Ex-Ante Assessment for a Financial Instrument to support investment in low carbon sectors in the east of England

Norfolk County Council

&

University of East Anglia

With additional content from

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NEWANGLIA Local Enterprise Partnership for Norfolk and Suffolk

CAMBRIDGESHIRE & PETERBOROUGH COMBINED AUTHORITY

Hertfordshire Local Enterprise Partnership

Introduction

Three of the Local Enterprise Partnerships (LEPs) in the East of England have worked together to evaluate the potential for a new financial instrument that would support investment in the region's Low Carbon Sectors. The evaluation here follows an Ex-Ante Assessment methodology that has been set out as a mandatory requirement by the European Commission in advance of the use of European Structural Investment Funds for such a financial instrument.

The three LEPs are:

- Hertfordshire Local Enterprise Partnership (Herts LEP at http://www.hertfordshirelep.com/)
- New Anglia Local Enterprise Partnership (NALEP at http://www.newanglia.co.uk/)
- The Business Board of the Cambridgeshire and Peterborough Combined Authority (http://cambridgeshirepeterborough-ca.gov.uk/business-board)

A steering group has been formed by the three partners comprising representatives from each of the LEPs, the University of East Anglia (UEA), Norfolk County Council (NCC), and the Ministry for Housing, Communities and Local Government (MHCLG).

The interests of the partners are as follows:

Partner	Interest
Herts LEP, New Anglia LEP & Cambridgeshire and Peterborough Combined Authority	The LEPs are responsible for convening local partners to work together on business support, workforce skills and infrastructure investment. All have published strategies to show how ESIF funds should be used in support of these goals and are members of the East of England Energy Hub.
University of East Anglia	UEA is host to a £20.5m co-investment financial instrument that supported 45 low-carbon ventures in the East of England Region from the 2007/13 ESIF programme. It invested from 2010 until December 2015 and is now re-investing legacies that are expected to be fully realised by December 2020. Further detail on UEA's LCIF1 Fund is provided in this report.
MHCLG	MHCLG is the Managing Authority for ERDF in England.
Norfolk County Council	Norfolk County Council manages the NALEP ERDF Technical Assistance project which part-funded the original Ex-Ante Assessment and has agreed to take on the role of Entrusted Entity to deliver this project.

Provisions for Update

As market conditions and investment trends may evolve before and during the implementation phase of the FIs, Article 37 (2) (g) CPR requires that the ex-ante assessment includes provisions for its revision and update.

Possible indicators to trigger an update include:

- **Significant anticipated variances between the proposed targets and observed and forecast results**
- **Demand – both in terms of inadequate volume of the financing to meet the observed demand, or lower demand than anticipated**
- **Miscalculation of the risk to be taken by the FIs**: A situation may occur where the risk profile of the FI is significantly higher than expected, leading the FI to incur significant losses and thereby compromising its revolving nature
- **Material change to the economic conditions and funding supply**

The need for update and review of the ex-ante assessment could be signalled through:

- Regular reporting/monitoring of the FI
- Through ad hoc or planned evaluations (e.g. ongoing evaluations).

Furthermore, the MA has advised that it will set out the conditions by which a formal review of the financial instrument will be triggered, in the proposed Funding Agreements and associated guidance. The MA plans to monitor performance against financial and non-financial targets on a quarterly basis, and the proposed FoFs will be required to submit a suite of management information to the MA demonstrating how each sub-fund and the FoFs overall are performing. This will enable the MA and FoF to assess cumulative performance.

In addition, at mid-point, and in conjunction with other financial instruments where appropriate, the MA has advised that it will assess the FoFs and the ex-ante assessment will be reviewed for ongoing relevance. The precise timing of this mid-point review will be determined at a later stage, but the MA anticipates it will take place during years 2 or 3 of the fund.

Provision for publication

Following the issue of a Funding Agreement it is proposed that the MA will submit the Ex-Ante Assessment to the monitoring committee (Growth Programme Board) for information purposes and in accordance with Fund specific rules.

Following the issue of a Funding Agreement it is proposed that the MA will publish a summary findings and conclusions of the Ex-Ante Assessment within three months of their date of finalisation (Publication on MA Website)

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1. Executive summary

1.1 The case for intervention in the support of SME access to finance for early stage technology in low carbon sectors is supported by Regeneris in its Block 1 Ex-Ante Assessment Report, carried out for EIB and summarised in this report. The Regeneris report considered the key area of need for finance for such businesses to be in the region of £200k - £2m; part of the so called 'equity gap'. The Block 1 Ex-Ante Assessment suggests that there is an unmet demand for finance of £80m per annum from established SMEs; assuming that just 10% of rejected ventures are viable and after taking existing publicly supported interventions into account. Regeneris were unable to differentiate between demand for debt and equity within this figure or to reach a definitive value of demand for early-stage venture capital. However, Regeneris suggest that the regional response to finance available from LCIF1 and UEA's success in investing over £20m at rates that were *pari-passu* (at equal risk and return) to private co-investment was a strong indicator that latent demand was present and that it appeared to be viable.

1.2 Each of the three participating LEPs support the need for a new fund of this type, to continue to support the kind of businesses in the region that were funded from the first round of the Low Carbon Innovation Fund (LCIF1) operated by the University of East Anglia (UEA). This report sets out the value that a new fund may bring in supporting the creation and growth of new, higher value-added businesses.

1.3 The LEPs would like any new proposed LCIF2 fund, to be integrated within an investment strategy that generated new pipeline deals from clients within and moving to their geographic areas. The LEPs are keen to learn from UEA's experience in running LCIF1 and wish to participate in shaping the investment strategy and policies for LCIF2 and receive updates on progress and performance for investment and returns and how results are distributed across the region. There is an expectation that LEP areas will benefit from results in proportion to their share of ERDF stake.

1.4 Partners appreciate that the regulatory landscape relating to the development of financial instruments has changed. Various options are considered in this report and the option that is favoured presents a fund of funds structure based upon a Limited Partnership. Such a structure is commonplace in commercial finance. Through the fund of funds model, the partners also build a structure which encompasses the legacy from LCIF1 and potential future investment opportunities.

1.5 Norfolk County Council (NCC) were invited to submit a full application and will therefore take on the Entrusted Entity role on behalf of the 3 LEP partnership. However, to fulfil all the requirements of Entrusted Entity status, an applicant must be able to demonstrate experience of running a similar investment vehicle. It is therefore through an ERDF delivery partnership with UEA, bringing their experience of delivering LCIF1, that NCC proposes to fulfil the technical requirements and establish a partnership which fully meets all the requirements and has the skill and expertise to deliver the project.

1.6 NCC will form a new Special Purpose Vehicle company in an operating partnership with UEA to operate as the Holding Company to a Limited Partnership created for the operation of the proposed fund. The operating costs of running the project will be claimed in line with Article 42 of the Commission's Common Provision Regulations and Article 13 of the Commission Delegated Regulations defining maximum limits on Holding Company running costs for financial instruments supported by ERDF. This is considered in detail in the operating costs section of this report.

1.7 A fully integrated financial model has been constructed to demonstrate that a £10,910,720 co-investment fund could support early stage investment in 38 companies, generating a recyclable legacy of at least £9.5m – £10.9m.

1.8 This report also includes a detailed review of the preferred option with key assumptions used for costs, investment profile, returns and impact projections.

Summary of the features of the recommended financial instrument.

Capital invested	£11,285,754 ERDF (£10,910,720 invested)
Fund lifetime (years)	12 years (5 investment +7 realisation)
Holding Company costs (net) (eligible costs)	£273,092 (investment period)
Fund management costs (Eligible ERDF)	£476,977 (investment period)
Number of enterprises receiving investment	38
Number of enterprises receiving 12-hour support	10 (in addition to invested companies)
Leverage	£16,272,000 - £21,696,000
Gross New Jobs	180
Number of new enterprises supported	10
Number of enterprises cooperating with re-search institutions	3
Number of enterprises supported to introduce new to the firm products	20
Estimated annual decrease of greenhouse gas	10,000 tonnes (+ future savings)
Recoupment after costs (as modelled)	£9,592,200 (after 12 years)

2. Demand and strategic drivers

2.1 For the 2014/20 ESIF/ERDF Programme, an Ex-Ante Assessment that follows a prescribed structure and approach, has been made a mandatory requirement by the European Commission, prior to any consideration of ESIF/ERDF funding for a new financial instrument.

2.2 In line with European Commission guidance, the assessment must consist of two separate stages, referred to as blocks. Block 1 should provide a market analysis to provide evidence of need, prospective user demand and the financing gap; whilst Block 2 should outline any proposed investment strategy and operating approach and should include an options appraisal and a comprehensive financial model.
The Block 1 Financial Instrument Ex-Ante Assessment for England with an annex that provided overviews for each of the 9 regions, entitled 'Using Financial Instruments for SMEs in England in the 2014-2020 Programming Period', was published by the European Investment Bank (EIB) in January 2015. The East of England Regional Overview may be obtained at the link in the footnote below.1

2.3 The report was drafted by Regeneris Consulting Ltd at the instruction and under the supervision of the EIB for use by them and MHCLG. The report was drafted to:

'…provide an overview of the SME finance market in the East of England, evidence of market failure and the implications for the overall scale and shape of market failures that could reasonably be addressed by future ERDF backed interventions for the 2014-20 programme period.

…informed by an analysis of national and sub-national data and other evidence, as well as consultations with public sector organisations and the business and financial communities.'

The Block 1 Ex-Ante Assessment provided a comprehensive analysis of all major types of SME business finance that might be used to support start-up, development and growth. As the partners in this Block 2 Ex-Ante Assessment for a Low Carbon Fund for the East of England are most interested in supporting early stage technology-based ventures, this report will focus on risk capital for early stage businesses.

2.4 The report will cover finance for start-up and early stage businesses with high growth potential (both pre-revenue and early revenue businesses), which typically require high risk venture capital investment up to £2m. These businesses are harder to define in terms of their size – some may be unincorporated at the point that they first seek funding, many will have fewer than 10 employees but are distinguished by their potential for rapid growth in turnover and job creation terms.

2.5 Risk Finance for Early Stage SMEs
Early stage equity finance is sought by a wide range of ventures but primarily by those characterised as being technology/knowledge-sector based, possibly having spun out recently from university or industrial research and development. Finance of this type is used to support the costs of development of new products or services, up to the point where they are able to generate commercially sustainable revenue streams. Investors that

[1] The full report - Using Financial Instruments for SMEs in England in the 2014-2020 Programming Period, is available on request from Chris Armstrong at MHCLG (chris.armstrong@communities.gsi.gov.uk).

back this type of venture, balance higher investment risk against relatively rapid growth, compared to more established companies in conventional or low-technology sectors.

As supported ventures progress through developmental milestones, increasingly more significant amounts of cash support are required. Since the venture is pre-revenue at this stage, debt finance is generally inappropriate as the enterprise is yet to generate the cash flows required to service repayments. However, early stage investment is frequently made under a convertible debt instrument that may allow deferred repayments and for loan notes to be swapped for equity once investors have had an opportunity to assess the venture and management team and determine a reliable and mutually agreeable valuation. In the event that the business does not achieve the promise that was anticipated at first investment, a simple term repayment schedule may be agreed.

Regeneris reported:

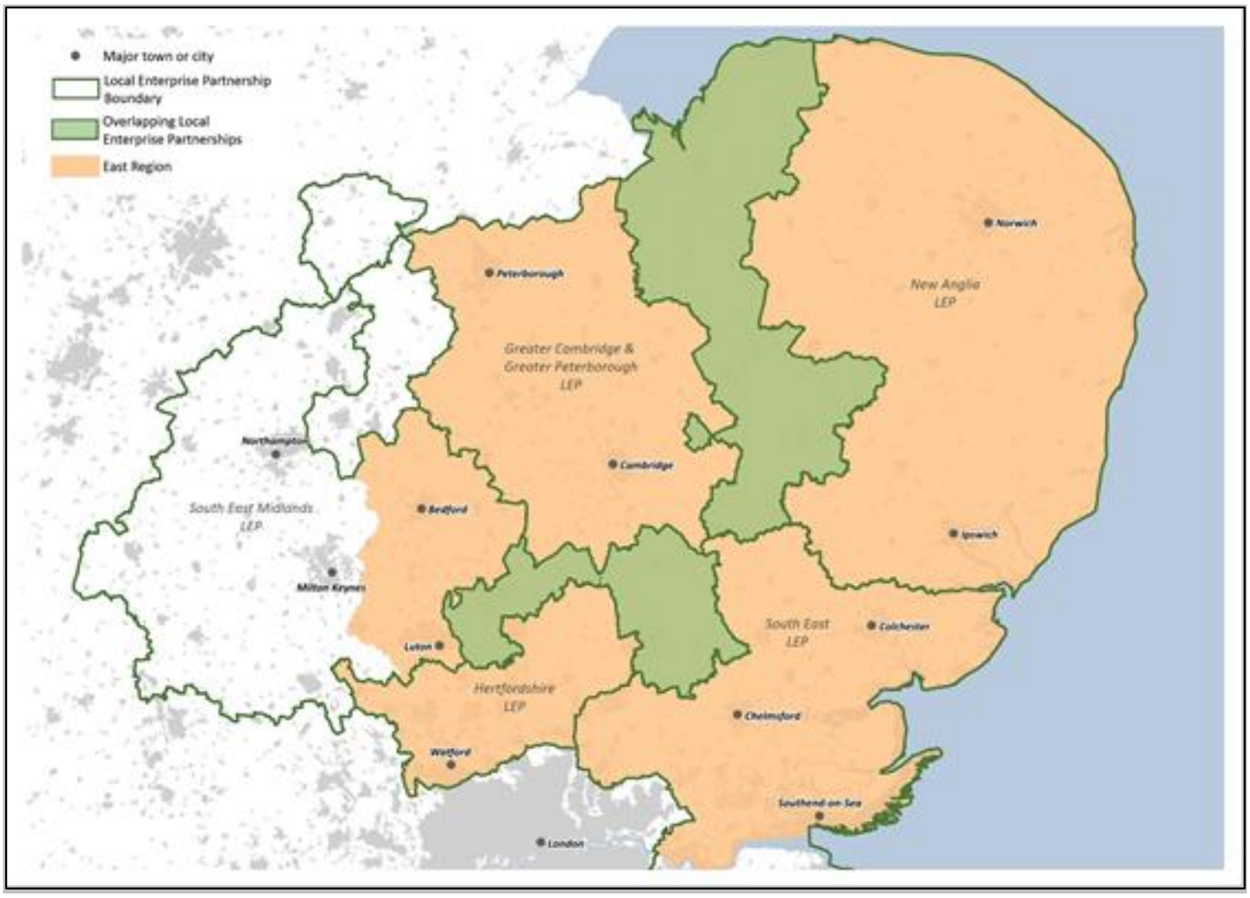
Equity investment has a major role to play in supporting ventures at a start-up and early stage to move towards commercialisation and thus to generate benefits for the economy. These types of ventures at this early stage are typically by their nature high risk propositions, offering the potential for high return.
The term 'Valley of Death' is often used to describe the period in between a start-up receiving an initial capital injection and revenue generation. At this stage, significant capital and operating expenditure is incurred in setting up operations and hiring staff, whilst revenues are yet to come through. It is at this point that the venture is most vulnerable and when it can be difficult to attract sufficient funding, due to the market failures described in an earlier section, private venture capital funds tend to focus on less risky, larger deals at the later stages.

2.6 Regeneris concluded that:
'there is a role for publicly backed venture capital funds to support firms through this stage in their development.'

Regeneris reported as others have found before them, that it can be difficult to assess the number of early stage ventures that exist and which require this type of finance. All too often, statistics are masked by the fact that many latent businesses only incorporate once funding is secured and only then, are they registered at Companies House, to subsequently appear in official returns and datasets. The Regeneris Block 1 Ex-Ante Assessment makes no attempt to define demand in value terms as they have done for debt and equity for established businesses but do point to the success of funds like the first round of UEA's LCIF fund as evidence of viable demand. LCIF1 invested around £2.5m per year at its peak and £20.5m in total, generating over £48m of pari passu private sector co-investment.

3. Implications for the East of England and for new financial instruments

3.1 The Regeneris Ex-Ante Assessment considered the East of England region. The regional boundaries do not correspond to those of the LEPs that have expressed an interest in a new financial instrument for low carbon sectors. For example, The East of England region included territories that are now covered by South East Midland LEP (SEMLEP) and South East LEP and there are extensive areas of overlap between contiguous LEP areas that have the potential for further uncertainty.



The Regeneris report provided a summary of the key priorities and actions identified by the Hertfordshire and New Anglia LEPs and Cambridgeshire and Peterborough Combined Authority area and they are set out below.

