise to carry out their roles, however strong programme management and interaction with AGMA will be critical to the success of the team. The proposed structure of the PDU is set out below.



- **Project Directors** (PDs) are vital in terms of not only technical and commercial understanding, but also in terms of their local knowledge. These roles require strong stakeholder engagement and co-ordination and should be appointed as early as possible. The PDs will work as a cohesive team to drive the programme forward.
- It is envisaged that the PD roles will be split between two full time staff, one that already works within GM and another that, where possible, has technical knowledge and previous PDU experience together with a strong GM stakeholder network. Both roles are anticipated to be GM in-house roles.
- **The PDU Director's** role will be to liaise with project sponsors and the PDs. This position is critical for overseeing the investment programme and would require high level involvement and understanding of all projects and the programme timeline and hurdles. This role, as with the remainder set out below could be external advisory appointments or internal / external recruits.
- **The PDU PM and PM Assistant** will be responsible for the day to day management of programme and communication with the PDs via the PDU Director. These roles will involve monitoring performance of project tasks and the work of the technical and commercial support team.
- It is advised that these roles should be filled with personnel that have a strong technical background. This will ensure the quality of engineering and provide other technical support and review for projects as necessary. This role should also responsible for disseminating learning of technical aspects across the PDU team.
- **Technical and commercial support** should be provided for each individual project. It is suggested that a team of two technical and two commercial specialists be assembled that have specific expertise in each of the target sectors. However, these staff should be required to be flexible enough to work across all the low carbon sectors. It is estimated that this team would require a minimum of 4 FTEs.
- It is important to note that legal counsel is also a role that may be required for contract negotiation with project sponsors, however utilising a PD with prior PDU experience will diminish this requirement. Furthermore, it is common for project sponsors to employ their own legal counsel to advise them directly.
- This indicative PDU structure may cost up to £2 million to run over a 3 year period. This figure assumes that the cost of one of the PDs is covered by GM directly. Using the GLA example, this type of resource might be expected to deliver around £40 million of capital investment into the sector (1:20 ratio).

- In addition to PDU activities, ongoing one off advisory mandates may also be required to assist the operation of the PDU from a programme wide perspective. Such activities may include:
  - The production of standardised documents such as skeleton MoU documents for sector specific contracts, model procurement contracts, design specifications for heat networks, and service level agreements.
  - The production of sector specific design manuals which outline the technical standards for the design of technology within that specific sector.
  - Marketing and communications activities to generate sponsor level interest in taking projects forward. This could include developing branding strategies, marketing collateral and facilitating launch events.

Role of ESIF in supporting PDU costs

- It may be possible to secure the proposed PDU funding requirement from the ELENA grant application that GM is preparing. This will require GM authorities to meet the 10% 'match' funding requirement.
- However, if GM wants to broaden the remit of the PDU beyond what is set out above and/or to mitigate against an unsuccessful ELENA bid, GM may want to consider allocating a small proportion of its ESIF as grant for low carbon PDU support, in addition to the proposed allocation to the Low Carbon Investment Fund.
- While grant cannot be recycled and will require 50% 'match' funding from GM, an ESIF funded PDU could deliver wider non-financial outcomes as set out in Section 11.

2016 Ex Ante update

- Since 2014, ELENA funding of circa €2.7m has been secured and used to establish and run the Low Carbon PDU, as set out earlier in this report.

11. Non-financial outcomes

Review of proposed non-financial outcomes

- One of the overarching themes of the GM EU Investment Plan relates to low carbon development and the need to 'drive economic growth towards a low carbon economy and increased resource efficiency'. The non-financial outcomes sought from the Low Carbon Investment Fund are:

Outcome	Greenhouse Gas Reduction ('000 tons)	Jobs Created	Private sector 'match' funding (£m)
Low Carbon Investment Fund	**10**	**20**	**15**

- This information is based on the investment time frame of 2014-2020 and presents total figures estimated to occur over that time.
- Using the information available from the sub-sector analysis undertaken in Section 7 the table below sets out the estimated energy and carbon saving for these projects, where available from the GM low carbon pipeline updates presented to the Chief Executive Investment Group[27].

Subsector	Capital value (£m)	Energy savings % or kWh	Average carbon savings	
			% or tCo2	£ capex/tCO2
NDEE Wave 1 – 377 buildings	19	46m kWh	17.2%	1,358
		16.1%	15,971t CO2 p.a.	1,193
Heat networks – 7 projects	20	N/A	50,106 t CO2 p.a.	0.88

- With the establishment of a dedicated PDU tasked with bringing projects to an investible state, GM is likely to make significant progress against its GHG reduction goals. However, this will be highly dependent on the specific nature of projects that are taken forward and the scheduling and success of these projects as they are delivered. Based on the current pipeline of projects, with a strong PDU presence, it is likely that the volume of emissions reductions estimated could be achieved.
- In respect of job creation to support the broader 'growth' agenda of GM the target appears reasonable.
- GM may wish to consider bolstering the delivery of other outcomes from the low carbon theme. For example, in addition to GHG emissions targets, other value added metrics could include energy savings achieved and energy generated, which are relevant in the following sub-sectors:

Subsector	Energy savings achieved kWh or %	GHG savings achieved tCO2e or %	Energy generated (if relevant) TWh/yr

[27] Chief Executive Investment Group GM Low carbon pipeline update, 20 September, 2013.

NDEE	✓	✓	N/A
Heat networks	✓	✓	✓
Small scale renewables	✓	✓	✓

- Based on the pipeline set out in Section 7, the initial funding need is likely to come from local authority backed projects, which may be up to 100% senior debt funded. In this case, the minimum leverage achievable from the FI will be equal to the minimum 'match' requirement of 50%. Albeit such 'match' funding could come from either public (e.g. PWLB) or private (e.g. EIB) sources.
- With project development support, the role of the Low Carbon Investment Fund is likely to evolve into providing equity, guarantees, subordinated and mezzanine debt products to both public and private sector developers or project vehicles. Provision of such financial support is likely to increase the leverage that the fund can achieve to beyond a 1:1 ratio.
- On this basis the 'match' funding target for the Low Carbon Investment Fund appears achievable.
- Furthermore, if GM decides to make a ESIF allocation to support a low carbon PDU, as outlined in Section 10 above, this too could significantly contribute to the delivery of non-financial outcomes for GM.
- It is recommended that as far as possible, outcome targets are kept as flexible as possible to remove the 'hassle' factor of having to re-engage with CLG/BIS and/or the EC to have amendments to the GM EU Investment Strategy made specifically in respect of outcomes.
- To support this, at the Low Carbon Investment Fund level, the delivery of outcomes should be sought on a portfolio, rather than project level basis. In the event that some outcomes cannot be met, the fund should be encouraged to evidence wider 'value added' in other ways.

