South East Midlands

ENERGY STRATEGY

Executive Summary

SEMLEP
South East Midlands
Local Enterprise Partnership

NATIONAL ENERGY FOUNDATION

Key Objectives

The key objective of SEMLEP's Energy Strategy is to ensure that energy availability does not limit the area's growth and prosperity. In addition to developing options to overcome energy supply and infrastructure constraints, a forward-looking and sustainable energy strategy needs to incorporate a range of considerations around emerging drivers and policies. The key considerations are summarised below.

Policy / Driver	Key targets / commitments / considerations
Climate Change Act (2008) legislation.gov.uk	UK is committed to reduce carbon dioxide emissions to 80% below 1990 levels by 2050.
Clean Growth Strategy (2017) gov.uk	Support businesses to improve energy efficiency and productivity, by at least 20% by 2030. Support for heat networks and innovation.
Clean Air Strategy (2018) consult.defra.gov.uk	New fossil fuel powered vehicles will be outlawed between 2040 and 2050. Including diesel trains.
Industrial Strategy (2017) gov.uk	Innovation and research funding, clean growth in construction, clean smart energy, electric vehicle infrastructure, industrial productivity.
Renewable energy (2018) ec.europa.eu	The UK has targets to meet 15% of energy from renewables by 2020 and 32% by 2030 (EU).
Heat Networks (2017) gov.uk	Clean growth strategy sets targets for heat networks to supply 17% of heat demand in homes and 24% of heat demand in industrial and public-sector buildings by 2050 (currently 1%)

If fully implemented, these policies will need to drive huge change and require new approaches and new solutions across all sectors of society. This Energy Strategy aims to provide a prioritised route map for SEMLEP across this changing landscape. The first step on this journey is to gain an appreciation of the current position across the area, in terms of energy supply, capacity and demand. The following section summarises the evidence gathered, in order to establish the 'baseline' position for SEMLEP.

Background

The South East Midlands is a high growth £50bn economy, with a population of around 2 million people, along with over 90,000 businesses. The South East Midlands Local Enterprise Partnership (SEMLEP) aims to help economic growth thrive across the South East Midlands.

SEMLEP's Strategic Economic Plan (SEP) (semlep.com/strategic-economic-plan/) sets out the actions and investments needed to achieve the full potential of the area, as a strategically important centre for growth, prosperity and innovation. Priorities identified in the SEP include the need for major new house building programmes, improved transport infrastructure, new investment to drive business and employment growth and support for innovation and 'showcase' sectors across the area.

The SEP also identifies the need for an Energy Strategy, to help address the immediate energy capacity and infrastructure issues and to define options for meeting the area's future energy needs. In order to achieve the target of doubling the size of the South East Midlands economy by 2050, a strategic approach to energy is required, to provide a viable, sustainable and secure energy infrastructure across the area.

Having successfully obtained funding from the Department for Business, Energy and Industrial Strategy (BEIS), SEMLEP commissioned the National Energy Foundation (NEF) to develop an energy strategy for the Area. The strategy aims to:

- Produce an evidence base of the current energy needs of the area for power, heat and transport, along with projected future requirements;
- Identify actions to unlock growth over the short term; and
- Determine opportunities and options for meeting the area's future energy needs, building on existing technological strengths.

It is intended that the strategy will influence the strategic vision and framework for the future development of the area, in particular the local planning process and the area's Local Industrial Strategy, as well as projects to be undertaken by the Greater South East Energy Hub (energyhub.org.uk).

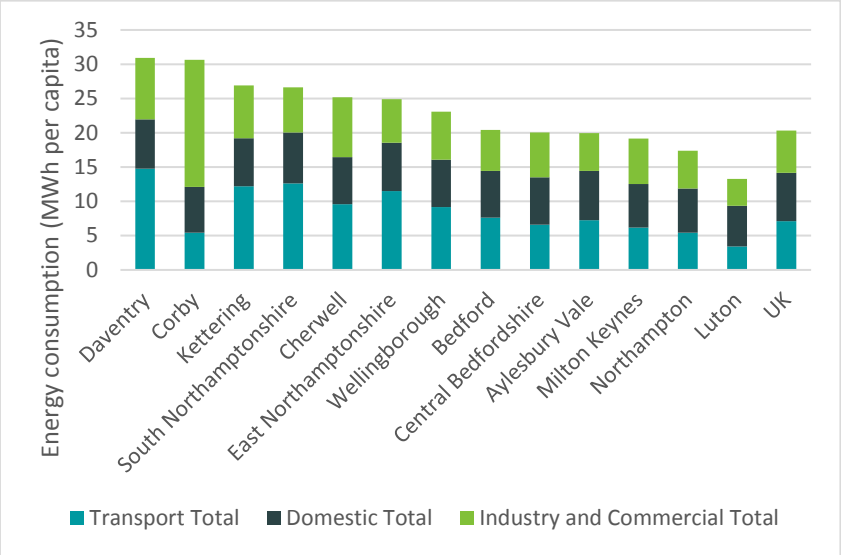
Evidence Base

The evidence was assembled through a combination of stakeholder engagement[1] (workshops and interviews) and desk-based research.

