CATAPULT Energy Systems

Enabling Smart Local Energy Systems: Finance and Investment

Energy Revolution Integration Service
Insight and Adoption Paper

UK Research and Innovation

Foreword

Enabling place-based investment

Local authorities can play a pivotal role, leveraging public funding to scale up the private finance needed to deliver Net Zero, however new approaches are needed to do so effectively.

Smart local energy systems aim not only to reduce carbon emissions but also provide wider benefits that respond to broader community needs, as well as tailoring projects to fit the characteristics of a local area. Integrating heat, transport and power systems can unlock potential new markets, revenue streams and business model opportunities that ultimately lead to reduced emissions, improved services, and more affordable energy bills.

To achieve this, there needs to be coordination across a wide range of actors. There is a risk that if investors take an asset-based approach, the potential value and co-benefits that an integrated, local system can offer will be missed. Public and private finance must work together to deliver an integrated portfolio resulting in a cost-effective energy transition.

Green and sustainable finance options are increasing in line with the growth in demand from investor stakeholders for demonstrable social and environmental impact. Local authorities can play a critical role in underpinning the value of investment, ensuring community buy in and ensuring that co-benefits such as job creation, skills development and low carbon and air quality improvements are realised.

To take advantage of this potential, it is vital that standard approaches are developed to communicate local opportunities at an aggregated level, providing a transparent and accessible pipeline of credible local energy projects to investors.

A small number of local authorities are well ahead delivering on their climate emergency targets and energy strategies. However, to enable the majority to benefit the argument is growing for the formulation and delivery of local energy transition strategies to be made a statutory obligation. Without this, stretched local authorities will not have the resources needed to prioritise and deliver the efficient decarbonisation of communities.

Through extensive engagement with both investors and local authorities, Energy Systems Catapult has set out definitive actions that we believe are required to accelerate development in this area. We are supporting local authorities to develop, and deploy, standard approaches, and we'll continue to work with all stakeholders to enable investment in and implementation of Smart Local Energy Systems.

Philip New,
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Acknowledgements

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- Abundance
- Aquila Capital
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- Hertfordshire County Council
- Humber Local Enterprise Partnership
- Ikigai Capital
- Leeds City Council
- Legal and General
- Local Energy North West
- Midlands Energy Hub
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- New Anglia Local Enterprise Partnership
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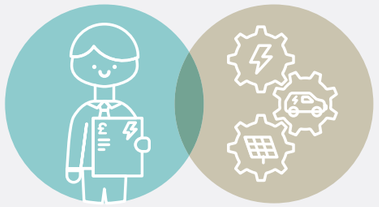


Executive Summary

To achieve the UK's Net Zero target by 2050, significant investment is needed across transport, heating, and electricity sectors. The Prime Minister's 10-Point Plan for a Green Industrial Revolution[1] has committed £12bn of government investment into low carbon technology, and the recent announcement of the UK Infrastructure Bank with a Net Zero remit shows that the UK is ready to accelerate investment and growth in this sector.

The Committee on Climate Change recommend however that low carbon investment must scale up to £50 billion each year from 2030-2050 to deliver Net Zero[2]. Private finance will clearly have a major role to play. Local energy should also play a major role though this will be shaped by the evolving market, policy and regulatory framework as well as the governance arrangements that define the role local authorities will have in achieving Net Zero.

Energy Systems Catapult is part of the government-funded programme, Prospering from the Energy Revolution (PFER), accelerating the development of Smart Local Energy Projects. Our role is to use the evidence and knowledge generated by the programme to encourage other local areas to realise the benefits of Smart Local Energy Systems (SLES), and to support creation of the wider environment needed. This includes policy, regulation, and finance.

Local energy projects driven by local authorities can have a pivotal role in delivering projects that not only help to meet Net Zero, but also provide additional benefits to communities and end users. There is potential for energy projects to be aligned with the current statutory requirements of local authorities, such as air quality, fuel poverty, housing, mobility, social care, and economic growth, to provide wider value and help to accelerate the development of Smart Local Energy Systems.

The key challenges for attracting the levels of private investment needed for local energy projects is the opportunity for local energy resources to capture full energy system value and wider societal benefits at scale. There is a current lack of standardisation or consistency across local authorities for how they define Net Zero strategies, prioritise and facilitate energy-related projects, and utilise private and public finance. This means opportunities are often viewed as bespoke, one-off projects.

A consistent, common approach, coordinated across the country, along with an improved market, policy and regulatory framework, are needed to improve investment conditions for local energy. This would enable investors to visualise a clear national scale pipeline of similar opportunities, making it easier to raise the needed volume of finance at a low cost of capital.

To better understand how LAs and private sector investors can work together to deliver SLES, Energy Systems Catapult has carried out this research project. The aim is to identify the challenges and make recommendations to encourage private sector investment into Smart Local Energy System projects, and to describe what is required to enable and support private sector collaboration with local authorities.

About Smart Local Energy Systems (SLES)

SLES aim to integrate elements of the energy system including power, heat, and transport to develop effective pathways to decarbonisation based on the characteristics and needs of a local area.

They serve a wide range of end users including industry, commercial, and public organisations, such as hospitals, libraries, leisure centres, and domestic consumers.

By considering the energy supply and demand profiles for a wide range of users, SLES will be able to offer different services and use new business models that can enable additional revenue streams, as well as creating operational efficiencies by operating assets more effectively, while delivering better outcomes for the local area.

Prospering from the Energy Revolution (PFER)

The Prospering from the Energy Revolution (PFER) programme is a £102.5m UK government-funded four-year programme to demonstrate the feasibility and additional value that can be achieved through taking a local approach to achieving Net Zero[14]. This programme comprises three demonstrator and ten detailed design projects with a broad range of organisations forming consortiums which include network companies, local authorities, technology developers, community groups, specialist consultants and academia where each considers a different local area in the UK. Details of projects can be found through UKRIs Gateway to Research[15].

Recommendations

The following recommendations have been made based on engagement with a range of local authorities, investors, and other stakeholders in this space. Actions from each stakeholder group are proposed in the report and the roles for each to progress the recommendations are summarised in Table 1.

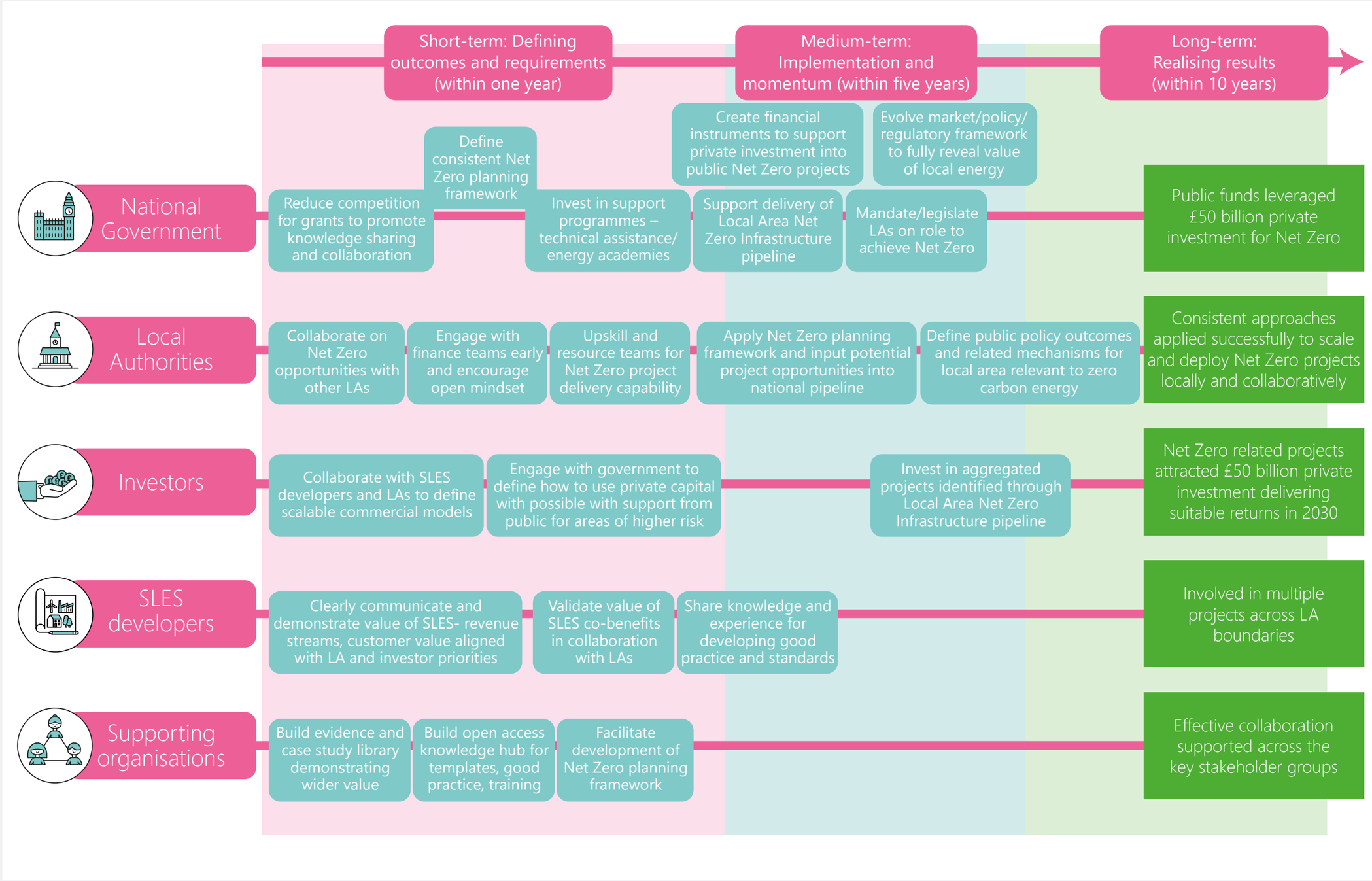
The essential next step to progress these recommendations is to convene a 'task and finish' group that has representation from key stakeholders identified in this report, to ensure the follow-on actions are developed collaboratively. Defining the terms of reference and roles and responsibilities for the group would be the first step. However, a suggested roadmap of the priority actions required is summarised in Figure 1. Some actions can run in parallel and others are dependent on progress in other areas.

