

Havant Borough Council

Feasibility of an Energy
and Climate Change
Strategy for Urban South
Hampshire

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and Climate Change
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Executive Summary

The Partnership for Urban South Hampshire (PUSH) has commissioned Arup to advise on the feasibility of an energy strategy for the sub region.

An underlying vision of how South Hampshire might look in terms of energy in 2026 is presented based on achieving a “local stewardship” approach to meeting the severe challenges ahead. This vision is presented as a contrast to the intensive use of energy and resources that characterise the current use of energy. A fundamental assumption is that “business as usual” is not an option for a future dominated by scarcity and climate change.

The approach adopted focuses on reducing the carbon content of supplies as a means of meeting both these concerns. Low carbon reduces the call on fossil fuels helping to bring down emissions under scientifically “safe” limits whilst simultaneously reducing dependency on fuels that are increasingly expensive and “at risk”.

The first task has been to establish an evidence base using official statistics to create a baseline for the South Hampshire area to understand how energy is consumed by different users within the area. The baseline has allowed carbon dioxide emissions to be calculated using official conversion factors.

The study then considers what the magnitude of emissions would be if nothing happened and trends continued aligned to past performance. This step allows the anticipation of expected growth in emissions to be factored into the reduction strategy.

Targeting frameworks are then reviewed identifying current and pending reduction targets together with a risk assessment on the likelihood of new reductions (currently under review by Adair Turner’s Climate Change Commission). A key issue for South Hampshire is the speed at which this sub region wants to reduce its emissions.

Total emissions are then broken down into manageable chunks called “wedges” which balance technical achievability against economic acceptability. The measures cover new development as well as the existing building stock. The majority of the potential for securing reductions does, however, originate in the existing building stock. The relative “speed” of reduction is dependent upon the pricing and tax frameworks established by government. Escalating costs of fossil fuels and the pricing of carbon will make it more likely that the pace of change can be quickened without disadvantaging South Hampshire in relation to other areas. The wedges identified above include;

- Greening the Grid;
- Code for Sustainable Homes
- Code for Sustainable Business
- Retrofitting Demand Reduction Measures to the Existing Housing Stock;
- Retrofitting Demand Reduction Measures to the Existing Non Domestic Stock;
- Implementing the Defra Waste Strategy Targets for Recycling;
- Applying Decentralised Generation to Existing Urban Areas;
- Traffic Measures and Demand Management;
- National and EU Measures.

The study has considered that South Hampshire is a low density urban area making constraints for the exploitation of wind power¹. Significant potential exists for the exploitation of biomass but this will rely on bringing supplies from outside the area. Utilisation of biomass has to be balanced with the need for food production and the viability of collecting/

¹ Modifications to the South East Plan has resulted in the removal of sub regional specific policy targets contained in Policy SH14. PUSH are considering their response to this modification.

processing the low energy density feedstock. This section reviews potential renewable options capable of contributing to South Hampshire’s development of renewable energy. A risk is that the adoption of a European Commission proposal for a 20% renewables target across electricity, heat and transport will require a substantial upward revision in the target at a future review.

The study also investigates the risks connected with the strategy many of which relate to uncertainties over the financial viability of measures. Potential solutions move through a development “pipeline” from initial R&D through to technical viability and, economic exploitation. A number of technical solutions exist but have not progressed to the market because of their financial payback. However, payback calculations change as fossil fuels become more expensive. Renewable options are also analysed in terms of their delivery risk and, this again reveals local risks associated with the location of plant to the longer term security of biomass supplies in what is likely to be a highly competitive market.

Under the emergent strategic themes section, a framework for managing the implications of the strategy is presented. The framework has four objectives supported by four enablers. The four objectives are concerned with the creation of:

- “Resilient Places”;
- “Resilient Networks”;
- “Informed Choices”; and
- “Culture Change”.

The four enablers needed to progress the objectives are: “Leadership”; “Skills”; “Finance”; and “Enterprise.”

Recommendations

1	Adopt the carbon dioxide reduction targets shown in Chapter 4 as an overall indicative guide to assess progress. Over the medium and longer term a move towards attaching a greater weighting to carbon dioxide reduction targets allowing flexibility for how reductions are to be met over a period of likely significant technological change.
2	The renewable resource assessment in Chapter 6 demonstrates a technical resource potential. Some of this technical capacity will be realised through dedicated new capacity (e.g. a wind farm), however new development is likely to be a major stimulus to the creation of new capacity either in the form of a dedicated facility or embedded in new development itself. It is, therefore, recommended that the indicative targets contained in Chapter 6 should be a guide subject to considerations of economic viability.
3	Establish a theme group within PUSH to provide strategic “leadership” but ensure actions are networked across all theme groups. Strategic leadership must not be seen solely as a planning issue and, therefore, must secure corporate ownership.
4	Consider incorporating the framework detailed in Section 7 as a basis for Local Strategic Partnerships to approach the management of energy issues in their areas through the Sustainable Community Strategies.
5	Agree the need for a procurement strategy for the establishment of an Energy Services Company to deliver outcomes consistent with the PUSH targets².
6	Review current economic development and skills strategies to establish additional