Baseline energy consumption

Since 2007, energy consumption in SEMLEP has shown a downward trend. This has mainly been driven by reduced transport demand post-economic recession, in line with UK and Europe-wide energy use patterns, as well as more environmentally aware consumer behaviours. In 2017 the baseline energy use for SEMLEP was approximately 37 TWh[2]. This energy use represents around 2.8% of the national total (for 3.6% of the national population). The SEMLEP area average for energy consumption per capita is around 21 MWh, 5% above the national average of 20 MWh per capita[3]. A breakdown of energy consumption per capita, by sector and by local authority, with a comparison to the national average, is shown in the chart below.

[1] List of stakeholder activities undertaken: Economic Development Officer meeting (Feb 2018); Stakeholder Workshop 1 – Opportunities and Challenges (April 2018); Stakeholder Workshop 2 – Action Planning (May 2018); Planning Officer meeting (April 2018); PDIIDG meeting (April 2018); Meeting with WPD (April 2018); Meeting with Cadent Gas (May 2018); Telephone interviews with UK Power Networks (July 2018); Telephone interview with Evenergi (July 2018).



Energy capacity and demand

Energy assets in the SEMLEP area

The following table provides a summary of the existing energy assets across SEMLEP.

Asset type	Location / Capacity	Notes
Power Stations [4]	Corby (CCGT) 401 MW Little Barford (CCGT/gas/oil) 737 MW	▪ 2% of total UK fossil fuel power station capacity
Renewable Energy Installations [5]	See table below	▪ 987 MW - 3% of UK. ▪ 76 MW per SEMLEP Local Authority ▪ 84 MW is the UK average
Heat Networks [6]	See table below	▪ 331 networks in SEMLEP ▪ 262 MW heating capacity (1.3% of UK capacity) ▪ 25 heat networks per SEMLEP LA ▪ National average is 27 per LA

Local Authority	MW	Local Authority	MW
Central Bedfordshire	146	Kettering	79
East Northamptonshire	135	Milton Keynes	71
Cherwell	128	Northampton	16
Aylesbury Vale	103	Wellingborough	16
South Northamptonshire	99	Corby	10
Bedford	96	Luton	4
Daventry	83		

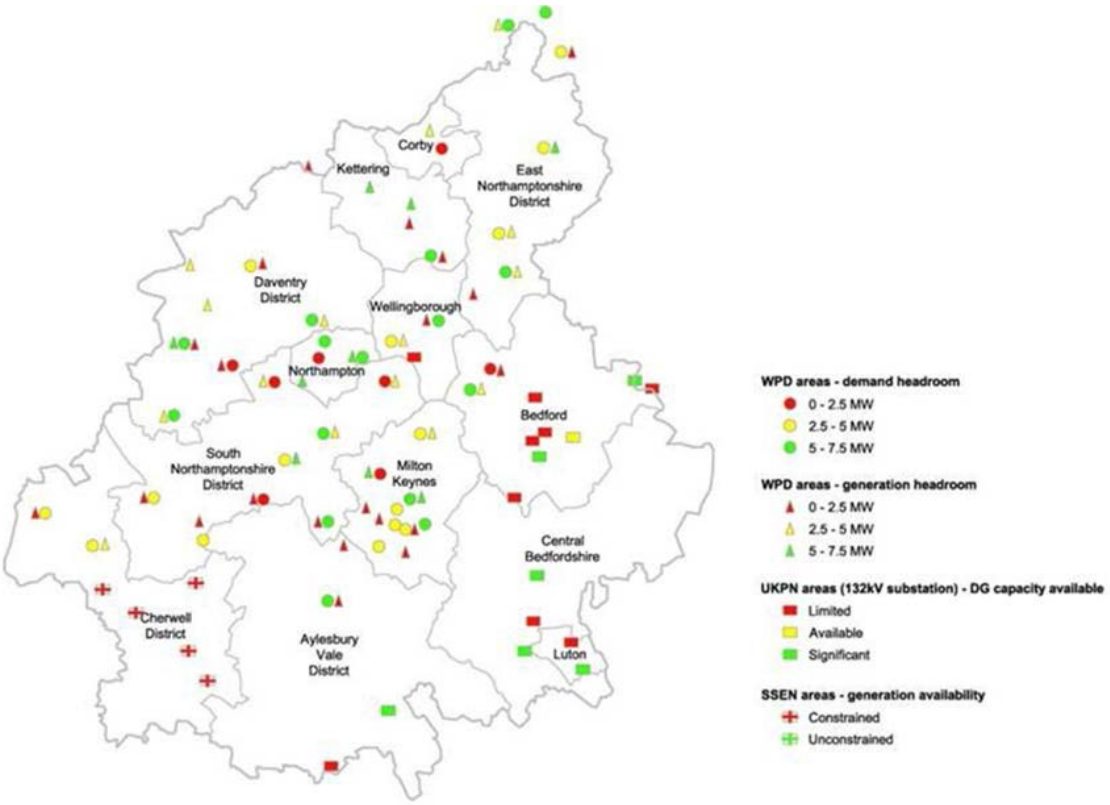
Local Authority	No.	Local Authority	No.
Milton Keynes	87	Corby	16
Luton	75	Wellingborough	12
Northampton	27	Kettering	9
Central Bedfordshire	23	South Northamptonshire	8
Aylesbury Vale	22	East Northamptonshire	6
Bedford	22	Daventry	3
Cherwell	21		