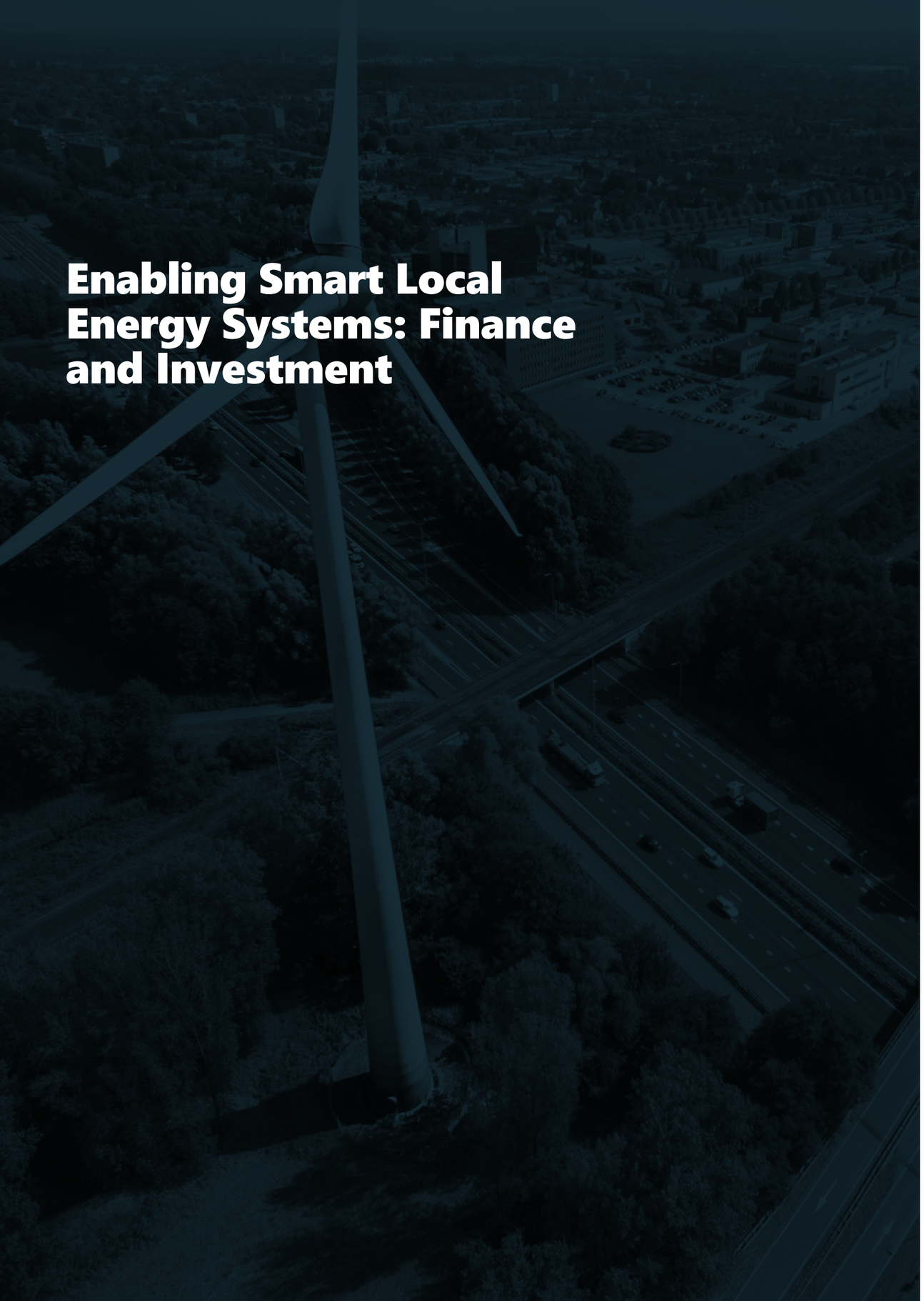
Further details on the suggested actions required by each stakeholder group and the evidence supporting these can be found in the report.

Table 1: Summary of recommendations and role of stakeholders.

Recommendation	National Government	Local Authorities	Investors	SLES Developers	Supporting Organisations
1. Generate **awareness of the value** and opportunities **of Smart Local Energy Systems**.	Own	Own	Engage	Engage	Support
2. Legislate so Local Authorities have power and capability to deliver local net zero strategies (including SLES).	Own	Support	Engage	Engage	Engage
3. Create a **consistent Net Zero Planning Framework for Local Authorities** to develop SLES.	Own	Support	Engage	Engage	Facilitate
4. Develop **innovative public and private finance mechanisms** for SLES.	Own	Engage	Support	Engage	Facilitate
5. Demonstrate a **visible pipeline** of credible SLES type projects.	Own	Engage	Engage	Engage	Facilitate
6. Develop a flexible **standard procurement framework** suitable for SLES type projects.	Support	Own	Engage	Engage	Facilitate

Actions


Short-term: Defining outcomes and requirements (within one year)
Medium-term: Implementation and momentum (within five years)
Long-term: Realising results (within 10 years)
National Government
Reduce competition for grants to promote knowledge sharing and collaboration
Define consistent Net Zero planning framework
Invest in support programmes – technical assistance/ energy academies
Create financial instruments to support private investment into public Net Zero projects
Support delivery of Local Area Net Zero Infrastructure pipeline
Evolve market/policy/ regulatory framework to fully reveal value of local energy
Mandate/legislate LAs on role to achieve Net Zero
Public funds leveraged £50 billion private investment for Net Zero
Local Authorities
Collaborate on Net Zero opportunities with other LAs
Engage with finance teams early and encourage open mindset
Upskill and resource teams for Net Zero project delivery capability
Apply Net Zero planning framework and input potential project opportunities into national pipeline
Define public policy outcomes and related mechanisms for local area relevant to zero carbon energy
Consistent approaches applied successfully to scale and deploy Net Zero projects locally and collaboratively
Investors
Collaborate with SLES developers and LAs to define scalable commercial models
Engage with government to define how to use private capital with possible with support from public for areas of higher risk
Invest in aggregated projects identified through Local Area Net Zero Infrastructure pipeline
Net Zero related projects attracted £50 billion private investment delivering suitable returns in 2030
SLES developers
Clearly communicate and demonstrate value of SLES- revenue streams, customer value aligned with LA and investor priorities
Validate value of SLES co-benefits in collaboration with LAs
Share knowledge and experience for developing good practice and standards
Involved in multiple projects across LA boundaries
Supporting organisations
Build evidence and case study library demonstrating wider value
Build open access knowledge hub for templates, good practice, training
Facilitate development of Net Zero planning framework
Effective collaboration supported across the key stakeholder groups



Enabling Smart Local Energy Systems: Finance and Investment

Contents

Introduction

More than three quarters of local authorities (LAs) in the UK have declared a climate emergency, demonstrating their commitment to Net Zero. The pathways to achieving Net Zero will vary for each location to ensure that the needs of the area and its citizens are kept central. Energy system transformation is a key component of Net Zero, however LAs do not currently have a statutory duty regarding energy.

Significant investment is required in energy infrastructure for the UK to meet Net Zero; it is estimated that low carbon investment must scale up to £50 billion each year from 2030-2050 to deliver Net Zero[2]. This is not achievable with public borrowing or taxes alone; private finance is also needed.

To encourage private finance at the scale necessary to deliver Net Zero, an investable market for decarbonisation is required. Smart Local Energy Systems (SLES) offer a potential way to de-risk and leverage public funding to make the capital available for relevant infrastructure and technologies.

Current challenges for attracting private investment for public infrastructure projects were highlighted by The Infrastructure Finance Review[3] in which the following recommendations were made:

- More clarity on how the private sector can engage with government on infrastructure, and greater use of mechanisms that could bring forward market-led proposals.
- Improve capacity and expertise of Local Government to allow them to deliver larger infrastructure projects.
- Create new co-investment funds where government acts as a cornerstone investor in infrastructure projects.
- Develop tools that address market failures and gaps, take targeted risks to improve risk profiles, and target new and developing markets.

This has been considered for the newly-created UK Infrastructure Bank (UKIB), which aims to provide private investment to projects that can offer social benefits as well as financial returns. £1.5bn will be available from the UKIB each year[4]. The UKIB aims to provide LAs across the UK with access to finance for high value and complex economic infrastructure projects. It should also offer advice and support to LAs to improve the quality of these projects so that they deliver greater value for money. A further aim of the UKIB is to act as a convenor, bringing together local actors for collaborative projects and aggregating projects together where appropriate.

SLES are an approach to support the delivery of Net Zero across the UK by integrating low carbon technologies to respond to the needs of individuals, communities, and energy networks in a local area.

The benefits of SLES include:

- Improved efficiency and reduced cost of assets and networks over the longer term through integrated planning.
- Ability to design and tailor energy projects to meet the varied needs of local areas based on data and insights held by LAs.
- Social value embedded in the design of the system – LAs have statutory duties that relate to air quality, health and building standards, among others.
- Reduced likelihood of leaving people behind as the local area is decarbonised. There is a risk this may happen if done purely through the private sector.

