

Local Energy Planning



A guide to developing local energy plans

Working methodology

March 2018



Cover photo: The Barra and Vatersay community are developing a Local Energy Plan in 2018. View across Castlebay, Barra.

Preface

The Scottish Government's Energy Strategy (2017) ¹ sets out Government's vision to achieve a flourishing, competitive local and national energy sector that delivers secure, affordable, clean energy for Scotland's households, communities and business.

A central theme to the Strategy is a focus on the requirement to look at our energy requirements together rather than separately. Taking a 'whole-system' approach will mean changing the way that we produce and use energy in everyday lives and such a change will need to be managed efficiently to ensure that the impacts are understood and tackled in the best way possible. It will require us to be smarter about when and how we use energy across the day and across the seasons.

The creation of local energy economies are a central part of the transformation of Scotland's energy system. It recognises that supporting and delivering local solutions to meet local needs, linking local generation and use can help create vibrant local energy economies and transform local communities.

Local Energy Plans are created by local communities and provide an opportunity to set out key priorities and opportunities that will promote the development of local energy systems that are designed and developed in line with local need. In doing this they must take into account relevant guidance at a Local Authority level and take into consideration other development planning processes and ensure alignment with the Local Heat and Energy Efficiency Strategies (LHEES) that may be in development or completed.

This Guide has been developed as part of the COBEN project (**CO**mmunity **BE**nefits of Civic Energy) ², an EU Interreg (North Sea Region) funded programme consisting of six community energy projects taking place across the North Sea region. The Scottish Highlands and Islands is one of the regions participating and is supporting a pilot project to support the development and implementation of local energy plans for four local communities within the Highland and Islands area. The Scottish pilot is fifty per cent match funded through the Scottish Government's Community and Renewable Energy Scheme (CARES). CARES is delivered by Local Energy Scotland. The development of community-led Local Energy Plans is being supported in; Barra and Vatersay (Outer Hebrides); Brae (Shetland); Drumnadrochit (Highland) and Oban (Argyll).

This Guide further develops areas of energy masterplanning identified in the Guide to Energy Masterplanning (2015) ³ produced by Scottish Enterprise. It has been developed as a working methodology to support the delivery of the project and will be reviewed and updated in July to September 2018 to incorporate learning following the development of the four funded plans. A series of toolkits will also be developed to support the guide as part of the review and update of the methodology.

Acknowledgement

The Guide has been developed for Local Energy Scotland by Amec Foster Wheeler Environment and Infrastructure UK Limited.

For further information, please visit: <https://www.amecfw.com/>



¹ <http://www.gov.scot/Resource/0052/00529523.pdf> (Accessed February 2018)

² <https://civic-energy.eu/> (Accessed February 2018)

³ <https://www.scottish-enterprise.com/knowledge-hub/articles/publication/guide-to-energy-masterplanning> (Accessed February 2018)

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1. Introduction

Our social and economic well-being depends on a secure, affordable and reliable energy supply. This energy supply needs to be capable of meeting our needs for power, heating and transport within homes and businesses across Scotland and the UK. Our demands for energy vary depending upon the time of day, and with changing seasons across the year. This means that the way in which we supply that demand needs to be flexible in order to meet these variations.

Given the diverse nature of our communities this provides different challenges in being able to match demand and supply.

In the case of demand, for example:

- Designs and sizes of home have varied energy requirements (e.g. detached houses, blocks of flats, terraced houses etc.)
- The mix of businesses in an area will have different requirements for power, heating and transport (e.g. hotels, retailers, supermarkets, warehouses, workshops etc.)
- Transport energy requirements will vary (e.g. roads, railways, ferries, distribution companies)

In the case of supply, for example:

- The mix of fuels used in different areas depend upon the means of supply (e.g. mains natural gas, mains electricity, LPG, oil, diesel, biomass etc.)
- Low carbon energy supply depends on local resources (e.g. wind, solar, biomass or hydro power)

1.1 Local energy systems

The supply of power and heat to homes and businesses is viewed strategically at a national level. However, local communities can also play a role in shaping their energy needs. From a demand perspective, householders and businesses can look to reduce their energy needs through, for example, better insulation of buildings and using more efficient lighting and appliances. The roll out of smart meters enables better understanding of actual energy consumption, rather than relying on periodic meter readings (and estimated bills).

From a supply perspective, communities can look to develop local generation to support their energy needs. This can be, for example, at an individual consumer level (e.g. solar panels on a roof) or at community scale such as investment in a wind turbine or hydro scheme.

Understanding the use of power, heat and transport energy in the community is the first step to being able to develop local energy systems. This has several benefits:

- End users can better understand the amount of energy they use (and the mix of requirements for power, heat and transport)
- The community as a whole can understand the size of energy demand and how this is proportioned between homes and businesses
- How much of this aggregate demand is met by existing local generation can be more easily understood
- Future energy requirements (e.g. new housing or business development) can be considered and compared with the size of existing demand
- Affordability and reliability of energy supply can be examined
- All these details can be collated in a single information source shared by everyone

One route to achieving this is a Local Energy Plan (LEP).

1.2 Purpose of document

This document explains the process involved in establishing a LEP. By preparing its LEP, a community will develop an understanding of its energy needs and identify opportunities to directly address them.

While the details within each LEP will reflect local community circumstances and thoughts, the methodology outlined here provides a consistent template and approach that is applicable across the diverse communities in Scotland. Appendix 1 contains a template for the contents of a LEP.

This document:

- Explains how a community can create its own LEP;
- Reviews how data can be used to assist understanding of community energy requirements; and
- Provides links to information and assistance that will be available through the accompanying toolkit.

2. Background to local energy plans

2.1 A changing energy landscape

Scotland's commitment to wider global actions to reduce the impacts of climate change are outlined in the Scottish Government's targets for greenhouse gas (GHG) emissions. These commit to:

- 80% reduction in total GHG emissions by 2050 (compared to the 1990/1995 baseline)
- 66% reduction in total GHG emissions by 2032

To achieve these targets means changing the way our whole society uses its resources. While focused on energy, waste and transport it also includes how we manage natural resources and the landscape.

The Scottish Energy Strategy⁴ has three main themes:

- **A whole-system view** – this simply means looking at energy requirements around power, heat and transport all together, rather than thinking of them as separate items.
- **A stable, managed energy transition** – taking the whole-system view means changing the way that we produce and use energy in everyday lives. This change needs to be managed efficiently to ensure that the impacts are understood and tackled in the best way possible.
- **A smarter model of local energy provision** – traditionally we have met our needs by supplying large quantities of energy from large generation plants feeding a large and complex supply network. Being smarter is about when and how we use energy across the day and across different seasons.

A new target of an 'all energy' equivalent of 50% of Scotland's heat, transport and electricity requirements to be met by renewable sources by 2030 shows the ambition behind the whole system approach.

The Strategy is also clear that local energy economies are a central part of the transformation of Scotland's energy system. It recognises that supporting and delivering local solutions to meet local needs, linking local generation and use, can help create vibrant local energy economies. This has the ability to transform both rural and urban communities.

The Strategy aims to build on the existing legacy of strong community engagement in local renewable generation to enable larger, strategic projects covering larger geographical areas. The Scottish Government retains a target of 1 GW of community and locally-owned energy by 2020; this target rises to 2 GW by 2030. It seeks to empower communities wherever possible to develop and commission local energy system plans where they are the full or part owners of the final scheme.

Ultimately, the Strategy aims to ensure that systems are designed and developed in line with local need, with both residential and non-residential consumers able to actively manage and meet their energy needs in an

⁴ <http://www.gov.scot/Resource/0052/00529523.pdf> (Accessed February 2018)

efficient manner. This should assist in lowering annual energy bills, while also offering opportunities for local supply chains and investment in local businesses.

2.2 Empowering community energy

The changing approach to energy production and consumption within Scotland means a continuing move away from a traditional model of supply, where large power stations and supply networks feed energy to businesses and homes and where end users don't control when and how supply is provided.

There has been considerable progress in community ownership and operation of on-shore wind and hydro energy generation assets. This generation has been primarily supported by the income available via feed in tariffs (and other support schemes). This encouraged generation of energy that could then be sold to the grid, creating a source of income for communities. While this has provided considerable benefits to local communities in terms of direct funds for injection into the local area this is becoming less valuable as support scheme payments have fallen.

The highest value of local energy generation is therefore increasingly about direct use in local communities which reduces the need to purchase grid supplied electricity and expensive fuels such as oil for heating. If energy can be generated locally and stored so that it can be used at times when it more closely matches demand then that too will offer increasing benefits.

2.3 What is a Local Energy Plan?

Local energy plans are created by local communities rather than being developed for them by other bodies (e.g. local authorities or National Government). They set out key priorities and opportunities identified by a community, assisted by a range of other organisations who have an interest in this community. These include local residents, businesses, community organisations, local authorities, distribution network operators and local generators.

A LEP enables a local community to look at its existing and future energy needs (in terms of power, heat and transport) and state where it sees priorities for action. It also identifies opportunities that the community determines offer practical action to support its current and future energy system developments.

A key aspect of the development process is the ability for the local community to understand its own energy and transport systems, but also place them in context within the wider changes taking place across Scotland. It can therefore look for opportunities that offer local benefits consistent with national low carbon targets. These benefits can be:

- Direct - such as the generation of electricity or heat for local use displacing more expensive imported grid supplied electricity or fossil fuel.
- Economic - developing employment opportunities associated with energy supply (e.g. in hydrogen production) or enhanced efficiency (e.g. insulation and glazing work on homes).
- Indirect – such as a switch from diesel to electric vehicles reducing local emissions of particulates in car exhaust emissions and improving air quality
- Social – Production of local energy to supply homes in fuel poverty can reduce stress and enhance health outcomes for residents.
- Strategic – using energy storage mechanisms to maximise outputs from community owned generators, or use of technology to enable better trading of locally produced energy offer the community more effective use of its local resources

The LEP provides a start in a community's engagement with its energy needs. It offers a focus for immediate opportunities that can be developed in the short term. It also provides scope for longer term planning for further changes in the future.

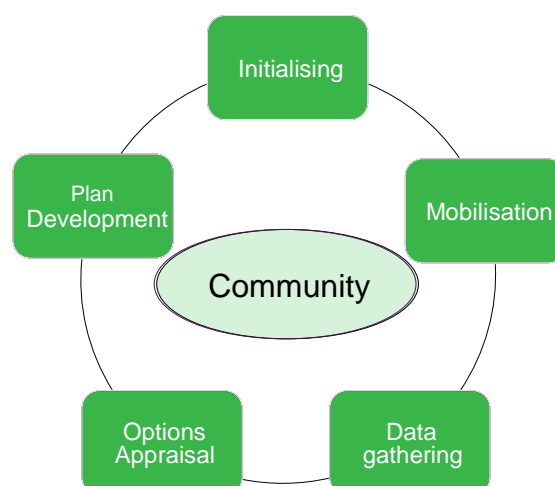


3. The Local Energy Plan Journey at a Glance

The process of creating a LEP involves a number of stages in its development. It requires a number of loops (iterations) of data collection, analysis and reflection to ensure that the outputs are those that the community has fully contributed to.

The overall development process can be considered as five inter-linked stages as shown in [Figure 3.1](#).

Figure 3.1 An overview of the LEP journey



The stages are deliberately drawn as a cycle, with the community at its centre. Development of a LEP can be seen as a series of 'loops', since at each stage there may be fresh data and knowledge that alters the overall picture of energy use and requirements.

With the community at its core, a LEP can ensure that it captures all local knowledge, as well as broadening its understanding of what options for change the community can consider.

3.1 Initialising

The first step in the journey is to reflect on what is already known by the community about its energy needs, challenges and opportunities at present.

What is it?

This can be as simple as an initial 'brainstorm' of ideas thinking about:

- What kind of community are we? (rural, island, semi-rural)
- What energy related actions have been undertaken up to now (if any)? (e.g. community energy generation feasibility study or development, programme of insulation for residential properties)
- What issues do we think we have regarding energy? (e.g. high cost of fuel for heating and transport, limitations to amount of energy generated by community renewables, hard to heat homes)
- What size of study area would suit our community?

Who does it?

It can be developed by any local group with community interests, or indeed an individual member of the community.

What is the output from this stage?

The output from this task is a short note summarising these initial thoughts. This can be used as a starting point to examine the details and thoughts in later stages.

Where can I find more information?

Section 4.1 provides more details about this stage of the journey.

3.2 Mobilisation

The next stage is identifying representatives from the local community who can work together to develop a LEP and what stakeholders can assist this process.

What is it?

This stage is about ensuring that the knowledge and skills within the community relevant to the LEP are understood, as well as thinking about what wider organisations need to be involved in the process. It also defines the proposed study area boundary and thinks about some initial aspirations that the LEP might address.

There are a range of individuals and organisations in a local community with knowledge, skills and experience relevant to energy use. This includes, for example:

- Community development trusts (and similar) involved in the feasibility and funding of potential local renewable energy generation
- Housing Associations and residents' associations
- Employees of energy supply companies, utility companies or engineering companies

Consulting with these individuals and organisations ensures that a broad view from the community is achieved, building on the thoughts noted in the initialisation stage.

It is also useful to think ahead about what other organisations might need to be involved to assist in offering guidance (e.g. planning or environmental regulations) or information and data (e.g. local authorities, business organisations).

This stage also needs to think in a little more detail about the study area boundary for the community, which will provide a point of focus for any data and information gathering. The final element of this stage is to offer some initial thoughts as to what main aspirations and ambitions the LEP could address.

Who does it?

The individual or organisation that wrote the initialising document can also carry out this task. Alternatively, they can seek others to tackle it, such as a Community Development Trust, Community Council or similar.

What is the output from this stage?

The main outputs from this stage are:

- Understanding of any relevant projects or work done in understanding the energy needs of the community
- Initial awareness of individuals and organisations within the community who have an interest in developing a LEP and what skills, knowledge and experience they can offer
- List of external stakeholders that need to be (or could be) consulted during the development of a LEP
- An initial study area boundary and aspirations/ambitions that the community would like to see addressed in a LEP

Where can I find more information?

Section 4.2 provides more details about this stage of the journey.

3.3 Data and information gathering

This stage uses publicly available datasets and local knowledge to build up an overview of energy use and generation within the area.