Electricity

The current electricity network capacity across SEMLEP is estimated to be 3,850 MW. Information provided primarily by Western Power Distribution (WPD), who operate the majority of this network, indicates that there are currently supply capacity constraints in some areas. A number of Local Authority stakeholders also provided evidence of supply constraints, which had negatively impacted new developments in areas such as Luton and Bicester. In addition, during the stakeholder engagement events, anecdotal evidence

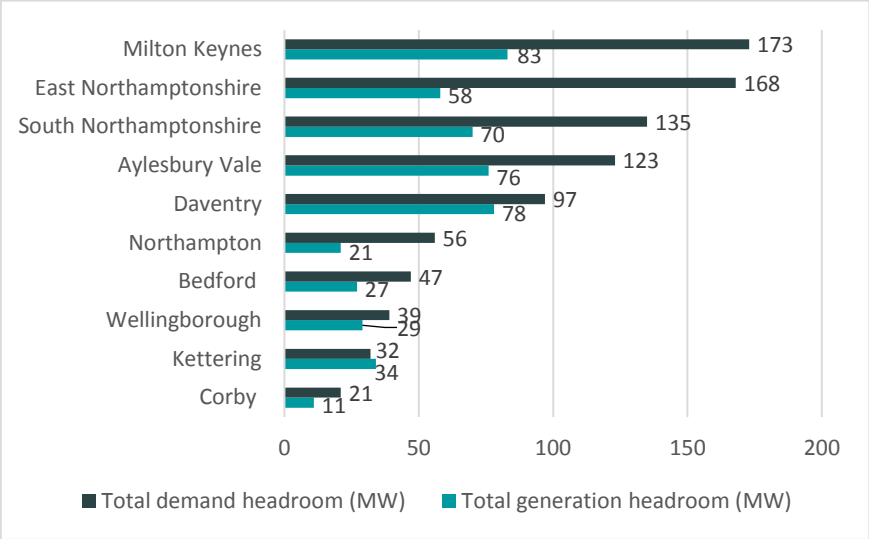
emerged of businesses struggling to expand and invest and commercial developments being delayed due to supply constraints. In addition, some developments are now being marketed primarily on the basis of available electrical capacity.

As part of this strategy development, NEF have developed maps showing areas of varying constraint across SEMLEP. A summary of these is provided in the map below. This illustrates the areas of supply constraint, as indicated by the amount of headroom (spare capacity available for new supply). Where available, it also shows the areas of constraint in terms of generation headroom (spare capacity for new generation to be connected to the network). The degree of constraint is indicated by colour coding with red indicating most constraint and green the least.



In addition to the map, a bar chart illustrating the relative constraints for different Local Authorities within the WPD licence area is provided below, with the blue lines for demand headroom and red for generation capacity.

For the WPD area, Corby is the local authority with the least capacity available across the area; Kettering, Wellingborough, Bedford and Northampton also face constraints, particularly on the generation side. Milton Keynes has the greatest headroom in terms of capacity to meet demand.



The overall spare demand capacity available in SEMLEP is estimated to be 911 MW, which is around 24% of estimated current network capacity. Across the SEMLEP area as a whole, this represents a relatively healthy position in terms of providing for traditional, incremental growth (1-2% per annum). However future growth is unlikely to follow an incremental path, due to the high growth opportunities of the Oxford-Milton Keynes-Cambridge Growth Arc, it will involve larger scale new developments and high growth locations. Scenarios for the future growth in electricity demand have been developed and are outlined later in this summary.

In some parts of the SEMLEP area, there is a significant shortfall of capacity headroom for renewable generation: WPD list 15 in this category compared to just 3 with demand headroom exhausted. For example, the Epwell substation in the Cherwell area, which is linked to the WPD West Midlands network, has a negative generation headroom of 5.03 MVA (Megavolt Amp) owing to a large solar farm near the village. In the longer term, this may act as a further constraint on adding new solar capacity and may encourage distributed storage. This could be achieved using batteries, or potentially through innovative solutions such as compressed air.

On top of these growth-driven constraints, there is also a known mismatch between peak demand periods and headroom capacity, with domestic demand peaks occurring in the early evening (6 pm), whilst industrial and commercial driven peaks occur towards the middle of the day (2 pm). Variation in demand peaks leads to imbalances in network loading, which affects available capacity for supply and generation along with affecting energy pricing. This requires new approaches to manage demand actively e.g. through smart data, technology and new financial incentives. It also requires user engagement.

