Agenda Item No: 7

Local Energy System Transition

To:	Environment and Green Investment Committee
Meeting Date:	13th July 2023
From:	Executive Director; Place and Sustainability
Electoral division(s):	All
Key decision:	No
Forward Plan ref:	N/A
Outcome:	The development of a Cambridgeshire Local Area Energy Plan in partnership with the Combined Authority and Cambridgeshire Local Authorities, to facilitate energy system transformation and deliver Climate and Net Zero ambitions.
Recommendation:	Committee is recommended to: a) Comment on the draft outcomes and scope of the Local Area Energy Planning process as set out in paragraphs 2.6-2.8 b) Delegate responsibility for awarding and executing contracts for the provision of the specialist energy consultancy services, described in paragraph 2.9, and any extension periods to the Executive Director Place and Sustainability in consultation with the Chair and Vice Chair of Committee.

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1. Background

1.1 The Government's Climate Change Committee's Sixth Carbon Budget (i.e., years 2033-37) identified that to continue to reduce emissions from the energy sector while meeting the future demands from the electrification of heat and transport, substantial reform to the national energy system is needed and in particular to the electricity system. Achieving the national target of Net Zero by 2050 and the security and resilience needed for an advanced and prosperous economy, cannot be done without transitioning to a smart energy system and dealing with market and grid connection obstacles. For example, rebalancing the costs of gas and electricity, building up local energy supplies and achieving cost effective, timely grid connections for projects.

1.2 The future electricity demand profile for the UK at Appendix A identifies there will be at least a doubling of demand by 2050 compared to usage at 2018 levels, even after all energy efficiency efforts have been made.

1.3 The Department for Energy Security and Net Zero is working closely with Ofgem on wider reforms to the UK energy system promoting a more flexible and efficient approach. Options being explored are looking at planning, governance and operation of the energy system at a regional and local level to facilitate a flexible system with clean energy generation and distribution, right down to the town, street and home level. The energy market is also being reviewed as currently it is too complicated, fragmented and difficult to navigate to deliver the UK's net zero and security ambitions. As part of this market review, the creation of a 'digital energy infrastructure' platform that allows communities, businesses and organisation to buy and sell surplus renewable electricity and services to each other and access multiple markets in a transparent and simple way, is being explored.

1.3 The development of smart local energy systems is the future. Critical to their development is the engagement and support of local communities to be more involved in the design and delivery of these systems. Local approaches will be key to achieve the electricity demand and system efficiency whilst delivering net zero, growth and resilience ambitions.

1.4 A smart local energy system is one that brings together energy generation, storage (e.g., batteries), demand management and infrastructure that is all connected in a digital way, at a local level. These systems have been shown to reduce costs to consumers, deliver value for communities, accelerate the journey to net zero and improve energy security for local places.

1.5 Critical to a successful transformation are the changes to the way people interact with the energy system, for example, fuelling their vehicles and heating their homes, along with the growth of local generation of electricity and heat. Importantly, the changes to the energy system must engage and empower consumers to be part of the energy system to deliver the right outcomes whilst also benefiting from its transformation. Appendix B provides a summary of recent local energy projects delivered by the Council which provide examples and benefits to a future energy system.

1.6 The outcome of this report is to proceed with the development of Local Area Energy Planning in partnership with Cambridgeshire Local Authorities, the Combined Authority and UK Power Networks.

2. Main Issues

Local Area Energy Planning (LAEP)

2.1 To reach Net Zero, a planned and coordinated approach to local area energy planning is needed to ensure delivery at least cost, whilst also embedding wider benefits including resilience, air quality improvements and better health and social outcomes such as fuel poverty alleviation.

2. 2 Local area energy planning is a 'data-driven, whole system approach that considers how to decarbonise the entire energy system across electricity, gas, heat, cooling, and transport systems. A plan will set out the change required to enable Cambridgeshire's energy system to meet the net zero ambition and put communities in Cambridgeshire at the heart of the energy transition, providing opportunities to engage and benefit from this change.

2.3 A Partnership Steering Group was set up in November 2022 comprising representatives from across all the Cambridgeshire Local Authorities including the Combined Authority, UK Power Networks (UKPN) and both Universities. Meetings to date have focussed on building the group's understanding of Local Area Energy Planning, reviewing existing plans, assessing the availability and costs of tools and technical platforms, understanding the data requirements to support the development, stakeholder mapping and developing a scope for a plan for Cambridgeshire.