What is it?

Data and information in this case means both quantitative details such as energy consumption and fuel used in transport or heating. It also means qualitative information, such as understanding local planning policies, knowing the location and capacity of electricity supply networks or being aware of studies already undertaken in the area.

The list of stakeholders from the mobilisation stage will provide a list of sources of information. There are also lots of sources of data available via public websites (e.g. Scottish Government, Scotland's Census, UK Government and others).

Who does it?

The organisation or group of individuals involved in the mobilisation stage can co-ordinate the data and information gathering. This will involve either direct research or sending and recording data requests to relevant organisations.

If the community had previously agreed that external help was required then there may be consultants (or similar) involved in this stage of the journey.

What is the output from this stage?

At the end of this stage there will be a snapshot of the energy needs of the community across a typical 12-month period. This will include an understanding of power, heat and transport energy needs, as well as the proportion of demand from homes and businesses. Some understanding of significant changes to future energy requirements (e.g. major new housing being built) can also be included here.

There should also be note of any existing or planned community energy generation.

Where can I find more information?

Section 4.3 provides more details about this stage of the journey.

3.4 Options Appraisal

This stage is about considering opportunities for change within the community either to reduce demand or provide alternative energy generation and supply.

What is it?

This stage of the journey uses the understanding gained from the data and information gathering to consider what actions the community might take to change how it uses and receives its supply of energy.

Ideas will address either how the community can use less energy (e.g. reducing heating energy demand through better insulation) or how it might change the way energy is supplied (e.g. locally owned energy generation).

As with all stages the views from across the community will be useful to include here. There may be good and bad experiences from previous energy efficiency works, or feasibility work that was previously carried out that are useful to understand. Equally, there will be other ideas and options that can be explored.

A list of potential opportunities will be drawn up, with assessment of the net benefits that might be delivered. This can be discussed among the community and a prioritised list of opportunities looked at in more detail.

Who does it?

The organisation or group of individuals involved in the previous stage(s) can co-ordinate the options appraisal. This will involve either direct research or sending and recording data requests to relevant organisations.

If the community had previously agreed that external help was required then there may be consultants (or similar) involved in this stage of the journey.

What is the output from this stage?

A finalised list of opportunities will be drawn up here for inclusion in a LEP. This will provide an idea of how much the action will cost and what the net benefits might be if it is undertaken. These benefits relate to energy saving, cost savings, but also wider environmental and social benefits (e.g. air quality improvements, improvements to local environment or economic activity). It also provides an idea of how long it might take for these actions to be completed. This is important where a specific project (e.g. a community wind turbine) is proposed, to understand how long it will take to achieve planning and environmental permits, for example.

Where can I find more information?

Section 4.4 provides more details about this stage of the journey.

3.5 Plan Development

This stage in the journey provides a summary of all the information and data collected and actions that have been prioritised by the community to take forward.

What is it?

The draft Local Energy Plan will bring together all the information and data collected in the previous stages of work.

Its aim will be to provide an overview of the characteristics of the study area in terms of energy and transport and offer an evidence base for how the actions in the plan were arrived at.

Who does it?

The organisation or group of individuals involved in the previous stage(s) can co-ordinate the writing of a LEP.

If the community had previously agreed that external help was required then there may be consultants (or similar) involved in this stage of the journey.

A draft LEP should be shared with the wider community so that feedback can be received on how easy it is to read and understand for lay readers. Comment on how well it addresses initial aspirations and ambitions are also useful. A finalised document can then be produced.

What is the output from this stage?

The output from this stage is a LEP, which can be a written report, presentation, web page or combination of several of these depending on what the community feels is most useful to them.

Where can I find more information?

Section 4.5 provides more details about this stage of the journey.

3.6 What happens when the plan is completed?

A beginning – not the end!

Development of a LEP is not the end of the process. It provides a single reference point for the community, which should be returned to and updated as circumstances change and actions within the community are carried out.

The LEP provides details that can be used by the community in applying for funding for specific feasibility studies or wider initiatives.

As individual actions are addressed, the LEP can be used to help monitor and assess the outcome and benefits that the community achieves.

Who 'owns' it?

Those members of the community involved in the development of a LEP can decide how it is to be managed in future. It can be done by the existing core group of contributors, passed to the Community Council or other local body, or involve a new group of individual representatives.

The community won't easily achieve any actions within the LEP without talking to wider organisations. While a LEP reflects a community view of what it would like to achieve in meeting its energy needs, it does not presently have any formal legal or statutory status. Any actions can therefore only be achieved by collaboration with other relevant stakeholders. A LEP gives the community an informed position from which to develop these collaborations.

At minimum, there should be clear understanding of what documents and supporting information was provided for a LEP, where it is stored (e.g. a website, server etc.) and how it can be accessed (e.g. if there are any passwords or username details that need recorded and kept safe).

How can a LEP be taken forward?

Collaboration with external stakeholders is likely to take one of two forms. The first is because there is a need for further information or expertise (e.g. awareness raising work with the community around energy efficiency or technical support in looking in more detail at a local energy generation scheme). The second is because it needs to confirm that the proposed action is consistent with any planning, environmental or other regulations.

Most of the organisations that may need to be contacted are likely to have been involved in earlier phases of work, or at least be aware that work around the LEP has been ongoing. Examples include:

- Local authority and key agencies
- Electricity network operator
- Land owners
- Individual businesses

An initial list of these organisations is provided in Appendix B.

Keeping a LEP relevant

A LEP needs to be reviewed periodically in order to consider what changes have taken place since its original development. These changes may reflect changes in energy requirements (growing or reducing demand for power, heat or transport energy) and/or changes in energy supply and the scale of local generation.

As actions within a LEP are tackled they are likely to achieve different levels of success. Some may have to be paused if sufficient funding can't be found; specific projects may be found to be unviable for technical reasons; others may become less relevant to the community due to changing demand requirements.

It is useful to update a LEP at a point when these outcomes are known about. This should be co-ordinated by whichever group or body has overall responsibility for the LEP.



Solar PV outside the school on Foula

3.7 Further details on how to tackle each stage

The flowchart here provides an overview of the inter-related key stages that are proposed in the development of the LEP. These are expanded upon in Section 4. The accompanying toolkit also has useful information, templates and suggestions to help your community develop a LEP.

Stage	Development Step	Description	Toolkit signpost
INITIALISING	Outline the challenges	Provide initial thoughts regarding a defined local area, its characteristics and energy challenges. This could be from an individual, community group or Local Authority.	Overview of Local Energy Plans Initial challenges document template
	Initial approach	Take initial discussions to wider organisations. Depending upon how initial thoughts were developed this could involve first discussions (or further discussion) with local authority, as well as other community groups, local DNO and transport organisations.	Identifying stakeholders checklist
MOBILISATION	Develop local community actors	Seek local community representatives to represent cross-section of views and interests. Consider initial mix of skills and experience in terms of data analysis and project development	Engaging with the community module
	Consider how to manage the initial study work	Reflect on how to manage initial study work. If appropriate, create a Local Steering Group from those representatives identified in previous step and via discussions	Managing a community led project module Template Terms of Reference for a Local Steering Group
	Determine study area boundary	Review proposed study area and agree initial boundary for data collection	Data output areas summary
	Aspirations and ambitions	Review national and devolved governments' view of low carbon future. Consider local response to these and how this relates to local challenges and opportunities. Determine initial aspirations and ambitions of themes of focus for the LEP	Information about climate change and energy policies in Scotland and the UK
DATA GATHERING	Local authority context	Review present planning policy position relevant to LEP. Include Local Development Plan, LHEES, Locality Planning, Local Outcome Improvement Plans, Local Place Plans, Carbon Management Plans and Sustainable Energy Action Plans (where applicable)	Introduction to local policies relevant to Local Energy Plans
	Energy and Transport work to date	Review relevant reports/studies and pilot schemes relating to local action around energy and/or transport	Examples of energy and transport studies in local areas
	Tier 1 Data gathering – baseline energy, transport and natural resources data	Use existing publicly available data from UK and Scottish Government sources. Supporting infrastructure data via relevant utility companies	Data gathering templates Data presentation module
	Tier 2 Data gathering – baseline energy data	Obtain actual billing data for RSL, local authority, NHS and other non-domestic premises (where available). Obtain access to EST held databases for domestic properties	Data gathering templates Data presentation module
	Tier 3 Data gathering – baseline energy data	Use energy billing information and efficiency information from local surveys, reports and studies (as available). Similarly in the case of travel surveys and transport related work.	Data gathering templates Benchmark data analysis overview

	↓		
	↻	Assess future development impacts	↻
	↓		
	↻	Create initial baseline and future projection	↻
	↓		
OPTIONS APPRAISAL	↻	High level options review	↻
	↓		
	↻	Review against original ambitions and aspirations	↻
	↓		
	↻	Concept design work	↻
	↓		
	↻	Initial net benefit analysis	↻
	↓		
	↻	Review initial options output	↻
	↓		
	↻	Refine options appraisal details	↻
	↓		
		Finalise opportunities identified	
PLAN DEVELOPMENT	↓	Draft Local Energy Plan	
	↓	Review Draft Plan	
	↓	Final Plan	
		Use local development plan, other regeneration/economic growth plans and relevant planning application details to determine scale of future changes in study area for duration of LEP	Examples of available information
		Breakdown of energy and transport profile based on datasets obtained	Data presentation module
		Review opportunities for action within areas of energy efficiency, low carbon generation, heat supply and transport. Combine case studies from other localities / areas with emerging technologies (as relevant)	Options matrix template Case study sources and examples
		Review with local steering group and wider community the range of high level options. Determine those most relevant to local ambition and challenges / opportunities identified in previous steps	Community engagement module
		Develop concept design for each option identified as relevant in the previous step. Sufficient detail to be determined in order to provide order of magnitude assessment of the costs, benefits and associated impacts of opportunities	Concept design module Option description template
		Develop initial benefit assessment for each option (financial, environmental, social)	Opportunity assessment templates
		Review initial options appraisal work and confirm prioritised options or seek further work	Option description template
		Refinement of initial work and/or extension of options	Concept design module
		Finalise details of opportunities and prioritise for inclusion in LEP	Opportunity assessment templates
		Develop initial draft of LEP based on outputs of earlier tasks	Overview of contents of a LEP
		Review draft LEP with local community to confirm details align with original aspirations/ambitions	Community engagement module
		Complete finalised LEP and collate all relevant supporting documentation and analysis. Feedback LEP to local community.	Task Checklist

4. Methodology overview

4.1 Initialising

In its first stage of activity, a local community develops an overview of its current position and initial views on the challenges and opportunities it faces in relation to energy and transport.

Stage	Development Step	Description	Toolkit signpost
INITIALISING	Outline the challenges ↓	Provide initial thoughts regarding a defined local area, its characteristics and energy challenges. This could be from an individual, community group or Local Authority.	Overview of Local Energy Plans Initial challenges document template
	Initial approach ↓	Take initial discussions to wider organisations. Depending upon how initial thoughts were developed this could involve first discussions (or further discussion) with local authority, as well as other community groups, local DNO and transport organisations.	Identifying stakeholders checklist

Outline the challenges

An outline of the energy challenges facing the local area should be prepared by a representative body from the local community. Examples of such bodies could be an individual, a Community Trust, Community Council, Renewable Energy Development Organisations or Local Community Co-operatives.

The review can include short form details, where available, regarding:

- Proposed area that would be included in the Local Energy Plan
- Challenges relating to energy supply and use (power and heat) within the proposed study area
- Details of any additional specific housing, fuel poverty or transport related issues within the proposed study area
- A list of relevant previous studies or reports that have been carried out in the local area
- A summary of characteristics relevant to the local study area:
 - Settlement area (urban, semi-rural, rural, island)
 - Environmental designations, (for example SSSI, Special Protection Area and/or Special Area of Conservation)
 - Cultural and historic designations (e.g. ancient monuments, listed buildings)
 - Infrastructure (major/minor roads, air, bus, ferry links, grid infrastructure)
 - Residential
 - Business and public bodies (commercial premises, NHS and local authority buildings)
- The extent to which the document has been discussed with local community representatives

This is not a prescribed list as local situations will vary. The intention at this stage in the LEP development is to provide a means of developing further dialogue and thinking around what could be achieved. Notes that might be included here include, but are not limited to:

- Details of renewable energy generation in the local area (wind turbines, solar PV panels, biomass boilers etc.). This can include offshore resources in the case of coastal communities (e.g. wind, wave and tidal)
- Large energy users in the area (e.g. businesses, local authority offices, transport companies)

- Energy efficiency projects that have taken place (e.g. local authority led insulation programme for some houses, supply of low energy lightbulbs from utility company)
- Future development that might change the energy requirements (e.g. replacement school, care home etc. or new build housing or commercial premises)

Output: A short document that summarises the initial view of energy and transport related challenges within the community and any existing or proposed projects that support local energy generation or supply.

Initial approach

Initial thoughts outlined in the previous step provide a starting point in engagement with wider stakeholders. The next stage is to consider how to capture and build local knowledge and gather further information to assist in the development of the LEP. Assistance here can come from a variety of sources; examples include:

- Local authority
- Community group support networks
- Community energy support organisations
- Local energy specialists within the local area

The requirement here is to decide how best the community can be supported in the data gathering and analysis work required to develop understanding around the energy generation and supply in the local area and its transport system energy requirements.

Output: Understanding of what individuals and groups can assist the LEP development process. Statement of support needs that the community feels is required from wider stakeholders such as the local authority.



4.2 Mobilisation

An effective LEP will reflect a broad range of views gathered in the course of consulting the local community. In doing so it is helpful to recognise the existing skills and experience within the local community and how these can be used to best effect in the development of the LEP.