Area	Actions identified
Hertfordshire	The LEP has key four objectives: • To encourage enterprise and business growth and build on our innovation assets. • To maintain and improve the skills and employment prospects of residents. • To identify and prioritise the strategic infrastructure required for economic growth • To secure greater investment from business and government in Hertfordshire by improved promotion and advocacy activity

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	One of the key delivery mechanisms is a Business Hub approach.
New Anglia	The LEP Economic Strategy sets out to make Norfolk and Suffolk – • The place where high growth businesses with aspirations choose to be • An international facing economy with high value exports • A high performing, productive economy • A well-connected place • An inclusive economy with a highly skilled workforce • A centre for the UK's clean energy sector • A place with a clear, ambitious offer to the world The LEP runs the New Anglia Growth Programme, and the Growth Hub would be a key collaborator in promoting this project and generating pipeline.
Cambridgeshire and Peterborough Combined Authority	Strong support for innovation – but predicated on a growth hub approach and the provision of world leading incubator space. This project is supported in the relevant ESIF Strategy.

On the strategic drivers for the three LEPs, Regeneris reported:

> 'A number of common themes arise, including the need to support existing growing businesses, support for start –ups and a focus on SME innovation. In addition, there is stress on the need to support the growth of new sectors. As in other regions, this implies that there is a strategic context which would support the provision of finance in many segments of the market that is being considered. There is a particularly strong emphasis on the Low Carbon agenda, with a willingness from many public bodies to extend and strengthen current finance provision in this area.'

3.2 Business distribution

Between the LEPs participating in this Ex-Ante Assessment, New Anglia has the largest SME business base (60,800) followed by Greater Cambridge and Greater Peterborough (59,825) and Hertfordshire (58,060).

Area	Total SMEs	Micro (0 to 9)	Small (10 to 49)	Medium-sized (50 to 249)	% of total SMEs
Greater Cambridge and Greater Peterborough	59,825	53,335	5,495	995	33
Hertfordshire	58,060	52,925	4,330	805	32
New Anglia	60,800	53,835	5,990	975	34
East of England	253,005	227,690	21,560	3,755	
Total for named LEP areas	178,685	160,095	15,815	2,775	100

Source: NOMIS 2016 Statistics 2

The composition of businesses by size band in each LEP area is similar, with each LEP area's business base comprising between 88-90% micro businesses. Across all areas, small businesses make up about 8-10% of

[2] Data contained in the table are compiled from the Inter-Departmental Business Register (IDBR) from information on VAT traders and PAYE employers in a statistical register which provides the basis for the Office for National Statistics to conduct surveys of businesses.

the business base and 2% for large firms. Hertfordshire and the Cambridgeshire and Peterborough Combined Authority LEP areas both have business densities higher than the national average (35 per 1,000 residents). The highest is found in Hertfordshire LEP (43 businesses per 1,000 residents), followed by Cambridgeshire and Peterborough Combined Authority with pockets of high business density located around urban areas.

Growth in medium sized firms has been most variable across the region: growth in Hertfordshire exceeds the national level (10%), while New Anglia's is slower (4%). In 2012 around 25,300 new businesses formed in the East of England, surpassing many regions with the exception of the South East and London.'

	Business Starts				Business Starts per 10,000 WAP (2012)	
	2009	2012	Abs Change		Number	England=100
Greater Cambridgeshire and Greater Peterborough	5,300	5,500	200	4%	63	90
New Anglia	5,200	5,100	-200	-4%	52	74
Hertfordshire	5,700	6,300	600	10%	87	125
Total East of England	23,500	25,300	1,800	8%	68	98

3.3 High growth firms

Regeneris reported:

'Given the difficulties in defining and measuring high growth firms, there is little data available. However, research on high growth firms, using data from Experian UK's business database. It defines high growth firms as those that have revenues of between £2.5m and £100m and have had 33% increase in turnover over three years, as well as 10% year-on-year growth for a minimum of two of these years. These are the kinds of firm that are likely to have a need for external finance to support this expansion.
'The latest report found that 22.8% of businesses with a turnover of between £2.5 million and £100m in the region fall into this high growth category. This ranks the East of England 3rd out of the 9 English regions, with a proportion that has been steadily increasing since 2011. The region's performance in 2013 was the first year that it achieved a proportion greater than the England average.'

High Growth Firms as a % of all Businesses, 2011-13

	2011 Population of High Growth Firms	Regional Rank (2013)	2011	2012	2013
East of England	358	3rd	16.6%	19.9%	22.8%
England	4,044		16.9%	20.9%	22.0%

Source: BGF Growth Companies Barometer

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3.4 Innovation activity

Regeneris has suggested that measures of innovation activity may be used as a proxy measure for demand for early-stage technology business finance.

> 'The East of England's innovation performance is slightly above the national average. About 46% of the businesses in the region are thought to be innovation active. While this is above the England average (45%), it is below that of other regions such as the South West (47%), East Midlands (49%) and North East (47%).[3]
> 'There have been 102 spinouts in the East of England since the year 2000, representing 11% of all spinouts in the UK. This is on par with the proportion of spinouts coming out of Yorkshire and the Humber and the North West. Almost all of the spinouts in the region have come from Cambridge University (82 spinouts). With the remainder coming from University of East Anglia, University of Essex and Cranfield University.'

3.5 Theoretical Unmet demand

Unfortunately, whilst the BIS SBS survey provides data that can be used to assess the extent of unmet demand from SMEs, this data is not available at a regional level in England. Regeneris' analysis indicates that, assuming the experience of SMEs in the East of England region is similar to those in the UK as whole:

- In 2012 there were around 28,500 SMEs in the region looking for external finance, of which 21,800 were microbusinesses
- Of these, around 13,400 SMEs had difficulties of some sort in obtaining this finance
- 9,200 SMEs obtained none of the finance they were looking for, and 1,700 received some, but not all of what they were seeking (the national data indicates that the likelihood of successfully obtaining finance varies directly with business size).
- 6,300 SMEs had a need for finance did not apply, for the reason that they thought they would be re-jected.

The Block 1 Ex-Ante Assessment suggested that -

> 'If just 10% of business propositions seeking finance were considered to be viable, this would imply an annual finance gap of £5 million for microloans, £100m sought by micros seeking small loans, and a further c£80 million sought by small and medium sized SMEs.
> 'It should be noted that this is, in effect, the gap over and above that what is already being addressed by public sector backed initiatives (including time limited ERDF backed schemes operating in the region). The survey also implies that this unmet demand has grown over time, although this is, of course, based on national rather than regional data.'

Regeneris has not been able to define unmet demand for larger amounts of finance between debt and equity finance. The SBS Survey reports that around 2% of SMEs overall are looking for equity finance. However, this does not necessarily accurately represent the extent to which equity finance might be suitable finance given the nature of their investment projects, as awareness of the benefits of this finance type amongst SMEs can be limited. Data presented by the British Business Bank suggests that around 4% of the value of finance to SMEs is in the form of equity.

Using SBS data which allows for the size of the SME and variations in the amount of finance sought by type of finance, around 8% of this overall unmet demand is likely to be accounted by equity finance (and 82% by debt finance and a further 10% by other forms of finance).

[3] BIS (2010), UK Innovation Survey

Regeneris suggested that:

'This would imply a total unmet demand of around £150 million per annum for debt (if 10% of propositions were viable) and around £14 million per annum for equity (again if 10% of propositions are viable), in addition to that which is already being met by publicly backed initiatives.'

3.6 Evidence of demand from existing interventions

The only major existing ERDF based financial instrument which has recently provided finance[4] throughout the region is the Low Carbon Innovation Fund, which has covered Norfolk, Suffolk, Cambridgeshire, Essex and Hertfordshire and the unitary areas of Bedford, Central Bedfordshire, Thurrock, Peterborough, Luton and Southend on Sea. LCIF1 targets SMEs contributing to the low carbon economy and can invest in companies developing low carbon products or components. Regeneris reported:

LCIF is a venture capital fund which makes early-stage investments as equity or convertible loans between £25k and £750k alongside co-investors. LCIF operates in a broad range of sectors and is now is now able to invest in the creative industries.

Throughout LCIF's life, strong deal flow was developed mainly through development of awareness and reputation amongst the intermediary and investor networks. Data shows that up to December 2015 LCIF1 had invested £20.5m to 45 SMEs as part of £69.4m total value of investment (including private co-investment). By the end of December 2015, 636 applications had been submitted, with 255 being assessed in detail and 27 companies helped to secure funding from other sources (and hence no longer requiring LCIF funds).

[4] LCIF 1 formally closed to new investment in 2015 but has received consent from MHCLG for the recycling of legacy returns as they arise.

3.7 Supply of External Finance

Regeneris undertook a review of publicly funded finance schemes and those that are relevant to NALEP and Herts LEP are summarised below. In addition to these publicly backed financial instruments, a number of grant schemes are available on a sub-regional basis. These include BEE Anglia, which focuses on small low carbon support and grants and the grants available through Growth hubs. Such grants are modest in scale in comparison with the investment potential discussed here.

Name of scheme	Funding Organisation	Geographical coverage	Eligibility	Type of finance	Size
East Regional Growth Loan Scheme	Former RDAs funded by RGF. Live until 2023 and expected to be extended by BEIS/BBB	Essex (EEDA Area), This scheme is also available in Essex, Suffolk, Norfolk, Cambridgeshire, Bedfordshire, Hertford	SMEs, viable, some sector exclusions. Debt only – may not support pre-revenue early stage businesses	Loans (50k to £200k	£6.5m
Foundation East	EEDA, RGF, etc.	Essex (EEDA Area), i.e. Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk, Suffolk and neighbouring areas.	SMEs, open. Debt only – may not support pre-revenue early stage businesses	Loans up to £100k	£1.5m
Low Carbon Innovation Fund	ERDF	East of England Ceased investment 2015	SMEs contributing to the low carbon economy. New investment reliant on receipts of investable returns.	Equity	£20.5m

Source: Access to Finance: Demand Assessment for the SE LEP Area, Centre for Evaluation and Strategy Services (2014)

The two remaining opportunities above are both offering loans and may not readily consider the early stage investment opportunities which are the target area for this proposal.

3.8 Early stage finance

Regeneris reported:

Data from the BVCA suggests that early stage investment in the East of England fluctuated significantly between 2007 and 2010: while £45 million was invested in 2007, this dropped to £20m in 2008 and £6m in 2009. After rising to £27 million invested in 2010, this figure has continued to fluctuate, dropping down to an average of £21 million in 2011 and 2013.
A number of national initiatives have had some impact on the early stage funding landscape in the East of England. These include:

The Angel Co-Fund.
This £100m Fund was launched in November 2011 with a grant from the Regional Growth Fund. The aim has been to invest between £100k and £1 million in high potential businesses, and to leverage significant co-

investment from business angels. It invests in both early and later stage businesses and has invested alongside LCIF1. The latest monitoring data indicates that a total of £8.8 million (including investment by co-investors to the ACF) has been invested in the East, in 7 companies. This represents 10% and 14% of the value of investment and number of companies in the UK, respectively. Regeneris Consulting do not have access to regional data on leverage but at the national level to date £3.80 has been levered in from business angel syndicates for every £1 invested by the ACF itself. At this stage it is clearly too early to judge the level of returns – the data available to us is at the national level, which states that one exit has been achieved at a 3 times return.

Enterprise Capital Funds
ECFs were originally set up in 2005 as a government-backed scheme with the aim of investing up to £2 million in early stage companies. ECFs operate as private companies that back private capital with Government-guaranteed leverage. The limit on the amount that ECFs could invest into any one fund was £25m, which has recently been increased to £50m. The ECFs are typically UK-wide Funds, although regional funds have been supported. For various reasons, two thirds of the value of investment made to date has gone to companies based in London, South East and East of England. There are two ECFs based in the East of England, including the first so-called super ECF – IQ Capital, which has the ability to invest up to £5m into individual companies. The latest monitoring data shows that 18 investments have been made in the East of England to date, with a value of £29 million (including co-investment).

Tax incentives.
Collectively tax incentives are the biggest intervention in the UK equity market by value. The Enterprise Investment Scheme (EIS) provides 30% tax relief for investors making an investment of up to £1m in any tax year. SEIS is a derivative of EIS, which aims to encourage seed investment in early stage companies. Investors receive tax relief of 50% on investments up to £100k and Capital Gains Tax exemption on any gains in SEIS shares. ONS data based on HMRC returns shows that a total of £135m has been invested through the EIS scheme, in 485 enterprises over 2009-2012, an annual average of around £45m. This is equivalent to £372 per SME employer, which compare to the English average of £650. There appears to be a general consensus from our consultations that these initiatives have had a strong impact in bringing forward investment from business angels and High Net Worth Individuals in the early stage arena.

3.9 How LCIF 2 complements existing provision

Whilst the above opportunities clearly deliver benefits to some recipients in the target market a considerable gap in availability of funding for earlier stage companies developing innovative technologies, products and services still exists, and particularly so for the 'low-carbon' sector. The Regeneris Block 1 Ex-Ante Assessment Report highlights the market failure in the Low Carbon sector and notes that "there is a particularly strong emphasis on the Low Carbon agenda, with a willingness from many public bodies to extend and strengthen current finance provision in this area". Since the LCIF1 initial investment end date of 31st December 2015 UK government subsidies in the renewable energy sector have been significantly reduced. At the same time SMEs in the energy sector are competing with major multi-national fossil fuel companies and the large energy companies that dominate the majority of the household energy market[1]. Whilst some returns from LCIF1 investments have been available for further investments since 2015 demand from SMEs has outstripped the investment funding available from the legacy. Utilising a relatively small proportion of the LCIF1 legacy as match funding, LCIF2 will enable the disbursement of further ERDF funding from the 2014-20 programme in order to address market failures across the region.

[1] https://www.ofgem.gov.uk/system/files/docs/2017/10/state_of_the_market_report_2017_web_1.pdf

In 2018 Beauhurst reported that LCIF 1 was the 5th most active investor in this space, and as a 'fund of last resort' this demonstrates that the need for funding was not being fulfilled by private sector investors or other provision. Whilst a number of other initiatives, such as localised, project specific, grant schemes have also been available as well as Innovate UK and other sector specific initiatives these do not address the need for core revenue growth funding for most ambitious early stage businesses. Requirements of grant funds, whilst beneficial for the purposes they set out to achieve can often cause 'mission drift' and often also require additional match funding to be found.

It is recognised by the EU that energy markets alone cannot deliver the desired level of renewables in the EU, meaning that national support schemes may be needed to overcome this market failure and spur increased investment in renewable energy[1]. Other sources of funds often employed by early stage businesses operating in the low carbon sectors are;

- R&D Tax credits – a valuable return of cashflow following significant spend on R&D, not, in itself, growth investment
- Directors and other shareholder loans – valuable for smoothing short term cashflow crunch points however not the answer for sustained growth to a considered plan
- Waiving of salaries – a measure often employed by management teams in early stage companies, destabilising for the team and unsustainable for most businesses.

The delivery of an LCIF 2 fund directly addresses the needs of potential high growth businesses in the region that are not currently being served well either by existing VC provision, who tend to overlook very early stage enterprises outside of major cities, or by the Angel investor community who have not the time or inclination to educate and nurture otherwise promising businesses who lack experience in fundraising through their first rounds. LCIF 1 has demonstrated that providing this through a publicly backed fund can unlock substantial amounts of private sector investment. Far from competing with other finance providers an LCIF 2 would be an effective and complementary provider of finance, enhancing the effectiveness of, and unlocking, private sector investment in the region by providing the assurance of the LCIF assessment and due diligence processes. In effect it 'prospects for' those very early stage opportunities and feeds them up to later stage investors. This encourages the coming forward of greater numbers of pipeline investment propositions and grows the investor community seeking opportunities as well.

[1] https://ec.europa.eu/energy/en/topics/renewable-energy/support-schemes

4. Implications for the East of England and for future Public Sector Backed Funds

Regeneris compiled this section of the Ex-Ante Assessment to summarise their findings in the East of England.