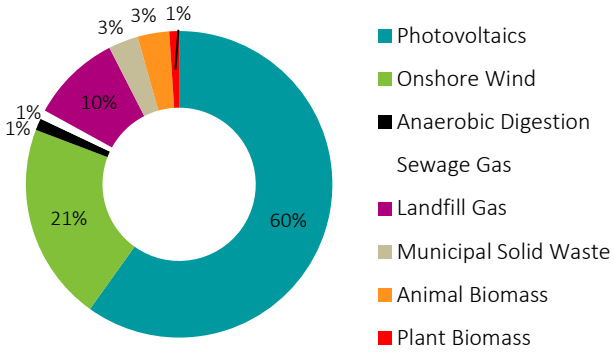
Finally, the SEMLEP area's plans for housing and employment growth aim to drive significant growth in new building developments (for homes and businesses) e.g. non-domestic building pipelines in Cherwell, South Northamptonshire, Milton Keynes and Bedford. There is compelling evidence[7][8][9] that new buildings are failing to achieve their basic design energy (and carbon) performance targets (with typical performance gaps of 200%). In addition, many of the buildings that will exist in 2050[10] have already been built and are inefficient.

The evidence indicates that electricity capacity constraints represent an important risk factor for SEMLEP, in terms of the potential impact upon high growth and major new development.

There is also good evidence that inefficient existing and new buildings increase demands on the energy network and reduce business efficiency and productivity. This is a particularly important risk for SEMLEP, in view of the high volume of development in the pipeline in areas such as Milton Keynes, Bedford, South Northamptonshire and Cherwell.

Distributed generation and renewable energy

Installed renewable energy generation capacity in the SEMLEP area amounts to approximately 987 MW, which constitutes 3% of the total installed in the UK (for an area which constitutes 3.6% of the national population). The chart opposite shows the breakdown of renewable energy across SEMLEP by source.



Across the area there are also network constraints in terms of the capacity to connect additional distributed electricity generation. 16% of substations operate at full capacity in the WPD licence area. The chart above showed the constraints for different areas across SEMLEP.

The current SEMLEP total 'headroom' capacity for connecting distributed generation is estimated to be 635 MW, which is around 60% of what has already been installed. This would represent a healthy position in terms of slow incremental growth. However, discussions with and data provided by Western Power Distribution, indicate that for the major growth targets for SEMLEP, this will present significant challenges and risks. During the stakeholder engagement, evidence emerged of such constraints e.g. Corby Borough Council has withdrawn early investment in solar projects due to grid constraints which has had an impact on domestic (fuel poverty) and operational carbon emissions. At the time the site proposed would have been one of the largest LA funded solar installations in the country. Scenarios for the growth in future distributed generation have been developed and are explored further in this summary. However, overall distributed generation will have an important role to play in meeting the future energy needs of the area.

The evidence indicates that network constraints, associated with the connection of new distributed generation, represent an important risk factor for SEMLEP, in terms of their potential impact upon growth, new development and sustainability targets.

Natural gas

The natural gas network across SEMLEP is mainly operated by Cadent Gas, which was formed following the sale of National Grid Gas Distribution in 2017. The SEMLEP area's baseline gas consumption is currently estimated to be 7,827 GWh for domestic buildings and 3,699 GWh for industry and commercial buildings. This equates to 2.6% and 2.1% of respective national totals (compared to 3.6% of national population). Analysis from Cadent Gas[11] suggests that overall gas demand and use will remain relatively flat, which is somewhat inconsistent with overarching UK targets to move away from fossil fuel use, in

order to meet carbon emission targets and Clean Growth Strategy objectives. In the development of the future scenario projections, outlined in this summary, it has therefore been assumed that gas and other fossil fuels use will be reduced. This will involve the widespread adoption of electrically powered technologies such as heat pumps.

The evidence indicates that gas network capacity constraints do not appear to present a key risk factor for growth and new developments. However, achieving the switch from gas to electricity and alternative fuels, in a practical and financially viable way, represents a huge challenge.

Heat networks

A heat network consists of a central heat generator e.g. a large boiler, which supplies one or more properties with heat via a distribution network. There are currently 331 heat networks across SEMLEP[6] supplying 211 GWh (262 MW installed capacity) of heating energy and 17 GWh (30 MW installed capacity) of cooling energy, with natural gas as the principal energy source.

A breakdown by Local Authority was provided earlier in the list of energy assets, with Milton Keynes and Luton having approximately 50% of heat networks in the area. Currently in SEMLEP the number of buildings connected to heat networks is around 1,800, approximately 0.1% of the total building stock.

Future scenario projections (provided later in this summary), assume around 20% of buildings will be connected to a low carbon heat network by 2050, in line with the projections set out in the Clean Growth Strategy.

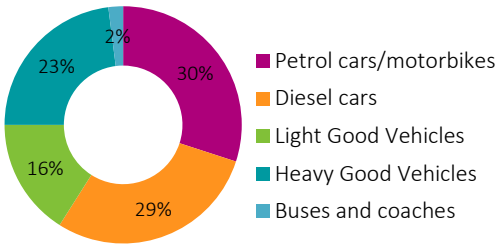
Heat networks have an important role to play in terms of meeting the future energy needs of the area and delivering carbon reduction targets. The development of a whole new type of infrastructure is a huge challenge and will require a large amount of support from a range of stakeholders across the SEMLEP area.