Stage	Development Step	Description	Toolkit signpost
MOBILISATION	Develop local community actors ↓	Seek local community representatives to represent cross-section of views and interests. Consider initial mix of skills and experience in terms of data analysis and project development	Engaging with the community module
	Consider how to manage the initial study work ↓	Reflect on how to manage initial study work. If appropriate, create a Local Steering Group from those representatives identified in previous step and via discussions	Managing a community led project module Template Terms of Reference for a Local Steering Group
	Determine study area boundary ↓	Review proposed study area and agree initial boundary for data collection	Data output areas summary
	Aspirations and ambitions ↓	Review national and devolved governments' view of low carbon future. Consider local response to these and how this relates to local challenges and opportunities. Determine initial aspirations and ambitions of themes of focus for the LEP	Information about climate change and energy policies in Scotland and the UK

Develop local community actors / consider how to manage initial study work

Recognising relevant knowledge and skills within the local community means having a conversation with individuals who have skills and experience that can contribute to developing the LEP. An important part of this experience is an understanding of the different aspects of community life in terms of their power, heat and transport energy needs.

An initial view of the capacity of the local community to develop the LEP would need to consider sources of support to help in the process. This could be simply in terms of a structured approach, managed solely by the community, as offered by this methodology and supporting toolkit. Equally it could be in seeking to bring in expertise from wider organisations or contractors to assist.

The existing group that began the process of thinking about the LEP may feel comfortable at this stage to continue to lead the development and seek wider support (where considered appropriate).

An alternative route is to develop a Local Steering Group offering a slightly more formalised way of including inputs from community representatives. This will vary for each local community but could include:

- Initial individual/group who carried out the initialising stage
- Local authority
- Community Council
- Development Trusts
- Community Development Groups
- Registered Social Landlord or other body with interest in housing
- Local business (es)

The numbers of representatives will vary depending upon the size of the community area and variety of interests that need to be considered. All representatives will be reflecting views of the community rather than solely the interests of their employer or organisation.

Stakeholders

In any local community there will be a number of different stakeholders who will contribute to the overall development and delivery of a LEP. Some are supportive stakeholders that can assist the understanding of local energy needs and how these might be met in future. Examples of such stakeholders include electricity suppliers, fuel suppliers and transport operators. Others will support both in developing data and in thinking about how they might change the way that they use and purchase energy. Examples include local authorities, public agencies and local businesses.

Some agencies are statutory consultees in the event of taking forward any project that requires planning permissions. Examples include SEPA, HES and SNH. Where it is already recognised at this stage that there are environmental, cultural or historic designations within the proposed study area it is worth noting the relevant agencies that would need to be consulted. Early consultation with them can assist in clarifying how best to take account of these local assets when evaluating opportunities for inclusion in a LEP. These agencies can also assist in understanding the national view of a low carbon future and how this relates to local challenges and opportunities.

It is useful to try and map out at this early stage who stakeholders might be and what role they might have in the overall process of developing the LEP. This helps both in reviewing where support might come from during data collection and analysis, but also in ensuring wide community engagement when thinking about how energy requirements can be met locally.

An example of a stakeholder list is provided in Appendix B. It is not an exhaustive list and there may be other organisations / agencies within a local area that can be brought into the project via links from some of the other stakeholders listed here.

Output: Agreement as to how the initial phases of the LEP development will be managed. Initial list of stakeholders who may be involved in development of the LEP.



Determine study area boundary

This provides a focus for data collection and related analysis. It does not exclude the wider region outside the study area where it has relevance to the challenges the community wish to address. Examples of this include where land is available for energy generation (e.g. suitable site for a wind turbine or small hydro scheme) or transport links / corridors (e.g. ferry routes or major roads).

There are a number of pre-defined areas used in the collection of statistics across Scotland. There are also other boundary areas used by local authorities in drawing up items such as school catchment areas. These may be useful as a guide to setting out an initial boundary for the study area. Examples of these pre-defined areas include:

Table 4.1 Examples of pre-defined geographical boundary areas

Item	Description	Data source
Output area	Smallest possible area used in collection of Census data. It contains at least 50 people and 20 households.	Scotland's Census http://www.scotlandscensus.gov.uk/ods-web/home.html
SNS datazone	This is a group of output areas containing 500 – 1,000 household residents	Scotland's Census http://www.scotlandscensus.gov.uk/ods-web/home.html
Local characteristic postcode sector	Areas defined by postcode (e.g. EH1 2LP is defined as the area EH1 2)	Scotland's Census http://www.scotlandscensus.gov.uk/ods-web/home.html
Settlement	Area of high density postcodes surrounded by lower density with a population of at least 500 people	Scotland's Census http://www.scotlandscensus.gov.uk/ods-web/home.html
Primary School catchment area	Boundary for catchment of a given school	Local Authority
Secondary School catchment area	Boundary for catchment of a given school	Local Authority

Note: Data sources offer maps showing boundary areas

Using one of these areas means there are likely to be a suite of Government or public sector collected statistics and data. This allows a simple match between the selected study area and the greatest amount of data available from these sources.

If a different area is selected then this will mean more work in compiling datasets. Collected statistics may not sit as neatly inside the study area, meaning that they need to be filtered to match with the data collection boundary. This is not a barrier to selection of the study area. A simple geographic boundary may be sufficient in the case of an island community or a local area with a major settlement closely linked to a satellite area, for example.

The size of community that can develop a Local Energy Plan is not prescribed. In general terms the details here are likely to be most applicable to communities within classification groups 4 – 8 on the Scottish Government 8 fold Urban Rural Classification⁵. Reflecting on the initial outline challenges and what knowledge is already available may guide the scale of the study boundary that is proposed.

⁵ See <http://www.gov.scot/Topics/Statistics/About/Methodology/UrbanRuralClassification> for details

Output: Initial study area boundary to be used as focus for data collection.

Aspirations and ambitions

The energy challenges and opportunities within the local community are impacted by the wider national picture in Scotland. For this reason a high level review of Scottish Government policy direction and wider action relating to energy and transport is useful. It is not a lengthy analysis of all implications arising from actions around climate change and development of a low carbon economy. Rather it is a summary of how energy generation and use (both power and heat) and transport systems may evolve and change in the short, medium and long term.

The Scottish Government position sets out the overall challenges that it feels Scotland faces in responding to climate change, and overall targets for reductions in carbon (GHG) emissions. Understanding the headlines targets and changes to energy and transport use provides a context for the local community to think about what projects and activities offer both local benefits and fit with national efforts. It is important that this understanding is on the premise that effective environmental conservation and enhancement of biodiversity are an integral part of these wider targets and changes.

This is helpful both for the immediate work in progressing an LEP, but also in offering a context for consultation with the community as a whole.

Potential sources of information include:

- Scottish Government publications (consultations, plans for Government, funding and budget announcements around energy and transport)
- Commentary from third party bodies (e.g. Local Energy Scotland, Energy Saving Trust, COSLA, Environmental charities)
- News articles by trade or professional bodies (e.g. Scottish Renewables, Engineering Councils, Energy Institute)
- Local authority news articles or energy/transport policy statements

Community engagement and consultation

Initial thoughts regarding the specific challenges and issues around energy and transport relevant to the study area will be reviewed at this point to reflect on what areas of focus the community has in shaping the LEP. Questions to consider are:

- What aspects of power, heat and transport energy might be addressed? (e.g. grid constraint to maximising use of local generation, switching of transport to electric or alternative fuels);
- What scale of ambition is the community looking for? (e.g. to deliver affordable energy to all members of the community, to become an exemplar low carbon community)
- What objectives is the community looking to achieve? (e.g. to reduce fuel poverty by 50% over a given time period, to maximise use of electric vehicle hubs).

These initial thoughts can then be shared with the wider community in seeking feedback and contributions. This is an important step in enabling the community to understand its energy and transport needs and establish ideas as to what areas of energy supply or generation people are interested in and think is of value to the community as a whole.

How the engagement is carried out is a choice for each area. Ideas include:

- Public meeting to provide a summary of thoughts to date around the LEP and a flavour of existing Scottish Government projections regarding use of energy and transport in the medium term

- Online survey seeking initial reactions to some stated potential aims and objectives as well as a view of energy requirements in general
- Poster display in a public building with a suggestion box for ideas around opportunities to change local energy supply and generation. This could also ask for volunteers with relevant skills to join the emerging plan development

These ideas provide a preliminary guide as to what opportunities and technologies will be reviewed as part of the LEP. These will be subject to revision as development of the LEP occurs and data, information and analysis is worked on.

It also provides a guide as to the immediate support needs that the community might have in developing the LEP. In the short term that will focus on the next step of data gathering and developing a deeper understanding of the local energy and transport system.

Output: Summary of community’s initial aims and objectives that the LEP can address.

4.3 Data and information gathering

Once an initial community view is in place then the wider data gathering stage can begin.

Stage	Development Step	Description	Toolkit signpost
DATA GATHERING	Local authority context	Review present planning policy position relevant to LEP. Include Local Development Plan, LHEES, Locality Planning, Local Outcome Improvement Plans, Local Place Plans, Carbon Management Plans and Sustainable Energy Action Plans (where applicable)	Introduction to local policies relevant to Local Energy Plans
	Energy and Transport work to date	Review relevant reports/studies and pilot schemes relating to local action around energy and/or transport	Examples of energy and transport studies in local areas
	Tier 1 Data gathering – baseline energy, transport and natural resources data	Use existing publicly available data from UK and Scottish Government sources. Supporting infrastructure data via relevant utility companies	Data gathering templates Data presentation module
	Tier 2 Data gathering – baseline energy data	Obtain actual billing data for RSL, local authority, NHS and other non-domestic premises (where available). Obtain access to EST held databases for domestic properties	Data gathering templates Data presentation module
	Tier 3 Data gathering – baseline energy data	Use energy billing information and efficiency information from local surveys, reports and studies (as available). Similarly in the case of travel surveys and transport related work.	Data gathering templates Benchmark data analysis overview
	Assess future development impacts	Use local development plan, other regeneration/economic growth plans and relevant planning application details to determine scale of future changes in study area for duration of LEP	Examples of available information
	Create initial baseline and future projection	Breakdown of energy and transport profile based on datasets obtained	Data presentation module

What data and information?

Data and information in this case means both quantitative details such as energy consumption and fuel used in transport or heating. It also means qualitative information, such as understanding local planning policies, knowing the location and capacity of electricity supply networks or being aware of studies already undertaken in the area.

To build up a picture of energy consumption in the area we look at a 12-month period so that we can account for changes in energy demand as a result of changing seasons.

In the first instance we can add up the data for each building in order to understand what the total energy demand in the area is for each type of fuel. An example of heating energy requirements for buildings is shown here.

Table 4.2 Example of heating energy data for buildings

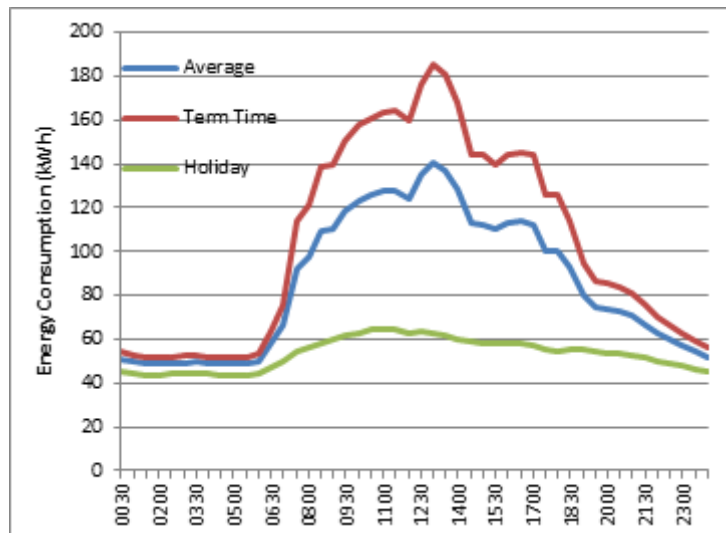
Month	Building 1 (MWh)	Building 2 (MWh)	Building 3 (MWh)	Sub-Total (MWh)
January	1	138	134	273
February	0	131	86	217
March	0	127	71	198
April	0	89	39	128
May	83	39	22	144
June	51	0	0	51
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
October	0	6	16	21
November	5	98	92	195
December	15	124	133	271
Total	154	753	592	1,499

Note: Values for illustration only

The process of collecting data for each energy source (electricity, LPG, oil etc.) is the same. Ideally this will come from billing information.

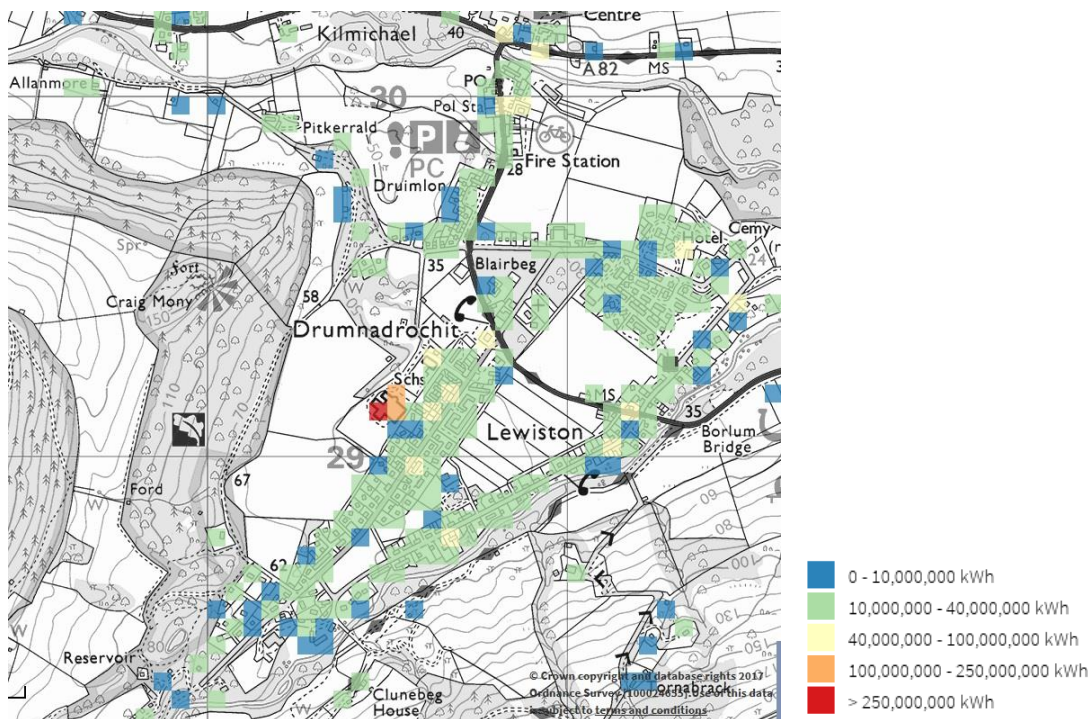
A further level of detail may be available for larger electricity or heat consumers where meters are in place that collect consumption data at half-hourly intervals. In this instance it is useful to look at typical hourly demand for a 24 hour period. An example is shown here.