Measurement & verification of outcomes

- These low carbon metrics can be calculated on an annual basis for actual figures achieved, as well as on a whole project predicted basis.
- While it is important to measure and verity the value of projects beyond financial return, it is important to ensure that project reporting and measurement requirements are not onerous activities as highlighted above.
- If GM decides to establish the Low Carbon Investment Fund and/or a PDU, during the implementation stage it should:
  - Consider the requirements of other 'match' and complementary funding investors in respect of non-financial outcomes; and
  - Develop a suite of value added metrics that meet these and GM requirements that can then be clearly articulated to project originators / developers. This will inform the sub-sector and individual projects targeted for development.
- See Appendix L for examples of the specific outcome measures required from the EIB and the GIB. Given the potential for them to act as possible sources of 'match' and/or complementary finance for GM low carbon projects, GM may wish to develop their measurement and verification processes in alignment with these.

2016 Ex Ante update

- The ERDF Operational Programme is now the focus for outcomes. It sets out the strategy for smart, sustainable and inclusive growth and the achievement of economic, social and territorial cohesion.
- The key outcomes are under Priority Axis 4 – Supporting the shift towards a low carbon economy in all sectors is relevant to the low carbon Investment fund.
- GM has identified Investment Priority 4a as being pertinent to this fund. As such, GM has undertaken to reduce greenhouse gas emissions by between 8,300 and 17,250 tonnes via investment into projects via the proposed Low Carbon Investment Fund.

- The sole agreed outcome attributable to the Low Carbon Investment Fund is a target reduction in the greenhouse gas emissions. Section 7 of this report includes a number of case study examples from the pipeline which include the proposed reduction in greenhouse gas emissions for these projects where known at this stage.
- Given the overall number of projects within the pipeline, this would seem to indicate that the minimum Greenhouse Gas Reduction target of 8,300 tonnes p.a. could be achievable by 2020, if not a tonnage above this minimum.
- It should also be noted that each individual project will, due to the differing sector and ownership of the projects, have varying IRRs and funding needs. However, there is clearly a need to provide funding assistance to projects with sub-commercial IRRs such as the Media City heat network, or those with limited ability to obtain external funding as demonstrated earlier in this report.
- The indicative project pipeline case studies have an overall project cost of around £70m but, as a number of the projects are still at feasibility stage, the exact financing needs of the projects are still to be developed. However, as it is envisaged that the majority of the FIs interventions will take the form of the debt and will also need to be structured in such a way to secure project level co-finance, as a minimum, a leverage of GBP 15m is foreseen.
- It is not envisaged that any leverage will be generated at the level of the financial instrument, due to its focus on market failures and the need to provide relatively long term, low cost finance.

12. Fund design: Key findings

Project pipeline

- The project pipeline review undertaken by GM together with support from advisors and potential investors evidences a possible capital investment requirement of around £371 million across 30 projects in five sub-sectors by 2018: heat networks, street lighting, building energy efficiency retrofit, hydro-electricity, waste-to-energy and wind. Most of these projects are at pre-feasibility or feasibility stage.
- Investment has been made by AGMA's low carbon project development team supported by advisors and investors to develop heat networks, street lighting and local authority led NDEE projects. However, while these are further advanced than most projects on the long-list, in broad terms they still require technical and commercial delivery options to be agreed, from which capital structuring and investment opportunities can then follow.

Potential role of Structural Funds

- The project pipeline review and sub-sector analysis all suggest that a key barrier to the delivery of low carbon projects is a lack of coordinated project development support. The scale of the pipeline and the recurring delivery challenges identified suggest that there is a need for grant support to fund the activities required to bring 'investment ready' projects to market.
- AGMA has already identified that greater capacity is required in order to develop projects to an investible stage in a timely manner and to date has been utilising its own internal resources, external consultants and potential lenders to try to better understand the current pipeline of projects and progress their development. Given this limited capacity and skillset within GM currently it may want to consider putting in place further project development resource, possibly as part of the Low Carbon Investment Fund, to bring forward the project pipeline identified.
- The sub-sector analysis suggests that while there may be limited immediate need for project level investment from the Low Carbon Investment Fund, in conjunction with project development, there is likely to be a growing medium-long term need. With intensive project development, this medium to long term need could potentially align to the implementation timetable for the 2014-2020 programming period.
- Some of the most developed projects in the pipeline are currently local authority led, which if they were to remain so, could in theory utilise reserves or borrowing from the PWLB to fund their construction. However, as evidenced by the lack of GM schemes being taken forward with PWLB funding, there is no assurance that an authority would opt to borrow from the PWLB for this type of activity, with PWLB borrowing capabilities often prioritised for other activities.
- In targeting such projects (e.g. NDEE), the Low Carbon Investment Fundwill need to ensure that its investment is carefully structured so as to unlock projects and maximise leverage and avoid) simply displacing existing funding sources. There may also be a value added role for the Low Carbon Investment Fund to target these early projects, if:
  - The opportunity to secure a competitive funding product specifically for low carbon projects acts as an added incentive for authorities to prioritise low carbon projects within their wider capital programmes; or,
  - Projects are ultimately developed into joint ventures with the private sector or private sector led propositions, which are not part of a new development or regeneration project that fit within the proposed Evergreen Fund II investment strategy.
- If the recommended project development support is put in place, in the medium - long term (i.e. 2-5 years) there is likely to be a greater need from

public-private JVs or private sector led project vehicles for the Low Carbon Investment Fund to provide for example:

  - **Senior debt:** for projects that are sub-£20m and for which currently it is difficult to attract bank funding;
  - **Subordinated and/or mezzanine debt:** above which third party senior debt can be secured; and/or
  - **Guarantees:** in the event senior lenders may require additional security from project sponsor for example, in respect of credit worthy counterparty agreements.