Transport energy

The transport baseline information was derived from the Evidence Baseline Report 2018[13], produced by WSP as stage 1 in the Strategic Transport Strategy for England's Economic Heartland, and DfT statistics. The Transport Strategy considered Statutory Local Plans developed by the EEH Authorities, which provided long-term guidance on a wide range of issues, including local transport and growth.

Road

Road transport energy consumption[12] in the SEMLEP area is estimated to total 14,200 GWh for personal use and 6,944 GWh for freight use. The breakdown in energy use by vehicle type is shown in chart on the right.



There are currently 1.5m licensed vehicles in the area, made up from petrol cars (including hybrids) (48%), diesel cars (38%); light good

vehicles (9%); motorcycles (3%); heavy good vehicles (2%); buses and coaches (0.4%). This population is expected to grow significantly over the next 30 years, by between 244,000 (medium growth scenario) and 422,000 (NIC high growth scenario).

As car ownership rises, weekday traffic is expected to grow by approximately 32% on rural principal roads and 35% on motorways, with particular growth in the central belt Aylesbury Vale-Milton Keynes-Bedford-Corby, the A507 in Bedfordshire, the A4146 and A421 in Milton Keynes and the M1 south of Luton.

The Strategic Road Network is well-developed along the north-south axis; the east-west transport infrastructure is missing strategic road or rail links towards Oxford and Cambridge. Strategic Road Network improvement are focused on M1 Smart motorway (M6/Milton Keynes); A47 junctions; A428 (Black Cat/Caxton Gibbet); and A34 junctions.

Road capacity stress is experienced on the A1 between the A14 and A421, and A421 as part of the area's Strategic Road Network; and A34, A40, A43 (Oxford-Bicester-Brackley); M1, A5, A509, A421, A43 (Luton-Dunstable-Milton Keynes-Northampton); A14 (Cambridge) as part of the non-motorway routes.

Public transport

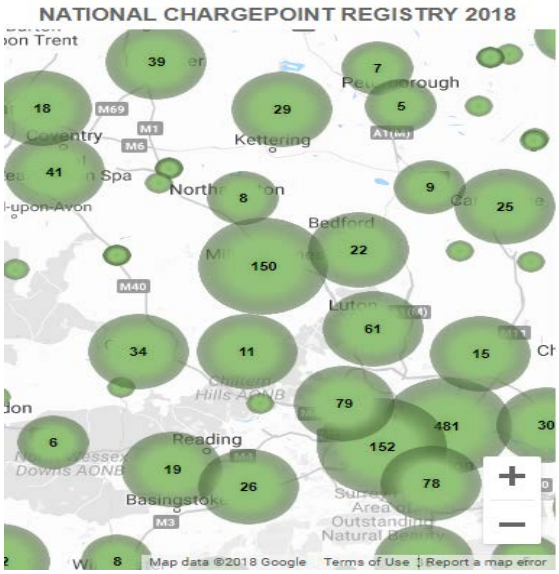
Across the SEMLEP area public transport use and walking are 1% lower than the England and Wales average; cycling is 1% higher than the average for England and Wales for residents (4%) and 2% lower for the workplace population.

The area suffers from rail network stress during morning peak periods in Thameslink (Bedford, Luton) and afternoon peak in London Northwestern (Northamptonshire and Milton Keynes), in addition to morning peak services to London in both train operators' services. There are two national rail schemes committed in the area: East West Rail and HS2.

Finally, coach services are focused on linking primary urban areas to major airports and do not normally stop at secondary settlements across the area.

Electric vehicle infrastructure

The adjacent map provides an overview of the current installed electric vehicle charging points across the South East and Midlands, obtained from the government's National Chargepoint registry[14], which contains 4,190 locations nationally, with around 231 (5.8%) in SEMLEP. Milton Keynes stands out with around 150 charging points, comparable with volumes in London. There is scope for improvement in other parts of the SEMLEP area.



The anticipated growth in private vehicles, along with the need to phase out the use of fossil fuels, highlights the importance of electric vehicles to the energy strategy. The development of new EV infrastructure, including the electricity supply network, is a key challenge and risk for SEMLEP in terms of sustainable growth.

The evidence indicates that poor public transport connectivity East-West and scarce modal shift opportunities (from private to public transport) affect inter-connection between towns/cities, commuters and local communities. This has a knock-on effect on the productivity of the Area and represents an ongoing risk to growth.

Energy scenarios

The Strategy contrasts four future scenarios for energy use across the area. These align with the high prosperity scenarios developed by the National Grid[15], referred to as 'Consumer Power' and 'Gone Green'. These were used to reflect the high growth ambitions of the SEMLEP area defined in the Strategic Economic Plan. Consumer Power is market-driven, whilst Gone Green is more sustainability driven.

The two scenarios contain two variants in relation to the scale of predicted housing development. One is based on Local Authority plans, while the other is based on the growth projections put together by the National Infrastructure Commission (NIC). These scenarios were selected as they align with the gone green high growth ambitions of the SEMLEP area, alongside the ambition to drive the sustainability agenda, as set out in the Strategic Economic Plan.