Figure 4.1 Electricity use profile for a school (example)



It is also useful to look at how energy demand is distributed among buildings within a given area. This can help when looking at the potential for district heating, for example. Scotland’s Heat Map is one way in which demand data is represented. The shading represents different scales of demand as shown here.

Figure 4.2 Example of mapping energy demand in an area



How to collect it?

This is inevitably an iterative process. Some datasets are readily publicly available and can be obtained from relevant sources. These vary in the detail and geographic scale over which they are collected. More detailed information can be made available through engagement and agreement with relevant organisations such as:

- Local authority
- Other public sector organisations (NHS Scotland, Police Scotland etc.)
- Energy Saving Trust
- Local businesses

At each stage of data gathering it is useful to consider what it means for the community and where there are areas of further detail that need to be explored. This requires a number of data gathering iterations as the local energy and transport picture emerges. The value of the data gathering process is to provide sufficient evidence to identify opportunities for action. Some of these will be areas of opportunity already identified in the initial view of the community's energy challenges. Others will be newly identified opportunities that weren't previously understood.

The overall aim of the data gathering is to develop an understanding beyond a simple overall aggregate of energy generated in the local area and that which is consumed. It also considers the scale of fuel use in local transport. This overall figure needs to account for variation in the energy needs throughout different seasons. It is useful to breakdown the overall figure in terms of monthly figures which show how needs for heating change across a typical year, as well as seasonal peaks associated with local business activity and the likes of tourism etc.

Another aspect of the data collection is the ability to understand actual consumption (as measured through bills and supplier dispatch notes) rather than estimates (typically based on understanding of the broad energy requirements of buildings such as flats, detached or terraced houses, offices etc.). This assists in understanding the scale of local generation that could support these needs.

Local authority context

A viable LEP needs to take account of relevant guidance as provided at Local Authority level. Of particular relevance are the Local Heat and Energy Efficiency Strategies (LHEES) that may be in development or completed at the point at which the LEP is being created. LHEES strategies take a long term view (20 years) for a given local authority area and consider how building energy efficiency can be improved and heat supplies switched to lower carbon sources. The two main themes suggest two main action areas:

- Energy efficiency works, enhancing insulation of existing buildings and minimising energy use
- Implementation of decentralised (district heating) supply networks where multiple properties receive their heating needs from a central source.

There are existing district heating networks in many areas of Scotland already, and ongoing programmes of work to enhance energy efficiency in homes and businesses. The LHEES will set specific targets against minimum levels of efficiency to achieve in buildings within a given area, as well as the extent of district heating development. There will be targeted finance from Scottish Government to support actions within the LHEES.

Specific actions within the LHEES are likely to be further categorised by smaller areas, or 'zones', within a local authority area. This recognises the very different requirements for larger towns as opposed to smaller settlements.

Any such programme of works will be complementary to the LEP. There may be several opportunities in the LEP that are similar to those laid out in the LHEES. Both the LEP and LHEES must be consistent with other local planning work including the Local Development Plans. For this reason they are likely to be supportive of one another. The important issue will be to ensure that both the community and the local authority recognise the mutual benefits and join together in seeking to finance and implement the solution.

Given the broader remit that a LEP has, there will also be other opportunities that do not fall within the remit of the LHEES. There may still be benefits to the LHEES delivery, where, for example, local renewable electricity generation is used to power heating in homes or simply offers lower cost power supply to homes resulting in lower levels of fuel poverty.

Aside from this a review of other policy areas should include (where applicable):

- Local Development Plan
- Strategic Growth or Economic Development Plan
- Locality Planning
- Local Outcome Improvement Plans
- Sustainable Energy Action Plans
- Planning guidance for low carbon energy generation

This review should be undertaken through consultation with the local authority. It will ensure that relevant changes and actions within the community (such as new facilities or infrastructure, energy efficiency programmes or decentralised energy systems) are noted and taken account of in the development of the LEP. It also ensures that actions arising from the LEP take account of planning and related guidance as they are finalised.



Table 4.3 Local Authority documents and relevance to local energy plan

Document	Acronym	Description	Relevance to Local Energy Plan
Local Heat and Energy Efficiency Strategies	LHEES	Area based strategies looking at how to improve energy efficiency of buildings and decarbonise their heat supply. Strategy looks at a 20-year period.	Proposed by Scottish Government to be developed and implemented by local authority. Shows where mutual actions by the community and local authority can deliver for both the LHEES and LEP
Local Development Plan	LDP	Vision for how communities will grow and develop in the future. The intention is that they provide certainty for communities and investors alike about where development should take place and where it should not and the supporting infrastructure required for growth. Updated every 5 years.	Shows where future development is anticipated and supporting infrastructure (roads, water treatment, and utilities). This enables an assessment of the scale of energy demand this may bring and what land areas are used in building
Strategic Growth or Economic Development Plan		Three or five year plans that prioritise activities by local authority to stimulate economic growth in the area.	This indicates the type of businesses and development that may take place in the local area. This allows thought about the scale of power, heat and transport energy requirements this may bring
Local Outcome Improvement Plans	LOIP	Sets out objectives for public sector agencies working in a local authority area. This brings together health, adult services, transport and housing. The collection of agencies forms a Community Planning Partnership	This provides some guidance regarding potential transport, infrastructure and building needs within a local authority area.
Locality Planning	LP	These are specific areas drawn up by the Community Planning Partnership to deliver supporting actions within the LOIP.	Provides an overview of how health and social care services are delivered and what impacts this may have in terms of energy use (community buildings and housing) and transport (home visits and clinical services)
Sustainable Energy Action Plans	SEAP	These plans show how a town, city or region will deliver a target carbon reduction. This includes actions and timeframes for work in the areas of buildings, equipment, transport and local energy production	Details may include specific actions relevant to the study area for the proposed Local Energy Plan
Planning guidance for low carbon energy generation		Each local authority has guidance about how to develop local energy generation projects. These need to be consulted to ensure that this is followed	Provides guidance as to what scale and nature of local energy generation is likely to achieve planning consent. Useful to avoid any immediate issues that would prevent development going ahead.

Output: Summary list of relevant plans from local authority and other public agencies. Note of relevant aspects of these plans that will impact on power, heat and transport energy requirements in the study area.

Previous Energy and Transport work

There may be a list of relevant studies and reports already carried out within the local community. Where available, this provides useful information regarding the scope of work already undertaken and initial views as to the feasibility of action in the areas explored (heat supply, electricity generation or transport). Where ideas have been explored and considered feasible then this can be looked at in more detail to understand what aspects have been taken forward (or are planned for completion via any of the relevant local action plans outlined in the previous step). Where the ideas were not considered feasible then this can be reviewed to understand if this was due to the maturity of technology, inappropriate match with local needs or financial viability. If circumstances have changed and this makes any of these ideas or options more feasible then this can be shared with the local community. A decision can then be made as to whether to include it in the options appraisal.

Potential sources of information include:

- Energy efficiency studies – any previous work relevant to energy efficiency in either residential properties or non-domestic premises. This, for example, might include surveys by the local authority or a registered social landlord.
- Renewable energy feasibility reports – Local community groups (e.g. renewable energy trusts or community development trusts) may have carried out feasibility reports for community scale renewable development. Local landowners may also have similar reports in relation to their managed assets. Individual local authorities may have initial feasibility studies for power generation (wind, solar PV, others) or heat supply (decentralised heat supply and district heating) with details specific to the local area
- Transport studies – Traffic count numbers or other studies of traffic movements may have been collected in support of planning applications for nearby renewable energy developments such as a wind turbine or wind farm for example. These would be available via planning application documents. Local authorities or regional transport partnerships (RTPs) may also have carried out studies of local traffic movements as part of initiatives around public transport, alternative vehicle roll out or supporting locality planning. Active travel studies and any associated works to encourage walking and cycling may also be available

Getting hold of these reports will involve talking to the local authority in the first instance and searching the relevant planning portal. This in turn could mean further conversation with local community groups, regional transport partnerships or other bodies as directed by the initial contact with the local authority.

Output: Summary of relevant details from any energy and/or transport related reports produced for the study area.

Tier 1 Data gathering – baseline energy, transport and natural resources data

A baseline view of energy use within a community is a total figure for energy use over a selected 12-month period. It looks at how this total demand varies with seasons (by month). It also shows the contributions to this total from domestic, non-domestic and transport demands.

The relevant data available for the local community will vary in its detail. The value of the data is in providing a snapshot of existing demand for energy (electricity and heat) and use of transport to act as a baseline. This also needs to include known proposed changes within the local area that will have an impact on future

energy and/or transport demands. Examples of this would include a major housing development or an extensive business expansion earmarked in the Local Development Plan.

While it is useful to have as much detail as can be made available for development of the LEP, its primary function is to assist understanding of the scale of impact that any changes to energy supply or use in the local area will have. A judgement needs to be made in each local area regarding how far data gathering work can be carried out within sensible overall timetables.

At an initial level of detail there are a number of publicly available datasets that can be used to begin to characterise the study area. These data sources, and how they contribute to understanding of local energy needs are shown here. Further details of these data sources is provided in Appendix B.

Table 4.4 Initial sources of data and information

Detail	Data sources	Existing Energy Needs	Future Energy Needs
Community characteristics	Scottish Census Data Local authority development plans	The local population in the study area, its demographic and broad nature and scale of employment and associated travel requirements	Population trends and known development proposed in future
Environmental resource and designations	HES Local authority SNH Renewable energy assessment tools	Estimated local resource (wind, solar, hydro) Existing environmental and cultural designations, sensitive habitats	Estimated local resource (wind, solar, hydro) Proposed designations (e.g. National Park)
Overview of buildings	Scottish Census Data Local authority	Number of domestic buildings, age, efficiency and fuel used for heating Number of non-domestic buildings and use	Proposed scale of domestic or non-domestic development
Energy demand	UK and Scottish Government Scotland's Heat Map	Electricity consumption data for domestic and non-domestic properties Other fuel consumption data for domestic and non-domestic properties Indicative heat demand for domestic and non-domestic properties	Additional energy demands from proposed developments
Energy generation	FiT/RHI registration Local authority Local community	Existing energy generation capacity	Any proposed local community generation
Supporting infrastructure	Utility companies Local authority Public agencies	Transport links, electrical grid infrastructure, water supply and treatment and waste management. Active travel networks and infrastructure	Proposed upgrades or changes to any of the supporting infrastructure
Transport	Scottish Census Data UK and Scottish Government Local authority	Vehicles owned by residents Active travel plans	Known future changes (alternative fuel changes or other changes)

This initial data provides preliminary understanding of the local energy and transport system. This should be reviewed to consider its preliminary findings in order to consider further areas for data development and understanding.

In most cases the data is available in a workbook format suitable for use in Excel. This data can then be analysed to produce summarised tables of data, and accompanying charts and maps where appropriate.

The level of detail can then be refined in a second round of data gathering.

Community engagement

At this stage there is likely to be a number of individuals involved in the process of data collation. It is helpful to create a summary of understanding at the end of the Tier 1 data collection to share with the wider community.

The process of engagement will differ depending upon how the work is being managed. If a Local Steering Group has been created then its members can seek opinions from within the wider community. If no Steering Group is in place then a communication to the wider community would be prepared.

The purpose of such engagement is to:

- Access local individuals, organisations or businesses willing to share more detail regarding their actual energy consumption
- Seek views on the emerging energy demand picture and any thoughts people have regarding the initial focus or ambitions offered previously
- Seek any details from individuals or organisations proposing to develop local energy generation in the near future

Output: Initial view of existing energy and transport systems in the study area (considering both demand for energy and how it is supplied). Identification of individuals and organisations to obtain further detail from regarding the energy baseline

Tier 2 Data gathering – baseline energy data

The Tier 1 datasets will provide an initial level of detail for the study area. It will include a mixture of energy consumption data, some based on actual consumption, the rest based on estimated data.

The summary position from the Tier 1 data can be used to communicate with wider stakeholders in seeking further detail regarding actual energy requirements and any proposed local energy generation.

The level of detail in this instance is collecting actual consumption details for individual buildings in terms of their use of heat and power. In the case of residential buildings it is to collect what information there is regarding actual or estimated consumption figures obtained from previous surveys and assessment by bodies such as local authorities or registered social landlords (RSLs).

This includes, but is not limited to:

- Actual billing data for a 12-month period broken out by month for electricity and heating fuels for buildings operated by:
 - Local authority
 - NHS Scotland
 - Registered Social Landlord
 - Other non-domestic consumers

- Energy Saving Trust data (domestic properties via Home Analytics database)
- Existing or proposed large scale energy generation (e.g. wind turbines, solar PV, biomass boilers, combined heat and power engines or turbines etc.) and how the outputs from these generators are used (energy used on site, heat and/or power supplied to other buildings or end users)
- Floor areas of larger buildings and details of any energy efficiency works that have been carried out or are planned in near future
- In the case of non-residential premises, what transport needs these organisations and businesses have and how they are met at present (e.g. small number of vehicles used by health visitors working from a local medical centre)

The owners of these datasets will be approached first to find out how much of this level of detail is available. Individuals within the community may be able to assist in obtaining this data. If the local authority has been involved at this point then they may be able to help in making contact with various organisations through their existing working relationships.

One potential option for wider non-domestic consumers is to carry out a short online survey promoted by a representative body (e.g. a local business forum representative or the Local Steering Group if one has been created at this stage).

An example of the type of data that might be received is shown in Appendix B.