² Modifications to the South East Plan has resulted in the removal of sub regional specific policy targets contained in Policy SH14. PUSH are considering their response to this modification.

	policies/ measures needed to meet challenges outline in Section 7.
7	Incorporate energy infrastructure into the sub region's approach to delivering new infrastructure including the use of publicly owned property assets and revenue streams.
8	Integrate energy infrastructure needs assessment into future district based infrastructure assessments used to support tariff, S106 or future Community Infrastructure Levy policies and make explicit any trade offs between improved carbon performance and other types of infrastructure.
9	Develop a capacity building programme to support the strategic leadership role on energy and carbon reduction including members, public officials and business leaders.
10	Ensure that a balanced membership supports the strategic function within South Hampshire representing business and the professions
11	<p>The existing housing stock needs to be substantially improved.</p> <p>Assess scope for the Local Housing Authorities to work with the Energy Supply Sector to collectively deliver Carbon Emission Reduction Targets and a possible renewable heat obligation.</p> <p>Target areas where the public or third sector (RSL) has a significant control to evaluate options for applying site wide low carbon infrastructure.</p> <p>Support the development the extension of equity release as a means of releasing capital to fund energy efficiency improvements to the existing stock against a sustainable asset base.</p> <p>Ensure housing officers/ Regional Social Landlords are represented on the strategic function within PUSH.</p>
12	Commission master planning of the two Strategic Development Areas and the Urban Extensions to deliver exemplar low carbon communities. Consider piloting flexible energy from waste and biomass generation and high quality public transport links.
13.	Consider the use of multi area agreements at the level of South Hampshire to take forward actions in the strategy as an extension to the pre existing LAA.
14.	Establish a common monitoring framework across South Hampshire for the collection of data on new installed capacity and performance.
15	Engage marketing expertise to reach disengaged segments of the population to seek views on potential solutions and encourage changes in behaviour (development of the local stewardship approach).
16	Create a strategic link with work undertaken to adapt South Hampshire to unavoidable effects of climate change. Undertake an early review/ assessment of the revised effect scenarios under preparation by the UK Climate Change Impact Programme.
17	Integrate energy issues into emergency planning in relation to climate change adaptation and other forms of threat which may disrupt supply into South Hampshire over the next twenty years.
18	Work with the North Hampshire authorities to establishes ways in which the South can capitalise on the potential biomass supply base in rural areas.
19	Use green procurement as the principle means of shaping behaviour towards energy use among small businesses.
20.	Consider scoping an evidence base monitoring system integrated with infrastructure planning to manage this agenda.

21.	Work with energy suppliers and transport planners to resilience proof critical infrastructure to protect against extreme weather events and other risks including access to these facilities.
22.	Use the network of existing energy from waste plants as hubs for supplying energy need including heat capture.
23	Ensure that the South Hampshire Energy Strategy is aligned with the Transport for South Hampshire (TfSH) Reduce Strategy by supporting measures that reduce the overall demand for travel and encourage a greater proportion of journeys by means other than the private motor car.

Sustainable South Hampshire – A Vision for 2026

Stern (2006) highlights that the opportunities to abate transport emissions are likely to be limited until after 2050. Reconciling the need for mobility to sustain economic growth with a persistent source of emissions and the rapid escalation in the cost of mobility will be a consistent theme for South Hampshire in the lead up to 2026.

Minimising the need to travel will have led South Hampshire's development to follow a compact model based on higher density, mixed use higher density urban development of centred on public transport nodes. This style of development reduces transport fuel consumption without designing in future excessive cooling demand needed to deal with unavoidable climate change.

By 2026, South Hampshire has moved towards becoming a dual city region where its identity is derived from its constituent communities each of which follow the compact urban design principles. Communities such as Gosport, Fareham, Havant and Eastleigh will become centres offering jobs, living space and shopping opportunities to their communities along with Portsmouth and Southampton.

The definition of community will not remain static. Communities will compete with one another for advantage in terms of new investment and residents. The ability to offer cost competitive energy supply will be a key form of advantage to attract both business and residents in 2026.

Regeneration activities increasingly become focused on assembling land to enable new low carbon development or public transportation links to happen. South Hampshire will have also taken steps to establish new centres where the costs of retrofitting the compact model are excessive. Each of these centres contain a significant amount of space given over to green spaces and parks which help break up the urban heat island effects that would otherwise occur. This becomes increasingly important as extreme heat waves become common place.