2.4 The County Council is leading the development of the Local Area Energy Planning process and will be responsible for the collective budget and procurement of specialist energy consultancy. The LAEP is not only essential in itself, but plays a vital role in wider infrastructure and land use planning across the county feeding into the Combined Authority's Strategic Infrastructure Delivery Framework and our Local Authority partners Land Use Planning. The Universities' role is advisory to inform future thinking and scenarios informed by their research and UKPN will look to use this process to inform future network investment and planning.

2.5 Critical to the development of a successful local area energy plan is having an effective partnership with a shared understanding of what is needed for the energy transition, a strong governance framework and a plan for multidisciplinary inputs from across the energy system including the energy networks and suppliers, developers, large users and the community. Only with this wide stakeholder input can a credible plan be developed that also manages a Just Transition and leaves no-one behind.

2.6 The LAEP will take approximately 18 months to develop once the agreement to resource and support its development is in place across the Local Authorities. It will provide a route map to deliver a Net Zero energy future, including grid upgrades, renewable generation, retrofits, EV charging, battery storage and other infrastructure plus the new types of behaviours needed to make a new energy system fit for everyone and the environment. Anticipated outcomes include:

- A dynamic digital platform, which can spatially map a future energy system
- Grid scale planning for UKPN to feed into their business plans with OFGEM

- A high-level business case and pathway for the future energy system, providing the quantum of investment and infrastructure required.
- A detailed 5-year programme prioritising no regret opportunities and supporting strategic infrastructure planning and delivery.
- A clear pathway for community energy to support communities to be at the heart of the new local energy system.

2.7 In addition to the outcomes above, other objectives include:

- Supporting the alignment of future spatial and energy planning frameworks in the County area
- Informing future planning for strategic infrastructure investment
- Informing other strategies including local economic and asset strategies
- Supporting future policy development
- Engaging communities and putting them at the heart of the Plan
- Identifying opportunities to develop new projects to meet our own and partner ambitions.
- Informing future bids and deals with government for future investment into Cambridgeshire
- Attracting private sector investment into the energy system transformation (Please see Appendix C, the headline investment for Peterborough's Local Area Energy Plan.)

2.8 A draft scope is developing including, but not limited to, the points below:

- Identification of likely future growth in energy demand, for example, from cooling
- Opportunities to avoid or mitigate energy demand in the first place – designing out where we can.
- The decarbonisation of heating, cooling and power for all buildings both new and existing, prioritising demand reduction and efficiency measures and meeting residual demands from renewable sources.
- Managing energy flexibility including demand management and storage to improve system efficiencies and whole system change.
- The decarbonisation of motorised transport through the provision of EV charging infrastructure for vehicles as well as potentially hydrogen infrastructure for large transport vehicles.
- The local generation of renewable electricity at all scales to support future demand, ensuring community energy schemes and community benefits are centre stage to the transition.
- Timely investment and delivery of distribution network upgrades and flexibility mechanisms along with National Grid upgrades to facilitate decarbonisation.
- Collaborations with high energy consumers, including research facilities, businesses, food processing, water, manufacturing to manage peak demand as part of the wider system management, as well as agriculture.
- Creation of highly resilient infrastructure, to provide continuity of supply to all customers, with priority for critical services; and

- Support the development of the local energy economy and the creation of green jobs.

2.9 The Council engages with the development of the LAEP in a number of different ways. It is:

- Leading LAEP as a Project, bringing together the resources from across the Partnership to fund and participate in its development; and ensuring effective stake holder engagement.

- A major asset owner, the Council can develop and support projects to facilitate the implementation of the LAEP benefiting the Council and its wider delivery e.g., participation in proposed heat networks as anchor loads and developing strategic generation and storage projects; and

- Championing and supporting communities to participate and benefit from the energy transformation. This will include collaborating on the development of community energy projects, building community capacity to engage effectively in the future energy system and partnering in project delivery.

2.10 To develop the LAEP, a budget of £155,000 is being proposed for phase 1. The budget will cover the extent of specialist energy service advice, guidance and analysis to deliver the Project. The intention is to procure external consultancy using a specification agreed by the Steering Group which will be informed by paragraphs 2.6-2.8 above. The County Council's Local Authority partners are each securing commitment to the LAEP project through their governance arrangements. The County Council is contributing £30,000 for Phase 1 from the Round 1 Just Transition Funding already allocated for this purpose.