The main challenge however is how these local solutions can scale or aggregate to exploit the value and benefits of local energy and to mobilise the levels of investment needed. Each LA has its own priorities and has individual strategies to implement and deliver. Net Zero is not currently a statutory duty for LAs and therefore there is no standard method of evaluating carbon emissions or defining solutions to achieve Net Zero objectives.

For LAs to have a pivotal role in delivering Net Zero, there needs to be greater support and incentives to build capability and create standard approaches, as well as encourage knowledge sharing across LAs to ensure effective, cost-efficient routes to Net Zero.

Aim

The aim of this research is to identify the challenges and make recommendations to encourage private sector investment in Smart Local Energy System projects, and to describe what is required to enable and support private sector collaboration with LAs.

The report is structured to initially give an overview of the SLES opportunity, followed by the approach taken in the research. The role of Local Authorities and private finance options are then summarised to highlight the challenges that are addressed in the recommendation section. Six recommendations are defined, each requiring actions from key stakeholder groups:

- National Government
- Local Government
- Investors
- SLES developers
- Supporting organisations

Smart Local Energy Systems: Overview and Opportunity

The energy system was previously highly centralised with one-way flow of energy from generators and producers to consumers. But now, with the need for wider decarbonisation, decentralised energy approaches and solutions are expected to play an important role with decarbonisation of energy-consuming sectors and energy flow possible in both directions.

Smart Local Energy Systems (SLES) integrate low carbon technologies to deliver the needs of individuals, communities, and energy networks in a local area. SLES take a whole systems approach to the challenge of Net Zero by delivering a local integrated energy system that results in efficient use of local assets. Other approaches to Net Zero may take a piecemeal approach to decarbonising individual sectors – for example, low carbon transport could be planned independently of the electrification of heat, which may lead to less effective solutions or additional costs such as multiple upgrades to network infrastructure.

SLES broadly comprise many Net Zero Projects that build on the following elements:

- **Long-term assets.** This includes projects such as heat or electricity networks, which are installed and operated for decades.
- **Short to medium-term assets.** These are projects that utilise assets that have a short operational life before needing to be replaced, for example, a battery asset where cells will need replacing every 7-10 years.
- **Software packages and platforms.** These are projects that utilise some form of proprietary software package or platform. This can include peer-to-peer energy trading, energy optimisation and aggregation, for example.
- **Service offering.** This refers to the services provided by SLES developers to customers. In practice all SLES projects will have some form of service offering. A key challenge for any SLES will be to provide a service offering that is comparable, if not better, than the established approach.

A Smart Local Energy System will form by integrating various elements, such as EV charging and domestic property retrofit, and utilising local assets to provide network services, better consumer experiences and local network constraint management. They can be developed over time, creating a consortium of a wide range of partners, including but not limited to LAs, network operators, technology and software developers, utilities, and community groups.

Benefits of this approach include:

- Cheaper to achieve decarbonisation to the taxpayer by ensuring improved efficiency and cost over the longer term through integrated planning;
- Quicker to decarbonise as action can be taken today to decarbonise the local area that will integrate in the future to deliver better outcomes to the local area;
- Better outcomes to the consumer by ensuring the whole community can engage with the energy transition – utilities or private sector organisations do not have the same drivers as LAs.

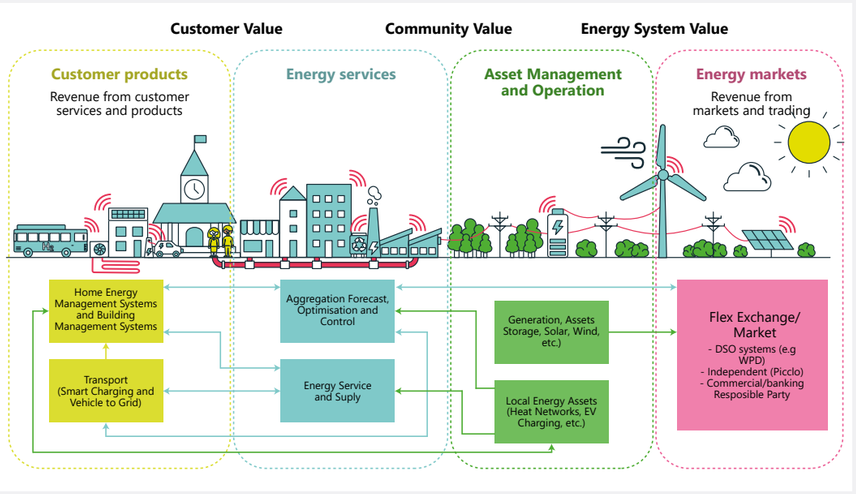


Figure 1: Outline of SLES and associated value streams.

Table 2 outlines both quantifiable financial value and wider 'soft' value available from a SLES. The flexibility of a SLES means that these can be balanced or prioritised depending on what is most important to the lead project developer. A LA leading SLES development will mean the value across customer, community, and networks can be balanced to ensure the best outcomes for all stakeholders. There may be scenarios where LAs are not the lead, however they should be considered a key stakeholder or partner to ensure community value and acceptance is achieved.

Currently, investment in SLES is either:

- Through individual elements of a SLES, where investment is being used for implementing EV charging network or heat network installation, for example; or
- By generating revenue from aggregation and supply of energy services to consumers, capturing the value across the whole system.

To scale SLES and accelerate progress to Net Zero targets, knowledge and capability need to be developed over time with continual feedback on consumers' and users' experiences, emerging successful business models and delivery approaches, and the performance of market design and the policy/regulatory framework on which they are based. However, immediate action is required not only to maximise the chances of Net Zero being met, but also to prove the SLES concept is attractive to the wider investor community by engaging with them during early development stages.

Table 2: SLES Value

Customer Value	Community Value	Energy System Value
• Focus is on delivering quality low carbon service or products to domestic or commercial customers. There is usually a direct revenue stream associated. • Prioritising customer value allows direct benefit to the customer through provision of novel, improved, or more competitive services.	• Focus is on providing benefits to the local area. Benefits leading to revenue are more indirect. For example, improvements in air quality by adopting low carbon transport meets local air quality management targets and could reduce associated health issues, ultimately improving quality of life and potentially reducing NHS health care spend. • Prioritising community value allows balance of the market and customers, but also enables flow of wider benefits outside the traditional systems boundaries, like improvements in air quality or an increase in local employment.	• Prioritising energy system efficiency through market design, policy and regulation allows local energy resources to provide system value including through: reduction of network congestion and losses; reduction in energy demand and peak energy demand; electricity balancing and power quality services. • This ultimately reduces total system costs and resulting energy bills for all consumers.

Several organisations that have been supported as part of the Prospering from the Energy Revolution (PFER) challenge have since received significant investment – a selection of published examples includes:

Legal & General Capital (LGC) **announced that it has taken a 36% stake in The Kensa Group**, one of the UK's largest players in the ground source heat pump technology sector, as it scales up its investments in addressing decarbonisation (**Energy Superhub Oxford**, April 2020)

EDF acquired battery storage and EV charging infrastructure firm Pivot Power in a bid to bolster its position in both markets. The transaction will see Pivot become a wholly-owned subsidiary of EDF Renewables, a move which plays into EDF's intent to become a market leader in both energy storage and EV charging (**Energy Superhub Oxford**, Nov 2019).

Smart Metering Systems, SMS Plc, which installs and manages smart meters and carbon reduction assets to facilitate effective energy management, has entered into the Virtual Power Plant (VPP) sector following the **acquisition of energy tech start-up, Solo Energy** (**ReFLEX**, Sep 2019).

ENGIE New Ventures has increased its strategic investment in second-life battery company Connected Energy. The increased investment from the corporate venture fund of ENGIE, along with existing investors in Connected Energy including Sumitomo, Macquarie and Low Carbon Innovation Fund 2 as well as an R&D grant from Innovate UK, will allow the company to continue to scale up its operations (**Smarthubs**, Jan 2021).

Low Carbon Hub raised £1.5 million through a community energy fund to deliver local projects that tackle climate change and pays them interest in return for investor support. (**Local Energy Oxfordshire**, June 2020).

Approach

Aim

The aim of this research is to identify the challenges and make recommendations to encourage private sector investment in Smart Local Energy System projects, and to describe what is required to enable and support private sector collaboration with LAs.

Objectives

- Understand investor appetite and awareness of SLES projects and pipelines.
- Identify investor perspectives on opportunities for SLES type projects.
- Identify needs of investors for working with LAs.
- Understand needs and opportunities of local authority finance and energy teams for undertaking complex infrastructure projects.

Outcomes

- Recommendations for what is needed across the sector to encourage private investment in SLES.
- Build familiarity and awareness of the opportunities and benefits of SLES within investor and local authority communities.

Local authority Sample

The local authorities we engaged with as part of this research are represented in Figure 2 and Figure 3 classified by size, based on area covered and population, and location across the UK. It is worth noting that the LAs who responded to our research are already driven by their carbon reduction targets and so are more likely to be actively engaged in the Net Zero agenda.

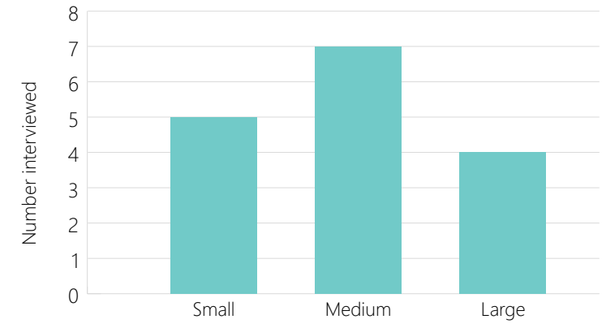


Figure 2: Size of local authority interviewed.