The data obtained at the end of this stage of work should be reviewed to understand how it adds value to the overall picture of local energy and transport systems. At this point there will be a greater level of detail regarding:

- Overall breakdown of energy use in terms of heat and power
- Fuel and transport costs
- Understanding of transport requirements associated with non-domestic premises
- Identification of peak periods (and scale) of demand for heat and power across a 12-month period
- Potential supplies of power and/or heat that could be used by some end users in the study area

It is likely that the community will be faced with some gaps or areas of uncertainty in the data at this point. Another review can be undertaken to consider how best to complete the gaps and reach a useful baseline data position. It may be possible to go back to some data providers and ask for more specific information about how energy is used or details of billing information. Otherwise it is possible to use benchmark data or rules of thumb to complete some reasonable estimates of energy use where actual details are not available.

Where considered useful, feasible and possible then further data gathering and analysis can be undertaken in a final iteration of the data gathering phase.

Output: Further details of existing local energy use by end use buildings. Identification of data gaps to seek to fill with another iteration of data collation.

Tier 3 Data gathering – baseline energy data

The final level of detail that can be sought is from specific surveys or studies carried out in the local area. Some of these may have been identified in earlier work. Examples could include:

- Local energy efficiency surveys carried out on domestic or non-domestic properties
- Local transport surveys (mode of travel, commuting patterns, use of public transport and/or ferry/air/rail)

- Local energy generation profiles (monthly for assets such as wind turbine, solar array etc.)

Any such work will provide greater detail within the study area than is available within the previously collected Tier 1 and Tier 2 datasets. Examples of detail that could be provided here include:

- Typical daily profiles of electricity demand over a 24 hour period for larger non-domestic properties that have half-hourly records of metered consumption
- Energy efficiency assessments of domestic or non-domestic properties carried out in the production of documents such as Energy Performance Certificates or Green Deal Assessments
- Transport information about vehicle movements in the local area and typical distances travelled and/or use of public transport by ferry/air/rail/road
- Active travel surveys or infrastructure and extent of walking and cycling in the local area
- Details of typical energy output from larger energy generation equipment such as wind turbines, large boilers etc

Industry and sector benchmark data can be used where no specific site data can be made available. These provide typical and best practice energy consumption information for different types of building and different uses of buildings. This relies on an estimate of floor area for each building, which can be measured from a map or might already be provided by individual organisations. Examples of these benchmark data sources include:

- CIBSE Guide F, Energy Efficiency in Buildings
- CIBSE TM46, Energy Benchmarks
- BSRIA, Rules of thumb – guidelines for building services (5th Edition)
- Elexon typical electricity demand profiles for classes of electricity meter (<https://www.elexon.co.uk/operations-settlement/profiling/>)

This final level of detail provides information that can be linked to individual buildings. This provides the greatest level of detail regarding the breakdown of local energy generation and use. A final review here should offer an extensive view of the scale and extent of the local energy systems.

Output: Finalised breakdown of existing local energy use by electricity, heat and transport end-use. Summary of existing local energy generation.

Assess future development impacts

The combination of the local authority context and review of previous relevant energy and transport studies will offer an overview of significant changes within the study area that will change the energy and transport needs. The impact of these changes will be estimated using appropriate assessment methods. This may include:

- Use of published benchmark figures for energy demand relating to new buildings
- Use of initial figures included within relevant reports (e.g. outline planning application documents available from the local authority planning portal)
- Use of population estimates (and visitor / tourist data where available) to assess transport needs

Further advice on how to determine future demands is included in the accompanying toolkit.

Output: Summary of estimated future changes in energy requirements for the study area by electricity and heating requirements.

Create initial baseline and future projection

The combination of the available Tiers (1 – 3) of datasets and future impact assessment will provide the overall snapshot of power, heat and transport energy needs within the study area. This will offer a profile of energy needs (power and heat) across a 12 month period as well as the aggregate total. It will also look at transport use and typical journeys made by the community.

The future projection will simply look at how the scale of total demand might change. It may include monthly variation if that level of detail can be justified based on available information.

The data here will provide the baseline to help assess how any proposed changes to energy supply, efficiency of use or transport use will impact on the scale of community use. The format of this breakdown can be provided in a number of different ways. One approach is shown here.



Photo: Eco-housing at the East Whins development at Findhorn include mechanical ventilation systems with heat recovery to ensure the heating systems are as efficient as possible. Under floor heating is fed by an air source heat pump in connection with solar thermal panels. Power is supplied from solar PV panels and wind turbines located on the Park.

Table 4.5 Example breakdown of energy profile of study area (annual snapshot)

Existing energy demand	Domestic	Non-domestic	Sub-Total	Carbon sub-total
Electricity	Residential – privately owned Residential – RSL	Local authority buildings NHS Scotland buildings Local commercial business Utility companies Transport companies Charitable and other bodies	Sum of domestic + non-domestic consumption	Carbon emissions associated with sub-total demand figure
Heating fuel (broken down by relevant fuel types e.g. natural gas, LPG, biomass, oil, peat etc.)	Residential – privately owned Residential – RSL	Local authority buildings NHS Scotland buildings Local commercial business Utility companies Transport companies Charitable and other bodies	Sum of domestic + non-domestic consumption	Carbon emissions associated with sub-total demand figure
Transport	Residential – privately owned Residential – RSL	Local authority NHS Scotland Local commercial business Utility companies Transport companies Charitable and other bodies	Sum of combined fuel use (where known) and distances travelled (otherwise) as an energy total	Carbon emissions associated with sub-total transport figure
Electricity generation	Existing domestic scale generation (FiT eligible)	Community generation (wind turbines, solar array, combined heat and power, other power generation)	Sum of total energy generation	Carbon emissions associated with sub-total generation figure
Heat generation	Existing domestic scale generation (RHI eligible)	Community generation (biomass, combined heat and power, heat pumps, district heating)	Sum of total energy generation	Carbon emissions associated with sub-total generation figure
Future Energy Demand	Domestic	Non-domestic	Sub-Total	Carbon sub-total
Electricity	New build Residential – privately owned New build Residential – RSL	New build premises: Local authority buildings NHS Scotland buildings Local commercial business Utility companies Transport companies Charitable and other bodies	Sum of domestic + non-domestic consumption	Carbon emissions associated with sub-total demand figure
Heat demand	New build Residential – privately owned New build Residential – RSL	New build premises: Local authority buildings NHS Scotland buildings Local commercial business Utility companies Transport companies Charitable and other bodies	Sum of domestic + non-domestic consumption	Carbon emissions associated with sub-total demand figure

This high level summary of overall energy requirements can be further broken out into some other levels of detail.

- A chart of overall energy demand by month across a given 12-month period
- Sub-totals within the monthly demand showing the mix of domestic and non-domestic use within this
- A summary of existing monthly energy generation from existing large scale generation over a 12-month period and how this compares with total energy demand
- Monthly profile of typical transport volumes and any seasonal trends in numbers of vehicles travelling within the study area
- Breakdown of residential energy use by age or type (detached, semi-detached etc.) of dwelling

Further examples of how these details can be presented are provided in the accompanying Toolkit.

In the case of premises where half-hourly electricity data is available then this can also be used to present some typical demand profiles for those premises over a 24-hour period. Charts for different days, e.g. weekday, weekend, winter, summer etc., can be presented to show how any significant variations occur during the 12-month period.

The final set of useful information will summarise details of local environmental designations, which summarises where local wildlife areas are protected and other local archaeology, listed buildings and ancient monuments. Advice from relevant bodies (HES, SNH, SEPA) can be sought, using this information, to understand what opportunities for renewable energy generation will be possible without causing undue impact on these designated sites.

It also provides a snapshot of local infrastructure, noting any existing capacity of sub-stations to accept local electricity generation and other aspects of capacity relevant to existing or future use (e.g. upgrade of distribution networks or additional transport services).

All of the energy details can be summarised in units of energy use (typically kWh or MWh (1,000s of kWh)). UK Government published statistics provide a guide as to the typical costs of these energy sources (e.g. electricity, LPG, biomass etc.). Using this data enables a summary of the energy data in terms of estimated costs.

Suitable factors are also published by the UK Government to enable conversion of energy used (for a given fuel) into the impact of its use in terms of output carbon emissions. This completes the summary picture of local energy use, showing:

- Scale of local energy demand within the study area
- Typical costs of current energy consumption
- Environment impact of this energy use in terms of carbon emissions

Community engagement

The completion of the energy baseline is another point at which the wider local community can be updated. A summary can be provided for wider comment that highlights:

- The aggregate total of demand for electricity and heat in the study area and the high level projection of how this might be significantly impacted by identified future development(s)
- Typical fuel use for heating
- Highlights of existing energy efficiency (properties with lowest demand; properties with highest demand)
- Identified high demand consumers (e.g. school, leisure centre, residential housing etc)
- Size of existing renewable generation output compared to overall demand in the study area
- Transport trends in terms of typical length of journeys and mileages travelled
- Typical costs and carbon impacts of existing energy consumed

These details enable the wider community to learn more about its overall energy use and understand where aspects of energy use might be studied in more detail to look at how to reduce overall demand or supply it from a different source. It also allows a wider discussion about what priorities the community might have in terms of reducing the impact of their energy use either in terms of costs to end consumers or in overall carbon emissions in the context of Scotland's wider targets to move towards a much lower carbon impact society.

Output: Summary energy baseline for study area in a given 12-month period. Sub-totals for electricity, heat and transport and by end users (domestic and non-domestic). Projection of significant changes to future requirements (electricity and heat). Summary of associated carbon emissions.

4.4 Options Appraisal

The preceding steps provide a view of the existing situation within the study area in terms of power, heat and transport energy use as well as the supporting infrastructure (local electricity grid, transport networks etc.).

The next stage of work is to develop an initial view of options for change that could be explored by the local community.

Stage	Development Step	Description	Toolkit signpost
OPTIONS APPRAISAL	High level options review	Review opportunities for action within areas of energy efficiency, low carbon generation, heat supply and transport. Combine case studies from other localities / areas with emerging technologies (as relevant)	Options matrix template Case study sources and examples
	Review against original ambitions and aspirations	Review with local steering group and wider community the range of high level options. Determine those most relevant to local ambition and challenges / opportunities identified in previous steps	Community engagement module
	Concept design work	Develop concept design for each option identified as relevant in the previous step. Sufficient detail to be determined in order to provide order of magnitude assessment of the costs, benefits and associated impacts of opportunities	Concept design module Option description template
	Initial net benefit analysis	Develop initial benefit assessment for each option (financial, environmental, social)	Opportunity assessment templates
	Review initial options output	Review initial options appraisal work and confirm prioritised options or seek further work	Option description template
	Refine options appraisal details	Refinement of initial work and/or extension of options	Concept design module
	Finalise opportunities identified	Finalise details of opportunities and prioritise for inclusion in LEP	Opportunity assessment templates

High level options review

To enable an informed discussion among the community an initial options review should be provided. This will offer short summaries of potential actions in the areas of energy efficiency, energy generation (power and heat) and transport. It will provide details in each case summarising:

- Brief description of what the action or technology involves
- Scale of operation (size of equipment and scale of energy output)
- Enabling infrastructure that might be required (e.g. charging points for vehicles, revised operation of local electricity grid, private wire arrangement)
- Maturity and technology readiness
- Assessment of the net environmental implications

- Scale of impact on community in terms of output and associated cost and wider social benefits

Where relevant and available case studies from other communities or localities can be used to demonstrate what sort of change would be required and how this might impact on energy and transport in the study area. This can include the impact of energy efficiency measures such as insulation works, wider community education programmes around energy awareness or roll out of smart meters, for example.

Some technologies will be more relevant to the needs of the community's LEP than others. The main issues to address here include:

- Suitability for energy needs – e.g. if power demand forms the majority of the requirements of the community then local generation should focus on electricity
- Using local resources – ability to use local natural resources for energy generation (e.g. wind, solar, water)
- Fuel switching – ability to reduce reliance on fossil fuel and more expensive imported energy sources
- Energy efficiency – options that offer improvements to the efficiency of energy use

There are a number of resources and existing introductions to technologies that can be referenced here.

The practicalities of each option also need to be referenced. At this stage this would include ideas of the size of equipment required, how it would be used (one unit serving several buildings, or one for each building) and what level of ongoing maintenance would be required.

The intention here is to offer a short and easy to digest summary of the options to enable a broader discussion in relation to the details of the energy baseline noted earlier.

Output: Summary of technology options and overall relevance to the energy baseline calculated in the earlier work.



The Inverter System on Foula provides instantaneous power requirements when renewable energy sources are not available and diesel generators are not running.

Review against original ambitions and aspirations

Community engagement

The options review will be discussed with the local community in order to begin to prioritise the options that are likely to be of most interest to the local community. This will therefore mean reflecting on the ambitions and aspirations outlined earlier in order to identify how the various options that could be considered best fit with these. It may be that the ambitions and aspirations are modified at this stage if some of the high level options are seen as important to the community but don't readily match the originally proposed ambitions. The data gathering element of the work to date provides a direct means of understanding local energy needs and therefore reflecting on options and ideas to take forward.

This engagement phase could be combined with the energy baseline review, or carried out as a separate engagement phase depending upon the preferences of the local community. In either case this should offer the wider community a chance to ask questions about both the energy baseline determined, so as to understand the implications for local energy requirements and understand where areas of greatest demand may lie. All individuals should also be able to understand, in broad terms, what initial options there may be to change the way in which energy is used in the local area.

Where high level options are not prioritised for further investigation at this stage then this will be noted and a short justification written.

The ability to revisit options as circumstances change will be encouraged via the supporting toolkit and within the structure of the LEP.

The outcome of this review phase should be an initial direction for concept design work, focussing on initial technologies and ideas that the community feel is most supportive of the ongoing energy needs.

Output: Refreshed aims and objectives for the LEP to address.

Concept design work

For each of the options taken forward for further investigation concept design work will be carried out to look at the requirements for implementation at the scale of the study area. The intention at this stage is to provide sufficient detail for comparison of the impacts of the different options on power, heat and transport energy requirements in the study area. This will not therefore offer sufficient technical detail to go straight to market suppliers and buy equipment or services. It will offer a summary in terms of:

- Nature of primary assets and associated requirements (e.g. a location for a new energy generation asset, storage medium or heat supply centre)
- Enabling infrastructure (e.g. supply pipework for heat when connecting a heat source to multiple buildings, an electrical supply cable if supplying directly from a wind turbine to local buildings, charge points for electric vehicles etc.)
- Output or impact of works (energy output or improvement in energy efficiency or transport impact as well as assessment of net environmental impacts)
- How it could be delivered (proposed ownership and governance of the output)
- Potential risks, constraints or other issues that may constrain or limit the ability to deliver the opportunity

Where relevant input from the local community will be used to help develop these options. This could include contact details for community stakeholders that offer expertise or local knowledge (e.g. Scottish Water, Utility supply companies or Community Trust members). Wider specialist contractors or suppliers may be consulted (where relevant) to seek further information or data regarding each particular option. Experience from other supporting bodies or organisations can also be drawn upon where ideas or technologies have been implemented elsewhere in other communities (Scotland, UK or globally).