Local Authority Plans	NIC
Gone Green Medium Growth	Gone Green High Growth
> High Prosperity – medium growth levels > Housing growth based on Local Plans projections of approximately 340,000 new units by 2050 > High sustainability ambition	> High Prosperity – high growth levels > Housing growth based on National Infrastructure Commission (NIC) estimates of 560,000 new units by 2050. > High sustainability ambition
Consumer Power Medium Growth	Consumer Power High Growth
> High Prosperity – medium growth levels > Housing growth based on Local Plans projections of approximately 340,000 new units by 2050 > Low sustainability ambition	> High Prosperity – high growth levels > Housing growth based on National Infrastructure Commission (NIC) estimates of 560,000 new units by 2050. > Low sustainability ambition

By using these scenarios, it was possible to integrate the significant analysis carried out by Western Power Distribution within the Strategy, and then to tailor the scenarios in line with SEMLEP requirements.

Outcomes of the scenarios to 2050

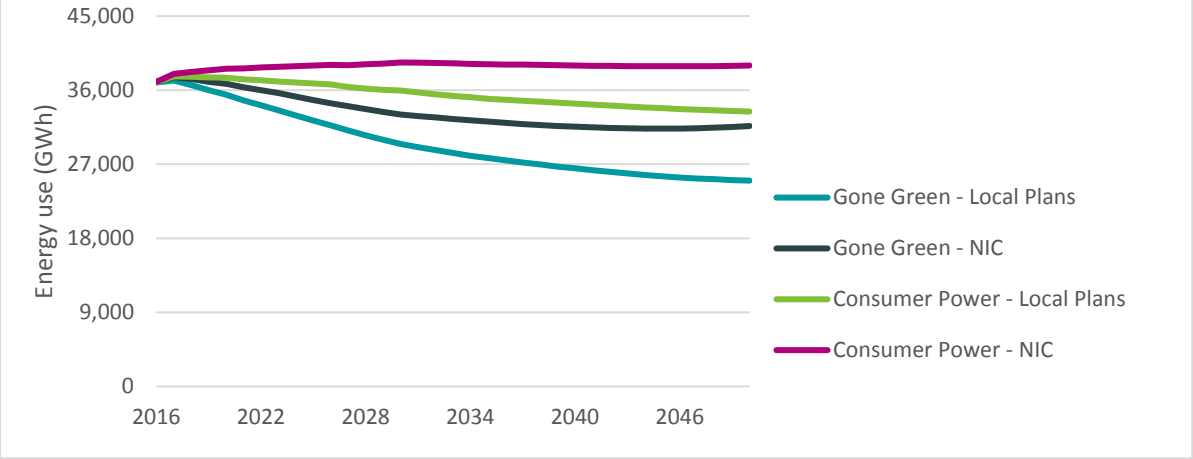
Starting from the current baseline position for SEMLEP, each scenario was modelled and the outcomes for each are summarised below.

Gone Green	Consumer Power

- By 2050 fossil fuel use will have been reduced significantly (by around 60-70%)
- Petrol and diesel will have been replaced by the use of electric vehicles and hybrids.
- Natural gas will have been significantly replaced by electric heat pumps integrated with solar energy as the main source of space heating.
- Low carbon heating systems will supply 1 in 5 buildings
- Renewable energy and distributed generation use will be making a significant contribution to electricity supply

- By 2050 fossil fuel use will have reduced by 20-30%
- Petrol and diesel vehicles will still be used but at significantly lower levels than currently, accounting for approximately 30% of overall number of vehicles
- Natural gas will still be used for space heating in a significant number of buildings
- Low carbon heating systems will supply 1 in 10 buildings
- Renewable energy and distributed generation use will have increased but to a lower level than for Gone Green

The main results, for each of the four scenarios, are summarised below.



Gone Green Medium Growth

- Electricity demand will rise by 111% (1,615 MW)
- 0% overall purely fossil fuel vehicles
- 31% reduction in natural gas use
- Distributed generation increases by 266% (2,087 MW)
- Energy from low-carbon heat networks will rise by 5,488 GWh

Gone Green High Growth

- Electricity demand will rise by 130% (1,896 MW)
- 0% overall purely fossil fuel vehicles
- 19% reduction in natural gas use
- Distributed generation increases by 315% (2,474 MW)
- Energy from low-carbon heat networks will rise by 8,919 GWh