People and business will secure a significant share of their electricity, cooling and heating requirements from decentralised generation including combined cooling, heat and power (CCHP) networks where heat demand and supply can be matched. People now consider connection to be an advantage given the escalating costs of fossil fuel energy. The economics of these networks will be founded on the stable heat/ cooling loads arising from public and commercial buildings in centres. Over the period, the fuel used in CHP networks will be natural gas however there will be a diversification of the fuel mix to include bio-methane.

The urban fringe areas of these communities become important resources for the future of South Hampshire offering the most economical sites for the processing of biomass crops purchased through long term contracts developed with rural Hampshire to secure supplies. South Hampshire uses planning powers to protect the viability of these locations from encroachment.

Each community also maintains a supply of sites separated from the main centres for burgeoning new businesses concerned with collecting, sorting, recycling and reusing products. A renaissance takes place in the local economy where skills previously deployed in converting primary materials into products are used to extend the life of existing goods. More people in South Hampshire now have to make do and extend the life of products that would have been taken to landfill in previous years. People with the skills to extend the life of consumer durables are valued members of their community. New businesses also emerge to broker second hand goods between suppliers and the market some of which will be mediated by the internet. The need to extend the life of products, will also feed into product design with a greater emphasis on inter operability.

The labour market will have adapted to changing circumstances. The workforce will have become much more sensitised to commuting costs when taking jobs. The notion of the workplace will become more diffuse as businesses use information technology to enable people to work from a variety of locations including worker's home or business "hotels" (shared service locations used by multiple businesses) for meetings/ workspace. These locations will require linkage to high capacity broadband facilities.

This will be symbolic of a larger progression, in which South Hampshire will confirm the step from a successful industrial society to a connected network society from which South Hampshire will secure its place in the global knowledge economy. This will be fostered through the establishment of advanced information communication technologies (ICT). ICT networks will be the basis of social structures, environmental monitoring and economic development. The power of cities will no longer be confined to their spatial boundaries yet be fluent within global networks, it will be South Hampshire's accessibility and connectivity within this network society that will mark its status. South Hampshire will inevitably be better connected and the need for travel will be reduced, yet this will rest on securing high capacity ICT requirements.

After years of skills shortages in the production, installation and maintenance of low carbon technologies, South Hampshire now has an adequate supply of people with the correct skills.

The mix includes the use of micro generation solutions; South Hampshire has entered into a series of compacts with its rural hinterland to supply a mix of biomass into a network of bio refineries on the urban fringe areas. South Hampshire took an ethical stance of only using biomass supplies that have not been derived from food crops e.g. set aside and sustainably managed woodland. The compact also guarantees the conservation of key locations on strategic renewable power generation and storage to meet the sub region's needs.

Following changes in government legislation mandating home owners to upgrade the energy performance rating of their dwellings to the next level in the rating system, around 14% of existing homes are becoming increasingly efficient (based on turnover). Whilst initially unpopular, the rapidity of fossil fuel price inflation has led to increasing public acceptance of the measure. Implementation has provided a major stimulus to the sub region's construction sector leading to opportunities for redeployment from industries formally dependent upon the fossil fuels.

By 2026, South Hampshire has experienced more extreme weather events than ever experienced in living memory. Several severe heat waves led to the premature deaths of many elderly and sick people in older housing unsuited to dealing with excessive external temperatures. South Hampshire communities now offer special shelters to support the needs of the elderly and sick – community centres are fitted with state of the art low energy cooling based on heat exchanger technologies attached to CHP networks. A revamped "Decent Homes" strategy now focuses improvements on poorly performing older properties populated with vulnerable people.

South Hampshire has also invested in a sophisticated geographic information system linked into insurance systems that can record and predict areas of risk in the sub region. This system has highlighted areas of the sub region that have been continually affected by flash floods, ground stability and tornado damage. The insurance industry has long since "red lined" properties within these areas effectively denying occupiers insurance cover and making their properties unsellable. By 2026, South Hampshire has moved to relocate businesses and homes out of these areas and turn these over to green spaces. Areas with a lower probability of impact are subject to special measures enforced on property owners that limit householder's rights to cover garden areas with hard standings.

By 2026, South Hampshire will have established a series of special power zones for key business service and financial information companies in the sub region offering back up renewable supplies and power storage. These facilities offer a level of security and quality of

supply to the sub region's key companies. The special power zones include the city centre plus a number of other centres in polycentric South Hampshire.

By 2026, South Hampshire will have come to terms with the need to limit the non essential use of energy especially at times when the wind is not blowing and the sun not shining. All local government buildings and essential infrastructure are fitted with smart metering and sensors that allow for real time management of energy consumption.