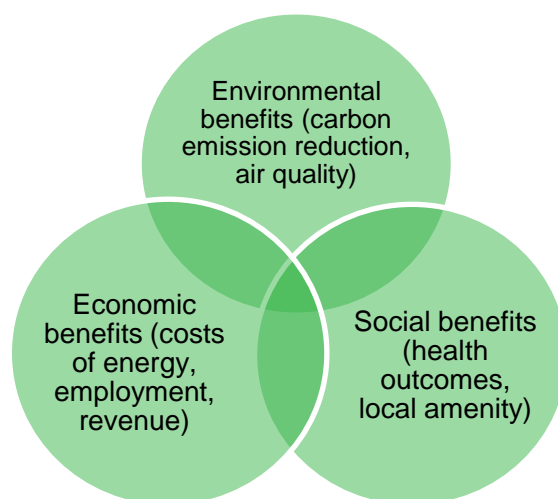
A simple table (matrix) of options can be created that captures all of this information in a form that enables easy comparison. An example is provided in Appendix B.

Output: Table of potential opportunities to address local power, heat and transport energy needs. Details to include how it might be implemented and the associated benefits and risks each opportunity offers.

Initial net benefit analysis

The 'whole system' approach to development of the LEP means that an assessment of the benefits of any given option needs to consider not only the economic impacts, but also the environmental and social benefits too.

Figure 4.3 Whole system approach to assessing benefits



The matrix of options put together in the previous step should be extended here to include an initial view of the net benefits from an economic, environmental and social viewpoint. A timeframe will also be included to provide an idea of how soon the opportunity might be achievable:

- Short term (up to 5 years)
- Medium term (5 – 10 years)
- Long term (more than 10 years)

This allows an indication of how options that are taken forward might be put together in a sequence in situations where preferred technology options may take time to be available to the community.

A summary table of details is most likely the easiest way to present this information. This brings together the combination of the earlier technical work to understand the change in energy use that the option will offer, and what that might mean in terms of the overall carbon emissions associated with community energy use and the associated costs.

Wider benefits that could be included here depend on the options being considered. Improving insulation and minimising dampness in houses, for example, is likely to assist better health outcomes for residents. A transport project that reduces use of conventional diesel cars in the study area is likely to offer better local air quality, which again will reduce associated health impacts.

There are many reasons why a given opportunity may be beneficial to the local community, over and above simple financial analysis of the cost of end use energy. It is useful to reflect all thoughts around primary and secondary benefits when summarising the options for consideration.

An example of the type of analysis that can be carried out is provided in the accompanying toolkit.

Output: Extension of initial options appraisal to look at the wider benefits of each opportunity in terms of financial, carbon and social impacts.

Review initial options output

Community engagement

The initial summary of options and associated net benefits will be reviewed with the local community. This will allow the community to offer its thoughts on the work to date and put forward further questions relevant to each option. This may mean that some options are put aside since the net benefits are seen as insufficient, the risk is considered too great for the community or where the timeframe is too long to be considered useful to the community.

The format of this engagement can be tailored to suit the requirements of the community. Depending on the skillsets of the local community it may need to be supported by external contractors or other technical specialists that can help in explaining how technology options will support the energy use in the community. The important details to get across in the engagement work here are:

How the opportunity supports energy use in the wider community. This is relatively simple to understand when it is a source of electricity or heat generation. It is harder to describe when it involves combinations of technology, such as use of battery storage alongside a wind turbine to maximise use of local energy generation, for example. The engagement work here will likely need to revisit some of the previous technology description and wider technology options narrative to help show the relative benefits of each opportunity. It may be helpful to bring in specialists for given technologies, or people from other communities with experience of a given option, to assist understanding of what might be feasible in the study area.

The outcomes here will be a mix of three elements:

Initial enthusiasm for certain opportunities that the community feels are most suited to their ongoing energy needs

- Lack of enthusiasm for some opportunities and high level commentary on why this is the case (e.g. fail to see wider benefits, consider opportunity too risky, costs too expensive for community to pursue)
- Some interest in opportunities but want more detail or explanation as to how it might be rolled out and delivered
- Details of the review will be summarised so that an evidence base of how options are refined or set aside can be maintained. This allows for ease of future review if similar potential opportunities are discussed in the community.

This again is part of the iterations that reflect on the requirements highlighted in the data analysis and use this to build up a number of options for consideration. It may be that the data analysis is reviewed to consider specific areas where more detail will assist in developing an opportunity that was initially considered of low priority.

Output: Commentary on initial options assessment. List of opportunities to take forward, those that need more detail to be worked on and those that are being set aside as inadequate to meet the community needs.

Refine options appraisal details

The remaining options from the first review will be refined to assist in finalising the list for inclusion in the LEP. This will include:

- Update or extension of details in concept design. Examples would include review of routing for pipework supplying a heat network, checking the size of electricity generating assets or reviewing how a local energy storage system might operate
- Discounted cashflow details to enable understanding of cashflows (initial investment and on-going operating costs)
- Net environmental benefits (impact on local carbon emissions, qualitative wider benefits for land use or enhancement)
- Wider socio-economic impacts (social NPV)

This step will result in a final list of options and associated details in terms of the scale of investment needed to achieve them and the estimated benefits that they will provide. There may be some options looking at emerging technologies where there is insufficient information available in the time available for creation of the LEP. In these instances the need for further feasibility work will be highlighted as an action point for inclusion in the LEP.



The community mini bus on Fetlar is powered by the local wind turbines that were part-funded through a community share offer.
(Photo: Fetlar Developments Ltd)

Finalise opportunities identified

Community engagement

The local community will then consider the updated list of opportunities and details developed in the latest iteration of analysis. This will provide the chance to reflect on the detail of the outputs and consider how to prioritise the various remaining opportunities. In doing so the combination of the net benefit assessment and previously agreed ambitions and aspirations will again be brought together.

At this point the process of local community engagement needs to come to a finalised list for inclusion in the Draft Plan.

Output: Finalised list of opportunities for inclusion in the draft LEP.

4.5 Plan Development

Stage	Development Step	Description	Toolkit signpost
PLAN DEVELOPMENT	Draft Local Energy Plan	Develop initial draft of LEP based on outputs of earlier tasks	Overview of contents of a LEP
	↓		
	Review Draft Plan	Review draft LEP with local community to confirm details align with original aspirations/ambitions	Community engagement module
	↓		
	Final Plan	Complete finalised LEP and collate all relevant supporting documentation and analysis. Feedback LEP to local community.	Task Checklist

Draft Local Energy Plan

The draft Local Energy Plan will bring together all the information and data collected in the previous stages of work.

Its aim will be to provide an overview of the characteristics of the study area in terms of energy and transport and offer an evidence base for how the actions in the plan were arrived at.

While the precise details will be different for each local area, it will typically include:

- A statement of the ambitions or aspirations of the local community in setting out the Local Energy Plan
- An overview of the characteristics of the community in terms of:
 - Residential and non-residential (community, commercial and institutional) buildings
 - Existing energy and transport infrastructure
 - Existing local low carbon energy generation
 - Environmental designations and natural resources
- An assessment of the identified challenges and issues for the local community in relation to energy (power and heat) and transport
- A baseline assessment capturing annual energy consumption for the local community and relevant transport details
- An assessment of how changes within the local area (typically economic development) are likely to change the existing scale of energy demand

- A qualitative review of high level options considered for inclusion
- Quantitative analysis of options taken forward (economic, environmental and social)
- Action list identifying priorities and timeframes (short, medium, long term)

The format of the LEP will be designed for a lay reader, but include supporting technical evidence and analysis where appropriate. Details of options not taken forward for detailed work will be included. It will therefore act as a single point of reference for evidence as to how decisions were made throughout the development of the plan in coming to the final prioritised list of opportunities.

The format of the LEP is for local communities to determine. Supporting information is likely to be in a series of spreadsheets and associated calculations. Maps of the study area showing details regarding the baseline and associated opportunities will also be useful. In thinking about the format of the LEP there are a number of factors:

- How can the combined detail and analysis be collated in a form that is easy for the local community to store and update in future?
- What file format is best suited for storage by the local community, avoiding costly software or potential limitations in system speed of access?
- Will a visual summary of the LEP be more useful than a written summary report?
- Is a non-technical summary of the opportunities for the LEP as a set of presentation slides useful?
- Which individual or body holds responsibility for the plan and manages access to the LEP and associated files?

Input here from a combination of technical specialists, graphic designers and others will provide an output most suited for the community's needs.

The work on the LEP is for the local community and, ultimately, owned by it. It is therefore important to consider how best to store and present the information. It should also be anticipated that the details will be revisited and updated in future as opportunities are taken forward.

Output: Draft LEP and associated supporting information.

Review Draft Plan

The draft plan will be shared with the local community for review and comment. The main purpose of the review will be to ensure that the outcomes of the LEP are understood and that the community is happy that the details included accurately reflect their expectations and ambitions as discussed throughout the development process.

A consolidated list of feedback comments will be determined in order to make the process of finalising the plan easy to manage.

Output: Feedback from community on draft LEP and associated supporting information.

Final Plan

The finalised LEP will be presented to the community. The format of this presentation will vary according to the local communities and how the process of development of the LEP has been managed. The intention would be to offer a practical summary that highlights the options and actions that have been determined and the next steps that are intended to be made.

Alongside the LEP will be all the associated supporting documents and analysis carried out. Where and how this information is best stored for future use by the community will vary according to the local needs in each case. This may include options for access to password protected systems operated by third parties. Alternatively it may simply be stored by a local representing body (the original applicant or other community body for example).

Output: Finalised LEP and associated supporting information. Confirmation of how community is allocating responsibility for management, updating and delivery of the LEP.

Glossary

Acronym	Details
BSRIA	Building Services Research and Information Association – Member based organisation offering range of services to help companies improve the design, build and operation of buildings
CIBSE	Chartered Institution of Building Services Engineers – Professional body for building services engineers, codes of conduct and standards development
COSLA	Convention of Scottish Local Authorities – Representative body for member local authorities
DNO	Distribution Network Operator – company responsible for maintaining the national electricity distribution network in a given regional area in the UK
EST	Energy Saving Trust – Independent organisation that manages programmes of advice and services around low carbon behaviour in Scotland and the UK
FiT	Feed-in tariff – Regulated by Ofgem, these payments are made to electricity generators for eligible low carbon technologies. Payments are for each kWh of energy generated and are fixed for a period of 20 years.
GHG	Greenhouse gases – The collective name for gases in the atmosphere that are monitored due to the impact they have in global warming and associated climate change impacts. Carbon dioxide (CO ₂), Methane (CH ₄), Nitrous oxide (N ₂ O), Chlorofluorocarbons (CFCs), Hydrofluorocarbons (including HCFCs and HFCs), Nitrogen trifluoride (NF ₃)
HES	Historic Environment Scotland – Public body responsible for the care of Scotland’s historic environment
kWh (also MWh or GWh)	Unit of energy consumption. A MWh of energy use is equivalent to 1,000 kWh. A GWh of energy use is equivalent to 1,000 MWh or 1,000,000 kWh.
kW (also MW or GW)	Unit of energy output from a given generator. A MW of energy output is equivalent to 1,000 kW; a GW of energy output is equivalent to 1,000 MW or 1,000,000 kW. This can be a measure of electricity or heat output
LDP	Local Development Plan – Vision for how communities will grow and develop in the future. The intention is that they provide certainty for communities and investors alike about where development should take place and where it should not and the supporting infrastructure required for growth. Updated every 5 years.
LEP	Local Energy Plan – Community developed action plan that identifies key priorities around energy and transport systems in a local area. It will identify opportunities for changes to these systems and what benefits these might bring directly to the community.

LES	Local Energy Scotland – Advisory body for business, communities and other groups in developing local, renewable energy
LHEES	Local Heat and Energy Efficiency Strategy – Area based strategies looking at how to improve energy efficiency of buildings and decarbonise their heat supply. Strategy looks at a 20-year period.
LOIP	Local Outcomes Improvement Plan – Sets out objectives for public sector agencies working in a local authority area. This brings together health, adult services, transport and housing. The collection of agencies forms a Community Planning Partnership
LP	Locality Plan – These are specific areas drawn up by the Community Planning Partnership to deliver supporting actions within the LOIP
LPG	Liquefied Petroleum Gas – a liquid fossil fuel used for heating homes, cooking equipment and transport
LSG	Local Steering Group – a body that is made up of representatives from a local community and oversees development of a LEP or specific projects that are actioned within it
NHSScotland	Ultimate administration body for delivery of NHS health services in Scotland. It consists of a number of individual Boards that operate service at local level
NPV	Net Present Value – A measure of profit using projected revenues and costs over a period of investment (e.g. 20 or 25 years)
RHI	Renewable Heat Incentive – Government regulated payment to eligible technology operators. Payments are received per unit of heat output and are fixed for a period of several years (typically 7)
RSL	Registered Social Landlord – Not-for-profit housing providers offering rental properties in a given area
RTP	Regional Transport Partnership – Body that develops strategic transport strategies for specific regions of Scotland. Includes local authorities in the development of these strategies
SAC	Special Areas of Conservation – designation of a particular area for protection of local habitat
SEAP	Sustainable Energy Action Plan – These plans show how a town, city or region will deliver a target carbon reduction
SEPA	Scottish Environment Protection Agency – Public agency whose role is to help protect and maintain Scotland's environmental resources
SNH	Scottish Natural Heritage – Public body responsible for protecting and promoting Scotland's natural heritage
Social NPV	Social Net Present Value – Similar to NPV, but includes monetary values for wider social benefits resulting from the specific investment
SPA	Special Protection Areas – conservation designation that protects a given habitat for migratory birds
SSSI	Site of Special Scientific Interest – conservation designation that protects a particular area of land
tCO_{2e}	Measure of GHG emissions. It accounts for the impact of all the reportable GHG in terms of equivalent impact of carbon dioxide emissions

Appendix A Proposed contents of Local Energy Plan

The following structure is a suggested overview of the details that may be included in a Local Energy Plan. It is intended as a guide to overall development rather than a comprehensive requirement. It can be used as a means of structuring thinking when developing the details within each Local Energy Plan.