	Micro Loans	Early Stage VC	Debt for Growing, Established SMEs	Expansion Equity for Established SMEs
Step 1 – Demand and Supply Characteristics	• 484,000 microbusinesses in East of England (including 65,600 sole traders and 289,000 unregistered businesses) • Good performance on enterprise indices; with start-up rates only slightly lower than the national average. Strong performance of Cambridgeshire and surrounding region. • Unusually sharp reduction in overdraft provision by the major High Street banks. • Range of schemes (CDFIs, local grant and loan schemes, start-up loans) operating in the region filling some of the gap at lower levels. Includes successful Foundation East partnership. However, many existing grant and sector loan programmes are due to end in the period up to 2015. 1.9	• Region has dynamic pockets of highly innovative research and production, and strong performance on enterprise indices • But significant number of university spin outs based on Cambridge and other nationally recognised universities. • EIS has had some impact on supply of co-investment, but less active than England average. 1.10	• 21,000 established SMEs in the region • National reduction in bank lending has been felt in region – particularly in terms of overdraft provision to small businesses • Reasonably strong take up of EfG in the region, close to the England average • Other initiatives (BFP and Investment Programme) appear to have had less traction. • P2P lending has had significant growth – impact on the region unclear and remains low in context of overall lending. Highly concentrated in certain sub-regions (Cambridge part of the Thames estuary). 1.11	• 21,000 established SMEs in the region • 22.8% of businesses in region defined as high growth. East of England ranks 3rd of all English regions • Demand for expansion equity hit by decline in business confidence but some signs of recovery • Equity aversion remains a long-term cultural issues amongst SME owners in the region, particularly in the rural and coastal fringes • Few mainstream providers, generally focussing on fewer, larger deals (e.g. BGF age investment of £5.4m)

Step 2 – Unmet Demand	• Solid evidence pointing towards particular difficulties experienced by micro-businesses in obtaining finance • Theoretical unmet demand of c.105m p.a. if only 10% of rejected firms had solid business plans (in addition to the gap being addressed by current public sector backed measures).	• Improved economic climate – leading to more start-ups. • Current Lack of strong evidence of demand unmet from mainstream sources, but this may change given higher growth for knowledge-based industries. • Other sources potentially filling some, but not all of the gap.	• National survey data suggests around 40% of small and 30% of medium sized businesses have problems accessing finance, and this has grown in recent years • Not possible to split theoretical unmet demand calculation for debt vs. equity, but unmet demand for established SMEs as a whole amounts to c.£80m p.a. even if only 10% of rejected firms had solid business plans (in addition to the gap being addressed by current schemes)	
Step 3 – Market Failure	• Only existing regional ERDF backed fund has solid demand profile but assisted by strong marketing effort. • Regional evidence base is compromised by statistical difficulties associated with ambiguous geographical position of schemes operating in SELEP area. • Many current grant-based schemes are due to end within the next 24 months. • Strong consensus amongst consultees of a structural long-term funding gap at microfinance level. 1.12	• Little consensus amongst consultees of a structural long-term equity gap at the early stage. • Commitment to Herts based scheme to use public agencies to kick-start wider private sector provision	• Evidence on bank lending suggests amplification of pre-existing market failures in region. • Existing structurally focused ERDF schemes (Low Carbon Freight, KEEP etc) due to expire. • Also evidence from other initiatives (e.g. LCIF) of market failures in specific sectors.	• Demand hit by business confidence – also long-term issues of equity aversion, especially in rural and coastal areas.

Step 4 – Persistence of Market Failure	• Consultations suggest banks likely to continue to focus on asset-backed, larger propositions in coming years • Market failure likely to continue for foreseeable future. • Evidence from Foundation East suggests continued reluctance of banks to lend. 1.13	• Evidence suggests mainstream players will continue to focus on larger, de-risked propositions • Little to suggest any changes in supply side provision outside of Cambridge and areas closer to London markets.	• Banks under continued pressure from regulation and increasing cost of capital – consultees view suggests unlikely to return significantly to SME market • P2P has grown but future path and sustainability unclear. Stronger performance in Cambridgeshire heartland, and in creative and high-tech industries. • Economic recovery points towards increase in demand for debt and therefore potential increase in unmet demand.	• No sign of mainstream players moving away from fewer, larger deals, potentially leaving a gap at lower levels of equity/mezzanine. • Economic recovery suggests demand for expansion could pick up and therefore increase unmet demand and market failure • Caution required: equity aversion still an issue in region.
Step 5 – Specific Economic Development Priorities	• Support for new businesses through start-up programmes identified as a priority for LEPs throughout region • Interventions to develop enterprise culture (e.g. through education) are emphasised in LEP strategies • Analysis to be further tested and reviewed as part of Block two work	• All LEPs place emphasis on SME innovation and are putting in place a range of related interventions • Analysis to be further tested and reviewed as part of Block two work	• Supporting the growth of existing businesses highlighted as a priority by all LEPs • Range of associated business support actions are supported • Analysis to be further tested and reviewed as part of Block two work	
Step 6 – Delivery Capacity	A limited track record in the region of delivering publicly backed Funds. LCIF and other interventions have helped to develop an embryonic infrastructure, linkages and networks in the region, but this is heavily centred in certain sub-regions. CDFIs more active than national data suggests, therefore stronger delivery potential. Analysis to be further tested and reviewed as part of Block two work as the potential investment strategy and delivery options are developed.			

5. Lessons learned from LCIF1

5.1 The business case for LCIF1 was drafted between UEA and the East of England RDA. It operated as a directly managed project by the University's Innovation Funding team. It is governed by a Board comprising senior university managers and experienced investment industry experts. It does not operate under a Limited Partnership or any other form of Special Purpose Vehicle structure. It reports on a regular basis to MHCLG.

5.2 LCIF was originally contracted in November 2009 and launched in 2010 as a co-investment fund with opening capital formed by £8m of ERDF. A co-investment fund operates by co-investing alongside finance from co-investors on a deal-by deal basis and in the 2007-13 ERDF programme, a ratio of at least 50:50 LCIF to private sector leverage was mandatory to provide match-funding.

5.3 LCIF received further top-ups of £4.5m in November 2011 and a further £8m in December 2012 following which the £1.74m Smaller Investments Scheme (SIS) supporting deals below £75k was created and additional funds allocated for follow-on investments into existing portfolio companies. Total ERDF invested is £20.5m to the investment end date of 31st December 2015.

5.4 The SIS fund was created in 2013 by LCIF in response to recognised demand from earlier stage businesses who were not at a stage of development to yet attract sums larger than £75k and to enable distribution of funds to a greater number of recipient companies

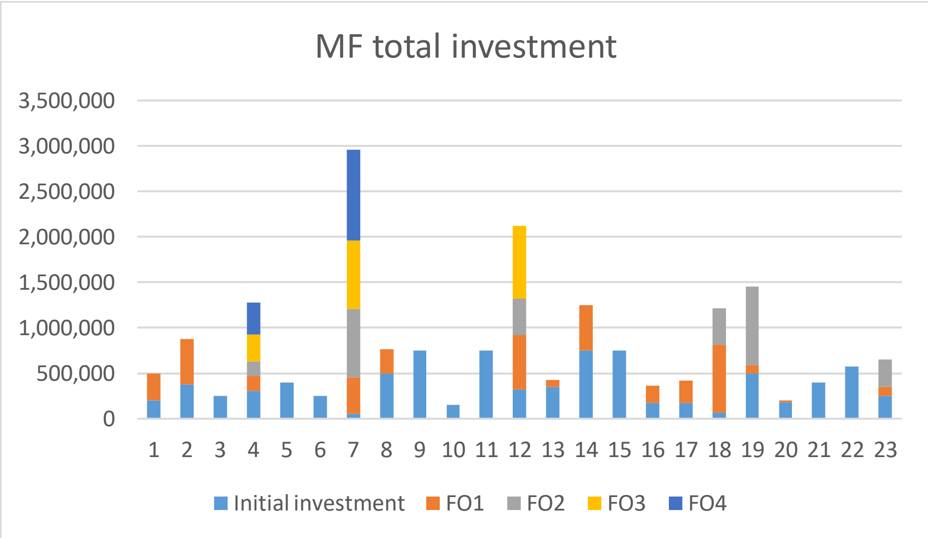
5.5 The fund is split into two portfolios, SIS – an 'in-house' operated strand worth a total of £1.74m (at investment cost), providing £25k - £75k into smaller ventures; and the 'Main Fund', its operation supported by a contracted fund manager, worth £18.74m that supports larger deals from £75k up to £1m . The lower limit of the SIS was originally capped at £10k at its launch, to attract more enquiries from creative sector businesses. However, there was found to be insufficient demand for equity, or quasi-equity style funding at this level and the cap was raised. At launch, the Main Fund was expected to deliver packages of finance in a range from £50k to £500k. To counter concerns between 2010 - 2012 that the fund was proving slower to invest than expected, the range was subsequently raised to £75k - £750k in 2013 and the upper limit to £1m in 2014, in response to demand.

5.6 The terms of the fund are that all investments are to be made pari-passu with co-investors (at equivalent or better terms for risk and reward). The SIS typically invests in convertible loans, with the intention of conversion to shares for the most promising companies and at the same pricing structure as co-investors. Investments from the Main Fund are usually made as equity although the fund manager has full discretion to use debt instruments too.

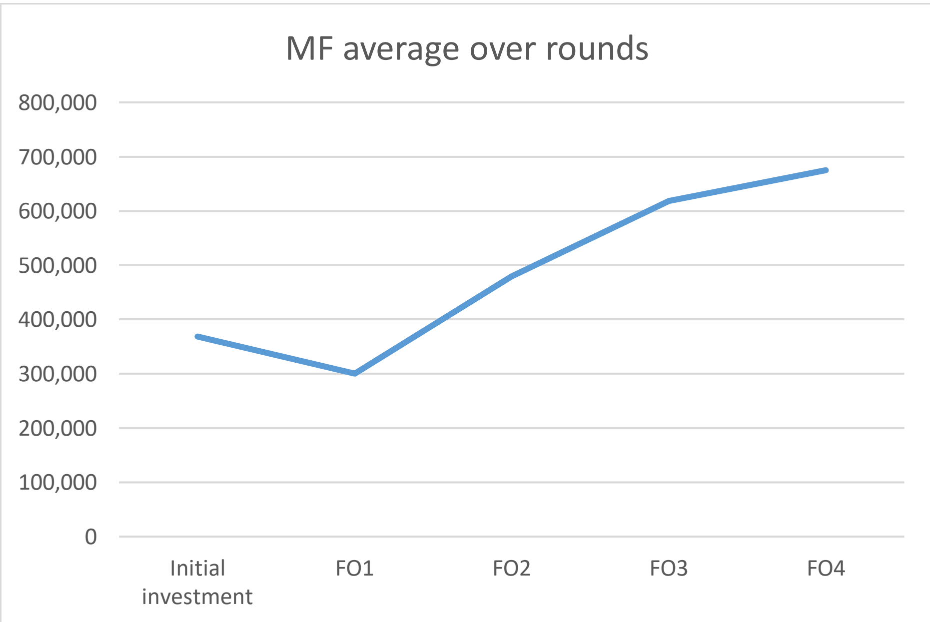
5.7 There are in excess of 500 individual sources of private co-investment, ranging from business angels, private equity and venture capital. Sources of additional public sector leverage include investment from British Business Bank's Angel Co-Investment Fund and Finance South East and grants from Innovate UK and others.

The Main Fund has generated £45.5m of co-investment (ratio of 1:2.43) and SIS, £3.48m (ratio of 1:2).

5.8 On the Main Fund, average investment per round was £335k and the average total investment per company was £852k. Average first, second, third and fourth round tranches were £300k, £479k, £618k and £675k respectively, made at 355, 418 and 372 days after the preceding tranche. Around two thirds of the Main Fund were invested in follow-on rounds. Once fully invested, holdings vary from 1.5% to 15% of share capital.

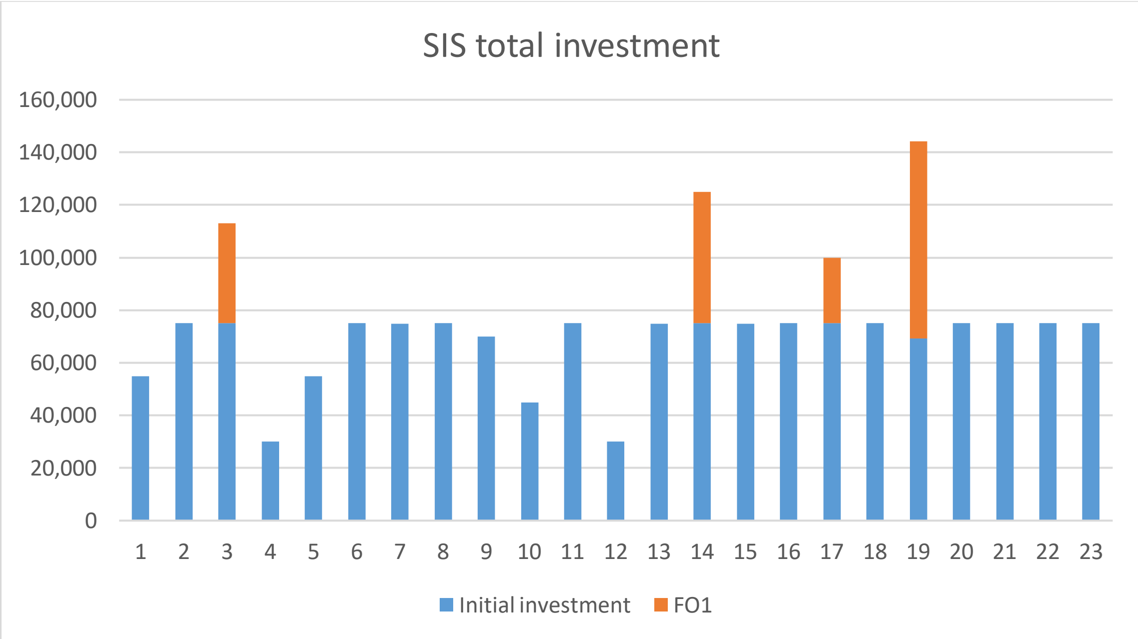


Source: UEA Adapt (NB 'FO' relates to the term follow-on or to tranches subsequent to the initial investment).



Source: UEA Adapt (NB 'FO' relates to the term follow-on or to tranches subsequent to the initial investment).

5.9 On the SIS Fund, average investment per round was £64.5k reflecting the fact that around two thirds of deals were placed at the top end of the intended investment range with the average total investment per company at around £75.7k. Just four SIS investees received a single follow on tranche of an average of just less than £47k made at an average of 398 days following tranche 1 meaning that less than 10% of the SIS funds value was used thus. This was in large part due to time restraints owing to the ERDF investment deadline of December 2015. Had more time been available for investment spend it is the view of UEA that a greater number of LCIF SIS portfolio companies would have been eligible to receive follow-on investments and to progress to Main Fund for larger investment rounds.



UEA Adapt (NB 'FO' relates to the term follow-on or to tranches subsequent to the initial investment).

5.10 Since its launch in 2013, the SIS fund has proved valuable as a means of supporting smaller deals and as a feedstock of ventures for investment by the Main Fund. It was designed to present a simple, streamlined and most crucially – an economical way of making first investment into promising ventures - and uses specifically designed template documentation wherever possible to support this aim.

5.11 Private and public co-investment for LCIF1 stood at £48.97m and £1.33m respectively by the end of the investment phase at 31st December 2015.

5.12 LCIF1 employed an FCA Regulated Fund Manager, Turquoise International Limited on the Main Fund and in an advisory role for LCIF1 SIS. For Legacy Fund operation and following a re-procurement, Turquoise provide full service on Main Fund and Enterprise Ventures provide advisory FCA supervision on SIS.

5.13 Turquoise International Ltd is a London based firm that is accredited (since 2003) by the Financial Conduct Authority (FCA) as a Small Alternative Investment Fund Manager (AIFM). Turquoise provides an advisory role to UEA. From its own website;

> 'Turquoise is a merchant bank specialising in Energy, Environment and Efficiency. Founded in 2002, Turquoise has established sector-leading expertise and track record in fundraising, M&A and investment management.'

5.14 Enterprise Ventures (EV) advises UEA on the operation of the SIS fund. Like Turquoise, Preston-based Enterprise Ventures is an FCA authorised AIFM with a long background as a fund manager in publicly funded financial instruments. From the EV website:

> 'One of the leading providers of venture & growth capital and loans to ambitious small businesses in England and Wales. We can provide finance of up to £2 million for businesses in all sectors and at all stages of development – from funding for start-ups to investment to help you grow your business, fund a management buy-out or buy-in and replacement capital.'

5.15 In this role, Turquoise are required to support the marketing of funds and their role tends to focus on promotion to co-investors with the UEA team, being locally based and in closer contact with investors and founders in the region finding investee deal flow. Fund Managers attend a range of investment events/fairs on behalf of the fund whilst the UEA team design and distribute marketing materials, manage LCIF's web presence and advertising campaigns.

When new enquiries were received, Turquoise would lead on proposal development for the Main Fund and the UEA team for the SIS Fund. In some cases, Turquoise assisted an investee company in finding co-investment. In others, third party advisers have been used for this purpose. Turquoise carried out most due diligence on main fund applications due diligence for the SIS fund was conducted in-house by the UEA team with specialist input procured as necessary.

5.16 All decision making for LCIF1 is undertaken by two investment committees – one for each of the Main and SIS Funds. SIS investment committees comprise four members. EV provides an Investment Committee member with a UEA representative and the Innovation Fund team manager. An independent chair appointed by UEA supervises both committees. Annual remuneration for non-UEA members as c.£12k per annum. For the Main Fund, the Investment Committee comprises up to 4 each of representatives from UEA (which may include the Innovation Funding Manager) and Turquoise with additional independent members co-opted to provide specialist technical knowledge as required.