Consumer Power Medium Growth

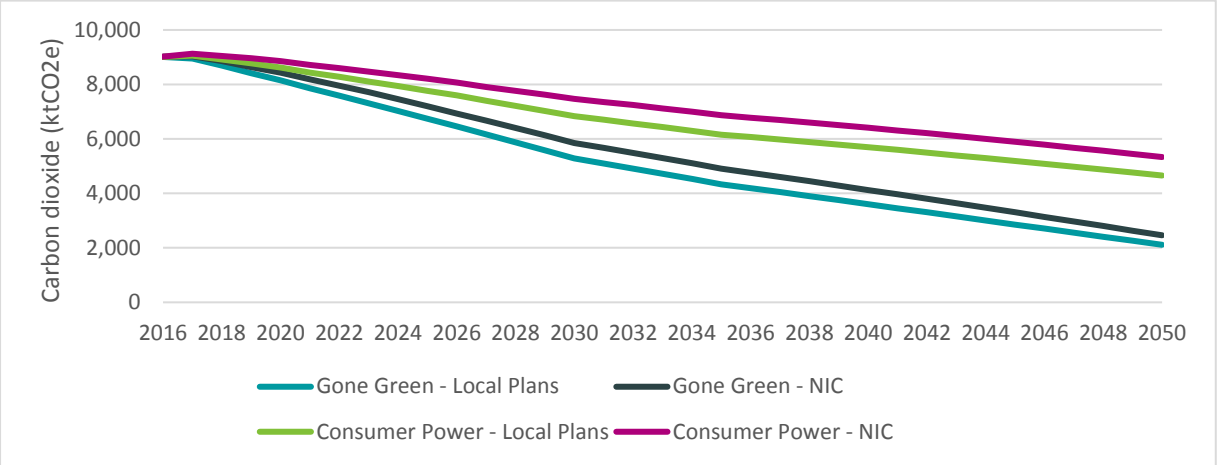
- Electricity demand will rise by 90% (1,315 MW)
- 30% overall fossil fuel vehicles
- 14% increase in natural gas use
- Distributed generation increases by 101% (795 MW)
- Energy from low-carbon heat networks will rise by 1,295 GWh

Consumer Power High Growth

- Electricity demand will rise by 107% (1,559 MW)
- 30% overall fossil fuel vehicles
- 33% increase in natural gas use
- Distributed generation increases by 124% (971 MW)
- Energy from low-carbon heat networks will rise by 2,087 GWh

Carbon dioxide emissions

The future projections for the SEMLEP area's carbon emissions, for each scenario, is shown in the chart below. The impact of each scenario against current (2016) emissions is as follows.



- 77% reduction (2016-2050), Gone Green, medium growth
- 73% reduction (2016-2050), Gone Green, high growth
- 48% reduction (2016-2050), Consumer Power, medium growth
- 41% reduction (2016-2050), Consumer Power, high growth

Note that are allowing for historical decarbonisation, both the Gone Green scenarios exceed the Climate Change Act targets for CO_2 reductions, but the Consumer Power ones do not.

Key issues

From a consideration of the evidence base findings and the scenario modelling, the key issues and challenges are summarised as follows.

	Evidence and Findings	Key Issues for SEMLEP
Energy Supply - Capacity constraints	Electricity network capacity is constrained in certain parts of SEMLEP. Around 5% of the network with zero demand headroom capacity (e.g. Hanslope Park, Northampton West, Silverstone, Weedon, Corby). A further 20% has demand headroom of less than 5MW.	Supply constraints can delay or stop developments and impact business operation. Recent examples include Luton and Bicester. Overall 'spare' capacity is around 24%. This is healthy for incremental growth but is a risk for a high growth area like SEMLEP.
Energy Supply – Distributed generation constraints	Around 16% of substations within the WPD area have no headroom to export distributed generation (e.g. from renewables). Constrained areas include Bletchley, Wellingborough, Irthlingborough, Daventry and Kettering.	Distributed generation from renewable sources is assumed to provide an important part of the future SEMLEP energy supply. Any constraints on generation will hinder growth, as well as the achievement of energy self-sufficiency, job creation and national carbon reduction targets.
Energy Supply – Low carbon heat networks	There are 331 heat networks (district and communal) in the SEMLEP area, with installed capacity of 262 MW for heating and 30 MW for cooling. Currently approximately 0.1% of SEMLEP buildings are connected to heat networks (current mapping by CBC under HNDU[16])	Government clean growth targets envision around 20% of buildings to be connected to low carbon heat networks by 2050. This represents a huge change and challenge for the area.
Energy Demand – energy (and carbon) efficiency of buildings	SEMLEP's housing and employment targets aim to drive significant growth in new building developments (for homes and businesses) e.g. non-domestic pipelines in Cherwell, South Northamptonshire, Milton Keynes and Bedford. There is compelling evidence that new buildings are failing to achieve	Inefficient existing and new buildings increase demands on the energy network and reduce business efficiency. This is a particularly important risk for SEMLEP, in view of the high volume of domestic and non-domestic development in the pipeline.

	Evidence and Findings	Key Issues for SEMLEP
	their basic design energy performance targets (typical performance gaps of 200%). In addition, many buildings that will exist in 2050 have already been built and many are inefficient.	A further issue is the poor level of energy efficiency of existing buildings which will remain in the future building stock of the area.
Transport – Electric vehicles	There are currently 1.5m licensed vehicles in the SEMLEP area and this number is expected to grow between 19% and 32% over the next 30 years. At present, almost all vehicles are powered by fossil fuels. Government has committed to improving air pollution, including the banning of all new fossil fuelled vehicles between 2040 – 2050.	Traffic-related air pollution, due to the increased use of private cars, would have a potentially severe impact on air quality and carbon reduction targets. All future scenarios predict significant growth in electric and zero emission vehicles. This represents a major challenge for SEMLEP in terms of a new EV infrastructure.
Transport - Connectivity	Success of the Cambridge-Milton Keynes-Oxford Arc requires improved East-West transport connectivity i.e. optimised transport infrastructure to connect towns and cities. Opportunity around innovation and changing dynamics e.g. self-driving vehicles, tele-working reducing commuting. High Speed 2 will free up capacity on West Coast main line.	Poor public transport connectivity East-West and scarce modal shift opportunities affect inter-connection between towns/cities, commuters and local communities, having a knock-on effect on the productivity of the SEMLEP area.