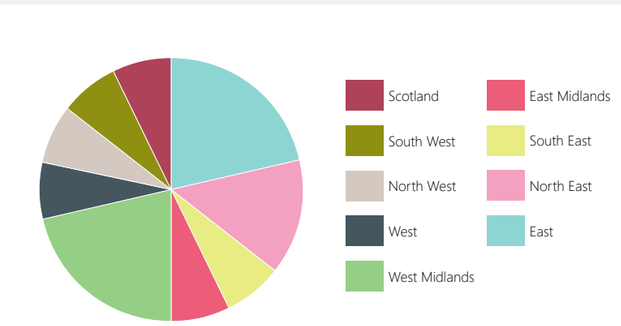


Figure 3: Location of local authority interviewed.

Investors Sample

All investors interviewed for this research are involved in low carbon energy investments either through technical assets such as solar, wind, and heat pumps, software development such as digital platforms, building energy efficiency improvements, or developing and providing home energy services. The investor archetypes included are summarised based on typical risk appetite and investment levels in Figure 4.

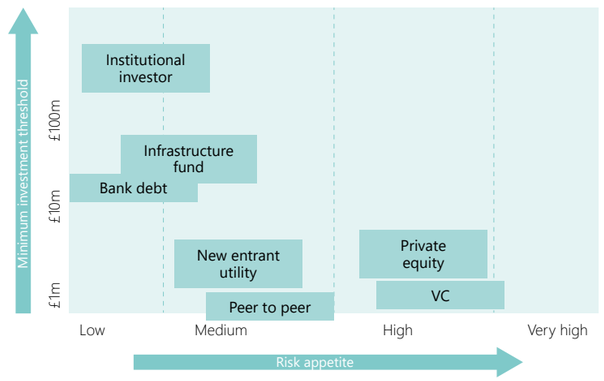


Figure 4: Typical risk appetite and investment levels of investor types.

Table 3 provides a qualitative summary of their current experience and potential interest in SLES, appetite for innovation, and current involvement with LAs. This represents those investors interviewed for this research – we recognise that this will not be common to all organisations in this sector.

Table 3: Investor archetype summary.

Investor type	Current experience in SLES	Interest in SLES opportunities	Appetite for innovation	Prior involvement with LAs
Private equity	Medium (technology assets)	Medium	Medium/low	Medium
New entrant utility	High (energy services)	High	High	Medium
Bank debt	Medium (technology assets)	Medium	Medium	Medium
Peer to peer/ crowd funding	Medium (local generation projects)	High	Medium	High
Institutional investor	High (system thinking approach incorporating heat, power, transport)	High	Medium (depends on internal business area)	High
Infrastructure fund	Medium (technology assets)	Medium	Medium	High
Venture capital	High (Novel business model)	High	High	Medium

The Role of Local Authorities in Financing Net Zero

The key strengths that a local authority can bring to financing Net Zero projects lies in their on-the-ground role and powers to act in the public interest, their relationships with local market actors of the public and private sectors, and their community "convening power". This, combined with a market and policy framework reformed to guarantee outcomes (e.g. decarbonisation) and efficiently reveal and enable capture of full system costs and benefits - particularly by local energy resources - could ensure that achievement of Net Zero is affordable, timely, societally beneficial and publicly acceptable.

LAs are well positioned to co-ordinate and drive action to achieve Net Zero targets. There is political backing and enthusiasm to progress current strategy to deliverable plans, and a recognition that their engagement with and trust from communities will help deliver plans that meet Net Zero targets. National data suggests that 33% of all LAs who have declared climate emergencies have published climate action plans[5].

There is a huge range of development progress across LAs in how to deliver on their climate emergencies, as outlined in Figure 5. For those LAs that have created Net Zero strategies and action plans, there is no consistency in how these targets and strategies are designed and then how these can be cascaded into programmes and projects. This makes it challenging to monitor success and progress locally, regionally, and nationally.

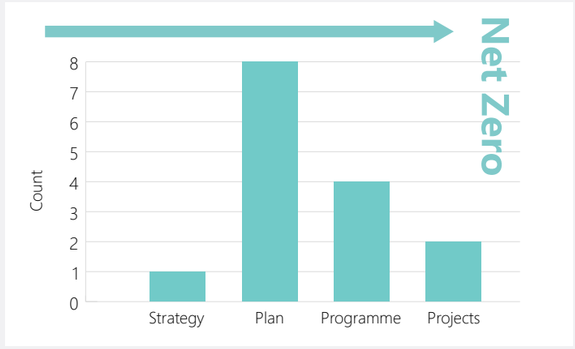


Figure 5: Net Zero progress in LAs interviewed.

Strategy	Have publicly committed to achieving Net Zero within a specific timeline.
Plan	Are in the stages of putting together a detailed time bound plan of how to achieve their Net Zero target.
Programme	Have identified specific opportunities for funding over wider themes, e.g. a transport programme, and projects that will allow them to implement their Net Zero plans.
Projects	Have active projects running with the specific aim of fulfilling their Net Zero targets.

Of the LAs who have started to successfully deliver energy projects, there is also a clear range of appetite for risk and adoption of innovation, as shown in Figure 6, which impacts the propensity of LAs to understand more complex SLES programmes.

Actively engaged in riskier projects with at least some already underway

Interested but still have to prove business case to implement

Low appetite for riskier projects if business case (% return) cannot be justified

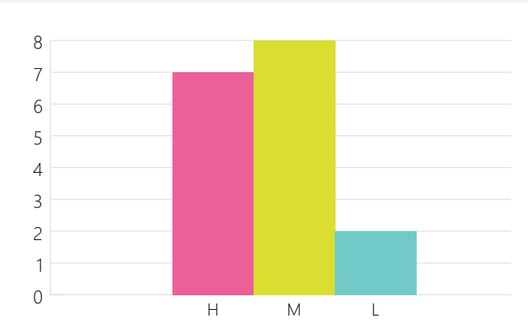


Figure 6: Local authority appetite for risk in energy projects from interview sample.

The primary funding sources that are used for energy projects, such as renewable installation, heat networks or retrofit programmes, are outlined in Table 4 below[6].

The funding sources mainly used for energy projects by LAs are grants, council funds or Public Works Loan Board (PWLB). Each of these funding options are not suitable for strategic, long-term, scalable investment, which is required to deliver Net Zero strategies, as described in the following sections.

Grant Funding

The structure of the national grant funding landscape is sporadic and usually announced with short timescales to submit proposals and complete projects. This means that unless LAs have a bank of approved projects that can be completed within the funding timeline, it is difficult to use grant funding to develop projects that fit within long-term Net Zero strategies.

In addition, the competitive nature of grant funding does not promote collaboration between LAs to find synergies and cost savings. LAs must compete to win funding for projects that fit the scope of the funding call. This combative approach does not encourage discussion and open collaboration to find ways to create economies of scale – for example, procuring EV charge point installations together. From a private investor perspective, the competitive funding landscape is discouraging as the lack of collaboration prohibits the scaling of Net Zero projects to create a larger pipeline for investment.

Council Funds

The use of council funds for Net Zero projects needs to be balanced against the needs of other mandated responsibilities, such as adult social care, for example. The same issue was also reflected in our research with regards to the need to divert funds to properly resource climate and sustainability teams. LAs across the UK are also in very different financial positions. Relying on council funds for focused, long-term funding is unfeasible for scalable SLES development.

Public Works Loan Board (PWLB)

The PWLB was viewed positively by many of those LAs interviewed as an easy to access, low-cost source of finance. However, as is the case with allocating council own funds, applying for PWLB funding must be weighed against other mandated responsibilities using private finance wherever possible, and council own funds when this is not possible. Therefore, this funding source should not be relied upon to deliver long-term programmes for Net Zero targets and creating SLES.

There have been recent updates to how PWLB can be used, and the government's aim is to develop a proportionate and equitable way to prevent local authorities from using PWLB loans to buy commercial assets primarily for yield, without impeding their ability to pursue service delivery, housing, and regeneration under the prudential regime as they do now. More details are available[7], however it is understood that further changes may be expected.

Table 4: Main sources of funding available to LAs for Net Zero projects.

Source of funding	Details	Examples
Grants	Government grants programmes, funding competitions and subsidies.	Local authority Delivery fund for Green Homes Grant, Heat Networks Investment project.
Council funds	Council acting either as primary investor or investor partner.	
Public Works Loan Board	Operated by HM Treasury and the Debt Management Office to provide low-cost loans for capital projects to LAs.	
ECO3	Energy Company Obligation (ECO) requires larger energy suppliers to deliver energy efficiency and heating measures to vulnerable or fuel poor homes.	
Private sector investment	Typically match funding in council-led projects.	Detailed examples discussed in Section 4.
SALIX funding	Mechanism to provide government funding to public sector primarily for energy efficiency, carbon emissions reduction and reduction in energy bills.	Public Sector Decarbonisation Scheme, Energy Efficiency Loan Scheme (SEELS).
Innovative funding	Alternative investment mechanisms gaining interest.	Crowdfunding, green municipal bonds, social impact bonds.

Private Finance Options

Private investment and capital are required for the UK to reach Net Zero. Returns from infrastructure projects are typically made by generating revenues from operation of an asset, delivery of a service, or from the sale of the asset. Private finance will be a necessity and should be considered a priority by LAs if a large amount of capital is required, as is typically the case with energy and infrastructure projects.