5.17 Turquoise are remunerated as per procured contract. Turquoise also has an option at exit, to buy up to 20% of LCIF's investment at the same rate paid by LCIF. Turquoise appoint one of their executives as a Non-Executive Director to an investee company. No additional NED fees are charged.

5.18 On investment from SIS, a team member from LCIF is assigned as a board observer to the investee company. Terms of investment allow the right to be appointed a full member of the board.

5.19 Originally, when the Fund was conceived in 2009 it was anticipated that operational costs would be offset by income from interest earned on idle ERDF and returns on deposit as cash at the bank. However, interest rates available on deposit accounts fell to such a low level following 2009 that UEA agreed to host and 'cash flow' the fund on the basis that it was permitted by MHCLG to recoup expenses including set up and operating costs including fund manager fees from uncommitted returns as they arose.

5.20 SIS investment is usually made as a convertible loan on a standard three-year term. At the end of three years, there are three options: For LCIF to convert its loan to equity, to enter a repayment schedule or to extend the loan.
To date,

- five conversions have completed – the first to enable a second, larger Main Fund investment.
- Five have either been repaid or are repaying via a schedule
- Ten have extended the term
- Three have failed (write-offs)
- UEA expect around 30% of loans to convert, usually after an earlier loan extension, 40% to repay and the remaining 30% to extend with some failures/write-offs. Where loans are scheduled, interest is normally rated at 4%.

5.21 One of 45 investee businesses is a University technology spin-out with one more from the Norwich and Norfolk NHS Hospital Trust. UEA would like to have generated more spin-outs but recognises that it has a greater humanities base than in science and technology. Following a sustained campaign of awareness and relationship development with other academic and research organisations in the region UEA is confident that a greater number of spin-out companies and start-ups could be encouraged to apply to LCIF 2.

5.22 The original proposal for LCIF1 anticipated the generation of returns and formation of a legacy for re-investment but made no claims for its likely value. It is understood that UEA agreed to participate on the grounds that the fund would be cost neutral to the university and would support parallel activities in its enterprise programme and enhance its status as a facilitator of low carbon economic growth as well as a technical, research and academic centre of expertise for environmental sciences and carbon reduction.

5.23 In the early days of LCIF, take up of investment took time to build momentum as a previously unknown, new source of investment funding. Since developing a more proactive approach and building awareness and reputation within the investor community a number of business leaders help to promote the fund and signpost demand for innovation funding in businesses.

5.24 LCIF 1 was originally established to support investment across the East of England (EEDA) region and included areas that are not covered by the three LEPs participating in the current Ex-Ante Assessment. There has been a broad spread of deal flow between sub-regional areas covered by the LEPs with investment from LCIF's capital pot distributed as follows:

1.14 Area	1.15 Indicative LCIF investment	1.16 % total investment
1.17 Cambridgeshire	1.18 £9m	1.19 45%

1.20 Hertfordshire	1.21 £2.5m	1.22 12.5%
1.23 Norfolk and Suffolk	1.24 £3.5m	1.25 17.5%
1.26 Essex	1.27 £4m	1.28 20%
1.29 Bedfordshire	1.30 £1m	1.31 5%

5.25 The relative level of co-investment between the five areas is highly varied with the ratio of leverage to LCIF investment in Cambridgeshire and Essex being two to three times that of Bedfordshire, Hertfordshire, Norfolk and Suffolk. This is thought to be down to the difference in investment patterns between areas with those in Norfolk and Suffolk tending to be smaller in scale compared to those in Cambridgeshire, which with its university science/technology base is intrinsically more likely to attract greater private interest. It is also important to note that investment readiness of very early stage businesses was a major factor in applicant companies being able to raise the co-investment required to achieve LCIF 1 backing particularly in the Norfolk and Suffolk areas. It is anticipated that this obstacle will be significantly reduced with the delivery of the Invest East Investment Readiness Programme now operating in this geography.

5.26 MHCLG has agreed to allow LCIF to recycle returns for use in new investment and the SIS fund has now been re-opened with the Main Fund expected to do likewise as funds permit. UEA has led a new procurement exercise to form a fund manager framework from which, Turquoise International has won a tender to provide fund management services for recycled returns from the first phase of LCIF 1. .

5.27 To date, LCIF 1 has invested in 45 businesses, 23 receiving investment from SIS and 22 from the Main Fund. £10.03m was provided as initial investments and £10.47m as follow-ons. An average of £5.75m was invested from LCIF1 in each of the last three years of its operation.

5.28 Just less than 5% of the LCIF 1 was invested in creative industry sectors with 49% and 2% of the SIS and Main Funds deployed respectively. It was found that such businesses sought smaller sums and on terms other than equity or convertible loan than those in technology sectors and were more likely to be micro-businesses employing less than 10 people and/or freelance workers. A number of applicants in this group were only prepared to accept soft loans when indeed, the risk presented was felt to be more suitable for an equity investment or grant. Experience of the LCIF team reports that there is a particular need for a wider approach to investments into the creative and cultural sectors which are not often suitable for equity type deals.

5.29 Nine investments have been written off, resulting in a loss of £5m from three deals in the SIS and six in the Main Fund.

5.30 To date, there have been ten exits (or part-exits) through trade sales and completion of loans from SIS that have not converted to equity. Those exits generated £5.3m on investments of £5.9m, a return of 89%.

5.31 It is too early to judge the overall financial success of the fund. Returns from early stage technology companies have been slower to mature than was envisaged in 2009, although this is now considered to be typical of the sectors which are often referred to as requiring 'patient capital'. Realisations are expected to grow to the end of 2022. Returns are consolidated to UEA's balance sheet and UEA has indicated that the latest valuation was c.£22.35m against investment cost of £20,786,492 (includes investment from legacy).

5.32 ERDF funded projects are frequently targeted for the creation of new Gross Value Added or GVA. GVA can be measured in many ways and for an investment fund, it is common to monitor the value of additional sales generated by beneficiary firms over and above a pre-investment baseline. LCIF achieved a net GVA of £22.5m in 2015. It is important to note that the majority of early stage businesses invested by LCIF 1 are pre-revenue and at development stage of innovative technologies.

6. Why a 'low carbon' fund?

6.1 LCIF 1 had an objective to support investments that could lead to carbon reduction and a verifiable methodology was developed in partnership with NAREC that could support an applicant's claim in this respect. By calculating the likely savings in greenhouse gas (GHG) from two thirds of the LCIF portfolio, UEA estimates that 220,000 tonnes of CO2 equivalent emissions had been abated by mid-2016. See Appendix A

6.2 LCIF 1 report that their experience of working with early stage low carbon companies demonstrated the importance of assisting often very technology focussed investee founders develop a clear and sustainable growth plan, and for advice from the right people at the right time to be made available in order that founders be able to raise the capital they need to deliver the plan at speed and scale. At pre-revenue stage debt funding is unavailable and so Angel, Crowd or VC investment is essential. The 'assurance factor' provided by LCIF 1 to private sector investors should not be underestimated here. In situations where investors are potentially interested in an investment proposal, they are yet often hesitant to commit until a well-regarded, experienced investor or Fund with knowledge, contacts and experience of the relevant sectors is involved. This was often the case with LCIF 1 investments and is expected to remain a significant factor during the LCIF 2 period.

6.3 In addition, with the LCIF team and Fund Managers acting as a point of reference for other investors and advocates of 'clean-tech' and GHG reducing businesses in the region a key benefit of LCIF 1 has been to 'prospect' for, assess and encourage the growth of businesses which other investors had not yet become aware of, feeding the pipeline of early stage companies through the funnel of, often, their first rounds of investment enabling their proposals to be more attractive to later stage investors. The operation of the well regarded, ethically sound fund encourages businesses to come forward for investment feeding this pipeline which, in turn, encourages the attention of a greater number of investors.

7. Key characteristics of specification of LCIF2 as a result of lessons learned from LCIF 1;

- That an investment fund dedicated to businesses involved in the development & growth of low carbon technologies, products and services requires specialist knowledge and contacts which will be integral to the delivery of LCIF 2.
- That there is clear demand and need (including unmet need for follow-on investment) for a fund of this type in the east of England – greater planning for follow-on investments has been designed into the investment profile of LCIF 2
- That developing a cohort of very early stage businesses through a SIS-style investment package is valuable for developing deal flow for later stage investors – this will be met through LCIF2's 'Pathfinder' group of investments
- That the awareness and reputation of the operation of specialised funds is crucial to its success in attracting the right deal flow and co-investors, LCIF 2 as designed will capitalise on the reputation and experience of LCIF 1
- That the intention to develop a varied portfolio is a positive attribute to a fund of this size constrained both by focus (low carbon) and geography in identifying the best investment opportunities.
- Further to the above point that a 'patient' approach in terms of years to exit is right and necessary in many cases and the portfolio should be mixed to allow for some shorter, as well as longer term investments

8. Low Carbon Investment Fund 2: project proposal

Convinced by the considerable benefits of developing a further Low Carbon Investment Fund for the Eastern region to build on the successes of LCIF1, the partnership then considered the best model for delivery of this. The key requirements in identifying the successful option were –

- **Eligible** governance and management structure under the 2014-20 programme regulations
- A **viable** and financially sound model
- A model which would be **sustainable**, creating a governance structure with the potential ability to take on other funds and opportunities in the future
- A **coordinated** approach which would enable complementary working of LCIF1 legacy and a new LCIF fund to enable appropriate collaboration between the two funding streams
- A **collaborative** model which, without compromising the probity of investment decision making, would enable the participating LEPs to play a key role in developing investment strategy and reviewing delivery.

Options Review

Including a ‘do-nothing’ option, four options have been identified to deliver an £11.3m Financial Instrument for the three LEP area identified:

- **Option 1**: A conventional Limited Partnership based financial instrument using a fund of funds model with Norfolk County Council (NCC) appointed by MHCLG as Entrusted Entity and in partnership with UEA, forming an SPV company to act as a Holding Company within a Limited Partnership structure and procuring a fund manager to deliver results-driven fund of fund and portfolio management. The Holding Company SPV would provide governance and management through a management board comprising executive and independent non-executive members. The governance structure would be underpinned by a Shareholder Agreement, to further assure compliance with Regulation 12(5) of the Public Contracts Regulations 2015. It would be responsible for strategic marketing/promotions, procurement/contracting, treasury functions, stakeholder liaison and reporting, and some deal-flow generation (especially from University sources). Eligible pari-passu co-investment will be used as match-funding for ESIF/ERDF. The procured fund manager may either be an FCA-Authorised Fund Manager or if unauthorised, should be prepared to enter into an arrangement with a hosted regulatory services provider.
- **Option 2**: A non-Limited Partnership based financial instrument comprising a single fund with UEA as an Entrusted Entity but in all other respects, established in the same way as LCIF1. FCA authorised fund managers may be engaged to support the fund but decision making will be retained by an investment committee under UEA’s control.
- **Option 3**: That British Business Bank be approached to run the proposed fund and act as Entrusted Entity on behalf of the participating LEPs and leading on the procurement of fund management services;
- **Option 4**: Do nothing. Future investment in low-carbon ventures will be made from LCIF1 returns as they arise and from the commercial market.

The benefits of each of these options was considered in turn, reviewing relevant benefits and concerns.

Option	Benefits	Concerns
1 Fund of Funds – NCC with UEA	This option delivered against all the requirements – • **Eligible** – An eligible Entrusted Entity must be a public sector organisation but must also have direct access to expertise in running a Financial Instrument as well as a strong relevant track record in project management. The proposed NCC/UEA partnership is discussed in more detail later in this section, but it combines NCC organisational eligibility and programme management expertise with UEA experience of running a Financial Instrument. • **Viable** – the financial model has been assembled by staff in both organisations with a detailed knowledge of LCIF1 and is strongly based on known pipeline and costs. • **Sustainable** – the Fund of Funds model enables the partnership to potentially add other investment opportunities	Because of the eligibility criteria, this project could not be delivered without the proposed Delivery Partnership between NCC and UEA ensuring eligibility across the 2 organisations. It is more difficult to minimise costs across 2 organisations, but considerable attention has been given to avoiding duplication of staff time and to developing a clear division of tasks and responsibilities.

	into the same governance structure in future • **Coordinated** – the proposed Fund of Funds model supports the inclusion of LCIF1 legacy under the same umbrella of investment strategy and overview. • **Collaborative** – Both organisations have been integral to the LEP vision from the start and the proposed Investment Advisory Committee is integral to the model.	
2. Single Fund run by UEA	Would score strongly under the **viable** requirement as UEA is an experienced operator with a high level of expertise developing in running LCIF1 so successfully. UEA would be happy to engage the LEPs in developing investment strategy, thus making the project **collaborative** and the **coordination** with LCIF1 legacy would be within the same team.	This option wouldn't score as strongly on **sustainability** as the single fund model would mean that UEA would only be set up to deliver the LCIF2 investment and wouldn't be able to include other opportunities in the same governance structure in the future. This model was not ultimately **eligible** as MHCLG determined that UEA was not eligible to take on the role of Entrusted Entity.

3. BBB-run Fund	Experienced operator of ERDF Financial Instruments, so could potentially deliver strongly on the **eligible** and **viable** requirements.	Would be less likely to deliver against the **coordinated** and **collaborative** points above, as there would not necessarily be a strong role for local development of investment strategy in this option, and the link with LCIF1 legacy and local expertise would not be strong. This option was not ultimately **viable**, as the British Business Bank confirmed they would not be interested in delivering a Financial Instrument of this size, preferring to work with larger investment sums.
4 Do nothing	None.	Significant lack of investment capital for relevant businesses in the East of England, and demand for LCIF1 legacy funding significantly greater than the funding available. LCIF1 legacy also prioritises follow on investment in existing investee companies so less likely to be able to invest in new opportunities.

It is clear from the assessment of options, that Option 1 meets all the requirements set by participating LEPs.

9. LCIF2 Model – Delivery Partnership

As stated in the options appraisal, the proposed partnership between NCC and UEA fully meets the eligibility criteria. The key relevant expertise of the partner organisations and within their staff teams is as follows –

Norfolk County Council (NCC)
Norfolk County Council has been an active partner and leader of EU and other external funding programmes for nearly 30 years. Over that time NCC has built up expertise in a wide range of programmes, from rural development (LEADER, Landskills and LIFT) to skills and employment (Apprenticeships Norfolk, Future Jobs Fund), to community-led regeneration (Investing in Communities).

NCC has significant ERDF experience, including through the 2000-2006 Objective 2 Programme, and has supported the New Anglia LEP in driving the ESIF programmes in Norfolk, including through hosting the facilitation staff. In more recent years NCC successfully bid for the management of the €330m Interreg VA France-Channel-England programme and remains the only English Interreg programme Managing Authority.

As a result, NCC has extensive experience of the requirements of ERDF specifically, and of programme management in general. They have built up a broad and shared corporate knowledge base which will be invaluable in managing the Financial Instrument. This includes a number of staff in Finance and Appraisal Officer roles who have developed detailed understanding of claims and compliance matters in ERDF, and are familiar with State Aid, as well as staff in management positions with programme-level experience of providing the monitoring, project management and compliance review necessary to successful programme management.

NCC Key Personnel include:

- Assistant Director Growth and Development (not supported by ERDF)
- EU Programmes Manager
- EU Project Manager

University of East Anglia (UEA)

University of East Anglia has been an active partner and leader of EU and other external funding programmes for many years as well as the direct experience of developing and operating the LCIF1 fund. The university has built up expertise in a wide range of programmes including a number of ERDF funded revenue projects including InCrops and Centre for the Build Environment as well as capital projects like The Enterprise Centre and Low Carbon Innovation Fund.
As a result UEA has extensive experience of the requirements of ERDF and FCA compliance, programme management generally as well as specialist knowledge and expertise in the management of public sector funds in collaboration with private sector investors and Fund Managers. In addition, the University in general, and the Innovation Funding team specifically possess valuable experience and knowledge in relation to energy and resource efficiency and greenhouse gas saving technologies and the mechanisms by which these technologies can be facilitated to be brought successfully to market.