Objectives and Actions

From the issues and opportunities identified, the following section provides a summary of the objectives and actions required. A more detailed action plan is provided in the full strategy report.

Key Issues	Objectives	Actions
Energy supply Capacity constraints	▸ To ensure that the electricity network capacity is capable of meeting the SEMLEP area's future growth in demand.	Support the development of new **Distributed Energy Resources**, to mitigate supply constraints on new developments. Working with DSOs and other stakeholders. ▪ Establish a new commercial framework. ▪ Establish (funded) pilot to develop new framework ▪ Revise Local Plans, priorities and develop new guidance. ▪ Develop and make the Business Case / Case study ▪ Engage domestic and non-domestic developers.
Energy supply Distributed generation constraints	▸ To ensure that the electricity network capacity is capable of meeting the area's future need for distributed generation, in line with growth and sustainability objectives.	Support the development of **Active Network Management** (ANM). ▪ Design into new estates / regeneration areas. ▪ Pilot trials (funded) – integrate learning ▪ Arrive at a zonal approach to ANM roll-out (start with areas with generation).
Energy supply New low carbon heat networks	▸ To support the development of new heat networks, in line with growth and sustainability objectives.	Develop an area-wide **heat network support programme**. ▪ Identify / focus upon areas with maximum viability (HNDU[16]) ▪ Large baseload, plus high density of demand ▪ Regeneration areas and developments adjacent to networks ▪ Develop business case support and case studies to support wider roll-out.

Key Issues	Objectives	Actions
Energy demand Energy (and carbon) efficiency of buildings	▸ Potentially develop enhanced planning and regulatory requirements, as well as incentives, aimed at in-use energy and environmental performance of new and existing buildings.	▪ Potentially define a consistent **SEMLEP-wide approach to (viable) new build standards and planning requirements**. ▪ Work to develop a more supportive and more certain regulatory framework (e.g. re-instate ZCH) ▪ Investigate land valuation options (lower values (e.g. EcoTown Bicester) to fund higher standards) ▪ Produce and disseminate **case studies and business case for best practice energy efficient homes and buildings**, including the use of new electric technologies.
Transport Electric vehicles	▸ Become an acceleration hub for electric vehicles that catalyses early adopters and investors.	▪ Planning Requirements (policy and guidance) to be used to require developers to accommodate EV (link to Distributed Energy Resources) ▪ SEMLEP innovation project (Govt. funded) to define routes to engagement (uptake) and impact on infrastructure ▪ Develop a support package for businesses to innovate on services associated with EV (e.g. new apps for EV charging). ▪ Support preferential planning for EV parking spaces (use SPD – standard parking spaces) ▪ **Develop a central repository for case studies and learning**
Transport Connectivity	▸ Work to develop a transport infrastructure, focused upon the sustainable growth dynamics of the area. In particular in terms of East-West connectivity; modal shift from private cars onto public transport; cycling and walking.	▪ Develop programmes to target the area's road capacity stress points. ▪ Develop programme to tackle rail network stress, focused upon Thameslink morning peak and PM peak in London Northwestern, in addition to AM peak services to London in both train operators' services. ▪ Support programme for the development of new strategic road or rail links towards Oxford and Cambridge

Next steps

The key issues and their associated objectives and actions are of varying urgency and priority, depending upon the future path or scenario considered. This is highlighted in the table below, which aims to indicate the suggested timescale for action and the relative priorities of the key issues, according to the scenario chosen.

It is clear that a number of issues are high priority for both scenarios and should therefore be included in the future strategy. The remaining aspects represent options for consideration, depending upon the strategic positioning of SEMLEP moving forwards.

		Gone Green	Consumer Power
Issues	Timescale	Priority	
Energy Supply *Capacity constraints*	Short	High	High
Energy Supply *Distributed generation constraints*	Short	High	Medium

Energy Supply *New low carbon heat networks*	Medium/long	High	Low
Energy Demand *Energy efficiency of buildings*	Short	High	Medium
Transport *Electric vehicles*	Short	High	High
Transport *Connectivity*	Medium/long	High	High

It is recommended that the following approach is adopted in the short term (over the next 1-3 years).

1 Focus upon the actions and plans to help minimise **Energy Supply Constraints** and **Distributed Generation Constraints**
2 Focus upon actions to support the development of **Electric Vehicle Infrastructure across the area**
3 Implement actions in support of improving the **Energy Efficiency of buildings**
4 Develop further approaches to improve **Transport Connectivity**

Over the medium / longer term (3-5 years)

1 Implement actions in support of **Heat Networks**

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