South Downs National Park Renewable and Low Carbon Energy Study – Scoping Report

Prepared for the South Downs National Park Authority by AECOM

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Introduction

1. Introduction

1.1. The South Downs National Park

Covering an area of 628 square miles (1,627 km^2) of unique and biodiverse landscape of southern England, the South Downs National Park (SDNP) is the newest of the UK's 15 National Parks. Building on its recognised status as an Area of Outstanding Natural Beauty, the South Downs' designation as a National Park affords this special area further protection through the 1995 Environment Act. As such, as the administering body the SDNP Authority (SDNPA) primary purposes are to:

- conserve and enhance the natural beauty, wildlife and cultural heritage of the area, and
- promote opportunities for the understanding and enjoyment of the Park's special qualities by the public.

In addition to the high quality environment, the SDNP is home to around 110,000 people distributed across a multitude of communities including the market towns of Lewis, Petersfield and Midhurst and numerous attractive villages, hamlets and farmsteads. As such, the SDNPA also has a duty:

- to seek to foster the economic and social well-being of the communities living within the National Park

By shaping the future of development, planning has a central role to play in balancing these priorities. On formation, the SDNPA became the statutory Planning Authority for the National Park area. In performing this role, the SDNPA will have to work closely with the 15 authorities (11 local authorities, one unitary authority and three country councils – see figure 1) that fall in part within the Park boundary. The SDNPA and Local Authorities have therefore established a unique partnership whereby the Local Planning Authorities will maintain responsibility day to day processing and determination of the great majority of all planning applications, whilst the SDNPA will focus on more significant development that might have an impact on the unique nature of the Park.

Figure 1: South Downs National Park Overview Plan.

Legend

District Boundary

South Downs National Park

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1.2. Scope of this Study

To fulfil its planning responsibilities, the SDNPA needs to develop policies, based on robust evidence, to restrict, promote and shape development in certain locations, protect the environment and support the vitality of communities. As such, the SDNPA is in the process of developing their Local Plan). Supporting evidence of which this study forms a component will inform the SDNPA's approach and policies to reducing development related carbon emissions and delivering renewable and low carbon energy.

To develop these policies, the SDNPA needs to investigate the key carbon emission issues specific to the South Downs area. As such, they have set out a two phase study. The first phase, which AECOM have been commissioned to undertake, is a scoping exercise to;

- identity the key issues, opportunities and constraints for managing development related energy carbon emissions across the South Downs;
- understand the current policy and implementation approaches set out at a national level, as well as across the 15 authorities operating within the park;
- investigate best practice approaches to tackling these issues in similarly sensitive environments;
- understand what information and data is available, as well as key gaps that need to be plugged, in order to effectively analyse the South Downs context;
- set out implementation, management and monitoring priorities; and
- make recommendations as to the key investigations SDNPA need to carry out in order to develop robust carbon reduction and renewable energy policies.

The SDNPA will review the recommendations made by AECOM before commissioning the second phase of the study which will seek to build the low carbon and renewable energy evidence base and set out policies for inclusion in the SDNP Local Plan. With this in mind, the remainder of this scoping report is set out as follows:

- Section 2: Key Policies and Drivers;
- Section 3: Learning from Best Practice;
- Section 4: Scoping the Key Issues for the SDNP;
- Section 5: Establishing the SDNP Energy Profile;
- Section 6: Improving the Energy Performance of the Existing Building Stock;
- Section 7: Determining the appropriateness of Different Renewable and Low Carbon Technologies;

- Section 8: Capitalising on Opportunities from New Development;
- Section 9: Managing and Using the Evidence; and
- Section 10: Summary of Recommendations.

Key Policy and Drivers

2. Key Policy and Drivers

2.1 International and National Drivers

The challenge of climate change and the drive to reduce greenhouse gas emissions has intensified in recent years. At the international level, the United Nations Climate Change Conference has been held annually with the most recent one held in Durban, South Africa over November and December 2011. The result of this conference was the establishment of a second commitment period for carbon reduction for 35 industrialised countries beginning on January 1, 2013 following the expiry of the Kyoto Protocol. The conference also agreed to begin the work of establishing new legally binding carbon reduction targets for both developed and developing countries by 2015 and coming into effect from 2020. The Green Climate Fund was also established to distribute $100 Billion per year to help developing countries adapt to climate change.

Nationally, the UK is already committed to reducing greenhouse gas emissions by 80% from 1990 levels by 2050, and at least 34% by 2020, through the Climate Change Act (2008). The Act is supported by the UK Low Carbon Transition Plan, a national strategy for climate and energy, which sets out the Government's approach to meeting their CO_2 reduction commitments. To achieve this long term target, the UK Government in May 2011 announced intermediate carbon reduction target of 50% by 2025. As building related CO_2 emissions currently account for approximately 25% of all CO_2 emissions, improving efficiency and supplying buildings with renewable and low carbon energy is a priority. It is predicted that around two-thirds of the current housing stock will remain in 2050[1], highlighting the importance of improving the existing housing stock as well as ensuring new buildings are highly efficient. The Transition Plan includes commitments to reducing greenhouse gas emissions from existing housing stock by 29% and by 13% for places of work on 2008 levels by 2020.