UEA Key Personnel include:

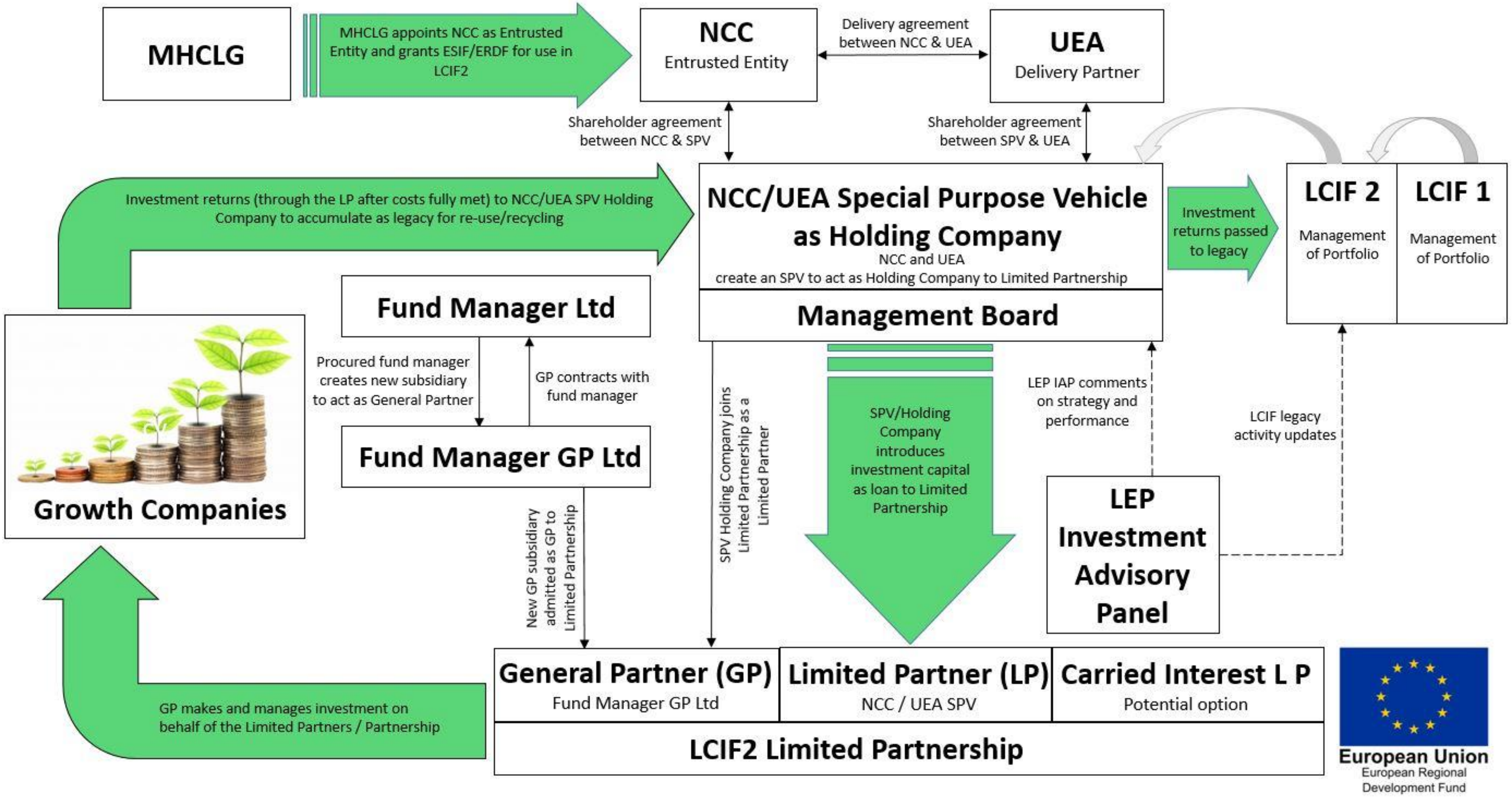
- Pro-Vice Chancellor for Research & Enterprise (Not supported by ERDF)
- Director of Research & Innovation (Not supported by ERDF)
- Head of Innovation (Not supported by ERDF)
- Innovation Funding Manager (Partially supported by ERDF)
- Investment Analyst/Advisors (Not supported by ERDF)
- Administrative Support

NCC and UEA have worked closely together in the development of this project and have a long track record of working in partnership, not least on the Invest East ERDF project which is discussed below as a key source of potential investee pipeline for LCIF2.

It is proposed that NCC and UEA will enter into an ERDF Delivery Partnership in order to deliver this project using expertise from both organisations. Care has been taken to ensure a clear division of tasks and responsibilities between the organisations and to avoid duplication of staff time – as discussed in the operating model section below.

To give both organisations a formal role in the operating model, thus fulfilling the Entrusted Entity requirements for organisational status and expertise, NCC and UEA will jointly form the SPV which will deliver the project, with NCC as majority shareholder. There will be a shareholder Agreement to underpin compliance with Regulation 12(5) of the Public Contracts Regulations 2015 and the ability of the Entrusted Entity to contract directly with the SPV without a procurement exercise.

10. LCIF2 Model – Structure



The Fund of Funds Structure

10.1 As discussed in the options appraisal above, the proposed LCIF2 fund is a ‘fund of funds’. The structure relies on two layers of implementing body, the Holding Company (bringing together NCC and UEA to share local and regional expertise) and the fund manager (a procured professional service bringing independent commercial expertise). One of the benefits of this structure is that it enables the partners to take a holistic view across LCIF2 and LCIF1 Legacy and links the two funds together, building on the success of LCIF1. It also provides scope for the partnership to add other opportunities and funds in future, potentially through the EU’s 2021-2027 programmes or from other funding sources, for example the proposed UK Shared Prosperity Fund. By building on the achievements of LCIF1 and developing further expertise at UEA and at NCC, the fund of funds structure is designed to enable the partners to demonstrate their capabilities and be ready and able to act swiftly to take on other investment fund opportunities which arise in the future.

10.2 This project is a financial instrument, making convertible debt and equity investments of ESIF money into early stage businesses whose activity will reduce carbon emissions. The ESIF money will be matched with money from private investors on a pari passu (equal) basis and the objective of the investment is to support the businesses to develop and grow and to contribute to a meaningful reduction in carbon emissions. The LCIF2 Fund will invest into promising early stage SMEs developing or selling products or services that will have a demonstrable carbon reduction impact. Eligible SME applications will undergo assessment of their business plans and potential for commercial success and, where appropriate, investment preparation. A further subset will receive equity or convertible loan investment funding on commercial pari-passu terms on at least 50:50 ratio with private sector co-investors.

10.3 The key benefits of the fund of funds structure are highlighted in the options table above. Firstly, the structure is eligible, and NCC’’s legal advice confirms this. Secondly it is viable, and it has been assembled by staff in both organisations with a detailed knowledge of LCIF1 and is strongly based on known pipeline and costs. It is also a sustainable structure because the model enables the partnership to potentially add other investment opportunities into the same governance structure in future. Finally, as explained in the table it is coordinated and it is also genuinely collaborative as both NCC and UEA are integral parts of the structure. In summary, the ‘fund of funds’ structure offers many significant benefits and although LCIF2 would be relatively small compared to some other UK funds, the ‘fund of funds’ structure is cost efficient and has the scope to grow and develop in the future.

10.4 The key features of a Limited Partnership for LCIF2 are as follows:

- NCC as Entrusted Entity would be the applicant and recipient of ESIF/ERDF and would receive grant in tranches from MHCLG, as illustrated in the financial model. In partnership with UEA, NCC will create a new SPV company that will act as Holding Company to the Limited Partnership for the purpose of investment. The governance of this company will be created to comply with Regulation 12(4) and (5) of the Public Contracts Regulations 2015, allowing NCC to contract directly with it.

- The Holding Company would be a Limited Partner (and investor) in the Limited Partnership, introducing investment capital as a loan to the Limited Partnership.

- The Limited Partnership must procure and appoint a Fund Manager to manage the affairs of the fund of funds – including investment decisions at all stages through to disposal or exit/realisation. The proposed activity of the Fund Manager is set out in more detail in the operating model section below. The Fund Manager creates a new wholly-owned, single purpose subsidiary that is appointed as 'General Partner' (GP) to the Limited Partnership. Technically, it's the GP entity that undertakes all decision making for the fund of funds and accepts all liabilities that may stem from this activity. By **NOT** engaging in decision making, the Limited Partner's liability is limited to the value of their investment stake.

- Limited Partners may not direct the investment decisions of a Limited Partnership based fund without sacrificing their limited liability status. However, they can and should influence the way that the fund of funds is invested at a strategic level by setting the Investment and Operational Guidelines (IOGs) that form part of the contract with and terms of engagement for the GP/Fund Manager.

- Should the Limited Partnership wish to cease the involvement of a Fund Manager, it may terminate the Fund Management Agreement with the GP and this action effectively ends the relationship with the fund manager, subject to the terms of termination in the Fund Management Agreement.

- Typically, the GP subsidiary of the fund manager is a 'shell company' without any direct employees or assets. The GP sub-contracts the various fund management activities (marketing, negotiation, investment/portfolio management etc) back to the fund manager's parent company under an Agreement for Services. The fund manager's parent company invoices the GP for services rendered but as the GP and the fund manager are under common ownership, there is no VAT chargeable on the transaction.

- The fund manager's remuneration will be linked to alignment with the IOGs, performance of certain key performance indicators (KPIs) that will include investment deal flow, the geographic spread of investments, financial returns to the Limited Partnership to form legacies and economic outputs and impacts that include jobs creation, gross value added (GVA) and carbon-saving.

- A Carried Interest Limited Partner option is included in the model as an option for possible future use as part of the remuneration options for the Fund Manager contract. Carried interest is a stream of remuneration which becomes available at the end of a Fund when returns from investments exceed a threshold value. The Holding Company might wish to use this option in the future as an extra performance incentive for a Fund Manager.

10.5 The Entrusted Entity/Holding Company would adopt a coordinating, strategic management/governance role that allows investment capital to be allocated (and if necessary, de-allocated) to suit the changing market for finance in the region or the performance of the fund manager. UEA created a management board for this purpose for LCIF1.

10.6 The Holding Company would receive and aggregate returns to form legacies for future re-investment, subject to MHCLG consent.

10.7 Private sector co-investment occurs alongside the investment from LCIF2 on a deal by deal basis. Although investment from the fund of funds is contingent on private sector co-investment on pari passu terms, that co-investment is not required to pass though this structure, only that it is fully demonstrable and evidenced.

10.8 MHCLG will provide ESIF/ERDF as a grant but typically, is likely neither to seek a seat on the Holding Company's SPV management board for LCIF2 nor join the Limited Partnership as a Limited Partner. Instead, it will protect its interest though a funding agreement, with terms that enable the control of further introductions of ESIF/ERDF in the event of an irregularity or dispute.

10.9 The ESIF/ERDF grant is held on trust by the Entrusted Entity/Holding Company for the lifetime of a new fund, with proprietorial interest remaining to be held by the Secretary of State until the fund of funds achieves final audit sign-off.

11. LCIF2 – State Aid

In assessing the State Aid implications of the project, we have followed the analysis principles set out in "State Aid Law European Regional Development Fund Guidance Note for Grant Recipients January 2016". Accordingly, the state aid implications of this project are initially considered in the following table:

Potential beneficiaries	NCC	UEA	Holding company and Limited Partnership	Fund Manager	Private sector co-investors	End Beneficiaries
Transfer of State resources	Yes	No	Yes	Yes	No	Yes
To an undertaking (operating as a business)	No	No	Yes	Yes		Yes
Advantage			No	No		No
Is the advantage selective						
Potential to distort competition						
Affects trade between member states						

Considering in further detail the position of each potential beneficiary below, it is relevant to consider the European Commission guidance "Guidelines on State aid to promote risk finance investments 2014", referred to as "the Guidance" for ease of reference.

Considering the position of NCC, as Entrusted Entity, NCC itself will not be co-investing. Its role is as a vehicle to channel the financing and it is not a beneficiary of aid. The Funding Agreement is expected to contain terms to assure that NCC is not over-compensated. Accordingly, it is not a beneficiary of aid. This reflects the position in paragraph 39 of the Guidance.

Considering the position of UEA, measures will be undertaken to ensure it is not over compensated. Concerning the position of the holding company and limited partnership, these will be vehicles for the transfer of aid to the end recipients (i.e., enterprises in which the investments are made), rather than a beneficiary in their own right. Again, it is assumed the Funding Agreement will contain terms to ensure they are not over-compensated. This reflects the position in paragraph 37 of the Guidance.

Concerning the Fund Manager, they will be selected through an open procurement procedure, in order to ensure their remuneration does not exceed the current market rates, and accordingly it can be presumed they will not receive state aid. This reflects the position in paragraph 40 of the Guidance.

Concerning the private co-investors, it is the intention that the end investments will be in line with the Market Economy Investor Principle and, accordingly, will also not constitute State Aid. One way this can be assured is by the methodology set out in paragraphs 31 – 34 of the Guidance, in summary:

- The investments will be effected *pari-passu* with private investors.
- The private investment will be significant, that is, at least 50%.
- Risks and rewards will be shared on the same terms between public and private sector investment.

It is the intention that the end investments will be in line with the Market Economy Operator Test and, accordingly, will also not constitute State Aid. In accordance with the guidance, this will be assured because:

- Aid would not (as above) be present at the level of investors, so would not be passed down to end recipients; and / or
- The terms of the investments will be acceptable to the private co-investor(s) operating under normal market conditions.

It is understood that there may be specific instances where it might be advantageous to consider applying a State Aid exemption to a particular investment. On these occasions the main options are as follows -

- GBER (General Block Exemption Regulation), in particular article 21, risk finance aid. It is possible articles 38, 39 and 41, all relating to environmental protection measures may also apply.
- the de-minimis regulation may be applied in those circumstances where other state aid not in excess of 200,000 euros has not already been received in the last three fiscal years. The guidance in the MHCLG document “European Regional Development Fund Guidance Note for Grant Recipients January 2016” can be applied, and it contains sample letters that be used to ensure compliance.

NCC and UEA have extensive experience of applying State Aid regulations at project and investment level and will be in a good position through the Holding Company to assess and determine any state aid provision suggested by the Fund Manager.

12. LCIF2 model - Strategy and scrutiny

There are three key Committees or Boards involved in the management and oversight of LCIF2 in this proposal, and it may be useful to set out briefly their respective roles.

12.1 LCIF2 Investment Committee
The Fund Manager's Committee to determine applications for investment.
Terms of Reference to be set in the contractual process of appointing the Fund Manager.

12.2 LCIF2 Investment Advisory Panel
Chaired by Norfolk County Council, this Board provides LEP scrutiny and direction for overall project and investment policy.

12.3 LCIF2 Holding Company Management Board and officer group
NCC will be the majority shareholder of the proposed Holding Company which will be established with UEA to deliver the project. The Holding Company will procure the Fund Manager and oversee their delivery. It will also be responsible for overall delivery and compliance against the ERDF contract, and Fund monitoring and evaluation. The Holding Company Board may appoint expert advisers with investment experience to supports its scrutiny of project delivery. However, the composition of the Management Board will be maintained so as to comply with the (joint) control requirements in regulation 12(5) of the Public Contract Regulations 2015.

12.4 The role of the LCIF2 Investment Advisory Panel has been informed by other examples of LEP's engaging with funds managed under Limited Partnerships (such as the Northern Powerhouse Investment Fund) where these have created a Strategic Advisory Panel (analogous to the Investment Advisory Panel) to support the fund of fund's management board by approving and periodically reviewing the fund's IOGs.

12.5 Fund managers may be encouraged to co-invest in the sub-funds to further align their interests with that of the other stakeholders and join the Limited Partnership as a Limited Partner. A Carried Interest Limited Partner may also invest if allowed to do so by the lead investor – in this case, the Entrusted Entity/Holding Company. Some publicly supported funds have used Carried Interest investment as a means of driving additional commitment and differentiation from prospective fund managers at procurement stage.

12.6 In this project, it is proposed that the Investment Advisory Panel will be comprised of appointed representatives of all LEPs contributing allocations to the project and covered by its provision – New Anglia LEP, the Cambridgeshire and Peterborough Combined Authority and Hertfordshire LEP. The Terms of Reference will be established by the Board under the direction of the applicant. This Panel will not be making or commenting on individual investment decisions, but will -

- Advise on the overall investment strategy and overall terms of investment and review these regularly during the lifetime of the project
- Comment on project delivery and provide challenge to encourage high performance.
- Advise on strategic fit and networking with other LEP initiatives, key sectors, Economic Strategies and Local Industrial Strategies.
- Monitor spread of delivery across the project geography.

13. LCIF2 Model – pipeline and linked projects

The operating model discussed below references a number of projects and organisations which will provide pipeline opportunities and relevant business intelligence to the Fund Manager and/or UEA Team before potentially eligible businesses develop and submit an online application. These are as follows –

13.1 LEP Growth Hubs – have a responsibility under the ERDF Programme to act as a 'gateway' to the full range of business funding opportunities. The applicant should ensure that Growth Hubs have a strong understanding of the project and its investment strategy, so that potential investment opportunities can be directed to the project.

13.2 ERDF Low Carbon grant funds – ERDF projects such as BEE Anglia in New Anglia provide generally relatively small-scale grants to eligible companies for carbon reduction costs, alongside (in the case of BEE Anglia) assessments of the carbon reduction potential in particular businesses. The applicant should liaise with BEE Anglia and similar projects in the other LEP areas to ensure that where investment would be a more appropriate intervention, companies are signposted to LCIF2. As the comments below on pipeline demonstrate, LCIF1 and its legacy fund co-exist with these projects already so there is no concern that there will be an unnecessary overlap or confusion in provision.