- However, particularly in the case of district heating projects, where the need for sub-ordinated / mezzanine debt and/or guarantees may be required to enable projects to progress, securing private sector 'match' funding is likely to prove challenging. In such circumstances the Low Carbon Investment Fund may be required to offer non-pari passu 'match' funding whereby a preferential return is earned by the third party investor. Where such an approach is taken, the Low Carbon Investment Fund will need to ensure that it is compliant with ESIF and State Aid Regulations.
- There is therefore a strategic decision to be taken by GM in respect of the role and potential timing of the establishment of the Low Carbon Investment Fund. If it is to play a role in developing the project pipeline, GM may wish to utilise the FI to support these projects that may also offer GM better potential to drive leverage, returns, recycling potential and outcomes.

Investment strategy of the Low Carbon Investment Fund

- Based on the sub-sector analysis, key features of the Low Carbon Investment Fund strategy in the short-term should include:
  - **Sector focus:** non-domestic energy efficiency, including both demand and supply side measures;
  - **Investment products:** primarily senior debt, but mezzanine and subordinated debt options available. Debt tenor of up to 15 years.
  - **Investment recipients:** public and quasi-public sector bodies / project vehicles and private bodies.
- This strategy may result in limitations in respect of:
  - **Recycling:** with debt tenors of up to 15 years recycling in the short-term will be limited to reinvestment of capital and interest receipts.
  - **Economic growth outcomes:** while the Low Carbon Investment Fund can deliver against GHG emissions and energy savings targets proposed in the GM EU Investment Strategy, delivery of site development and job creation is likely to be more challenging.
- However, the advantages of this strategy are:
  - **'Match' and complementary funding:** EIB is currently in discussions with GM on a possible Framework Loan that could be accessed by all GM authorities. This could cover the activities proposed in the investment strategy and therefore offers a potential source of 'match' funding. Other alternatives include PWLB and other private sector financial institutions.
  - **State aid:** Lending to public sector organisations is unlikely to fall within the state aid rules, and in the case of private sector sponsored projects, for senior debt, state aid reference rates can be applied to price loans. However, as the funding needs of the fund evolve it may be beneficial for GM to apply for a notification in conjunction with the requirements of other FIs.
  - **Complementarity:** with a public sector focus in the short-term it is complementary to Evergreen Fund II which can invest in low carbon real estate and regeneration projects.

Low Carbon Investment Fund design

- As agreed by the Steering Group on 10 December 2013, as the initial focus of the Low Carbon Investment Fund is likely to be public sector sponsored/promoted projects it is proposed to establish the fund as a primarily in-house investment decision making and with external fund management to support the delivery of some fund management tasks.

- This was selected due to the simplicity of the funding product and recipients GMCAs track record in managing RGF and GPF money and the flexibility this could offer in the event that the fund may need to evolve over time to address different funding requirements (e.g. could require full external manager support).
- GM also proposes to establish project development support under the same oversight as the Low Carbon Investment Fund to develop investment ready projects. It is understood that GM is in the process of developing an ELENA funding application to meet the anticipated costs of its operation.

Updates to the Ex Ante Assessment

- In accordance with EU Regulations it is recommended that GM periodically tests the conclusions of this assessment against key market indicators such as market demand, funding supply, national and regional policies etc. This will assist in ensuring that the proposed design of the FI set out in this report remain valid vis-à-vis the prevailing market failures and/or sub-optimal investment situations in the low carbon sector. Where changes are noted, GM can then assess the impact, if any, on the proposed Low Carbon Investment Fund and update, or undertake an addendum to the Ex Ante Assessment if required.

2016 Ex Ante updates

- The project pipeline review undertaken by GM together with support from advisors and potential investors evidences a possible capital investment requirement of around £230 million across 15 projects in the district heating sector by 2020, together with c. £10m across 3 projects in the renewable energy/solar PV sector. Most of these projects are at pre-feasibility or feasibility stage although one is at procurement stage.
- Since this report was first commissioned, GM has been awarded ELENA grant funding allowing them to establish the low Carbon Project Development Unit.
- As such, supported by advisors and investors the heat network projects have been developed. However they still require technical and commercial delivery options to be agreed, from which capital structuring and investment opportunities can then follow.
- The Low Carbon Investment Fund is shortly to commence the process of procuring a fund manager however this may be on a more flexible basis, allowing GM to manage the fund internally with oversight and input from the fund manager.
- Furthermore, it is the intention to aim to achieve operational commencement on the procurement stage/successfully completed feasibility stage projects prior to 2020 and therefore this, combined with the market failure of external third party investment in heat networks, would align with the Low Carbon Investment Fund rationale.
- Additionally, the project pipeline also includes some NDEE and hydro projects. Given the small capital values of these projects, the key to ensuring a successful project is to group the schemes together to ensure there is sufficient critical mass to outweigh the costs of due diligence and transactional support. However, even once the schemes are in the procurement phase, there is often a difficulty, due to the relatively low capital values, in obtaining funding. The Low Carbon Investment Fund may consider assisting these types of projects which would otherwise struggle to obtain external funding. Based on the total capex of the pipeline, together with the proportion of projects in the procurement/feasibility stage and even accounting for a share of the £300m UK wide DECC funding for heat networks, this would seem to indicate that £15m could be deployed on low carbon projects in GM up until 2020.

Appendices

Appendix A – Terms of reference

Stage one – Strategic and market need

Research should be undertaken to demonstrate the strategic and market case for the two funds. This will include identifying market failure, links to strategic policy. Specific deliverables will include:

- An assessment of national, sub-regional, city policy links to the strategic case for the two proposed funds;
- An assessment of scope for the proposed funds to address policy and market failure that is identified;
- Review of relevant findings/recommendations from previous studies and existing financial instruments which are pertinent to the continuation of Evergreen and the design and structure of a new Low Carbon fund;
- Analysis of market need for the proposed funding models, assessing market performance of key sectors; and
- Assessment of both the complementarity of different programme funding streams/investments (including returns generated from 2007-2013 programmes and Growing Places funding, any relevant agglomeration effects and the proposed value added of the two funds.