Attracting private finance for SLES programmes led by local authorities may also enable a more strategic approach for financing, aligning with wider community benefits. This would allow development of a wider programme that integrates benefits from multiple projects, compared with the more traditionally siloed approach that is often found with Public Works Loan Board (PWLB) or grant funding.

Further details and case study examples on financing opportunities for infrastructure in local authority areas are available[6].

Three of the main options for private finance for LAs include:

1. Asset sales and land development

Local areas often own undeveloped land which can be used to raise funds to invest in infrastructure. This is one way that local assets can be directly leveraged to fund SLES-type projects, but is also essential in planning key development sites to deploy low carbon technology. There are various ways of using the land for this purpose including:

- **Selling the land** outright to raise upfront capital.
- **Leasing the land** to the private sector to raise capital over time.
- Entering into a **joint development agreement** with private sector partners where the city provides the land, the private partner finances the development, and then both parties share in the profits in a negotiated ratio.
- Revenue generating infrastructure assets, owned by the LA, can also be **sold on a perpetual or limited life basis** to raise money to reinvest in other infrastructure assets or with a contractual obligation to not pay money to the public sector but rather to re-invest in the infrastructure asset to improve public services.

2. Public-Private Partnerships (PPPs)

PPPs are long-term contracts between a private party and a government entity for providing a public asset or service. PPPs can take different forms, such as where the private party is paid entirely by service users, or where a government agency makes some or all of the payments. The project functions transferred to the private party, such as design, construction, financing, operations, and maintenance, may also vary from contract to contract, but in all cases the private party should be accountable for project performance and should bear significant risk and management responsibility.

PPPs can improve value for money in infrastructure projects through:

- One party owning whole life costing and integration responsibility. They are therefore incentivised to reduce total costs over the lifetime of the project, including construction, maintenance, operation and decommissioning.
- Reducing costs relating to risks as private parties are often more able to manage these than government.
- Encouraging innovation through more flexibility to define project outputs. A competitive procurement process further incentivises this.
- Accountability of private parties to deliver the agreed outputs to suitable quality and within certain time frames.

For SLES, the balance between cost efficient deployment of funds and ensuring wider community benefits are achieved will be essential. LAs can play a unique role in balancing these priorities.

Green/municipal bonds

Green bonds are fixed-income securities that governments can issue to raise capital for a project that contributes to a low-carbon economy. Green bonds can be particularly attractive to institutional investors seeking to increase their participation in green infrastructure investment. Currently, these are not available at the scale required in the UK but are widely used internationally[8].

Progress is being made to develop common standards to grow this area further by organisations such as the Climate Bonds Initiative with the "Climate Bonds Standard" and the "Green Bond Principles" overseen by the International Capital Markets Association.

To be eligible for this type of finance, LAs are required to have a good credit rating and may need to set up new governance procedures to ensure they can monitor and evaluate the impact of investment in addressing climate change.

For SLES, this funding structure has strong potential to support scalable SLES development as the interests of public and private sector can be balanced. However, significant upskilling in finance and administration is required to enable municipal bonds to be accessible across all UK LAs.

Further information and case studies can be found here[9].

All three funding options could be suitable for the development of SLES type projects, as outlined in the table below.

Additional general benefits of involving private finance include[10]:

- Provides supply chain support and maturity
- Increases employment across the UK
- Brings additional skills and options for LAs
- Encourages a more competitive market, and potentially lower cost delivery
- Encourages a more sustainable and robust business case
- Passes risk of projects from the public sector to the private sector developers or asset owners.

All these points can ultimately lead to scalable, and repeatable projects that enable Net Zero in an effective way.

Table 5: Funding option most suited to SLES elements.

SLES element	Asset sales and land development	Public-Private Partnerships	Green bonds
Energy generation/storage assets (grid/commercial scale)	✓		✓
Energy generation/storage assets (domestic scale)	✓		✓
Asset management and operation (control and trading platform)		✓	✓
Energy services (heat, EV charging, electricity)		✓	

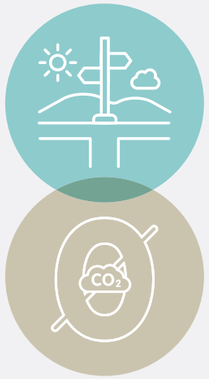
Recommendations and Actions

Our ambition is that SLES projects are developed across the UK, applying the learnings from the Prospering from the Energy Revolution government-funded innovation programme to deliver effective solutions that form part of the journey to Net Zero.

However, for this to succeed, the right market design, policy/regulatory framework and governance arrangements will be required in future. The government's market and policy framework continues to evolve to drive investment in renewables, drive out high carbon assets and increase the flexibility of the energy system to integrate variable renewables and distributed energy resources. It will be important for local energy resources that, in future, the wider electricity market and policy framework aligns the monetary incentives faced by investors with their wider impact on the system, ideally by **designing a market framework that internalises system costs and externalities as much as possible**.

This is key to ensuring local energy resources are properly valued. Wider outcomes that may not be monetizable should also be identified and considered. Any policy support should be based on a 'whole system cost' methodology and metrics and it should strive to achieve a level playing field for different zero carbon energy resources, whether large or small/aggregated, demand-side or supply-side.[11]

The following sections detail our recommendations and actions for what is needed to accelerate the development of SLES. These have been defined based on the interviews with LA members and a range of investors, and include actions for national government, LAs, investors, SLES project developers, and supporting organisations (such as Energy Systems Catapult). Each recommendation requires collaboration across the stakeholders, however, in order to clarify responsibility, each has been given a role of either own, support, engage, or facilitate.



These are defined as:

- **Own**: take responsibility and lead the progress of the recommendation
- **Support**: provide significant commitment to support the owner, either through funding or time and resource
- **Engage**: be involved in process scoping and developing the recommendation's activities
- **Facilitate**: enable collaboration and knowledge sharing across stakeholders involved.

The high-level recommendations are:

1. Generate **awareness** of the **value** and opportunities of Smart Local Energy Systems.
2. **Legislate** so local authorities have power and capability to deliver local net zero strategies (including SLES).
3. Create a **Standardised Net Zero Planning Framework** for LAs to develop SLES.
4. Develop **innovative public and private finance mechanisms** for SLES.
5. Demonstrate **visible pipelines of credible SLES type projects**.
6. Develop a flexible **standard procurement** framework suitable for SLES projects.

Recommendation 1: Generate awareness of the value and opportunities of Smart Local Energy Systems

Why?

In order to promote integrated SLES programmes with robust support from the private sector, the SLES opportunity needs to be clarified and communicated across key stakeholder groups.

Evidence

Both LAs and the investor community were receptive to the SLES concept as an effective approach to achieving Net Zero. However, the novelty and lack of clarity around potential value streams was viewed as a direct barrier, not just to private investment, but also to LAs taking on such projects with any confidence.

All investors that were interviewed are already involved in some elements of SLES and saw the value of the integrated approach SLES provides. Such projects included combining electric bus charging with solar and batteries, for example, where integrating technologies with software platforms created an opportunity for revenue stacking.

As SLES are currently understood, it was felt that it is difficult to identify where best to focus investment: either in individual assets, or the consortia as whole. As each SLES approach is currently unique and there is no standard business model, proposition to customers, or framework for communicating these opportunities, extensive due diligence is required on each project to understand the investment opportunity. This is not scalable to promote private investor engagement in SLES.

Investing in SLES programmes to achieve environmental and social benefits for their investment portfolios was repeated by those interviewed as a significant benefit. However there was general unwillingness to accept lower returns simply because a project delivered these wider benefits.

Most LAs interviewed aspired to undertake an integrated Net Zero programme to action their declaration of a climate emergency, but noted that there were significant barriers preventing this. In LAs where Net Zero strategies had progressed into integrated plans across different areas of the LA – for example highways, heat networks and social housing – internal organisational structures promoted responsibility and accountability, as well as support from the council executive. It was noted that this approach allowed those working on Net Zero projects to align activities with other areas of the LA. Unfortunately, those LAs who were able to do this were in the minority.

Climate change or sustainability teams were often under resourced and did not have significant representation at an executive level within the council to drive the Net Zero agenda forward. This means that, although an integrated approach may be cited in a declaration of climate emergency or the Net Zero strategy, organisational siloes, under resourcing, and lack of institutional knowledge prevent this from occurring.

Actions

To generate interest from the investor community in SLES, the first step is to clearly outline the predominant SLES business model types and how they generate revenue. Given the changing market and policy framework and the need to build and maintain investor confidence, it is crucial that the Government and LAs inform investors how future change could impact sources of value (e.g. for capacity, commodity, congestion, capability/ flexibility, carbon, co-benefits) in markets, network tariffs and policy mechanisms. This will demonstrate the opportunity to the sector and drive interest to promote the SLES approach.[12]

LAs similarly recognised the benefits of taking the SLES integrated approach to delivering their Net Zero strategies. However, the challenges they were already experiencing highlighted the barriers to delivering SLES at scale.