13.3 Invest East – is an investment readiness project in New Anglia, also run by NCC with UEA as a partner, which will be working with businesses in the New Anglia area to develop their investment offer and potential. It already has staff working within both NCC and UEA teams so will be ideally placed to propose businesses for inclusion in the LCIF2 pipeline.

13.4 LCIF 1 and LCIF 1 Legacy Portfolio companies who are eligible may apply to LCIF 2 to be assessed on equal criteria to any other application. Any investments made through LCIF 2 to these companies are likely to be more mature that those in the LCIF 2 'Pathfinder' cohort and may be expected to realise earlier returns than others in the LCIF 2 Portfolio.

13.5 In addition, the network of business intermediaries, investor community, mentors and business founders which the UEA team have long established links with are expected to continue to provide introductions and intelligence for the growth of the already demonstrable pipeline of potential applicants to the fund of funds.

13.6 The demand for the project will be discussed in more detail in the ERDF application. However, it is important to note that the most important source of pipeline for the project, in addition to those listed above, will be the LCIF1 legacy team. They have a pipeline of over 45 companies either already in the LCIF system or enquiring about application across the geography in the context of the current general message of 'funds currently unavailable' whilst additional funds are awaited from returns from exited LCIF 1 portfolio companies. In this period no active promotion of the fund of funds has been undertaken. As funds do become available it is anticipated that significant numbers of new enquiries will be generated allowing the fund of funds to assess and pursue the 'pick of the crop' for new investment.

13.7 Currently, LCIF 1 Legacy is unable to meet demand from existing portfolio companies requiring follow-on funding or new investees whilst capital is unavailable due to the unpredictable timing of exits from existing investments. Currently 33 portfolio companies are seeking investment which LCIF is unable to participate.

It is therefore clear that there is ample existing and potential pipeline to deliver the proposed project.

14. LCIF2 – Delivery model and investee journey

It is a key mechanism of this project that LCIF1 legacy, LCIF2 and ultimately LCIF2 legacy interface in the delivery of this project.

14.1 LCIF1 legacy

LCIF1 legacy funding is used for –

- providing a gateway for businesses seeking investment, giving initial advice and direction.
- Directing applicants to LCIF1 legacy or LCIF2 for investment although most new businesses to LCIF will be directed to LCIF2.
- Delivering further investment into companies which have already received investment from LCIF1.
- It will also be subject to reclamation of the costs of the Entrusted Entity/Holding Company costs of LCIF 2. These comprise staff costs at NCC and UEA for setting up and running the activities of the Holding Company as well as the Fund Manager costs.

14.2 LCIF2

As above and in the ERDF application, LCIF2 sets up a new fund of funds for investment across 3 LEP areas. The eligible cost of the Fund Manager, and legal and set-up costs are included in the ERDF component of the project, as are the costs of the Holding Company during the ERDF investment period, with costs in the realisation phase funded through LCIF2 legacy.

14.3 LCIF2 legacy

As with LCIF1, LCIF2 legacy funds will support a further programme of investment in eligible businesses and will cover the running costs of the legacy fund.

The following table sets out how these funds are used in support of delivery of the project and explains who delivers each key activity in each phase of project delivery.

Set Up		
Activities	**Delivered by:**	**Funded by:**
Negotiate & Agree structure of Holding Company	UEA & NCC	LCIF 1 Legacy (UEA) & NCC
Negotiate & Sign Delivery Partner Agreement	UEA & NCC	NCC
Procurement of legal services	UEA & NCC	NCC
Legal Formation of Holding Company & Fund Structure	UEA & NCC	LCIF 1 Legacy
Set up bank account & authorised signatories	NCC	LCIF 1 Legacy
Recruit & appoint advisory panel	UEA & NCC	LCIF 1 Legacy
Write draft IOGs (to be reviewed by Fund Managers when procurement complete)	UEA (with Advisory Panel)	LCIF 1 Legacy
Write Fund Manager Procurement Specification	NCC, UEA & Advisory Panel	LCIF 1 Legacy
Manage Fund Manager Procurement Process	NCC	LCIF 1 Legacy
Procure & set up 3rd party evaluation process	NCC	LCIF 1 Legacy
Appoint Co Secretary to Holding Co	NCC	LCIF 1 Legacy

Operational Phase		
Secretariat services to Holding Co Board	NCC	LCIF 1 Legacy

Secretariat services to Advisory Panel	NCC	LCIF 1 Legacy
Collation & reporting outputs to CLG	NCC	LCIF 1 Legacy
Financial Management of Holding Co	NCC	LCIF 1 Legacy
Financial transactions of investment funds to recipient cos (on confirmation of CPs from FM)	NCC	LCIF 1 Legacy
Ongoing review & supervision of outputs and evidence to support them especially concerning GHG reduction quantification reported by FM	UEA	LCIF 1 Legacy
Awareness of the Fund of Funds through marketing (particularly word of mouth) or contact with team or advocates	UEA Team	LCIF 1 Legacy
	Fund Manager	LCIF 1 Legacy
	Invest East Investment Readiness Programme	Invest East
	External advocates such as Growth Hub, other business support agencies, investor network members, professional advisors existing applicant or portfolio companies.	other agencies
Initial contact with potential applicants regarding business aspirations, suitability & eligibility for investment	UEA Team	LCIF1 Legacy as part of an initial gateway evaluation service which includes determining whether the potential for investment is LCIF1 legacy or LCIF2.

	Fund Manager	FM Fees (LCIF 1 Legacy)
Preparation and submission of online application form	Fund Manager	FM Fees (LCIF 1 Legacy)
Assessment Engagement: Full review of submitted application and business plan. Meetings, email & phone-calls for further detail & clarification on topics including assessment of alignment to Fund Strategy as delegated by Holding Company (as articulated by the Advisory Panel) 1. Allocation to most appropriate lead analyst for assessment 2. Exploration of needs & funding aspirations and introductions to potential mentors, NEDs or co-investors 3. Business proposition analysis – team/tech/structure etc. 4. Market analysis 5. Value proposition analysis 6. Resources and assets 7. Finance history & projections 8. Ascertain business strengths & weaknesses 9. Signposting to other assistance available including introductions to potential co-investors 10. Cap table analysis 11. Risk analysis for reputation of Fund partners	Fund Manager	FM Fees (LCIF 1 Legacy)
Explanation and negotiation of Heads of Terms.	Fund Manager	FM Fees (LCIF 1 Legacy)
Presentation to Fund Manager appointed Investment Committee	Fund Manager	FM Fees

		(LCIF 1 Legacy)
On approval: Legal & Financial due diligence.	Fund Manager	FM Fees (LCIF 1 Legacy)
· Corporate governance & structure		
· Legal, articles, SHA's, debt & debentures		
· Managing Shareholders & Board		
· Investment documentation		
· Issue Heads of Terms		
On receipt of Heads of Terms signed:	Fund Manager with …	FM Fees (LCIF 1 Legacy)
1. Preparation of Investment documentation from templates (if appropriate).		
2. Evidence of co-investment gathered.		
3. Conditions Precedent achieved and evidenced.		
4. Monitoring and Reporting obligations acknowledged		
5. Non-exec Director/Board Observer appointed		
6. Funds transferred	Holding Company	LCIF1 Legacy (NCC and relevant UEA costs)

Portfolio Management		
Non-exec Director/Board Observer attends company Board meetings & maintains up to date contact with company operations, strategy and plans identifying opportunities for Fund team or extended network to provide assistance or support. Contributes to the deliberations of the Company Board as appropriate to optimise the company's potential to grow, develop and achieve its aims and an optimal return to the Fund of Funds for reinvestment. This may include discussions regarding timing and size of follow-on investment or other corporate finance in future rounds and exit strategy and tactical relationship building with potential future acquirers.	Fund Manager.	FM Fees (LCIF 1)
Regular updates and reports to all 3 governance and management Committees – the Investment Committee, Investment Advisory Panel and Holding Company Management Board. Information requirements to be established in the initial procurement brief (IOGs)and at contract stage	Fund Manager in liaison with Holding Company	FM Fees (LCIF 1) Relevant NCC and UEA costs funded from LCIF2 to the end of the ERDF investment and thence from LCIF2 legacy.
Exit & recoupment of funds plus return	Fund Manager plus monitoring by the Holding Company.	LCIF1 (Fund Manager Fees). Relevant NCC and UEA costs funded from LCIF1 Legacy to the end of the ERDF investment and thence from LCIF2 legacy.

The key activities of the Holding Company include:

- Fulfilling activity on behalf of NCC, the 'Entrusted Entity' for MHCLG as the ERDF Managing Agent.
- Applicant for grants and credit arrangement – ESIF/ERDF, bank overdrafts etc.
- Holding company for the Limited Partnership in which it would be a Limited Partner.
- Secretariat function for the Board and an Investment Advisory Panel.
- Convening strategic development/management/review – guided by the Investment Advisory Panel.
- Approving the GP/fund manager's annual business plan with budgets/targets for investment activity, marketing and other undertakings.
- Treasury management for idle funds – ESIF/ERDF prior to investment and returns.
- Liaison with stakeholders and interface with fund manager.
- Strategic marketing and promotion.
- Pipeline and investor community development especially focussed on supporting more technology transfer from the HE and research sectors.
- Procurement, contracting, performance reporting and management of the GP/fund manager.
- Consolidated accounts and management information and reports for the whole fund, consolidating results from the GP/fund manager for the Limited Partnership.
- Commissioning performance evaluation of the Fund of Funds at key points in the investment phase.
- Act as intelligent customer for the provision of legal services and fund management

The key responsibilities of the NCC Project Manager in project set-up, delivery and wrap up will be –

- Carry out Company formation and associated legal activities
- Instigate Company accounting practices in preparation for trading
- Set up governance arrangements including banking, delegated authorities and advisory members
- Carry out promotional activity, including marketing, networking and support of UEA, Fund Manager and external advocates
- Carry out accounting activity of holding company, managing and transferring funds in a timely manner to Fund Manager, preparing and gathering evidence for quarterly claims and providing financial Management reports for oversight by Governance Boards
- Monitor progress of activity to time, cost and quality, reporting variances in a timely and effective manner

- Review success upon completion of investments, carrying out lessons learned reviews when necessary, and liaising with technical delivery staff and management
- Prepare and communicate management accounting information at a project and or programme level
- Conduct stakeholder engagement including UEA, NCC, LEP and fund recipients etc
- To deliver required reporting data and act as main relationship manager to MHCLG

The key responsibilities of the UEA staff working on the project will be –

- In addition to contribution to the general Holding Company responsibilities above it is expected that UEA staff will contribute the capability, knowledge and experience, to be shared with NCC colleagues, to enable the swift set up and development of the fund of funds in order to allow all elements to be in place in time to make investments at the speed and scale as defined in the operational budget.
- In particular the market consultations and development of the specification for the procurement of Fund Managers will be key.
- Ongoing support and attention to the detailed operation of the fund of funds, development of good pipeline, investor relations and supporting appropriate and communication between Fund Manager, Holding Company and Advisory Panel ensuring any required adjustments to investment strategy to maximise benefit of the fund of funds to achieving its objectives can be effected and ERDF compliance is upheld.

15. LCIF2 – Remuneration of costs

Article 42 of the EU Common Provision Regulations and Article 13 of the Commission Delegated Regulation (EU) No 480/2014 are of particular relevance to the proposed LCIF2 fund as they contain limits on the costs of management arrangements for financial instruments that feature the use of an Entrusted Entity that is appointed by MHCLG as managing authority for ERDF, rather than through an open competitive procurement procedure.

Eligible management costs may include costs incurred by the body implementing the FI as part of the preparation of investment decisions, and the subsequent monitoring and follow-up of investments, the role proposed to be undertaken by the NCC/UEA SPV company as a fund of funds.

To be considered eligible at closure, management costs generated by the Holding Company must not exceed the thresholds set out in Article 13(1), (2) and (3) CDR. As these represent ceilings, any costs and fees exceeding the ceilings will be treated as ineligible and must not be recovered from ESI Funds programme resources, but from others, resources attributable to the support from ESI Funds programmes which are paid back or from own resources. The thresholds are considered as an aggregate value over the whole eligibility period and not on an annual basis.

Cost thresholds for a fund of fund are made up from two components and the lower amount resulting from the calculation will determine the amount of eligible costs for the Holding Company;

1. A General Cap which is defined as a sum no greater than 7% of the total amount of Programme Contributions paid to the fund of funds. In this context, Programme Contributions is understood to be defined as the value of ERDF plus any co-finance capital used to create the financial instrument. It is understood that co-investment cannot be included for this purpose.

2. The thresholds linked to the implementation progress consist of two elements (pro rata temporis):

    - A Base Remuneration (Threshold) which is calculated as a percentage of the phased contribution to the fund of funds, effective from date of disbursement by the implementing body to the fund of funds (the Holding Company) and cumulative as each tranche is received, until repayment to the managing authorities or the date of winding up, whichever is earlier. Once 60% of the first tranche has been disbursed this will trigger the transfer of the second tranche. The third and last tranches will only be triggered when at least 85% of the cumulative amounts of the interim payments have been spent.

    - A Performance Remuneration (Threshold) calculated as a percentage of the cumulative investments made from the date of the commitment of the guarantee until the date of repayment of the investment by final recipients, the end of the recovery procedure in case of default or the end of the eligibility period, whichever is earlier.

These percentages are calculated on a pro rata temporis basis, incentivising early disbursements and should reflect changes on a daily basis and would be cumulated in order to establish a maximum operating cost threshold.

The lowest of the two thresholds generated forms the effective cap on management costs.

Body implementing…	**General –Cap Rate- Thresholds**		
		Base remuneration: rates p.a./*pro rata temporis*	**Performance remuneration: rates p.a./*pro rata temporis***
Fund of Funds	7.00%	For first 12 months* 3.00%	0.50%
		For next 12 months* 1.00%	0.50%
		Following years 0.50%	0.50%

An estimate of the NCC/UEA SPV Holding Company's operating costs for the 5 years of the implementation period of LCIF2 are set out in the table that follows.

The lower table shows the results of applying both the 7% General Cap and the pro-rata temporis threshold and demonstrates that the pro-rata temporis calculation is the lower of the two figures and therefore demonstrates the maximum level of eligible operational costs.

16. LCIF2 – financial model

The partnership has kept the operating costs of the project to a minimum and will abide by the cap as set out above. The roles set out above for individual staff members have informed the salary costs included in the project, which will be funded in the short term by UEA and NCC with costs cash flowed by NCC until the end of the investment period and then matched from LCIF1 Legacy.

The projected Fund Manager costs are based on the assumption of a fixed fee of 1.95% fund value, plus a performance remuneration of 0.5% per annum of invested value. Arrangement fees of 2% per investment plus annual monitoring fees of 2% of invested value per annum will be paid by portfolio companies to the Holding Company and these are used to offset fund manager fees.

Please note: This is an illustration of expected costs based on an industry standard remuneration package however it should be noted that final costs and fee structure will not be confirmed until a procurement process, including a detailed market consultation stage is completed.

Operating costs

The management and operating costs which are included in the project budget are as follows -

Role	Time allocation	Indicative key responsibilities
NCC Programme Manager	2 hours per month	Oversight, strategy, reporting, governance.
NCC Project Manager	0.5 fte	Project Management, company formation, provision of legal and fund manager services, financial oversight and strategy, marketing, management of financial activity through Holding Company, accounting, record keeping.
UEA Investment Manager	0.1 fte to be charged to the project, any and all further activity will not be charged to the project	Development of pipeline opportunities, marketing, line management, targeting, reporting, relationship management with fund manager.

UEA Investment Analyst	Not chargeable to the project	Development of pipeline opportunities, marketing.
UEA Admin support	0.2 fte	Supporting above roles

For full details see granular budget.

The projected operational costs of the Holding company are likely to be greater than the maximum eligible expenditure calculated by the Base Remuneration. Operating costs for the Realisation phase will be based on similar activity levels and are assumed to increase with inflation at a rate of 2% per year.

17. Illustrated Investment Profile

Description of illustrated investment profile above.

Pathfinder rounds

£1,380,000 will be invested into 'Pathfinder' investments. Equivalent to LCIF1 Smaller Investment Scheme initial rounds these will be made mostly as convertible loans repayable/convertible within three years of average £60k. (Range £25k - £75k).

It is anticipated that 23 investments will be made in this range with 12(of the 23) businesses going on to receive subsequent follow on rounds.

This size of investment is typical of the requirement of an early stage company's first serious investment round based on industry, and in particular LCIF 1, experience. Investing at this size of round predominantly through Convertible Loan Agreements provides benefits to both parties. In many cases valuation is uncertain, and it is of mutual benefit to LCIF 2, as well as the SME to postpone fixing the valuation at this time. With most young companies' future revenues, and hence valuation, is based on assumptions and it will take time to ascertain the quality of these assumptions. It also enables immature businesses, who may need to keep their options open with regards equity ownership to take some time to consider whether they wish to convert or repay the loan. Having this option for 3 years has been very helpful in the past with LCIF 1 portfolio companies.
A further benefit to LCIF 2 is that a fixed term convertible loan gives more control over timings of exits and returns than with equity purchase, this is essential for the sustainability of LCIF 2 and is a key learning from the experience of managing LCIF 1.