Stage two – Fund design

This stage should establish the delivery mechanisms and investment strategies of the two funds. It will also identify and assess the initial project pipeline and consider the implications and options for financing, governance and management. Specific deliverables will include:

- Establishing the objectives of the proposed funds, building on the approach developed to date in the case of Evergreen;
- Establishing the scale, focus and outline investment strategies for the funds (again building on the focus and strategy already established for Evergreen);
- Assessing and establishing the management, governance and delivery options for the funds, including the role of a fund of fund, the role of fund manager(s) and their remuneration requirements;
- Considering the extent to which the existing governance structures and processes currently established to manage and review the performance of Evergreen may require adapting and the financial and legal implications of establishing the proposed new Low Carbon Fund;
- An analysis on indicative outputs, outcomes and project returns (based upon representative sample of projects);
- Identification of an indicative pipeline of projects from both public and private partners;
- Assessment of the forms and levels of financing needed for potential projects and indicative timescales;
- Assessment of existing grant programmes and initiatives in operation to inform potential funding scenarios, including the need for complimentary grant funding as part of the two funds, both for capital expenditure and also technical assistance to develop projects in the pipeline to investment readiness;
- Assess potential sources of public and private investment and investor requirements, including the potential to utilise projected income streams from the 2007-2013 programme and Growing Places fund;

- Consideration of any state aid issues arising, noting the existing NWUIF state aid approval;
- Assessment of value added of proposed funds, including how best to align to existing and prospective funding programmes; and
- Assessment of potential sources of public and private investment and investor requirements, including Green Investment Bank and European Investment Bank, soft market testing where appropriate.

Appendix B – Summary of meetings

Name	Organisation	Name	Organisation
Laura Blakey	Commercial Lead (GMCA)	John Brooks	MMU and Corridor Manchester
Mark Duncan	GM ERDF Team Manager	Steve Turner	Manchester City Council
Emily Smith	European Investment Bank	Johnny Sadler	Manchester City Council
Frank Lee	European Investment Bank	Ashley Crumbley	GM Low Carbon Hub
Desmond Gardner	Transport for Greater Manchester	Andrew McIntosh	Manchester City Council
Eamonn Boylan	Stockport Metropolitan Borough Council, Chief Executive	Mark Atherton	Greater Manchester
Deborah Mcloughlin	HCA	Michael O'Doherty	Manchester City Council
David Chilton	HCA	Ben Byers	PwC
Sean Davies	GMCA	Lee Helms	PwC
Charles Abel-Smith	GIB	Thomas Briault	Arup
Alina Gheorgiu-Currie	GIB	Roger Milburn	Arup
Andy Allan	Bruntwood	Steve Lesser	Arup
Alan White	Lloyds Banking	Gordon Richardson	Arup
Claire Lowe	Corridor Manchester	Steve Pimlott	Arup

Appendix C – Documents received

1 GM Environmental Strategy Board papers:
   a GM Low Carbon Economy (June 13)
   b Low Carbon Investment (June 13)
   c Low Carbon Pipeline Update
   d Low Carbon Investment (Sept 13)
   e GM Evidence Base Summary
   f GM LCEGS Sector report 2013
   g GM LCEGS Key Facts and Figures
   h GM Adaptation Sectors report
2 Decentralised and Zero Carbon Energy Planning 2010
3 AGMA's Integrated Infrastructure Strategy
4 Current pipeline of projects, SKM and Ramboll report
5 Status of proposed heat networks for which feasibility studies have been undertaken.
6 Work undertaken by the GIB/GM joint venture to date on street lighting, NDEE and heat networks
7 Greater Manchester EU Investment Plan 2014 – 2020 (final draft)

Appendix D – European strategic priorities

Resource Efficient Europe (REU)[28]

As an initiative of the Europe 2020 Strategy, the REU includes a number of specific plans to support EU Member States in promoting and delivering low carbon projects that will facilitate the delivery of the 20-20-20 objectives. These include:

- The Low-Carbon Economy Roadmap 2050– which sets out a strategy to meet the long-term target of reducing domestic emissions by 80-95%;
- The Energy Efficiency Plan 2011– which identifies measures to close the gap in reaching the EU's 20% energy efficiency target, and aims to increase energy independence and security of supply; and,
- A Roadmap for a resource-efficient Europe– which sets out a vision for the structural and technological change needed up to 2050.

Directive of the European Parliament and of the Council on energy efficiency[29]

Alongside regional policies, energy efficiency continues to be a key focus of legislative development in the EU, which has adopted the Directive 2012/27/EU on energy efficiency. The directive establishes a common framework of measures for the promotion of energy efficiency within the EU in order to ensure the achievement of the EU 2020's 20% energy reduction target. Whilst not introducing binding targets at national level; the directive legislates some 'binding measures' such as an obligation to upgrade public buildings, the need to develop a roadmap for efficient buildings by 2050 and to enforce energy audits for large companies.

The EU Emissions Trading System (EU ETS) [30]

The aim of the EU ETS is to combat climate change by encourage carbon emission reductions through use of a market mechanism. It puts a price on greenhouse gas emissions to create financial incentives for industry and businesses to reduce emissions (overcoming the negative externality associated with traditional capital markets). It also limits emissions from entities involved in power generation (combustion installations that generate steam, heat and electricity) with a minimum capacity of 25MW.

[28] http://ec.europa.eu/resource-efficient-europe/.

[29] http://ec.europa.eu/energy/efficiency/eed/eed_en.htm.

[30] http://ec.europa.eu/clima/policies/ets/.

Appendix E – UK fiscal and policy reforms

'Push' mechanisms

- **Energy Act (2011)** – Mandates minimum energy performance standards for letting residential and commercial properties from April 2018 onwards, prohibiting the rental of F or G rated properties (the two most energy inefficient ratings).
- **Carbon Reduction Commitment Energy Efficiency Scheme (CRC)**– The CRC is a mandatory scheme aimed at improving energy efficiency and cutting emissions in large public and private sector organisations. The scheme features a range of drivers, which aim to encourage organisations to develop energy management strategies that promote a better understanding of energy usage. In the case of energy supplies, CRC is levied where they are not already covered by EU ETS. Organisations which participate within the CRC are required to monitor their energy use, and report their energy supplies annually. Participants must purchase and surrender allowances to offset their emissions.
- **Climate Change Levy (CCL)** – Encourages reduced energy consumptions via a tax on consumption of electricity, coal (solid fuels), natural gas and LPG (non-transport) through energy bills for industrial, commercial, agricultural, public and services organisations. However,
- **Climate Change Agreements (CCAs)**– Give energy-intensive industries a discount on the Climate Change Levy (a tax on energy use in industry, commerce and the public sector) as long as they meet government-agreed energy efficiency improvement targets.