Recommendation 1: Generate awareness of the value and opportunities of Smart Local Energy Systems		
Actions	National Government Own	• Clarify long-term "direction of travel" in relation to energy market design, policy and regulation to reduce regulatory risk and provide clarity on sources of value and potential revenues. Promote reforms to energy market design and policy that internalise system costs and externalities as much as possible, and establish a level-playing field for different types of zero carbon energy resource and market actor. • Support LAs with funding and capacity to explore SLES opportunities
	Local Authorities Own	• Engage and collaborate with SLES developers and supporting organisations who are looking to clarify the SLES opportunity • Be open to collaborate with innovative energy project developers • Engage with LA finance officers to understand and discuss potential new revenue opportunities • Share experience of complex programme delivery with other LAs
	Investors Engage	• Embrace the opportunities for delivering Net Zero through an integrated portfolio of projects • Collaborate and provide support to SLES developers and LAs to understand opportunities and define scalable commercial models
	SLES Developers Engage	• Ensure customer value is clear to local authority and Investor stakeholders and aligns with their interests • Engage and share learnings to develop best practice for SLES with LAs, supporting organisations, and policy makers • Incorporate wider system impacts and co-benefits into business plans and future integration opportunities • Demonstrate and prove the short-term opportunities as well as outlining the longer-term business models and benefits
	Supporting Organisations Support	• Support the creation of standard language and communications explaining the value of SLES business models and customer value propositions • Develop and share information on types of private investor and finance available to LAs for SLES projects • Collate evidence and case studies from innovation programmes to demonstrate the wider value of SLES projects to investor and LA audiences

Recommendation 2: Legislate so local authorities have power and capability to deliver local net zero strategies (including SLES)

Why?

LAs need to be given the mandate and the respective powers to deliver Net Zero. This in turn will ensure LAs prioritise budget and resource to those teams that will deliver Net Zero projects. The strengthened commitment and capability of LAs will provide a market signal that local decarbonisation is a viable policy pathway for the UK, thereby reducing uncertainty and helping to attract investment. Without this, public and private investment will not be effectively channelled into Net Zero projects and therefore SLES will not develop consistently across the UK.

Evidence

Implementing a local Net Zero strategy requires skills, resources, and securing long-term funding to allow for continuity. Currently, it is down to the individual priorities of LAs to decide how well-resourced and funded their Sustainability and Climate Change teams are, and whether they even have dedicated resources for delivering Net Zero at all. Engagement in decarbonisation is not currently a statutory requirement.

Budget and resources need to be balanced with other statutory requirements, such as adult social care and planning. Additionally, it is worth noting that LAs have limited and inconsistent ability to enforce Net Zero strategy in their area – the size of Climate Change teams in LAs has fluctuated significantly even over the past decade.

For many of those we spoke to, apart from the larger LAs with well-resourced energy or sustainability teams, success came from a champion within the organisation who was persistent over a long time, driving the organisation to take this approach forward. This is not sustainable or scalable if LAs are to play a central role in delivering Net Zero.

Responsibility and drive are required from leadership right down to those who are delivering the projects.

Experience and capacity to deliver Net Zero is a significant gap that requires addressing. While some LAs have a lot of experience and institutional knowledge that allow these projects to progress, the majority have limited experience and are highly risk averse. LAs need their teams to be able to effectively work with the private sector and ensure there is sufficient institutional memory to take on long-term delivery of Net Zero programmes. By clarifying the role of LAs and mandating them to achieve Net Zero targets, the necessary budget and resourcing will be prioritised to ensure this is the case.

To leverage private investment in Net Zero plans, investors need to see competent teams who can deliver projects themselves or effectively engage with the private sector to do so. This is particularly pertinent for innovative projects, where it is important for potential investors to have confidence in the delivery capability of the team. Ensuring LAs have sufficient resources and skills to deliver Net Zero projects that integrate to SLES will give investors more confidence in LAs, therefore bringing more private investment into this sector.

Actions

Recommendation 2: Legislate so Local Authorities have power and capability to deliver local Net Zero strategies (including SLES)		
Actions	National Government Own	• Clarify the role of LAs and empowering them to achieve Net Zero targets – this will motivate and enable LAs to identify and unlock the benefits of local energy and will encourage implementation of SLES as a delivery mechanism • Fully engage LAs in reforms to energy market design and policy to ensure the full system value and co-benefits of local energy resources can be fully realised • Ensure LAs have appropriate powers, capability and capacity to co-ordinate implementation of place-based net zero policies and strategies tailored to local circumstances • Support energy academy/technical assistance programmes to grow skills and expertise in regional and local energy delivery supply chains
	Local Authorities Support	• Upskill and resource teams to manage Net Zero plans to be able to evaluate private sector proposals for delivery • Develop clear communication material to inform senior officials to encourage buy in and support • Realise range of options for delivery such as where an LA can facilitate delivery, not necessarily lead • Engage with carbon literacy and training available to incorporate Net Zero strategy across LA teams, from politicians to officers
	Investors Engage	• Work with LAs, policymakers and SLES developers to highlight what they need from LAs to enable scalable private investment in SLES
	SLES Developers Engage	• Engage and share learnings to develop best practice for SLES with LAs, supporting organisations and policy makers
	Supporting Organisations Engage	• Provide tools designed for LAs to realise and understand full benefits of SLES that are available now and as they emerge with change to market design and policy change

Recommendation 3: Create a consistent Net Zero Planning Framework for local authorities to Develop SLES

Why?

Local authorities need confidence in the approach they are taking to proceed with their Net Zero plans and create better/cheaper outcomes for the area. A consistent Net Zero Planning Framework will provide a reference point for all LAs to help them proceed with confidence, cementing common learnings and embedding good practice. In addition, a framework will provide clarity to private investors on the opportunity for them to invest. Energy Systems Catapult has been developing such a framework – Local Area Energy Planning (LAEP) – for some time, including guidance for local authorities. Others have also been active in this area. Ofgem is exploring how local area energy planning can support better decisions and proposals for developing and investing in energy networks.[13,14]

To allow LAs to create and deliver a long-term Net Zero vision to develop SLES they need the power from central government to deliver the plans, support from the funding landscape and supporting bodies, as well as the processes and tools to be able to create the plans and engage with other key decision-makers such as network companies, developers and social housing providers.

Evidence

Delivering Net Zero projects to develop a fully integrated SLES is challenging to plan and execute in the current planning/funding cycle structure. A combination of long-term public funding and private funding to deliver Net Zero plans that will build into SLES in the future is required.

To gain interest from investors in SLES programmes, the opportunity needs to be clear, and a pipeline of projects to provide scale for investment needs to be visible and credible. In the current Net Zero project landscape, each LA uses their own planning approach, with key performance indicators and businesses cases calculated in different ways, usingdifferent assumptions.

An investor with experience of working with LAs also raised how LAs interpret their powers differently across the UK, which made designing and developing a standard plan, or potentially aggregating a number of similar projects challenging. As SLES projects will require involvement across multiple teams within a LA, there is a clear need to develop a standard planning process for an effective energy transition.

It is impossible for investors to understand the total potential market for SLES with these disparate planning and reporting approaches.

A Net Zero Planning Framework can help promote interest from private investors in two ways.

1. It allows analysis of the market to understand the total market size and therefore the potential opportunity for them.
2. A consistent Net Zero Planning Framework can help LAs identify collaborative opportunities on projects, for example pooling public EV charging projects, which can in turn create economies of scale in a Net Zero pipeline to suit the size of investment that is sought.

Investors interviewed stated that they would consider a range of minimum potential pipelines, averaging around £10 million, before committing to a new type of asset or business model.

Many LAs we interviewed were struggling to identify how to take their Net Zero strategy into project initiation. Although there is a fast-developing market for consultancy to help LAs develop Net Zero strategies and programmes, the methodologies implemented are disparate and assumptions and methods are often not clearly communicated. Lack of Net Zero planning standardisation will continue to hamstring large-scale private investment in this area.

National government should empower LAs to develop and implement local Net Zero strategies and ensure they have the responsibility and power to drive forward investments. A common planning approach will allow for clarity in the action and progress that is being taken, which in turn will allow national government to monitor and take iterative steps to design ongoing policy and funding support. It would also enable private investors to find opportunities to bring private finance into SLES programmes.

The Net Zero Planning Framework should encourage a long-term view to be taken; projects should be implemented today, such as EV charging or home retrofit programmes, with a perspective towards integrating these projects into SLES in the future. A suggested framework to build towards SLES is outlined in Figure 7. This will mean projects being delivered today can lead to SLES in the future and will ultimately:

- Encourage delivery of projects today that do not prohibit potential future developments to drive Net Zero action.
- Create better value to the taxpayer by realising system efficiencies, creating a level playing field between energy resources and market actors, and by ensuring projects of today are resilient to the future.
- Demonstrate visible pipeline to investors which means public funding can effectively leverage private investment.
- Create better outcomes to the local community by tending towards an integrated Smart Local Energy System that brings power, heat, and transport together, rather than individual, disparate schemes.

As outlined in Figure 7, the Net Zero planning methodology should:

1. Develop a Net Zero strategy defining the scope of the plan and key targets, using data to baseline the plan, and to examine local assets and how they can leverage them. This will set the principles of integration towards a SLES in the future and define the prioritisation of value pools as it develops.
2. Build an Action Plan which is cascaded through the Local Authority and supports bodies (i.e. Local Enterprise Partnerships and Energy Hubs) to provide clear targets and responsibilities.
3. Implement a Programme from the Action Plan which is the overall delivery mechanism for managing funding and ensuring integration of projects in the long-term to tend towards a SLES.
4. Undertake projects within the programme that deliver the technology and infrastructure that will deliver Net Zero targets and become the building blocks for the SLES.

Further engagement with LAs and national government is required to ensure this framework is fit for purpose.

The challenge with such a long-term, integrated planning approach is that the current funding landscape for LAs does not promote long-term, strategic, integrated, collaborative thinking. The public and private funding landscape needs certainty, a clear direction of travel and a standardised Net Zero Planning Framework to stimulate action.