Next Stage Rounds

£5,486,000 will be invested as 'Next stage' or 'Development' rounds. These will be made either as convertible loan or equity investments at average £225k. (Range £75k - £300k)

It is anticipated that 24 investments will be made in this range of which will include investments into 12 of the 'Pathfinder' cohort of companies.

This size of investment is intended to be utilised for follow-on investments into 'Pathfinder' companies who have successfully met their milestones, showing greater promise or reduced risk and are now considered suitable for a larger scale investment as part of a subsequent round.
This size of investment may also be utilised as a first investment for LCIF 2 into some recipients who the Investment Committee consider suitable, e.g. more mature stage of technology or route to market.

Growth Rounds

£4,050,000 will be invested as 'Last stage' or 'Growth' rounds. These will be made as equity investments (with discretion given to Fund Manager of convertible loans) at average £450k. (Range - £300k - £600k)

It is anticipated that 9 investments will be made in this range into companies including follow-ons into 5 businesses already in the LCIF 2 portfolio.

This size of investment is intended to be utilised for follow-on investments into portfolio companies who are considered by the Investment Committee to show greatest potential for growth and delivery of financial and non-financial objectives of LCIF 2.
This size of investment may also be utilised as a first investment for LCIF 2 into some recipients who the Investment Committee consider suitable, e.g. mature stage of technology or route to market.

It is important to note that the above profile is an illustration and is subject to a variety of factors which will dictate the precise number, timings and values of each investment completed. These factors include; investment readiness of applicants, likelihood of applicants to achieve the contracted outcomes of LCIF 2 in the view of the Investment Committee, successful raising of co-investment funds in reasonable timescales amongst others.

18. Projected returns to the Fund of Funds.

Returns to the Fund of Funds are projected to commence during Year 4 of the fund, initially through repayments of convertible loans that have not been converted to equity and potentially, also from more mature companies that applied to LCIF 2 at a later stage in their development who were already closer to a potential exit.

Models predict that the LCIF 2 Fund of Funds will return between 87-100% of its invested capital across Years 4 – 12 of operation. It should be noted that this is an illustration only and cannot, with any certainty, be predicted either for the final value, or timing of exits. A great number of factors will influence the future value and liquidity of shareholdings within the portfolio which can only be monitored and anticipated whilst in close contact with the portfolio companies involved. However, the model aligns well with the experience of the LCIF 1 fund and this model has utilised the experience of the previous fund and relatively conservative forecasts of future company valuations.

19. LCIF2 – ERDF deliverables

The success of the Smaller Investment Scheme (SIS) in LCIF1 has played a key part in informing the investment model for this project. Only a small number of companies receiving smaller investments then moved onto larger equity investments in LCIF 1 but this was due to time constraints (SIS investments only delivered over the last two years of LCIF 1). This model has been improved for the current project and forms the basis of the investment and growth trajectory for SMEs in LCIF2 – initial small debt-based finance, followed by performance monitoring, then review and based on progress and need, follow-on equity investment. This model significantly reduces the risk associated with investments into early stage companies, is simple, streamlined and more economical to deliver. In addition to the cohort of SIS style portfolio companies, LCIF 1 portfolio companies who are eligible to apply to LCIF 2 will be allowed to do so and would be assessed on their individual merits by the LCIF 2 Fund Manager Investment Committee.

The outputs and results have been modelled based on the experience of the Low Carbon Innovation Fund (LCIF1) project.

C1 - enterprises receiving support: **10** Plus enterprises receiving investment **38**	This represents eligible businesses receiving at least 12 hours of support in the investment pipeline plus businesses who will go on to receive investment (38 SMEs). This reflects usual investment process and the benefit of experience of LCIF1: many investment proposals to LCIF1 either failed to raise sufficient private sector match or were successful in raising all the funding required from private sector sources, as a result of the support provided during the LCIF investment appraisal process. The figure is calculated using the number of companies expected to reach investment committee presentation stage which will entail a minimum of 12 hours of engagement.
C5 - new enterprises supported: **10**	Calculated based on LCIF1 delivery experience.
C26 – enterprises cooperating with research institutions: **3**	This includes formation of joint ventures and spin-out companies, and collaborations on new product development.
C29 – enterprises supported to introduce new to the firm products: **20**	Supporting early stage technology companies will result in innovation and new product development, however, the LCIF1 experience suggests that this occurs, on average, several years after growth finance receipt which may not be within the investment period of the project. The relevant LCIF1 count unit was successful innovation related initiatives and this figure has been calculated to take that into account.
C34 – est. annual decrease of GHG (tonnes of CO2 eqv): **10,000 tonnes pa**	LCIF1 developed an independently verified carbon impact assessment tool which it proposes to utilise in this project. The tool utilises the BEIS GHG

	Conversion Factors. This figure has been calculated on the basis of LCIF1 delivery. N.B It should be noted that the annual GHG reduction is maintained (and expected to increase) for the effective life of the portfolio companies and beyond that of the project funding period.

Additionally, the project hopes to result in a leverage of private sector funding (C07) and gross new jobs created (C08) although neither of these are PA4 targets. Estimated numbers for both targets over the investment period to 2023 have been calculated but are not expected to be contracted targets under a Funding Agreement:

ER/C/O/07 Private investment matching public support to enterprises (non-grants) will be at least £10,858m (i.e. 1:1 ratio with ERDF) however, based on LCIF1, it is estimated that the final private sector leverage could be between £12m and £19m.
ER/C/O/08 Employment increase in supported enterprises is estimated to be 160.

20. LCIF2 - Priority Axis 4 – delivering low carbon priorities

The LEP partners that support the launch of LCIF 2 have allocated grant from Priority Axis 4 to capitalise the Fund of Funds. Priority Axis 4 (PA4) is focussed on a range of projects that have the joint potential of supporting SME development and greenhouse gas reduction (GHGr) – the latter measured by an assessment of the likely reduction of Carbon Dioxide equivalent (CO2e) that are likely to result.

All investment deals considered through LCIF 2 will be required to demonstrate fit with the strategic requirements of PA4: Supporting the shift towards a low carbon economy. The main focus will be on PA4f: Promoting research and innovation in, and adoption of low carbon technologies.

This will be delivered by the following indicative actions:

- Supporting low carbon technology start-ups and development companies to facilitate greater commercialisation of low carbon products and services
- Directly supporting enterprises to develop and bring to market their products and services
- Supporting early stage technology spin-outs from universities and other enterprises and innovative financial mechanisms (subject to eligibility) that could facilitate new ways to finance lower carbon activity

In practice, the identification of potential pipeline companies for LCIF2 will be found amongst a wide range of sectors with products and services delivering innovative ways of delivering increases in energy, or resource, efficiency to the extent that measurable GHGr can be demonstrated. Specialisms developed during the delivery of LCIF 1 have allowed significant innovations of this type to be recognised and optimised by engagement with the Fund of Funds and its network and this forms an important capability for the successful delivery of a specialist PA4 fund such as LCIF2.

The LCIF model for investment into businesses wishing to lower their carbon emissions addresses investment priority 4f through demonstrable case studies from its previous iteration. The same investment model will be carried forward into LCIF 2. LCIF 1 invested into 45 businesses adopting low carbon technologies through developing new products, expanding their business, or through operational changes to reduce carbon emissions. LCIF 1 worked across many sectors from renewable energy, automotive, engineering to creative industries. The fund invested in companies across the East of England researching and developing a range of innovative products, components and ways of working.

Case Study examples from LCIF1:

Essex based **Controlled Power Technologies (CPT)** develops a family of technologies that help car makers meet tightening legislation on CO2 emissions and fuel economy by making the car significantly more fuel efficient, without the need to redesign the car or the car engine, and therefore at significantly lower cost than other available alternatives. The company offers several products which have been developed since it was established in 2007. The products are low carbon powertrain related such as an electronically controlled supercharger, a stop-start system and an exhaust energy recovery system. All products utilise switched reluctance electric motor technology delivering 'micro-hybrid' vehicle functionality.

Norfolk based **EnLight (Signplay Ltd)** provides a future-proof communications platform that is scalable and flexible enough to be used for a multitude of other intelligent city and Internetof-Things applications. Their products can be retrofitted to dramatically improve the efficiency of existing street lighting, and other types of indoor and outdoor lighting, reducing the costs of upgrading lighting infrastructure. Energy costs are reduced by upgrading the control gear with highly efficient electronics, and maintenance efficiencies are made by enabling remote management and control.

Cambridge based **Breathing Buildings** has developed the e-stack natural ventilation system, an energy-efficient ventilation solution for use primarily in new buildings. The e-stack provides extremely energy-efficient ventilation, helping to save money on power bills, reducing the building's carbon footprint and giving better air quality so that the occupants can work more efficiently.

Portfolio companies invested by LCIF 1 can be seen at https://www.lowcarbonfund.co.uk/about/portfolio.

The East of England has a burgeoning green and clean-tech sector which has already benefitted from the impact of LCIF 1 and its leveraged private sector investment. A new generation of potential high growth, high value businesses developing innovative low carbon technologies and services will benefit from the investment, contacts, knowledge and experience of the delivery team.

In addition, the virtuous cycle created by the presence of a dedicated 'low carbon' fund attracts the interest of business founders who wish to maximise the environmental benefits of a product or service they are in the process of developing as well as potential co-investors who seek opportunities to get involved with businesses in this space.

21. Benefits of the Proposed project

The project would enable:

- **The delivery of a significant regional Low Carbon initiative**, delivering innovative business growth activity across three LEP areas, and building on the recognised strengths of LCIF1 which during the period 2011 – 2018 LCIF1 was the 5th most active cleantech investor in the UK (The Deal – Equity Investment in the UK 2017, Beauhurst).
- **Investment in key growth businesses**, as the analysis from the previous Low Carbon Investment Fund above shows.
- A **close partnership between NCC and UEA** in a field where UEA are recognised leaders on low carbon innovation, but where NCC and partners also have a key interest, through involvement in renewables and other low carbon initiatives.
- A **collaborative approach across three LEP areas**, which also work jointly on the low carbon agenda through the East of England Energy Hub.
- Considerable **low carbon benefits for the region**, with a projected saving of 10,000 tonnes CO^2 every year for the funding period with greater savings achieved in the future as investee company products and services are brought to and achieve market position.

The Fund of Funds would also:

- provide an estimated additional ££16M - £22M private sector investment
- enable the growth of up to 75 knowledge intensive, innovative businesses
- enable the creation of at least 10 new businesses
- create approximately 180 new high value jobs
- facilitate greater attention of the wider national and international investor community on businesses in the east of England
- draw businesses with a focus on GHGr to the economy in the region
- increase in the interest of regional, national and international investors as potential co-investors, by way of provision of qualified deal flow

22. Appendix 1

Summary Report – Low Carbon Innovation Fund Impact Assessments

Adapt Low Carbon Group c/o University of East Anglia
Document reference: 16-449-4386 November 2016

Contents

Tables

Figures

1 Executive summary

The Low Carbon Innovation Fund (LCIF), part of Adapt, has been successful in investing £20.5m ERDF funds through equity and convertible debt into a range of SMEs that have provided evidence that their products or services are able to reduce carbon emissions. Cycle One of LCIF currently stands at £68.5m, of which £48.9m is private co-investment from UK and international investors.

Narec Distributed Energy (NDE) was commissioned by Adapt to retrospectively establish the carbon savings as a result of the investments made through the first iteration of the fund, as well as set a methodology for carrying out carbon assessment for future investee companies.

After a significant engagement exercise with some 40 investee companies and the completion of 34 individual carbon impact assessments, carbon savings from 31 investee companies had savings carbon savings quantified.

By the end of 2020, Cycle One of the funds has been forecasted to save over 12 million tonnes of $CO_{2(eq)}$. Although this is the case, it is important to state that this figure draws upon the carbon savings realised by the end-users of investee company products and services, rather than own operations of investee companies.

Investments made during Cycle Two should be clear from the outset what the base and new case for each product or service is and set a reasonable operational boundary, identify appropriate conversion factors and quantify these activities. A judgement should be made on the potential for carbon savings and whether associated assumptions and sales forecasts are reasonable. In particular, whether activities[5] are fully attributable to investee products and services.

2 Introduction

2.1 Background

The Adapt Low Carbon Group (Adapt) is a business-facing department of the University of East Anglia (UEA) that provides expertise in a number of aspects of the low carbon economy.

The Low Carbon Innovation Fund (LCIF), part of Adapt, has been successful in investing £20.5m ERDF funds through equity and convertible debt into a range of SMEs that have provided evidence that their products or services are able to reduce carbon emissions. The minimum investment from LCIF is £25k and the maximum is £1m; this must always be invested alongside private co-investment and the maximum LCIF can invest being 50% of the amount the company is seeking.

Cycle One of LCIF opened in 2010 as a £20m fund, with £8m from ERDF and £12m of co-investment. Over time this increased to £20.5m from ERDF with an expectation of raising £30.2m of co-investment. In actual

[5] Something that can be quantified within the operational boundary that the product or service changes in a quantitative way (i.e. electricity consumption or travel). Activities are multiplied by emission conversion factors to establish carbon footprints.

fact £48.9m of co-investment from UK and international investors was realised, taking the fund to £69.4m. Energy and environment investment specialists Turquoise is currently working on the exit phase, the proceeds of which will be fed into Cycle Two. Cycle Two of LCIF is due to open in 2017.

Narec Distributed Energy (NDE) is a spin out company from the UK National Renewable Energy Centre (Narec), focused on low carbon technologies. Over the 2007-13 ERDF programme NDE and its staff have delivered on 9 ERDF low carbon projects, supporting many hundreds of SMEs. Having acted in the capacity of lead partner, partner and subcontractor has created an unparalleled wealth of experience and ability around SME carbon assessments and calculating carbon footprints.

Through a competitive procurement process, NDE was commissioned by Adapt to establish the carbon savings as a result of the investments made through the first iteration of the fund, as well as set a methodology for carbon assessment for future investee companies.

This piece of work involved engaging with each of the investee companies from Cycle One and resulted in individual carbon impact assessments for each, allowing the fund to quantify the carbon impact of Cycle One investments to date as well as forecast carbon savings up until 31st December 2020.

3 Methodology

As this was a retrospective carbon impact assessment, an initial assessment phase took place where all historic LCIF paperwork was reviewed. This enabled NDE staff to gain a technical understanding of the products and/or services behind 40 investments.

A baseline assessment followed where potential carbon savings were identified using the existing information captured by LCIF. This included original company applications to the fund, as well as separately commissioned carbon reports for some investments. Although in few cases this was useful, methodologies varied significantly and carbon savings were often based on out of date sales information, meaning each was not comparable and could not be used in an aggregated figure for the entire fund.

Now appraised of the scope and diversity of products and services, NDE was able to develop a bespoke questionnaire to gather qualitative and quantitative data from investments. A Google Form was produced to facilitate the capturing responses from investee companies although in reality, bespoke support was required for the majority of respondents in order to elicit appropriate information. In some cases this was several days of work per company and involved lengthy phone calls and email correspondence.
Having initially engaged with 40 companies, it was decided to focus on 34 where there was sufficient quantitative information to proceed to a carbon impact assessment. This later reduced to 31 due to issues around appropriate conversion factors and the setting of operational boundaries. Consequently, only the carbon savings from the products and services of 31 investee companies contributed to the LCIF funds total carbon savings. The progression of each investee company through this process is summarised within Table 3 of the Appendices. Figure 1 below outlines the approach taken for each carbon impact assessment.

Low Carbon Innovation Fund adap+

narec distributed energy

Carbon Impact Assessment

Company name
Controlled Power Technologies Limited (7706745)

Background
CPT specialises in development of technologies and products that help car makers meet tightening legislation on carbon dioxide emissions and fuel economy by making the car significantly more fuel efficient, without the need to redesign the car or the car engine, and therefore at significantly lower cost than other available alternatives.

Products/Services
SpeedStart
A powerful robust ultra-fast highly-programmable electric motor which allows the engine to be stopped whenever the car stops in intermittent traffic, including best-in-class re-start and response to driver change-of-mind, and very efficient energy recuperation during braking. Achieving c.12% fuel and emission savings.

Sales

76 sales to date. At present with a TRL 6-8, forecasted sales have been weighted at 70%, reducing future sales to 175,000 by 31st December 2020.

COBRA
An electric supercharger technology enabling the downsizing of engines achieving improved fuel economy by c.6%. The target market for this is heavy duty/commercial vehicles where vehicles perform many heavy duty cycles per year.

Sales

40 sales to date. At present with a TRL 4-5, forecasted sales have been weighted at 60%, reducing future sales to 69,000 by 31st December 2020.