'Pull' mechanisms

- **Feed in Tariff (FIT)**– The period between April 2010 and April 2012 saw small scale low carbon electricity generation benefit from a FIT mechanism which applied to new installations with a capacity of less than 5MW and provided generators with a fixed tariff for generation and export capacity. A system of quarterly tariff digression has applied for solar Photo Voltaics from 1 November 2012.
- **Renewables Obligation ('RO')**– Applies to installations above 5MW and places an obligation on energy suppliers to source a proportion of their electricity supply from renewable sources. Under the scheme, in addition to being remunerated for power produced, generators receive ROC payments for using eligible renewable technologies. The ROC 'Buyout Price' is fixed each year by DECC
- **The Energy Bill (2012/13)**– The ongoing Electricity Market Reform ('EMR') will come into force in 2014, with a transition period applying between 2014 and 2017. The key mechanism which will affect renewable energy generation will be the replacement of ROCs with a Contracts for Difference (CFD) based scheme. Under this mechanism electricity generators from 2017 will receive a fixed revenue stream for renewable generation and avoid the fluctuations (currently c. 40% of revenues) that currently apply under ROCs from the market power price. Draft strike prices were published in Q2 2013 and will be available to all new generators from 2014 (although generators will be able to elect to receive either ROCs or CFD's during the transition period to 2017). Separately a Carbon Floor Price has been announced to underpin EU-ETS price.
- **Renewable Heat Incentive (RHI)**– Pays commercial, industrial, public, not-for-profit and community generators of renewable heat for a 20 year period.
- **Enhanced Capital Allowances (ECAs)** – Enables businesses to claim a 100% first-year capital allowance on the purchase of energy saving machinery and equipment.

Appendix F – GMCCS Implementation Plan

Summary

In 2011, approval of the Greater Manchester Climate Change Strategy (GMCCS) created a high level framework of actions to steer Greater Manchester on a course to a low carbon future by 2020. GMCCS set a stretching target for CO2 emissions reduction – 48% on 1990 levels – as well as setting the strategic agenda for other actions on climate change – transition to a low carbon economy, adaptation to a changed climate and culture change that embeds low carbon thinking in the behaviour of organisations, residents and employees.

- The Implementation Plan sets out the actions to be taken in pursuit of GMCCS during the period from approval in 2011 to 2015. Headlines of the approach include:-
  - Developing integrated plans that incorporate strategies for both mitigation and resilience, low carbon economic development, and cultural change.
  - Adopting a 2015 CO2 emissions reduction target of 2,600 kilotonnes (kt), on 2010 levels, in line with a trajectory drawn up to meet GM's 48% target for 2020.
  - Developing and delivering a range of actions that stimulate the low carbon economy- promoting resource efficiency, stimulating the sector, investing in skills and accelerating economic transition.
  - Integrating the contributions of all partners in an integrated approach focused on the GM Low Carbon Hub, its Board and theme groups.
  - Including national Government in this partnership, recognising that more than 50% of our emissions reduction target will be delivered through national policy and programme activity, including decarbonisation of national energy supply.
  - Investing and delivering major schemes in transport infrastructure, energy infrastructure, use and supply; building retrofit; and flood risk management, to enhance resilience. Harnessing GM strengths in research and innovation to explore and demonstrate new mechanisms and technologies and to provide stimulus and opportunity for GM businesses.
  - Maintaining programmes of stakeholder engagement that optimise the awareness and participation of residents and organisations, and which align low carbon activity with the overarching objective of prosperity for all.

Appendix G – GM strategy and planning documents

Greater Manchester climate change strategy

Launched in July 2011, identifies four key objectives:

- Make a rapid transition to a low carbon economy.
- Reduced collective carbon emissions by 48% by 2020 on 1990 levels.
- Be prepared for and actively adapt to a rapid climate changing.
- Embedded 'carbon literacy' into the culture of the GM organisations, lifestyles and behaviours.

An implementation plan has been developed to drive achievement of the region's emissions reduction target.

Greater Manchester energy plan

Provides an overview of GMs energy system and sets out core energy challenges and priorities between now and 2020. Actions arising from the plan will be integrated into the Greater Manchester Climate Change Strategy Implementation Plan.

Low carbon economic area programme

Established to promote low carbon economic development for businesses within GM.

Appendix H – Complementary funding sources

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
UK Energy Efficiency Investments Fund	Aug-12	Sustainable Development Capital Limited	UK Treasury (sub-fund of the GIB)	£50m	Investments in UK NDEE organisations to: reduce energy consumed and/or GHG emissions increase the supply of locally sourced renewable energy.	To 2015	Debt and equity	Projects with a capital value of <£30m	Funding can only support up to 49% of the capital cost of a project. Project must offer a net reduction in GHG emissions
Energy saving investments	Aug-12	Equity		£50m					
GIB	Oct-12	N/A		N/A	NDEE; Decentralised Energy/Combined Heat and Power; Industrial EE; Smart Metering; Street lighting. Solar PV/renewables can only be supported if < 20% of the overall capital cost.	To 2015		Projects with a capital value of >£30m	

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
EIB	N/A	N/A	N/A	N/A	TBC	Ongoing	Primarily debt, but in some cases equity	Direct investment for projects with a capital value of >£50m Projects with a capital value of <£50m may be supported via a credit line through a local bank or a framework loan to the project sponsor (e.g. local authority)	Minimum of 20% energy savings; Project must support the EU climate objectives. Up to 50% of project cost.