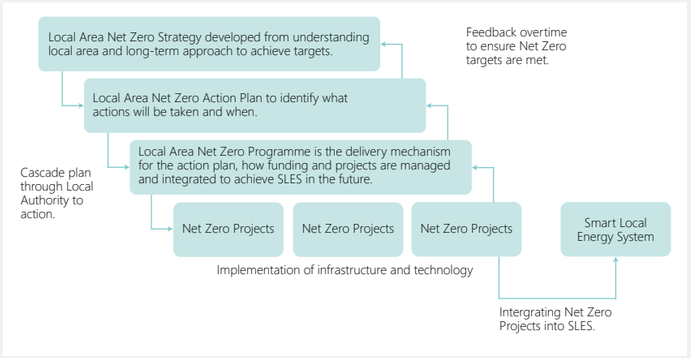


Figure 7: Suggestion of the structure of Local Area Net Zero planning methodology and how this relates to Smart Local Energy Systems.

Actions

Recommendation 3: Create a consistent Net Zero Planning Framework for Local Authorities to Develop SLES		
Actions	National Government Own	• Agree ownership and responsibility of government department to lead local strategy for Net Zero • Promote consistent planning and programme development process for LAs to understand progress against targets and investors to understand opportunities suitable for range of local areas • Define a legal requirement for plans to be developed using certain methodology
	Local Authorities Support	• Be ambitious! • Engage and collaborate with the supporting bodies and policy makers defining the standard Local Net Zero Planning Framework • Incorporate Net Zero outcomes in strategic objectives and cascade into all programmes and projects • Invest in developing long-term Net Zero strategies that incorporate local assets and energy infrastructure, including electricity, heat, and transport • Ensure alignment of strategy with local area objectives
	Investors Engage	• Engage with national government initiatives to shape strategy • Incorporate Net Zero targets for all investment decisions
	SLES Developers Engage	• Engage with LAs to understand how proposal can meet wider needs of an area and integrate effectively with planning framework • Engage with the development of the Local Net Zero Planning Framework to ensure projects will integrate into SLES in the future
	Supporting Organisations Facilitate	• Develop tools for LAs to apply in collaboration with key stakeholders • Facilitate collaboration between stakeholders to develop the planning framework

Recommendation 4: Develop innovative public and private finance mechanisms for SLES

Why?

The funding currently available to LAs for Net Zero projects is sporadic and short term. Restructuring public grant funding to promote collaboration between LAs as well as long-term planning will help, but this will only go so far. Private finance is needed to reach the £50 billion per year that is required to deliver Net Zero from 2030[2].

Although there is interest from investors, they need to see a strong market signal in terms of requirements for LAs to achieve policy outcomes, and a supporting, coherent market and policy framework that they can have confidence in.

Local authorities need mechanisms that they can use to share risk with developers and investors in order to leverage private finance with the public funding available to them. This will help lower the returns that investors will accept.

Evidence

Investors are driven, primarily, to generate attractive returns, but increasingly they see demand from clients to invest in sectors that address climate change and provide social value. There is also increasing pressure to divest from non-renewable energy and industries with high carbon emissions. Projects that can demonstrate their role in supporting a pathway to Net Zero and social value by incorporating the knowledge and drivers of a local authority could offer extremely strong opportunities for investment. SLES were viewed as potential opportunities to achieve this by investors in our research.

The level of risk investors are prepared to accept varied depending on the type of investor, as indicated by Figure 4. The ones with lower risk appetite were not prepared to take on any technical risk and required the business models to be proven and demonstrated, with relative certainty of revenue at least for ten years. The main areas of interest for these investors were in commercial technology, such as wind and solar assets.

Others were more willing to take higher risks where the opportunity complemented their wider portfolio or there was possibility for scaling in future. Some of the investors commented that the potential existed for the risks and benefits of a SLES to act as a natural hedge for other assets held in their portfolios.

To make the SLES concept more investable under current market and policy arrangements, it was suggested that projects might need to be split up to simplify the cash flows and associated risks in a clear way. Investors would also want to understand how these could integrate in an optimised system, ensuring assets do not become stranded. Efforts will need to focus on ensuring appropriate allocation of risk and efficient use of public funds i.e. direct public funding or public sector risk sharing mechanisms used for risks that private finance would not be able to accept. This could be supported by developing long-term strategic plans for Net Zero, close working between investors and LAs to understand risks, and knowledge exchange between LAs to share learning.

The view of investors interviewed was that the uncertainty of policy was impacting their decisions to invest in local energy projects particularly around flexibility services. Some suggestions for mitigating this included whether the government could offer some financial assurance policy or guarantees to cover potential project failures or otherwise de-risk projects. Another was for a subsidy mechanism, like Contracts for Differences, that would provide greater predictability to the offtake price from the project, and hence longer-term revenues, for flexibility services through a price cap and a guaranteed lower limit.

The consensus of investors interviewed was that they were keen to engage with national government to shape future direction and strategies either directly or through organisations that represent investor views such as Core Cities, Local Government Association, and Green Finance Institute.

Clarity on the Government's long-term future of energy market design and the supporting energy policy framework for Net Zero is necessary for investors to be able to understand the potential sources of revenue (and how they might change) and level of risk. Improvements to market design and a more coherent policy framework for the whole energy sector can level the playing field for different energy resources.

Community municipal bonds were also highlighted as a particularly suitable mechanism to bring private investment into public SLES programmes. These bonds are fixed-income securities that governments can issue to raise capital for a project that contributes to a low carbon, climate-resilient economy. Green bonds can be particularly attractive to institutional investors seeking to increase their participation in green infrastructure investment.

The main sources of funding highlighted by LAs we interviewed for energy-related projects are summarised in Figure 8. As discussed in the Role of Local Authorities section, the popular funding mechanisms - grant funding, council funds and Public Works Loan Board (PWLB) – are not appropriate for long-term, strategic planning and delivery of Net Zero projects.

These grant funding sources are sporadic and do not promote collaboration between LAs or integrated thinking, and council funds and PWLB are not prioritised for Net Zero projects. The lifetime of energy and infrastructure assets are often longer-term than grant funding sources, and therefore it is challenging to apply and rely on these as suitable funding options.

New public and private funding mechanisms need to be developed urgently alongside the right market/ policy framework, to drive efficient action to implement Net Zero projects that will integrate to create SLES in the future.

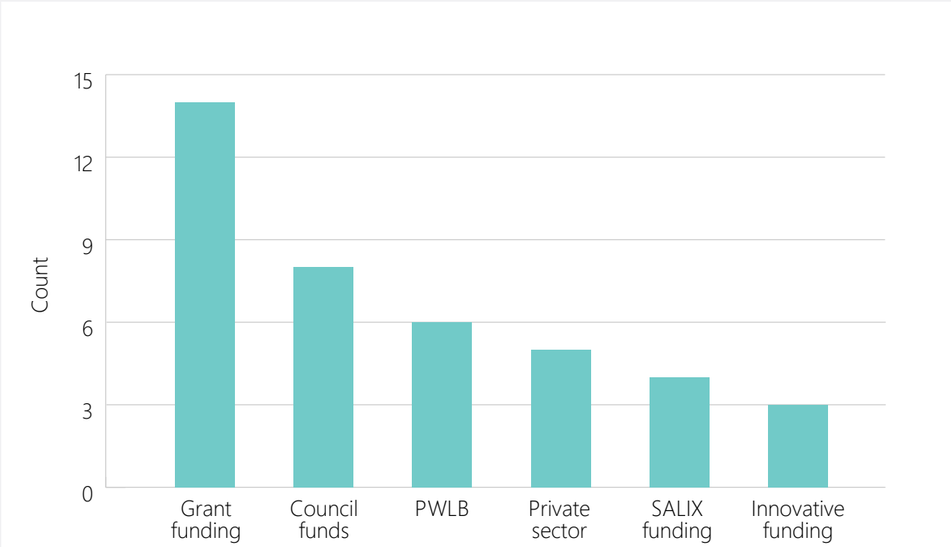


Figure 8: Main sources of funding for LA energy projects from interviews.

Actions

Recommendation 4 Develop innovative public and private finance mechanisms for SLES		
Actions	National Government Own	• Design public funding to be additive to private finance, supporting areas of higher risk and innovation where private finance is not possible • Utilise public money to assure and share risks to leverage more private investment • Ensure the UKIB is designed to meet the needs of Local authority climate change teams in a fair, transparent way • Reduce competition element for grants and other public funds to encourage knowledge sharing and collaboration
	Local Authorities Engage	• Increase LAs knowledge, skills, and literacy in finance, and engage finance teams early in project development process • Upskill and resource teams delivering on Net Zero plans to ensure they can interrogate and select project delivery proposals from the private sector • Resource and encourage a mindset for LA finance teams to consider and engage in alternative private finance options • Promote investment opportunities to private finance audiences • Collaborate and share experience with other LAs with supporting organisations help
	Investors Support	• Be prepared to work with and advise LAs during project/programme planning phases to develop potentially innovative investment options • Articulate levels of risk prepared to take to LA and project developers • Publish investment interests for Local authority audience to identify possible opportunities • Investor collaboration to develop potential solutions suitable for LAs to incorporate public and private finance
	SLES Developers Engage	• Define risk profiles associated with different SLES technologies to enable investors to design specific financial products • Clearly communicate value and revenue potential for commercial operation for LAs and investor audience • Share learnings on investment and funding approaches that have worked/not worked during the Prospering from the Energy Revolution (PFER) programme with LAs
	Supporting Organisations Facilitate	• Provide platform to facilitate knowledge sharing (including signposting to relevant skills development opportunities such as financial literacy training) • Develop standard templates and good practice guides to promote energy projects to private investors • Build open access knowledge hub including a case study library of SLES projects that have attracted private finance

Recommendation 5: Demonstrate a visible pipeline of credible SLES type projects

Why?