2.11 The next steps for the LAEP Project is to:

- Finalise inputs to the objectives and scope of the LAEP with partners.
- Develop the programme to build a clear timeline for delivery including procurements, key decision stage gates, governance, stakeholder engagement and critical pathways.
- Confirm participation and resourcing from Local Authority partners
- Procure the specialist energy support needed once partners have confirmed their support to the project and approved the steps above.

3. Alignment with ambitions

3.1 Net zero carbon emissions for Cambridgeshire by 2045, and our communities and natural environment are supported to adapt and thrive as the climate changes.

Without Local Area Energy Planning Cambridgeshire will not reach Net Zero by 2045 in a planned and resource efficient way.

3.2 Travel across the county is safer and more environmentally sustainable.

Local Area Energy Planning will identify the underpinning energy infrastructure requirements to delivery EV charging for electric vehicles in a planned and coordinated manner.

3.3 Health inequalities are reduced.

Retrofitting of homes is a key element. This will improve health from reducing costs for heating homes and preventing further fuel poverty. It will also help tackle and improve air quality through cutting fossil fuels for heating homes and cars.

3.4 People enjoy healthy, safe, and independent lives through timely support that is most suited to their needs.

As above.

3.5 Helping people out of poverty and income inequality.

By putting communities at the centre of the energy transition this will help build community wealth, create green jobs and support the Just Transition.

3.6 Places and communities prosper because they have a resilient and inclusive economy, access to good quality public services and social justice is prioritised.

As above.

3.7 Children and young people have opportunities to thrive.

No significant implications.

4. Significant Implications

4.1 Resource Implications

The Council committed Round 1 Just Transition Funding towards Local Area Energy Planning in 2022 and this budget is supporting the leadership of the work and a contribution to the consultancy budget.

However, wider inputs from across the Council will be needed including property, rural estate, transport policy, corporate policy, procurement, communications, communities and business insights.

4.2 Procurement/Contractual/Council Contract Procedure Rules Implications

It is too early to provide a clear procurement route for the specialist energy analysis and consultancy that is needed for the Local Area Energy Planning process. As the specifications are developed over the next couple of months, advice and guidance on procurement options will be sought from the procurement team to inform the Steering Group decisions on the best approach for the project.

4.3 Statutory, Legal and Risk Implications

The development of a LAEP is non statutory. However, to deliver the Council's net zero ambitions it is essential the energy system transitions to low carbon.

The major risks include:

- Credibility: the plan must be based on sound evidence and strong stakeholder engagement.
- Acceptability: The Local Planning Authorities must accept the plan and adopt it as an evidence base for Local Plans
- Commitment: Public sector organisations commit to using their assets to support, anchor and deliver the plan and its ambitions

4.4 Equality and Diversity Implications

Assessment being completed.

4.5 Engagement and Communications Implications

Strong engagement with all stakeholders will need to be planned and delivered. In particular, large energy users, developers, communities and energy network managers.

4.6 Localism and Local Member Involvement

The LAEP will facilitate and support the transformation of Cambridgeshire's energy system.

4.7 Public Health Implications

Please see section 3.3.

4.8 Climate Change and Environment Implications on Priority Areas (See further guidance in Appendix 2):

4.8.1 Implication 1: Energy efficient, low carbon buildings.
Positive/neutral/negative Status: Positive
Explanation: The LAEP will plan for the scaling up of building retrofits including low carbon heating solutions.

4.8.2 Implication 2: Low carbon transport.
Positive/neutral/negative Status: Positive
Explanation: EV charging infrastructure relies on clean electricity supplies. The LAEP will be planning for the increase in demand for electrified transport.

4.8.3 Implication 3: Green spaces, peatland, afforestation, habitats and land management.
Positive/neutral/negative Status: Negative
Explanation: Competition for land is a major challenge whether for food, nature or energy. It is important that brown field and buildings are maximised for renewables energy and storage solutions and green field land minimised.

4.8.4 Implication 4: Waste Management and Tackling Plastic Pollution.
Positive/neutral/negative Status: Neutral
Explanation: Energy from waste is lower on the waste hierarchy and will be considered in the LAEP.

4.8.5 Implication 5: Water use, availability and management:
Positive/neutral/negative Status: Neutral
Explanation: N/A

4.8.6 Implication 6: Air Pollution.
Positive/neutral/negative Status: Positive
Explanation: Planning for greater level of renewables for heat and power will cut emissions from fossil fuels providing cleaner air.