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
Carbon Energy Fund (CEF)	Jul-11	CEF is overseen by a board of trustees, to ensure it acts in the best interests of the NHS. The CEF is supported by advisors that work with NHS Trusts to develop and execute projects.	Various– A Trust's existing budgets/relationship bank or private sector finance (historically Co-op has supported a number of projects and more recently Aviva and GIB have considered funding applications)	N/A – CEF is a facilitator, not a fund in itself	NHS Trusts	Ongoing	Debt	Projects with a capital value of >£0.5m	Project must offer a net reduction in GHG emissions
EEEF	Jul-11	Deutsche Bank	European Commission, EIB and Deutsche Bank.	€265 million, with up to 70% targeted at energy efficiency	Targets investments in the member states of the EU in energy efficiency, small-scale renewable energy, and clean urban transport projects. A separate project development facility (EUR 21m) is available to support project readiness for EEEF investment.	Unclear	Projects: Debt investments can have a maturity of up to 15 years, equity investments can be adapted to the needs of various project phases. Financial Institutions: Selected partner financial institutions will receive debt instruments with a maturity of up to 15 years.	Renewable energy or energy efficiency projects: €5-25m	Project investment facility: projects must achieve at least a 20% energy saving or GHG emission reduction. Project development facility: Payment received only when EEEF project finance is secured.

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
									Contribute to the EU's '20-20-20' outcomes. Leverage (minimum 20). Only support up to 90% of advisory support costs.
SALIX	2004	Carbon Trust	DECC, Welsh and Scottish Governments	Investment valued at £149 million to date	Renewable energy and energy efficiency of public sector organisations.	Two types, 5 years or less, and 7.5 years or less	Interest free debt (management charge levied)	N/A	Projects must comply with either of the following criteria: • A payback period of 5 years or less which costs no more than £100 per tonne lifetime carbon saved; or • A payback period of 7.5 years or less with a cost of no more than £50 per tonne lifetime carbon saved.

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
Green Retrofit Investment Programmer	Jul– 2013	BRE and Sustainable Development Capital Limited	GIB and private	+ £100m available	Non-domestic energy efficiency retrofit projects in the UK. The scheme will support projects that deliver reduction in energy demand, cost and greenhouse gas emissions for four areas: Building retrofits; Renewable heat; combined heat and power (CHP); and Urban infrastructure.	Uncertain, however the return on investment will come from a proportion of the savings in energy bills	The fund provides backing for up to 100% of project cost	The fund is open to projects of £2 million plus	
European Local Energy Assistance	2009	EIB	European Commission	€15 million annually for project development support	• Public and private buildings, including social housing, street and traffic lighting, to support increased energy efficiency • Urban transport to support increased energy efficiency and integration of renewable energy sources • Local infrastructure including smart grids and information and communication technology infrastructure	N/A	Grant funding to support activities necessary to prepare and mobilise finance for public sector led investment programmes, including: feasibility studies, business plans, preparation for tendering procedures.	N/A	• Contribute to the EU's '20-20-20' outcomes. • Leverage (minimum 25). • Only support up to 90% of advisory support costs.

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
Intelligent Energy Europe (IEE)	N/A	European Commission	European Commission	€730 million available in 2013 funding round for project developme nt support.	Grant funding should support the following investment programme opportunities: • Energy efficiency in the building and industrial sectors. • New and renewable energy sources	N/A	Grant funding to support activities necessary to prepare and mobilise finance for public sector led investment programmes, including: feasibility studies, business plans, preparation for tendering procedures.	N/A	Recipient of funding must be a public sector body in the UK
NW Europe Programme Interreg VB	2014	European Commission	ERDF	c.€355m (TBC)	The criteria will focus on 4 of the ERDF/ESF priorities but these have not yet been agreed. Potentially, the focus could be on Research and technological development, SME's competitiveness, Low Carbon and Social Inclusion	2014-2020	No information	No information	

Fund name	Date established	Manager(s)	Funding source	Fund size	Sectors targeted	Investment period timetable	Form of funding available	Ticket size	Other criteria
Horizon 2020	2014-2020	No information	No information	€70bn	Research and innovation focus helping innovative enterprise to develop their technological breakthrough into viable products with real commercial potential.	2014-2020	No information	No information	Three priority focus for the fund: excellent science, competitive industries and tackling societal challenges. Climate action, environment, resource efficiency and raw materials is identified.

Appendix I – Project pipeline

Project name/ID and Location	Type	CAPEX (£m)	FC Close	Estimated lifetime CO2e savings	Overall project state of readiness
Civic Quarter and Noma	CHP	22.800	2015		1. Pre-feasibility
Barton Biomass Power Station	CHP	60.000	2017	10,127	1. Pre-feasibility
Oxford Road Corridor	CHP	30.200	2015		1. Pre-feasibility
University of Manchester	Energy Efficiency/PV	4.000	2015	0	1. Pre-feasibility
Bruntwood	Energy Efficiency/PV	29.000	2015	0	1. Pre-feasibility
Oldham Heat Network	CHP	5.250	2015	133,000	2. Feasibility
Stockport Heat Network	CHP	3.800	2015	44,500	2. Feasibility
Raikes Lane Incinerator DH	CHP	9.000	2015	0	1. Pre-feasibility
Blakelys EfW	CHP	3.500	2015	0	1. Pre-feasibility
Rochdale District Heating	CHP	8.000	2015	113,150	1. Pre-feasibility
Airport City Heat Network	CHP	12.000	2016	Not yet calculated	1. Pre-feasibility
Tameside DH Scheme	CHP	3.000	2016	0	1. Pre-feasibility

Project name/ID and Location	Type	CAPEX (£m)	FC Close	Estimated lifetime CO2e savings	Overall project state of readiness
Bury Town Centre/Pilsworth landfill District Heating Network	CHP	4.600	2015	79,323	2. Feasibility
Otterspool Hydro, Stockport	Hydro	0.313	2015	3,240	9. Construction
Strawberry Hill– Roman Lakes Hydro	Hydro	0.368	2015	4,000	2. Feasibility
Stringer's Weir, Stockport	Hydro	0.724	2015	8,560	6. Tender
Chamber Hall Hydro	Hydro	0.600	2014	6,400	2. Feasibility
Bickershawe Wind	Wind Turbine	2.380	2014	47,655	2. Feasibility
Tameside Wind	Wind Turbine	18.655	2015	456,530	2. Feasibility
GM Wind Portfolio 0.5-1MWe	Wind Turbine	9.900	2015	147,351	2. Feasibility
Manchester Streetlighting	Street lighting	30.000	2015	Not yet calculated	1. Pre-feasibility
Bolton Street Lighting	Street lighting	11.200	2014	52% annual saving	1. Pre-feasibility
Bury Street Lighting	Street lighting	5.700	Unknown	54% annual saving	1. Pre-feasibility
Stockport Street Lighting	Street lighting	9.800	Unknown	52% annual saving	1. Pre-feasibility