Document control

Process

Version	Date	Author
Prepared by	22/09/16	Adam Stewart
Reviewed by	22/09/16	Tom Bradley
Approved by	22/09/16	Adam Stewart

Version history

Version	Date	Author	Reason for issue
1.0	02/09/16	Adam Stewart	First draft
2.0	16/09/16	Adam Stewart	Various assumptions amended.
2.1	21/09/16	Adam Stewart	Base case and product amended
3.0	22/09/16	Adam Stewart	Weighted sales

Base case
In respect of SpeedStart a typical application would be a bus operating in an urban environment travelling 30,000 km per annum. Whilst for COBRA would be for more heavy duty articulated vehicles typically travelling 50,000 km per annum.

New case
SpeedStart provides a 12% and COBRA a 6% improvement in efficiency.

Operational boundary
Improved fuel efficiency and resultant scope 1 emissions related to fuel consumption attributable to the operation of SpeedStart and COBRA technology.

Assumptions and UK Government conversion factors
Average laden diesel HGV in the all rigid category, 0.83124 kg $CO_{2(e)}$ per kilometre relevant for SpeedStart.
Average laden diesel HGCV in the articulated >33 tonne category, 1.00031 kg $CO_{2(e)}$ per kilometre relevant for COBRA.
For sales to date only mileage for one year will be counted

Absolute savings to date
SpeedStart 76 sales to date, each travelling 30,000 km per year for average laden diesel HGV in the all rigid category. 12% improvement in efficiency, 0.83124 kg $CO_{2(e)}$ per kilometre base case, to 0.73149 kg $CO_{2(e)}$ per kilometre new case, a saving of 0.09975 kg $CO_{2(e)}$ per kilometre.
76 sales × 30,000 km × 0.09975 kg $CO_{2(e)}$ km^{-1} = 227,427 kg $CO_{2(e)}$

COBRA 40 sales to date, each travelling 50,000 km per year for average laden diesel HGV in the all rigid category. 6% improvement in efficiency, 1.00031 kg $CO_{2(e)}$ per kilometre base case, to 0.94029 kg $CO_{2(e)}$ per kilometre new case, a saving of 0.06002 kg $CO_{2(e)}$ per kilometre.
40 sales × 50,000 km × 0.06002 kg $CO_{2(e)}$ km^{-1} = 120,037 kg $CO_{2(e)}$

Total: 227,427 kg $CO_{2(e)}$ + 120,037 kg $CO_{2(e)}$ = **347,464 kg $CO_{2(e)}$**

Absolute savings forecasted by 2020

SpeedStart 175,000 forecasted, each travelling 30,000 km per year for average laden diesel HGV in the all rigid category. 12% improvement in efficiency, 0.83124 kg $CO_{2(e)}$ per kilometre base case, to 0.73149 kg $CO_{2(e)}$ per kilometre new case, a saving of 0.09975 kg $CO_{2(e)}$ per kilometre.

1 sales × 30,000 km × 0.09975 kg $CO_{2(e)}$ km^{-1} = 2,992 kg $CO_{2(e)}$

	sales	sales cumulative	carbon savings / kg $CO_{2(e)}$
2016	19,444	19,444	58,186,800
2017	38,889	58,333	174,560,400
2018	38,889	97,222	290,934,000
2019	38,889	136,111	407,307,600
2020	38,889	175,000	523,681,200
		Total	**1,454,670,000**

COBRA 69,000 forecasted, each travelling 50,000 km per year for average laden diesel HGV in the all rigid category. 6% improvement in efficiency, 1.00031 kg $CO_{2(e)}$ per kilometre base case, to 0.94029 kg $CO_{2(e)}$ per kilometre new case, a saving of 0.06002 kg $CO_{2(e)}$ per kilometre.

1 sales × 50,000 km × 0.08002 kg $CO_{2(e)}$ km^{-1} = 3,001 kg $CO_{2(e)}$

	sales	sales cumulative	carbon savings / kg $CO_{2(e)}$
2016	7,667	7,667	23,007,130
2017	15,333	23,000	69,021,390
2018	15,333	38,333	115,035,650
2019	15,333	53,667	161,049,910
2020	15,333	69,000	207,064,170
		Total	**575,178,250**

Total: 1,454,670,000 kg $CO_{2(e)}$ + 575,178,250 kg $CO_{2(e)}$ = **2,029,848,250 kg $CO_{2(e)}$**

Page **1** of **1**

Figure 1 – a typical carbon impact assessment report

Each carbon impact assessment report was conducted on a company wide basis, setting out product(s) and/or service(s) concisely, as well as detailing sales to date[6] and those forecasted by 31st December 2020[c]. A base case was established defining the business as usual scenario in the absence of each product/service, followed by a new case setting out would happen differently with the product/service in a quantitative way. An operational boundary was set to ensure both the base and new were comparable. Conversion factors were then selected from the UK Government GHG Conversion Factors for Company[7] and applied to the quantitative activities set out in both the base and new case, the aggregated difference being the carbon savings per product/service. This was then multiplied by sales to date and those forecasted by 31st December 2020. In respect to forecasted sales, a weighting factor was applied based on the current technology readiness level of the product or design phase of the service, so to ensure an early stage concept or prototype with ambitious sale forecasts did not skew the fund's carbon savings forecasted by 2020. The weightings which were applied to forecasted sales are set out within Table 4 of the Appendices.

4 Carbon savings

With savings to date, and those forecasted by 2020 from 31 investee companies, it is possible to state:

To date, the LCIF portfolio of companies has saved 200,000 tonnes of $CO_{2(e)}$ and is forecasted to save a total of more than 12 million tonnes by the end of 2020.

[6] from investment to 30th June 2016 [c]
from 1st July 2016 to 31st December 2020

[7] https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2016

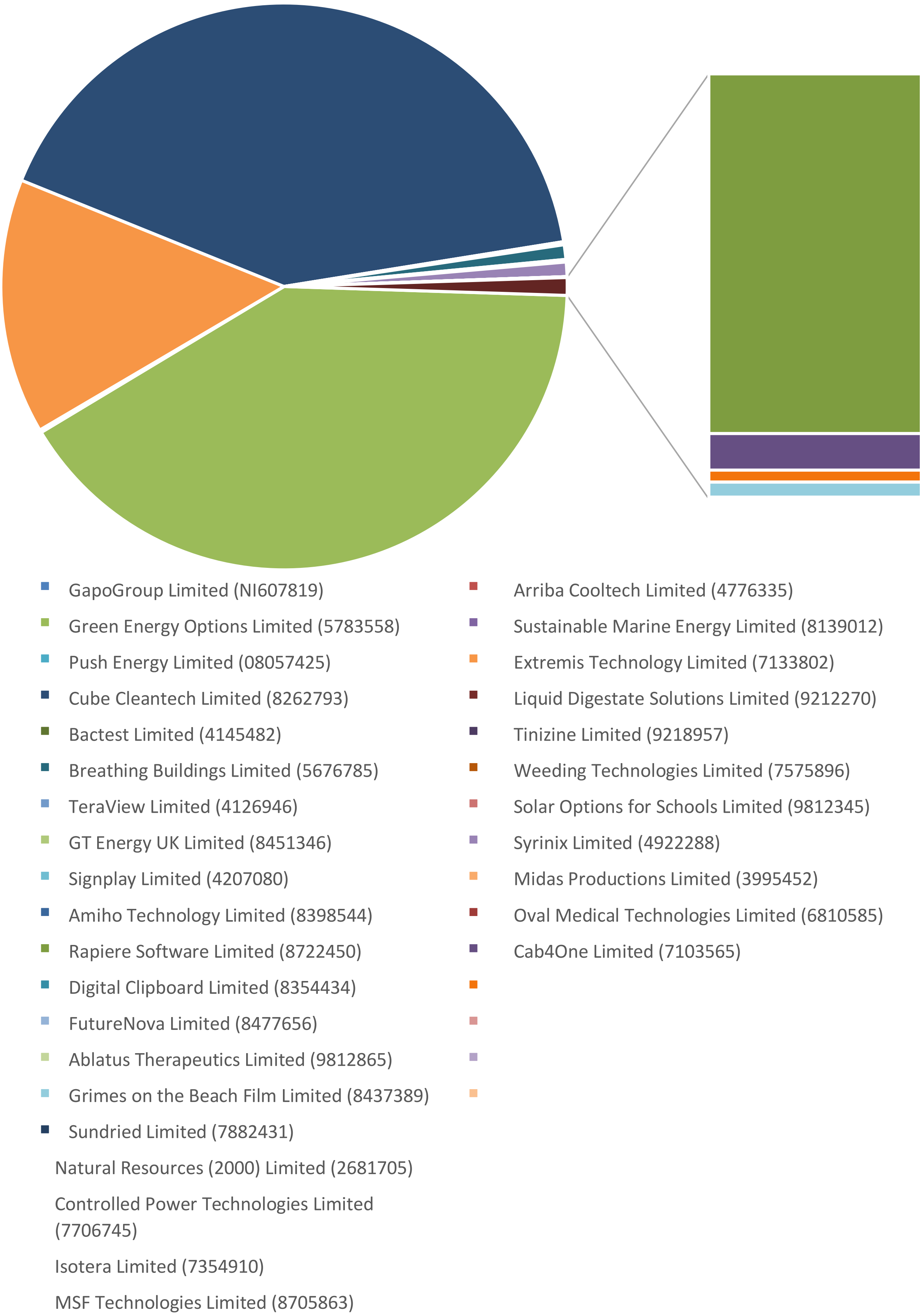
The full breakdown of which is outline below within Table 1.

Table 1 – carbon savings by each investee company

Company	Carbon savings / kg $CO_{2(e)}$			
	Actual[8]	Forecasted[f]	Total	Total /%
GapoGroup Limited (NI607819)	0	4,209,828,480	4,209,828,480	33.1860%
Natural Resources (2000) Limited (2681705)	0	2,437,333,333	2,437,333,333	19.2134%
Green Energy Options Limited (5783558)	89,947,688	1,998,837,500	2,088,785,188	16.4658%
Controlled Power Technologies Limited (7706745)	347,464	2,029,848,250	2,030,195,714	16.0040%
Push Energy Limited (08057425)	0	670,611,375	670,611,375	5.2864%
Isotera Limited (7354910)	32,041,008	467,264,700	499,305,708	3.9360%
Cube Cleantech Limited (8262793)	90,987,300	158,385,300	249,372,600	1.9658%
MSF Technologies Limited (8705863)	0	167,288,341	167,288,341	1.3187%
Bactest Limited (4145482)	377,860	73,808,682	74,186,542	0.5848%
Arriba Cooltech Limited (4776335)	0	49,283,423	49,283,423	0.3885%
Breathing Buildings Limited (5676785)	1,830,351	33,657,596	35,487,947	0.2798%
Sustainable Marine Energy Limited (8139012)	311,310	33,903,867	34,215,177	0.2697%
TeraView Limited (4126946)	0	34,070,533	34,070,533	0.2686%
Extremis Technology Limited (7133802)	9,059	32,352,000	32,361,059	0.2551%
GT Energy UK Limited (8451346)	0	19,699,838	19,699,838	0.1553%
Liquid Digestate Solutions Limited (9212270)	1,814,400	16,329,600	18,144,000	0.1430%
Signplay Limited (4207080)	2,241	15,091,934	15,094,175	0.1190%
Tinizine Limited (9218957)	733	5,861,384	5,862,117	0.0462%
Amiho Technology Limited (8398544)	106,446	4,435,250	4,541,696	0.0358%
Weeding Technologies Limited (7575896)	0	3,037,500	3,037,500	0.0239%
Rapiere Software Limited (8722450)	1,876,800	0	1,876,800	0.0148%
Solar Options for Schools Limited (9812345)	190,871	1,460,290	1,651,161	0.0130%
Digital Clipboard Limited (8354434)	0	874,028	874,028	0.0069%
Syrinix Limited (4922288)	62,620	742,689	805,309	0.0063%
FutureNova Limited (8477656)	0	744,228	744,228	0.0059%
Midas Productions Limited (3995452)	0	447,789	447,789	0.0035%
Ablatus Therapeutics Limited (9812865)	0	160,080	160,080	0.0013%
Oval Medical Technologies Limited (6810585)	0	137,282	137,282	0.0011%
Grimes on the Beach Film Limited (8437389)	78,300	0	78,300	0.0006%
Cab4One Limited (7103565)	9,942	49,461	59,403	0.0005%
Sundried Limited (7882431)	32	22,207	22,239	0.0002%
Grand Total	**219,994,425**	**12,465,566,940**	**12,685,561,365**	**100.0000%**

Graphically, the carbon savings from each investee company in Table 1 is shown below within Figure 2.

[8] from investment to 30th June 2016 [f] from 1st July 2016 to 31st December 2020


GapoGroup Limited (NI607819)
Green Energy Options Limited (5783558)
Push Energy Limited (08057425)
Cube Cleantech Limited (8262793)
Bactest Limited (4145482)
Breathing Buildings Limited (5676785)
TeraView Limited (4126946)
GT Energy UK Limited (8451346)
Signplay Limited (4207080)
Amiho Technology Limited (8398544)
Rapiere Software Limited (8722450)
Digital Clipboard Limited (8354434)
FutureNova Limited (8477656)
Ablatus Therapeutics Limited (9812865)
Grimes on the Beach Film Limited (8437389)
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Controlled Power Technologies Limited (7706745)
Isotera Limited (7354910)
MSF Technologies Limited (8705863)
Arriba Cooltech Limited (4776335)
Sustainable Marine Energy Limited (8139012)
Extremis Technology Limited (7133802)
Liquid Digestate Solutions Limited (9212270)
Tinizine Limited (9218957)
Weeding Technologies Limited (7575896)
Solar Options for Schools Limited (9812345)
Syrinix Limited (4922288)
Midas Productions Limited (3995452)
Oval Medical Technologies Limited (6810585)
Cab4One Limited (7103565)

Figure 2 – total carbon savings by each investee company Overall 85% of the carbon savings originated from just four investee companies, all of whom fall under the category of clean technology. Furthermore, 99.938% of the carbon savings originate from clean technology companies, with 0.047% from creative and 0.015% from medical technology. This is summarised within Table
2.

Table 2 – carbon savings by each investee category

Category	Carbon savings / kg $CO_{2(e)}$ Actual[9]	Forecasted[h]	Total	Total /%
clean technology	219,915,360	12,457,767,731	12,677,683,091	99.938%
creative	79,065	5,883,591	5,962,656	0.047%
medical technology	-	1,915,618	1,915,618	0.015%
Grand Total	**219,994,425**	**12,465,566,940**	**12,685,561,365**	**100.00%**

5 Conclusions

By the end of 2020, Cycle One of the fund has been forecasted to save over 12 million tonnes of $CO_{2(eq)}$. Although this is the case, it is important to state that this figure draws upon the carbon savings realised by the end-users of investee company products and services, rather than own operations of investee companies.

Furthermore, only quantifiable activities with conversions factors listed within the UK Government GHG Conversion Factors for Company Reporting were selected. This limited approach of carbon footprinting will have likely underestimated the true extent of carbon savings, whereas more detailed Life Cycle Assessment (LCA) may have been able to quantify the true extent of actual savings, although an LCA approach would have far exceeded the scope and resource of this retrospective carbon impact assessment.

Less than 2% of carbon savings from the fund have been realised to date. Primarily, this is because the majority of products and services sales are yet to be realised and are just forecasts, but also the cumulative effect of those products and services in operation will be realised after the point of sale between the second half of 2016 to the end of 2020.

To ensure that the headline carbon saving of the fund was robust, tiered weightings were applied to sales forecasts where the product Technology Readiness Level (TRL) was below 9 or the service was not live. The aim of this was to sensitise sales forecasts proportional to the current development phase and therefore minimise the potential for ambitious sales forecasts of early stage products or services to unduly contribute to the total carbon saving.

In some cases, whilst setting the operational boundary for each investee company, the wider carbon savings from particular products or services were excluded, as quantifying these activities would have led to too much uncertainty. There were also notable examples such as Anvil Semiconductors Limited (7300225) where appropriate conversion factors were not available and the extent of the worldwide markets were not possible to define. In this particular example, the investment in itself may eventually dwarf the carbon savings of the entire fund.

In another example, the investment in Vayon Holdings Limited (8783512) resulted in higher carbon emissions due to the current carbon intensity of UK grid electricity. The product in financial terms enabled a cost reduction, but not a carbon saving. It can be argued though this was a worthwhile investment as it has led to demonstrator activity helping to grow the supply chain around hybrid systems with battery integration services.

[9] from investment to 30th June 2016 [h] from 1st July 2016 to 31st December 2020

Investments made during Cycle Two should be clear from the outset what the base and new case for each product or service is and set a reasonable operational boundary, identify appropriate conversion factors and quantify these activities. A judgement should be made on the potential for carbon savings and whether associated assumptions and sales forecasts are reasonable. In particular, whether activities are fully attributable to investee products and services.