A visible pipeline of SLES projects is a key priority to generate interest from investors as it demonstrates the size of the investment opportunity. It can also communicate project activity across LAs, helping to find opportunities to collaborate on projects. This will help to generate economies of scale for efficient use of public funds, and to aggregate projects to create the scale of investment investors are looking for.

Evidence

Investors interviewed strongly stated that a visible potential pipeline of credible projects is required to enable them to consider investment. The amount required for the pipeline to be "material" and thus worth the investment of time and resources in assessing business case and suitability averaged around £10 million per year, but varies considerably across the investors interviewed, and correlated to the size of team, typical investment quantum, and so on.

However, all had a minimum level below which a new asset class would not be attractive to assess as the due diligence costs could not be justified with only a small addressable market. Some were more willing to take on higher risk elements, such as digital market trading platforms, if they considered it complemented other parts of their portfolio and they could see potential value.

To help further demonstrate the pipeline, a database should be created and shared, similar to the National Infrastructure and Construction Procurement Pipeline[15], to demonstrate and communicate the Local Area Net Zero Infrastructure and Construction Pipeline.

For LAs, a database of Net Zero projects can help aggregate information to share learning and best practice and create economies of scale. Developing long-term partnerships between groups of LAs and investors is challenging due to the political, geographical, organisational, and risk appetite differences. Figure 9 outlines the differences in how each of the LAs interviewed prioritise different elements of the business case where gold represents high priority, silver medium, and bronze low. It should be noted, however, that this reflects the current market, policy and governance conditions that would change if the recommendations of this report would be implemented.

Facilitating systematic collaboration between LAs to find opportunities to bring Net Zero projects together to procure and fund in tandem will help to develop the scale of funding private investment wants to deliver. In addition, a visible pipeline can also help to promote development of local skill sets to deliver projects, providing co-benefits from local green growth in the area.

To allow this collaboration, the priorities and needs of LAs should be identified, and supporting bodies (e.g. Energy Systems Catapult, UK100, Local Partnerships, APSE, Energy Hubs) are well positioned to facilitate new relationships. A database that shows the pipeline of SLES Net Zero projects should also communicate characteristics and strategic priorities of LAs to promote collaboration between LAs.

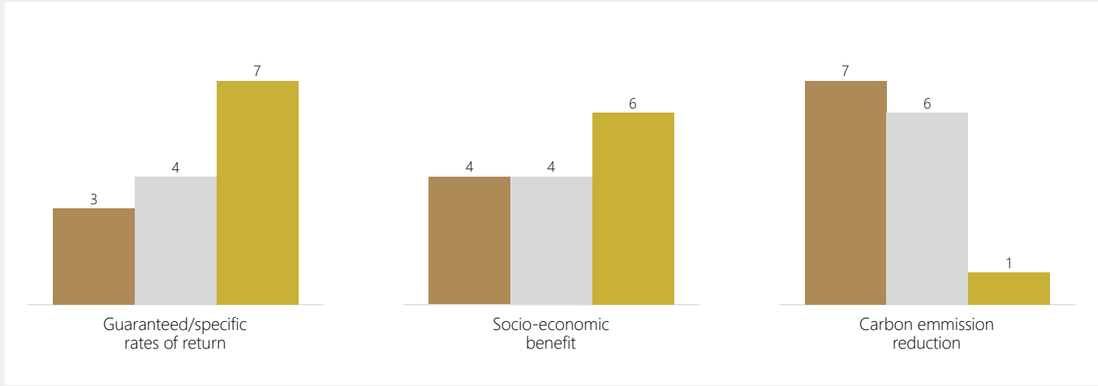


Figure 9: Number of Local Authorities that prioritised different elements of business cases for energy projects to make decision on which ones to take forward where gold represents high priority, silver medium, and bronze low.

Actions

Recommendation 5: Demonstrate visible pipeline of credible SLES type projects		
Actions	National Government Own	• Develop, or co-ordinate delivery and maintenance of, a Local Area Net Zero Infrastructure and Construction Pipeline. • Engage with LAs to ensure there is flexibility to align with local area objectives as well as national
	Local Authorities Engage	• Apply standard approaches for communicating local energy project opportunities. • Develop and publish Net Zero strategy with proposed timescales and anticipated projects.
	Investors Engage	• Engage with the development of a Local Area Net Zero Infrastructure and Construction Pipeline to ensure information to demonstrate a credible pipeline of projects is collected. • Give clear feedback on attractiveness of opportunities to improve credibility as pipeline matures.
	SLES Developers Engage	• Ensure customer value is clear to Local authority and Investor stakeholders. • Demonstrate and prove the short-term opportunities as well as outlining the longer-term business models. • Engage with the development of a Local Area Net Zero Infrastructure and Construction Pipeline to ensure potential SLES opportunities are communicated across public and private sector.
	Supporting Organisations Facilitate	• Facilitate collaboration across investors with local stakeholders to further develop delivery of a Local Area Net Zero Infrastructure and Construction Pipeline.

The complexity of procurement can delay projects, which may lead to negative publicity for private organisations. Usually, investors engage at the stage where funding options are being sought, after the project has been identified and the initial business case has been prepared. It can take years to gofrom initial conversation to project initiation. This is not acceptable for the future to create the pace of project implementation required to achieve our national Net Zero targets.

Many LAs interviewed spoke of instances where Net Zero project ideas had progressed to a mature stage, including engagement with private organisations to create joint ventures, but were either delayed or halted when finance and procurement teams were engaged. Often these projects did not meet internal finance or governance requirements to allow them to proceed.

The ownership, leadership, and responsibilities for project development needs to be clear and the outcomes that are needed communicated early to build investor confidence.

The Re:fit scheme is one example where creating a national energy scheme has helped to demonstrate a pipeline of projects. As a result, there is an increase in the number of public bodies that have implemented energy efficiency measures and local energy generation projects. To date, over 250 organisations have utilised Re:fit to procure upwards of £180 million of works, with the current pipeline at over £91 million and growing[16].

Creating a standardised procurement framework can help to speed up progress from planning to implementation, which is the stage at which investors would engage to understand the scope for their investment.

Recommendation 6: Develop a flexible standard procurement framework suitable for SLES type projects

Why?

Although the planning framework and supporting funding landscape can enable SLES to develop, the different SLES projects will need to be procured in such a way that promotes integration and delivery of wider benefits, e.g. community benefits in the form of improved air quality.

Creating a national procurement framework, that allows flexibility for the range of Net Zero projects and business models that can integrate into a SLES, will help reduce procurement times, ensure best practice is followed across the country, and demonstrate the potential market to the private sector to attract funding and services for SLES.

A framework could also allow for collective procurement that can lead to lower costs as well as accelerating Net Zero Project delivery.

Evidence

In the interviews with investors, several highlighted procurement as an area for concern that can prohibit working with LAs. In their experience, progress from project inception to delivery could be significantly slowed by the public procurement process, as there are often no existing frameworks for new innovative business models or technology.

In addition, many LAs take an individual approach to procurement, which means the same products and services are being tendered in different ways nationally. This does not create the environment for standardisation and scale that will enable private investment to support LAs to develop Net Zero programmes that incorporate SLES. Having political leadership and buy-in from LAs is generally viewed positively by investors; however, there is also a risk to this changing within the project development time, particularly for complex energy projects with long lead times.

Actions

Recommendation 6: Develop a flexible standard procurement framework suitable for SLES projects		
Actions	National Government Own	• Support the development of a national procurement framework to procure consultancy and project delivery for SLES to speed up procurement processes and share best practice so private sector support is value for money.
	Local Authorities Engage	• Engage and collaborate to develop a suitable procurement framework with other LAs and national government for SLES. • Share experiences of successful approaches for procuring innovative energy projects with other LAs and supporting organisations to show the art of the possible.
	Investors Engage	• Engage with the development of a SLES procurement framework to ensure it is suitable for private investors to engage.
	SLES Developers Engage	• Engage with the development of a SLES procurement framework to ensure it is suitable to enable the projects to be integrated to develop SLES in the future.
	Supporting Organisations Facilitate	• Facilitate development of adaptations required to existing procurement frameworks. • Support collaboration to understand challenges and gaps with existing procurement frameworks for local energy projects. • Raise awareness and accessibility of procurement options suitable for SLES.

Conclusions and Next Steps

Smart Local Energy Systems are an opportunity for private investors to work with local authorities to build resilient low carbon energy systems for their communities. However, the right investment conditions need to be created (including support and financing mechanisms) and governance arrangements established so that LAs can play their full role in achieving Net Zero by realising the full value of local energy. The prospects for developing future SLES investments are also highly dependent on the progress of wider reforms to national market and policy frameworks to create market signals that incentivise well-designed SLES investments capable of efficiently exploiting and unlocking local sources of system value and flexibility.

To create the right support, address the challenges described in this report, and carry out the suggested actions, collaboration is needed across national and local government, private investors, SLES project developers and other organisations with specialist expertise. The UK Infrastructure Bank has the potential to close the gap between public and private finance for innovative Net Zero projects and it is vital the needs and required outcomes of all parties involved are well understood.

The essential next step to progress these recommendations is to convene a 'task and finish' group that has representation from key stakeholders identified in this report to ensure the follow-on actions are developed collaboratively.

Through the Prospering from the Energy Revolution programme, Energy Systems Catapult is supporting local authorities and facilitating collaboration between key stakeholders to ensure the benefits of Smart Local Energy Systems can be realised, and much more than just Net Zero emissions can be achieved. The SLES Toolkit that is being developed is an essential resource to support SLES development, but many other supporting changes are required across the energy sector.

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