Project name/ID and Location	Type	CAPEX (£m)	FC Close	Estimated lifetime CO2e savings	Overall project state of readiness
Tameside Street Lighting	Street lighting	8.300	Unknown	57% annual saving	1. Pre-feasibility
Trafford Street Lighting	Street lighting	8.300	Unknown	55% annual saving	1. Pre-feasibility
Wigan Street Lighting	Street lighting	9.000	2015	44% annual saving	2. Feasibility
LA NDEE Wave 1 Bury, Manchester, Oldham, Trafford & Wigan	Retrofit	19.100	2015	17% over 12 years	2. Feasibility
LA NDEE Wave 2	Retrofit	23.800	Unknown	Unknown	1. Pre-feasibility
LA NDEE Wave 3	Retrofit	17.700	Unknown	Unknown	1. Pre-feasibility
TOTAL		**371.000**			

Appendix J – FI design

Option 1: GM investment decision making and management

Advantages	Disadvantages
Potential to avoid procurement of FI and investment management support– timetable and establishment cost benefits.	May lack knowledge/expertise offered by an independent investment manager
Potential to align FI with other GM project development and funding activities which could create synergies.	Potentially less incentive to develop pipeline than independent investment manager
Existing local knowledge of GM by the Core Investment Team provide added insight.	Potential regulatory implications
Focus on loans to public sector in the short term therefore less complex products offered.	
Control is retained by GM allowing greater input to drive forward those projects seen as strategic and meeting wider GM objectives.	

Option 2: GM investment decision making with external management support

Advantages	Disadvantages
Potential to avoid procurement of FI– timetable and establishment cost benefits.	Timetable and cost implications of procuring external investment management services.
Offers robust investment management capability.	Fund costs may exceed 'value add' of external management depending on fund investment strategy.
Could secure private sector bank framework loan for public sector led projects.	In the short term an external investment manager might be an unnecessary expense when majority of loans will be to local authorities.
Investment manager will have strong financial incentives to drive pipeline.	In the short term, match funding likely to be sourced from public sector or existing funding pots, therefore ability to attract private sector match less pertinent.
Investment managers will be appointed based on their track-record and experience in developing pipeline and managing fund.	

Appendix K – Project development activities and skills

- **Policy development and political support:** The first stage in developing a credible pipeline is to strengthen or develop policy that can send a strong signal to the market and foster political support to enable projects to come forward. For GM, this means ensuring that the policies it has developed (see Part 1, Section [ ]) and will develop in the future are robust and clearly establish the overarching strategy for its low carbon economy. This may include granting powers to establish and delegate powers to a PDU (or equivalent).
- In addition, policy measures should identify how a local authority's planning powers and Area Action plans could be used to create stronger obligation for, and therefore supply of, low carbon projects. Policy measures could include, for example:
  - Defining the number of buildings that the GM authorities will retrofit over a set period of time;
  - Requiring all new developments over a certain size to connect to district heating;
- Policymaking should be consistent across Greater Manchester, but targets and scope may vary within each individual local authority. For example Manchester City Council is part of the Core Cities Group and is at the forefront of lobbying government for additional powers and freedoms to implement low carbon measures to help the cities grow, reduce fuel poverty and CO_2 emissions and ensure continuity and certainty over fuel supply. The Core Cities have made the following proposals in their growth agenda:
  - To use the Core Cities combined purchasing power to create next generation energy solutions and competitive consumer costs through arrangements such as Power Purchase Agreements linked to locally generated energy.
  - Request for greater powers to organise infrastructure plans and become the prime delivery partner for Energy Company Obligation Funds.
  - Acceleration of non-domestic energy efficiency
  - Stimulating investment in training and innovation
  - Enabling for future Smart Cities
  - Aggregated demand side energy management
  - Aggregated energy procurement
  - Provision of direct power purchase agreements
  - Deployment of heat networks
- **Pre-feasibility studies:** These studies provide an initial basis for determining the potential feasibility of rolling out large scale low carbon programmes and establishing the strategic need for the project/programmes. They explore investment opportunities at a high level to better understand their scope, costs and benefits. For example, for district heating this may involve undertaking heat mapping to identify the need and availability of resource for future heat network development, and the potential costs and benefits.

- **Feasibility studies**: This activity involves detailed technical and financial evaluation of projects to prove their viability. These are aimed at assessing the adequacy of different technical solutions and their costs, benefits, value and risks. Additional technical design may be required after this stage.
- **Commercialisation:** The development of commercial (ownership models and contracts) the allocate roles, responsibilities, risks and opportunities to appropriate parties. This activity is primarily about defining the commercial delivery approach to bring specific projects or clusters of projects to markets.
- **Financial structuring:** This activity involves financial modelling and development of a financial structure that fits the commercial structure. It may be undertaken by the PDU or by investment managers appointed to deliver low carbon projects.
- **Legal:** Development of contracts that meet the commercial structures developed and the legal requirements of funders.
- **Procurement:** This involves development of tender documents and technical specifications, shadow bid models (if appropriate), road shows and running open competitions to seek the preferred partner(s) to deliver projects.
- **Monitoring and verification:** These activities require a certain level of financial monitoring to make sure money is being spent adequately and appropriately. It may also require preparation of progress reports against key performance metrics that measure the impact of the project, such as carbon saved or energy produced or jobs created etc.

Project development skillset

The combination of skills required to support project development within the low carbon sector includes:

- **Technical:** Experience with operation and management of each asset class, understanding of carbon savings calculations, understanding of technical risks and how they are managed, technical design engineering, understanding of cost implications, and ability to draft technical specifications.
- **Financial/Commercialisation:** Understanding of funding options available for different project types, financial/economic modelling, experience in financial advisory and structuring of low carbon projects, including different delivery vehicles.
- **Legal:** Understanding of governance structures, contract development and review skills for technical projects across each asset class, interface agreements, energy service contracts etc. between parties.
- **Planning:** Understanding of local government and national planning regulations and processes, understanding of specific planning requirements for each asset class, stakeholder engagement skills.
- **Procurement:** Understanding of typical procurement contracts and models used across each different asset class, experience in running competitive procurement processes.
- **Project/Program director:** Ability to lead and have oversight of the project pipeline, team and budget and stakeholder management.