Introduction

Overview of 'whole system' approach

Introduction to the overall 'whole system' approach looking at all relevant aspects of energy use within the proposed study area. Statement that the plan will cover all aspects of energy use in terms of power, heat and transport both in terms of demand side management and supply technologies.

Aims and objectives

The intention of the Local Energy Plan is to address the aspirations and ambitions of the community. These high level objectives, agreed as part of the process of Plan formation, should be laid out here.

Local Infrastructure

Electricity – Description of local grid supply in terms of key high voltage feeds into the study area and relevant transformers and sub-station capacity details. This may be written by the DNO, but at very least needs to be informed by them. Note of any community generation assets already in operation (e.g. wind turbine etc.)

Heat – Details of supply capacity relating to relevant local gas networks or existing decentralised heat supply networks. Short overview of other relevant fuel sources used in local area.

Water – Overview of local water supply (including extent of any private water supply) and wastewater treatment capacity.

Transport – Description of key road, rail, air and sea links or corridors (as applicable).

Characterisation of local area

Residential

Estimated total number of dwellings and classification in terms of:

- Archetype and size (flat, semi-detached, terrace etc.; 1-bed, 2-bed etc.)
- Tenure (owner occupied, RSL owned, tenant etc.)
- Construction type (cavity wall, solid/stone wall, system built etc.)
- Estimate of fuel poverty levels from Scottish Government statistics
- Estimate of existing energy efficiency (e.g. where EPC ratings are available)

Non-residential

Estimated number of non-domestic properties in terms of:

- Local authority buildings (offices, schools, care homes etc.)
- NHS buildings (hospitals, GP surgeries etc.)
- Business premises (sector and size of property)

Transport

Transport system classified in terms of:

- Local road network

- Rail and/or ferry links
- Estimated vehicle ownership within settlement area (UK Government and Scottish Census data)
- Estimated commercial vehicle ownership and use in settlement area
- Extent of passenger/freight movements into and outwith study area
- Breakdown of fuel type usage (petrol, diesel, ULEV etc.)
- Estimated distance travelled by pedestrians and cyclists

Environment

Overview of study area in terms of:

- Areas of recreational use, open land, etc. within study area
- Summary of environmental designations and other relevant heritage items
- Estimated solar resource
- Estimated wind resource
- Estimated hydro resource
- Estimated biomass resource

Energy Baseline

Electricity – Overview of total demand over a 12 month period broken out by month. Sub-categorisation by residential and non-residential demand. View of power demand (rather than consumption patterns) where details are available. Depending upon resolution of data this to be visualised at street and individual building level.

Heat demand – Analogous to electricity – heat demand overview and monthly breakdown for 12-month period. Further sub-characterisation by end users where data allows.

Transport – Overview of local travel patterns via privately owned vehicles and estimated fuel consumption and annual mileage. Review of other relevant public transport routes and use of air and ferry services (as applicable) over selected 12-month period.

Future changes – Statement of significant known changes to occur in the local area that will impact on future demand (e.g. housing development, incoming business premises or other). Estimate of impact in terms of energy consumption within existing 12-month model

Options Appraisal

Scottish context

Overview of existing position from Scottish Government in terms of changing features of energy supply and use that impact on local area. This captures extent to which change may be seen in electrification of vehicles, alternative fuels and use in heating, power and transport.

Local context

Overview of relevant local planning documents (e.g. Local Development Plan and associated documents) and context at local level in terms of any known changes to energy and transport networks.

High level technology review

Given preceding commentary some brief introductions to technology options most relevant to local area. This to be gleaned from supporting information within the Toolkit. Details focused on nature of technology, how it would help in the local area and the scale of impact it might provide (in relation to the energy baseline).

Review of local options

Summary of concept work used to develop options for consideration, including:

- Nature of primary assets and associated requirements (e.g. a location for a new energy generation asset, storage medium or heat supply centre)
- Enabling infrastructure (e.g. supply pipework for heat when connecting a heat source to multiple buildings, an electrical supply cable if supplying directly from a wind turbine to local buildings, charge points for electric vehicles etc.)
- Output or impact of works (energy output or improvement in energy efficiency or transport impact)
- Net local environmental impacts (positive and negative as applicable)
- How it could be delivered (proposed ownership and governance of the output)
- Potential risks, constraints or other issues that may constrain or limit the ability to deliver the opportunity
- Net benefits from an economic, environmental and social viewpoint

Summary of prioritised actions

Summary of details and actions to take forward in each case. This to include:

- Nature of opportunity
- Scale of net benefits (energy, carbon, finance, social)
- Actions to take forward
- Proposed timeframes for development



Appendix B Supporting information

Mobilisation – identification of stakeholders

Table B.1 Wider initial potential stakeholder list

Stakeholder	Influence	Role
Development Trust	Ownership or management of local community assets and investment in local area	Introductions to other partners e.g. local authority, private or third sector bodies
Community Council	Promotion of local activities to support community	Source of previous surveys or questionnaires relating to local energy or transport issues Links with local authority and other public bodies
Community Energy group	Charitable or third sector body involved in promoting sustainable energy use and associated initiatives	Details of existing community energy generation Source of previous surveys or questionnaires relating to local energy or transport issues Links with local authority and other public bodies
Community groups / enterprises	Operation of community assets (e.g. shops, advice centres)	Experience in seeking funding for projects Direct energy consumption data for any buildings they operate
Local business representatives	Energy requirements for local businesses	Views of local business energy needs Source of previous surveys or questionnaires relating to local energy or transport issues Direct energy consumption data for any buildings they operate
Scottish Natural Heritage (SNH)	Protection and promotion of Scotland's natural heritage	Guidance on what items need to be considered in initial development thinking around stand-alone energy generation (e.g. wind turbines etc)
Scottish Environment Protection Agency (SEPA)	Permitting of energy generation where impacts are large enough and relevant to air, land or water	Guidance for initial work on hydro schemes Guidance for initial work on larger combustion plant (e.g. air quality requirements, decentralised energy schemes)
Historic Environment Scotland (HES)	Management of cultural heritage and ancient monuments	Guidance for siting community energy generation taking account of relevant cultural heritage issues. Experience and case studies of energy efficiency works and renewable energy installation within traditional buildings
Scottish Canals	Management of all assets associated with Scottish Canal network	Advice on feasibility work looking at using water source heat pumps or other ways of extracting heat from Canal water
Forestry Commission	Management of forestry in Scotland	Advice on land ownership Details of existing energy generation either proposed or operational on Forestry Commission land Advice on biomass supply chain
Scottish Power Energy Networks (SPEN)	Distribution network operator for electricity distribution and transmission network in central and Southern Scotland	Initial details regarding local electricity network and relevant sub-stations Support in developing larger scale energy generation Experience from any previous local community

		<p>generating assets</p> <p>Supplier of information about location of electricity supply cables and infrastructure</p>
Scottish and Southern Electricity Networks (SSE)	Distribution network operator for electricity distribution and transmission network in Northern Scotland	<p>Initial details regarding local electricity network and relevant sub-stations</p> <p>Support in developing larger scale energy generation</p> <p>Experience from any previous local community generating assets</p> <p>Supplier of information about location of electricity supply cables and infrastructure</p> <p>Information regarding potential future investment in the local area network</p>
Scottish Gas Networks (SGN)	Gas distribution operator for Scotland	<p>Initial details regarding local gas network and relevant details</p> <p>Support in developing larger scale energy generation</p> <p>Experience from any previous local community generating assets</p> <p>Supplier of information about location of mains gas pipework</p> <p>Information regarding potential future investment in the local area network</p>
Scottish Water	Management of local water supply and wastewater treatment works	<p>Overview of existing capacity of supply and wastewater treatment works in local area</p> <p>Details of energy consumption relating to operation of water supply and wastewater management</p> <p>Understanding of existing or planned energy generation on Scottish Water land (e.g. combined heat and power, anaerobic digestion, solar PV etc.)</p>
Local Authority	<p>Operator of buildings in the local area</p> <p>Operator of transport vehicles in the area</p> <p>Local planning and economic development lead</p>	<p>Support in understanding relevant local development, planning and other policy documents</p> <p>Broker to liaise with other stakeholders</p> <p>Supplier of data regarding energy consumption in local authority operated buildings (offices, schools, leisure centres etc.)</p> <p>Understanding of potential new development (residential and non-residential buildings) in the local area</p> <p>Understanding of existing support schemes for energy efficiency in targeted households</p>
NHSScotland Health Board	Responsible body for operating health service buildings in the local area	<p>Part of Community Planning Partnership group working in local area</p> <p>Details of energy consumption of health service buildings</p>
Energy Saving Trust (EST)	Supporting organisation for energy efficiency and low carbon behaviours in Scotland	Details of existing support initiatives led by Home Energy Scotland and other third party bodies
Local Energy Scotland	Advisory body supporting communities across Scotland in seeking local energy projects	<p>Advice around how to go about developing project ideas and sources of funding</p> <p>Experience from other existing community energy schemes and projects</p>

		Working relationships with other bodies relevant to energy generation
Registered Social Landlord (RSL)	Not-for-profit owner and operator of social housing (Housing Association)	<p>Details of existing housing stock in the local area and current works around energy efficiency and local energy supply</p> <p>Details of existing energy consumption among relevant housing stock</p> <p>Understanding of any future development in terms of the scale of development and associated energy requirements</p> <p>Experience in raising and applying for funding for projects</p>
Regional Transport Partnership (RTP)	Prepare and support regional transport strategies	<p>Details of transport / travel surveys relevant to local area</p> <p>Understanding of ongoing transport system initiatives in local area and across Scotland</p> <p>Working relationships with other bodies relevant to transport planning</p>
Transport Scotland	National transport agency for Scotland	Understanding of larger transport projects across Scotland that may impact on local area
Scottish Enterprise	Main economic development agency in Scotland	<p>Understanding of wider development programmes relevant to local area</p> <p>Overview of previous studies or reports relevant to local energy planning</p> <p>Connections with wider stakeholders</p>
Highland and Islands Enterprise	Economic and community development agency for Highlands and Islands	<p>Understanding of wider development programmes relevant to local area</p> <p>Overview of previous studies or reports relevant to local energy planning</p> <p>Connections with wider stakeholders</p>

Tier 1 Data Sources

Table B.2 Tier 1 data sources and use in Local Energy Plan

Data source	Description	Purpose for Local Energy Plan
Scotland's Census Data	Population estimate (and breakdown of age profile). Trends in population within the area	Provides a guide as to the scale of overall energy demand and how this might change in future based on broad population trends. Age profiling shows where different needs within the community might need to be met
	Housing data (total number of houses by tenure, age, type of dwelling and form of central heating)	<p>Knowledge of tenure helps understand who can influence improvements in energy efficiency or changes to energy supply (private owners, registered social landlords etc.)</p> <p>Understanding the typical age and type of dwelling (pre-1919, post-2002, detached, terraced etc.) helps to build a picture of the scale of energy requirements and what efficiency options are more or less appropriate for given dwellings (e.g. pre-1919 solid wall properties won't benefit from cavity wall insulation)</p> <p>Understanding how many properties have central heating and what fuel is</p>

		used to supply them helps understand how alternative systems could be used to replace or update them
	Employment (numbers of economically active and inactive; typical occupations and sectors of work)	Offers a snapshot of the scale of employment in the local area and how many residents are likely to travel to work rather than being home-based. Also shows scale of population likely to be at home during large parts of the day.
	Typical journey to work	Details of how economically active population typically travels to work guides understanding of scale of car use and other transport modes
	Vehicle ownership	Direct measure of the number of cars and vans registered as owned by residents within the study area. This supports the journey to work data and other statistics (see below) to understand travel patterns in the study area
Scottish Government Urban Rural Classification	6-fold or 8-fold scale that classifies areas on a scale of large urban to remote rural	This is useful simply to help direct further data gathering from other sources.
Scottish Index of Multiple Deprivation (SIMD)	Provides a basket of indicators that offer a view of relative deprivation for a given area. The ten point scale ranks from 1 (most deprived) to 10 (least deprived)	<p>Within the indicators are specific details that relate to transport requirements:</p> <p>Geography:</p> <ul style="list-style-type: none"> - Average drive time to a petrol station in minutes - Average drive time to a GP surgery in minutes - Average drive time to a post office in minutes - Average drive time to a primary school in minutes - Average drive time to a retail centre in minutes - Average drive time to a secondary school in minutes - Public transport travel time to a GP surgery in minutes - Public transport travel time to a post office in minutes - Public transport travel time to a retail centre in minutes <p>There are also details that enable a cross-check of central heating details</p> <p>Housing:</p> <ul style="list-style-type: none"> - Number of houses without central heating <p>The overall SIMD rating also offers guidance in terms of where aspects of fuel poverty or wider deprivation could be addressed to some extent by the LEP</p>
Scottish Government Energy Statistics	Overarching data for local areas looking at electricity and other fuel consumption. This combines some specific Scottish Government data with other data available via UK Government	<p>Provides a guide to overall trends in energy consumption across Scotland and in specific regions and areas.</p> <p>Provides more detailed overall consumption data for localities and settlements.</p>
	Community owned renewables	Details of existing community owned renewables within local authority areas.
Scotland's Heat Map	Overview of heat demand in local areas across Scotland	<p>Combines actual and estimated data for all areas across Scotland. Guides initial thoughts around where largest sources of heat demand are. It also provides details of large heat generating equipment (e.g. boilers, heat pumps) within a given area. Some information is also available regarding renewable energy generation including existing or proposed district heating networks.</p> <p>Geothermal data such as old mine working locations helps to identify potential ground based heat sources</p>
Historic Environment Scotland	Searchable details of environmental designations and cultural heritage and	Need to consider location of sensitive environmental areas and other cultural designations to ensure that any community energy development doesn't impact on them. Planning permission is less likely to be granted for any energy proposal if it impacts on these aspects. Case studies from HES