4.8.7 Implication 7: Resilience of our services and infrastructure and supporting vulnerable people to cope with climate change.
Positive/neutral/negative Status: Positive
Explanation: Securing local energy supplies will build resilience for essential services along with the strategic planning for local communities to benefit from the energy transformation through lower bills.

Have the resource implications been cleared by Finance? Yes
Name of Financial Officer: Mike Falconer

Have the procurement/contractual/ Council Contract Procedure Rules implications been cleared by the Head of Procurement and Commercial? Yes
Name of Officer: Clare Ellis

Has the impact on statutory, legal and risk implications been cleared by the Council's Monitoring Officer or Pathfinder Legal? Yes
Name of Legal Officer: Emma Duncan

Have the equality and diversity implications been cleared by your EqIA Super User?
Yes
Name of Officer: Sheryl French

Have any engagement and communication implications been cleared by Communications?
Yes
Name of Officer: Kathryn Rogerson

Have any localism and Local Member involvement issues been cleared by your Service Contact? Yes
Name of Officer: Sheryl French

Have any Public Health implications been cleared by Public Health?
Yes
Name of Officer: Iain Green

If a key decision, have any Climate Change and Environment implications been cleared by the Climate Change Officer?
Yes
Name of Officer: Emily Bolton

5. Source documents

5.1 Source documents

Cambridgeshire and Peterborough Combined Authority Strategic Infrastructure Delivery Framework (12th June 2023, Environment and Sustainable Communities Committee, Item 11)

Consultation: Future of local energy institutions and governance | Ofgem

Call for Input: The Future of Distributed Flexibility | Ofgem

Local Area Energy Planning - Energy Systems Catapult

5.2 Location

Cambridgeshire and Peterborough Combined Authority Strategic Infrastructure Delivery Framework (12th June 2023, Environment and Sustainable Communities Committee, Item 11)

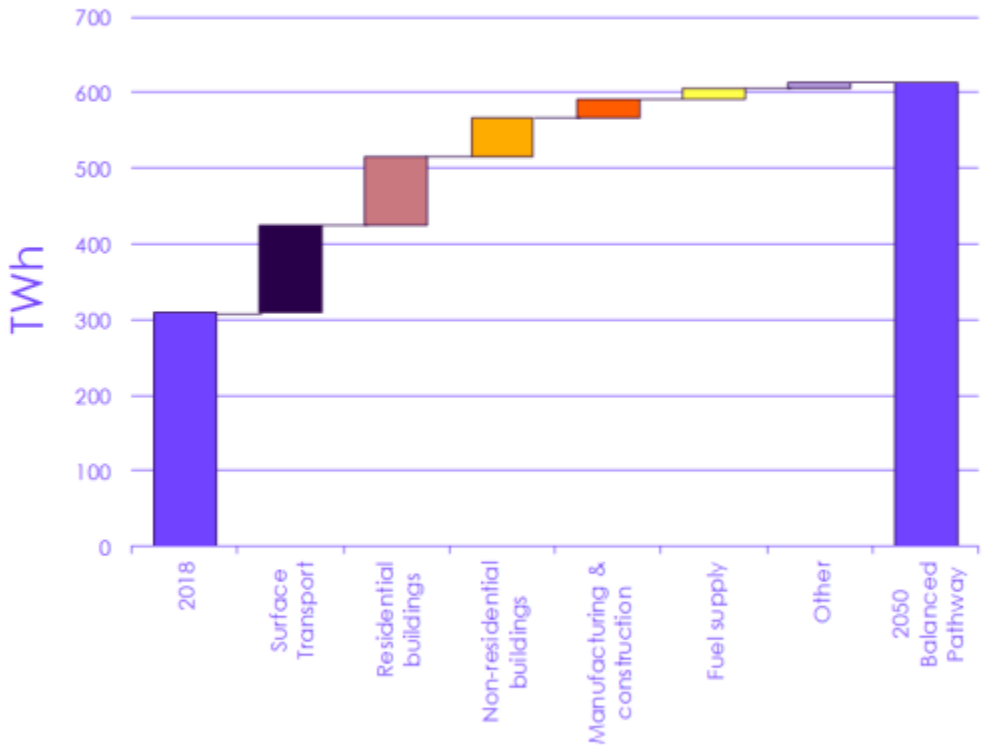
Consultation: Future of local energy institutions and governance | Ofgem

Call for Input: The Future of Distributed Flexibility | Ofgem

Local Area Energy Planning - Energy Systems Catapult

Appendix A:

Figure M5.5 Contribution by sectors to increased Electricity demand in the Balanced Pathway (2018-50)



Source: CCC analysis.
Notes: 'Other' category includes agriculture, aviation, direct air capture, shipping and F-gases.