Appendix L – Low carbon measurement & verification requirements

The following table outlines the value added measurement and verification metrics utilised by EIB and GIB. The shaded metrics represent those that are common or similar across each fund.

Fund/ Funder	Value added element	Metric	Measurement	Optional/ Required
EIB	Leverage effect	Amount of finance to final recipients divided by the amount of EU contribution	%	Optional
	Direct financial benefits	Energy savings	€	Optional
		Energy generated	€	Optional
		Project revenues	€	Optional
	Direct economic benefits	Energy efficiency	%	Optional
		GHG reduction	CO_2e/kWh	Optional
		Monetised GHG reduction	Member state– specific carbon price	Optional
		Number of properties renovated	Number	Optional
		Job creation	No. of jobs created and estimated economic value	Optional

Fund/ Funder	Value added element	Metric	Measurement	Optional/ Required
		Productivity improvements	Increase in gross value added (GVA)	Optional
	Wider economic benefits	Improvement in air quality	Member state– specific measurement	Optional
		Reduction in energy poverty	No and % households reduction in energy poverty	Optional
		Health and welfare benefits	Qualitative measurement (survey-based)	Optional
GIB*	Reduction of GHG emissions	GHG emissions avoided (IPMVP** compliant)	tCO2e	Required
		Renewable electricity generated	TWh	Required if relevant
	The protection or enhancement of the natural environment	Waste-to-landfill avoided	t	Required if relevant

** GIB utilise other value added metrics for waste related projects including volume of waste recycled, however this metric is not relevant to the sub-sectors of interest for this study.*

*** IPMVP – International Performance Measurement and Verification Proto*

Appendix M – Ex Ante Checklist

Requirements	CPR Reference	Ex Ante Reference
Identification of market problems existing in the country or region in which the FI is to be established.	Art. 37 (2) (a)	Section 5: Market gaps and failures
Analysis of the gap between supply and demand of financing and the identification of suboptimal investment situation.	Art. 37 (2) (a)	Section 3: Complementary funding sources /Section 5: Market gaps and failures/Section 6: Strategic and market needs
Quantification of the investment (to the extent possible).	Art. 37 (2) (a)	Section 7: Project pipeline review
Identification of the quantitative and qualitative dimensions of the value added of the envisaged FI.	Art. 37 (2) (b)	Section 6: Strategic and market needs
Comparison to the added value of alternative approaches.	Art. 37 (2) (b)	Section 4: Key findings from existing relevant UK FEIs & Section 6: Strategic and market needs
Consistency of the envisaged FI with other forms of public intervention.	Art. 37 (2) (b)	Section 9: Low Carbon Investment Fund design/(Section 4: Key findings from existing relevant UK FEIs)
State aid implications of the envisaged FI.	Art. 37 (2) (b)	Section 7: Project pipeline review
Identification of additional public and private resources to be potentially raised by the envisaged FI and assessment of indicative timing of national co-financing and of additionality contributions (mainly private).	Art. 37 (2) (c)	Section 2: Strategic priorities/Section 11: Non-financial outcomes

Estimation of the leverage of the envisaged FI.	Art. 37 (2) (c)	Section 11: Non-financial outcomes
Assessment of the need for, and level of, preferential remuneration based on experience in relevant markets.	Art. 37 (2) (c)	Section 3: Complementary funding sources/Section 5: Market gaps and failures/Section 7: Project pipeline review
Collation of relevant available information on past experiences, particularly those that have been set up in the same country or region as the envisaged FI.	Art. 37 (2) (d)	Section 1: Background to EU structural funds & Section 4: Key findings from existing relevant UK FEIs
Identification of main success factors and/or pitfalls of these past experiences.	Art. 37 (2) (d)	Section 4: Key findings from existing relevant UK FEIs
Using the collected information to enhance the performance of the envisaged FI (e.g. risk mitigation).	Art. 37 (2) (d)	Section 6: Strategic and market needs/Section 4: Key findings from existing relevant UK FEIs.
Definition of the level of detail for the proposed investment strategy (maintaining a certain degree of flexibility).	Art. 37 (2) (e)	Section 8: Low Carbon Investment Fund investment strategy
Definition of the scale and focus of the FI in line with the results of the market assessments and value added assessment.	Art. 37 (2) (e)	Section 6: Strategic and market needs/Section 7: Project pipeline review/Section 8: Low Carbon Investment Fund investment strategy/
Selection of the financial product to be offered and the target final recipients.	Art. 37 (2) (e)	Section 8: Low Carbon Investment Fund investment strategy
Definition of the governance structure of the FI.	Art. 37 (2) (e)	Section 9: Low Carbon Investment Fund design/Section 10: Low Carbon Project Development Unit.
Selection of the most appropriate implementation arrangement and the envisaged combination of grant support.	Art. 37 (2) (e)	Section 9: Low Carbon Investment Fund design
Set up and quantification of the expected results of the envisaged FI by means of output indicators, result indicators and FI-performance.	Art. 37 (2) (f)	Section 11: Non financial outcomes

Specification of how the envisaged FI will contribute to deliver the desired strategic objectives.	Art. 37 (2) (f)	Section 2: Strategic priorities (for background)/Section 8: Low Carbon Investment Fund investment strategy/Section 11: Non-financial outcomes
Definition of the monitoring system in order to efficiently monitor the FI, facilitate reporting requirements and identify any improvement areas.	Art. 37 (2) (f)	Section 9: Low Carbon Investment Fund design & Section 10: Low Carbon Project Development Unit/Section 11: Non-financial outcomes
Definition of the conditions and/or the timing in which a revision or an update of the ex-ante assessment is needed.	Art. 37 (2) (g)	Section 8: Low Carbon Investment Fund investment strategy
Ensure that this flexibility, and trigger points, is reflected in the monitoring and reporting provisions.	Art. 37 (2) (g)	Section 8: Low Carbon Investment Fund investment strategy
The ex-ante assessment is submitted to the monitoring committee for information purposes and in accordance with Fund-specific rules.	Art. 37 (3)	Yes
Publication of summary findings and conclusion of the ex-ante assessment within three months of their date of finalisation.	Art. 37 (3)	To be done.