	other aspects of local environment	also offer understanding of how energy efficiency and renewable energy related works can be carried out in traditional buildings
Scotland's Environment	Website that provides environment information and data in one source.	Provides data about environmental designations and relevant indicators of environmental impact that need to be considered during the formation of the LEP
Scottish Renewables	Details of existing and proposed renewable energy schemes	Provides a national picture of the scale of renewable energy generation. Also offers more detail at a local authority level
Local Authorities	Details of existing and proposed renewable energy schemes	Some local authorities provide interactive maps showing renewable energy schemes in their area. This provides an indication of the scale of energy output that these schemes offer as well as their physical location
Home Energy Scotland	National provider of advice regarding energy saving, renewable energy, sustainable transport, waste prevention	Understanding of energy use in residential properties and data availability (including limitations) in this respect. Source of information regarding programmes of energy efficiency works and use of renewable energy generation in residential properties
Resource Efficient Scotland	National programme offering advice and technical support to organisations around resource efficiency	Experience and case studies relating to resource efficiency and renewable energy generation within organisations and businesses across Scotland
Third party sites	Details of existing and proposed renewable energy schemes	There are a number of other sites that can offer a view of existing and proposed renewable energy developments, for example http://renewables-map.co.uk/county.asp?countycode=HLD&SUBMIT=Show+by+County
Scottish Power	Details of individual sub-stations and existing capacity to connect energy generation	Interactive map provides overview of existing sub-stations and how capacity is available for future local energy generation https://www.spenergynetworks.co.uk/pages/sp_distribution_heat_maps.aspx
Scottish and Southern Electricity Networks	Details of individual sub-stations and existing capacity to connect energy generation	Interactive map provides overview of existing sub-stations and how capacity is available for future local energy generation https://www.ssepd.co.uk/ContractedDemandMap/?mapareaid=3
Scottish Water	Details of water treatment capacity and scale of wastewater treatment facilities. Energy consumption and generation on operating sites	Determines any constraint to future development due to over capacity on water and sewage systems. Potential supplier of electricity or heat from operating sites. Otherwise, also a large energy consumer that could purchase energy generated within the local community.
Scottish Gas Networks (SGN)	Overview of mains gas supply pipelines	Initial overview of the location of high pressure transmission pipework and availability of mains gas supply in a given area

Tier 2 Datasets

Figure B.1 Example of consumption data collected

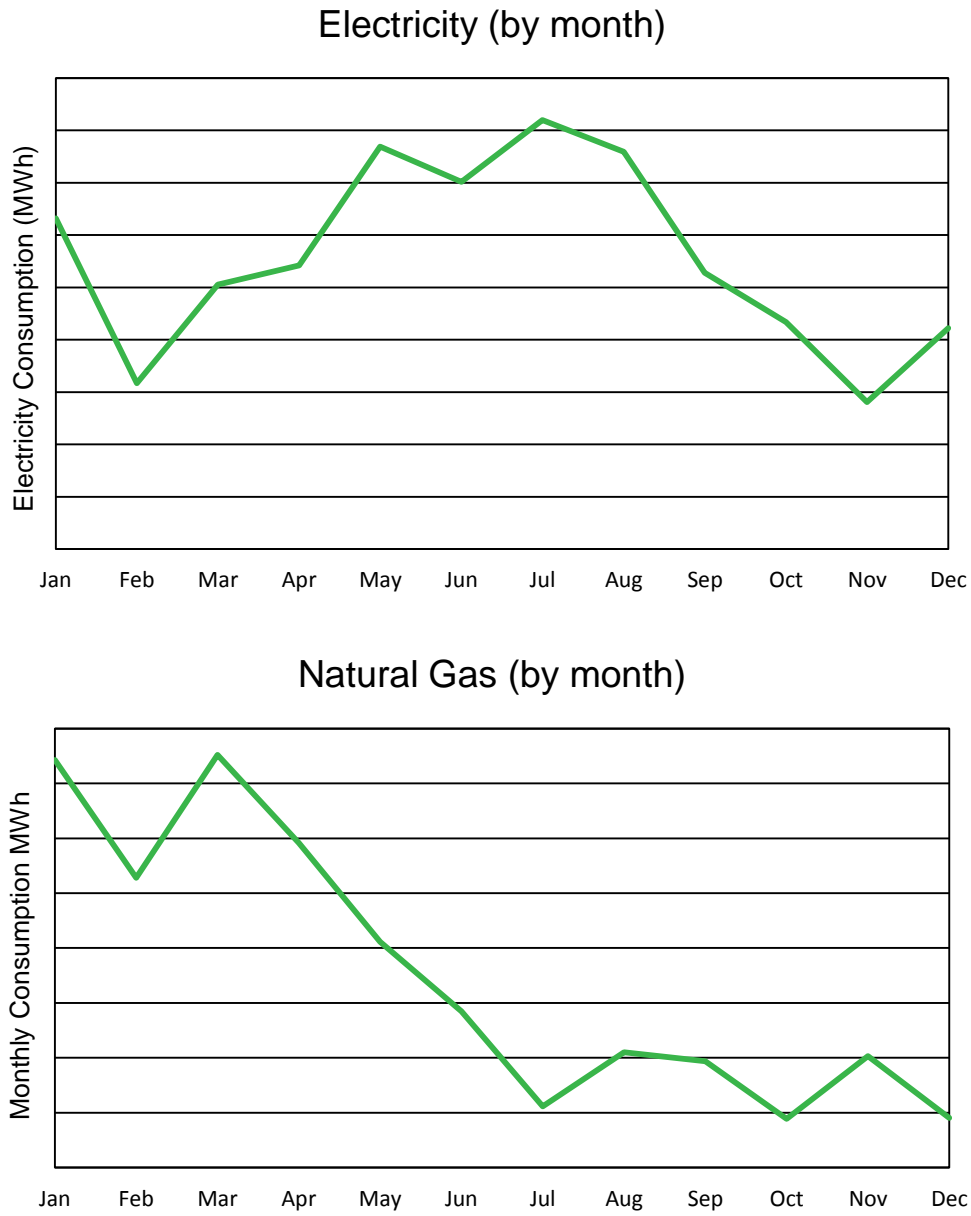


Table B.3 Tier 2 datasets available

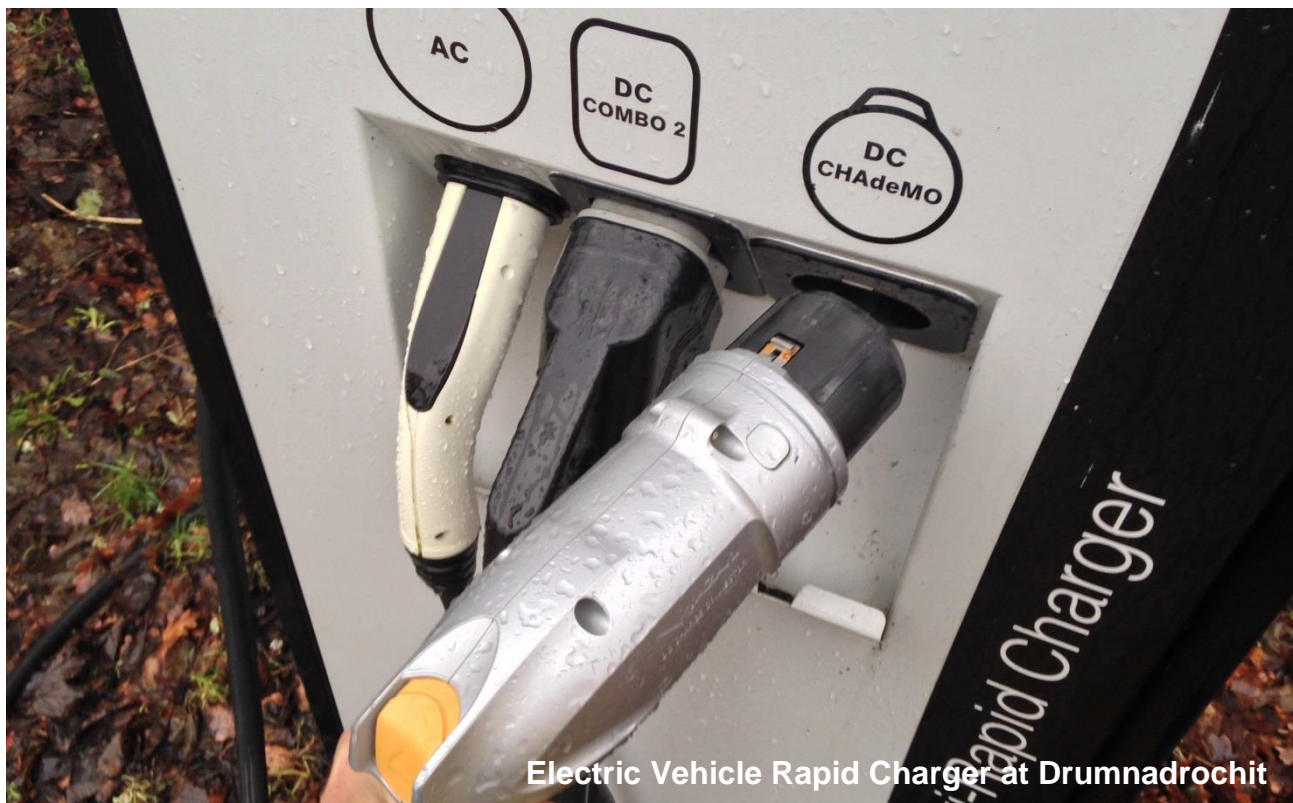
Source	Description	Examples of buildings	Level of detail	Use in Local Energy Plan
Local Authority	Energy use data from buildings operated directly by the Authority Renewable energy generation in operation	Offices, storage facilities, depots, leisure centre, community halls, theatres, court buildings	Monthly breakdown of actual billing data by fuel type over a 12-month period. Energy data in kWh (or similar energy units) for each fuel Confirmation of floor area of individual buildings and general construction details Monthly output from renewable energy generation	Builds detail of local energy plan demand Builds detail of existing available energy generation
NHS Scotland	Energy use data from buildings operated directly by the NHS Renewable energy generation in operation Fleet vehicles used locally	Hospitals, clinics, health centres, community care facilities	Monthly breakdown of actual billing data by fuel type over a 12-month period. Energy data in kWh (or similar energy units) for each fuel Confirmation of floor area of individual buildings and general construction details	Builds detail of local energy plan demand Builds detail of existing available energy generation Overview of fleet vehicles that might be alternatively fuelled in future
Registered Social Landlord	Energy use data from buildings operated directly by the RSL Renewable energy generation	Housing schemes, housing blocks	Monthly breakdown of actual billing data by fuel type over a 12-month period. Energy data in kWh (or similar energy units) for each fuel Confirmation of floor area of individual buildings and general construction details	Builds detail of local energy plan demand Builds detail of existing available energy generation and heat networks (where applicable)
Other businesses	Energy use data from buildings operated	Industrial premises	Monthly breakdown of actual billing data by fuel type over a 12-month period. Energy data in kWh (or similar energy units) for each fuel Confirmation of floor area of individual buildings and general construction details	Understanding of demand for energy and potential waste heat or electricity that could be used to supply neighbouring premises
Transport operators	Existing services and fuel used Ongoing or proposed changes to vehicle fuel or type	Road, air or ferry links	Description of vehicle fleet Quantities of fuel used and typical fuel efficiency	Understanding of impact within local community and where future energy supply might support fuel switching
Energy Saving Trust	Home Analytics database / Portfolio Energy Analysis Tool (PEAT)	Residential dwellings in the area	Details of energy efficiency, existing heating fuel used and costs of energy. Estimates of benefit of interventions such as insulation or renewable energy generation	Builds understanding of existing efficiency and fuel use and how this might be improved or changed

Energy baseline

Table B.4 Example breakdown of energy profile of study area (annual snapshot) - electricity

Existing energy demand	Domestic	Non-domestic	Sub-Total	Carbon sub-total
Electricity	Residential – privately owned	Local authority buildings	401,000 kWh	154 tCO _{2e}
	40,000 kWh	30,000 kWh		
	Residential – RSL	NHS Scotland buildings		
	120,000 kWh	65,000 kWh		
		Local commercial business		
		40,000 kWh		
		Utility companies		
		100,000 kWh		
		Transport companies		
		0 kWh		
	Charitable and other bodies			
	6,000 kWh			

Note: Carbon emission conversion factor taken from BEIS



Electric Vehicle Rapid Charger at Drumnadrochit

Concept Design Options

Table B.5 Options matrix summary example

Opportunity	Description	Enabling infrastructure	Output / Impact	Risks / Constraints	Funding / Delivery
District heating	Use of waste heat from industrial user to feed heating for new development of 12 houses	Distribution pipework from industrial user to housing development site (ca. 1 km) Underfloor heating for new homes (40 deg C supply temperature)	80,000 kWh per annum of heat. Sufficient for ca. 80% of total heat demand	Industrial user may replace existing turbine Developer selects wall mounted radiators	Work with local authority as identified project within LHEES
Water source heat pump	Heat pump fed from local loch supplies space heating for community centre and adjacent industrial units	Heating coil in loch Plant room housing for heat pump Large radiators	50,000 kWh per annum of heat. Sufficient for 100% of demand	Maintenance regime for heat pump (insufficient local experience)	Crowd funding route
Solid wall insulation programme	Solid wall insulation work on targeted pre-1919 dwellings in the area	None	40% reduction in heating energy for each dwelling	Lack of associated work to reduce damp in some dwellings Lack of local installers	Work with local authority and explore funding routes via ECO or SEEP
Solar PV ground mounted array	Ground mounted solar array in land adjacent to settlement	Private wire to feed supply to community hall and RSL operated housing block	100 kWp array	Objection through planning process	Match funding with RSL
Etc	Etc	Etc	Etc	Etc	Etc

Note: All examples are for illustrative purposes only; this does not reflect actual analysis for any LEP

Commissioned by the Energy Saving Trust on behalf of the
Scottish Government and European Union
Produced by Local Energy Scotland and Amec Foster
Wheeler Environment & Infrastructure UK Limited

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This document was last updated March 2018