Appendix B: CCC energy projects as case studies to describe what building this new system looks like.

CCC energy asset	What do these energy projects do?	What is their role in the smart local energy system?	How does this benefit our communities locally
Swaffham Prior Community Heat Project	Electrification of heating and hot water for a previously oil dependent village	Cut carbon emissions at scale; avoided the need to upgrade the grid; put in place a system to manage demand flexibly using storage i.e. When there is high demand the project cuts demand and used its stored heat	Avoided upfront capital cost for homeowners to decarbonise their heating (compared to individual ASHP) Future management of heating bills to prevent fuel poverty. Equitable opportunity to decarbonise across all homes. Achieving saleability quickly. Demonstrator of new business model.
St. Ives and Babrham Park and Ride Projects	Smart integrations of low carbon technologies including solar generation, EV charging, battery storage and local energy supplies	Local supply of clean electricity increasing generation, delivery of ev charge points supplied by clean electricity; smart technology platform to manage demand across power, transport demands, flexibility services with battery storage to manage peak demand.	Local supply of clean electricity to build resilience for local businesses; building investor confidence of connecting different technologies together and how they operate. Demonstrator of new business model to build market and investor confidence.
Triangle Solar Farm	Generate clean electricity to supply to the grid using the contract for difference mechanism	Generation of clean local energy to support future demand for electricity.	Increased supply of local clean energy generation. Local Authority benefitting from the income.
North Angle Solar Farm and the Private wire	Generate clean electricity to supply to the grid, to the heat network and for other local projects to reduce future grid connection requirements and costs	As above but in addition, reduction of future grid upgrades and costs as direct connections to the solar farm electricity via private wire (when built!) can be accessed.	As above.
Schools retrofit programme	Install energy efficiency and renewable energy measures controlled with building management systems	Reduced demand on the energy system for electricity and heating, greater resilience; reduced grid scale infrastructure investment needed	Schools reduce their energy and hence their bills (plus avoided future cost); local energy generation builds local self-sufficiency and resilience

Appendix C- Peterborough City Council's Local Are Energy plan headlines.

To meet a net zero target of **2040**, this plan requires capital investment of:

£8.8 billion
total

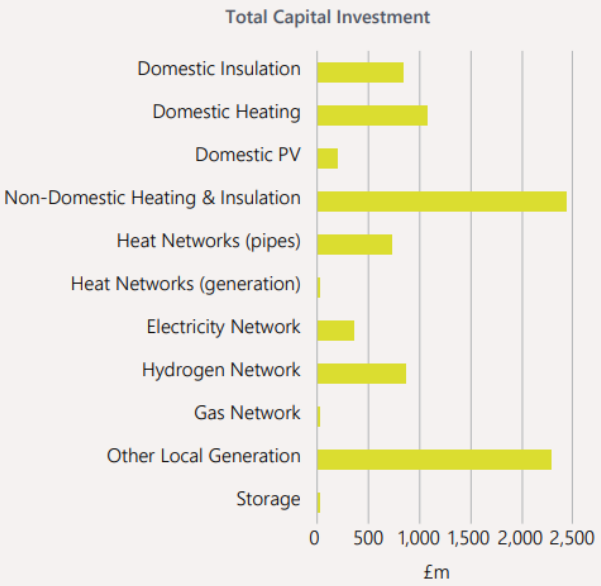
Including:

£2.1 billion
in domestic properties

£1.6 billion
in energy networks

Saving:

4.3 million tonnes CO_2
cumulatively to 2050 against a business-as-usual pathway



Peterborough's energy system will have transformed, with:

80,000
heat pumps installed in homes

At least 16,000 new connections to a district heat network

66,000
homes retrofitted with insulation, glazing and draughtproofing improvements

72%
of cars fully electric or plug-in hybrid

35%
homes generating their own electricity with rooftop solar

Up to 1,350 MW
of large scale renewable generation