A crucial part of the Government's strategy to reduce CO_2 emissions is a step-change in the resources used to generate electricity and heat, through a switch away from fossil fuels (such as coal, oil and gas), to a much higher reliance on renewable and low carbon energy. Installations of renewable and low carbon energy infrastructure will need to be both significant and widespread, with every local authority area looking to utilise opportunities. The UK is committed to the EU Renewable Energy Target, which requires a 20% reduction in CO_2 associated with electricity, heating and transport by 2020. To meet this overall target, the UK has set targets according to its strengths, as follows:

- 30% of electricity
- 12% of heat

[1] Ramachandran Kannan and Neil Strachan, Modelling the UK residential energy sector under long-term decarbonisation scenarios: Comparison between energy systems and sectoral modelling approaches, April 2009

- 10% of transport

This study will focus on the use of electricity and heat in the built environment.

The National Parks and Access to the Countryside Act of 1949 created the National Parks Commission, which eventually evolved into Natural England. As their position as the designated body for National Parks, Natural England's position on renewable energy often provides the basis for local authorities' policies in designated landscapes. While Natural England is generally in favour of using sensitive landscapes for renewable energy, large scale developments, such as wind farms do present challenges. In the guidance on renewable energy*, Making Space for Renewable Energy* (2010), they state, *"the presence of statutory protected landscapes will substantially reduce the degree to which wind energy development can be accommodated."*

To fulfil their statutory duties and protect the character and quality of National Parks, Natural England recognises that any development occurring in these areas must not compromise the qualities, which make the designated landscape special. Their stance also applies to renewable energy:

> *"The process of assessment and judgement is the same as for non-designated areas: the difference arises from taking into account the value society places on the special qualities of these areas and the additional determinative test of assessing whether major development is likely to compromise the objectives of designation."*

As a designated landscape, it is also important to acknowledge South Downs' special renewable energy considerations. Within Defra's *English National Parks and the Broads: UK Government Vision and Circular 2010*, it is recognised that National Parks should be "exemplars in renewable energy" and that renewable energy should become the norm in all Parks, providing it does not conflict with the Parks' primary duty and is appropriate to landscape. In addition, the Circular promotes Park operations to be energy efficient and reduce their own carbon emissions.

Considering that 85% of the South Downs is farmland, agriculture and its ability to support low carbon and renewable energy policies will be key to the National Park's initiatives. In the National Farmers' Union's (NFU) report, *Why Farming Matters to the South Downs*, they "support and encourage renewable energy and climate adaption projects." The NFU also supports the development of local food strategy with the National Park to improve local economies and reduce transport emissions.

2.2 National Planning Policy, the National Planning Policy Framework and Supporting Documents

The 2004 *Planning and Compulsory Purchase Act*, as amended by Section 182 of the Planning Act 2008 sets out the legal framework for planning in England. Section 19 of the Act requires that 'Development plan documents must (taken as a whole) include policies designed to secure that the development and use of land in the local planning authority's area contribute to the mitigation of, and adaptation to, climate change'. Furthermore, in discharging their duties, Local Planning Authorities must have regard to *the National Planning Policy Framework* (NPPF) (2012). The NPPF has been developed under the Localism agenda, and as such confers many powers to local authorities and communities. While the NPPF was developed to support all areas of sustainable development, with respect to renewable energy, one of the 'Core Planning Principles' is its support for a transition to a low carbon future. This recognises that planning plays an important role in reducing greenhouse gas emissions, mitigating vulnerabilities, and adapting to climate change impacts, including the delivery of renewable and low carbon energy and associated infrastructure. Section 10 of the NPPF reinforces the Planning and Compulsory Purchase Act recommending that 'Local planning authorities should adopt proactive strategies to mitigate and adapt to climate change (in line with the objectives and provisions of the Climate Change Act 2008)'. Paragraphs 95 and 96 of the NPPF go further by specifically stating that planning authorities should:

- Plan for new development in locations and ways which reduce greenhouse gas emissions;
- Actively support energy efficiency improvements to existing buildings; and
- When setting any local requirement for a building's sustainability, do so in a way consistent with the Government's zero carbon buildings policy and adopt nationally described standards;
- Expect new development to comply with Local Plans policies for decentralised energy, and take account of site characteristics to minimise energy consumption, when determining planning applications.

As per the Localism Act (2011), the NPPF also suggests that all communities have the ability to contribute to renewable, low carbon sources. In order to support initiatives from these sources, local planning authorities should:

- Have a positive strategy to promote energy from renewable and low-carbon sources, including deep geothermal energy;
- Design their policies to maximise renewable and low-carbon energy development while ensuring that adverse impacts are addressed satisfactorily;
- Consider identifying suitable areas for renewable and low-carbon energy sources, and supporting infrastructure, where this would help secure the development of such sources;
- Support community-led initiatives for renewable and low carbon energy, including developments outside such areas being taken forward through neighbourhood planning; and
- Identify opportunities where development can draw its energy supply from decentralised, renewable or low carbon energy supply systems and for co-locating potential heat customers and suppliers.

Importantly, the NPPF does not require energy developers to prove the need for renewable or low carbon energy developments. Rather, it requires the approval of the application if its impacts are acceptable and recognises that renewable energy at all scales help cut greenhouse gas emissions.

In support of the NPPF, the Committee on Climate Change released, *How local* authorities *can reduce emissions and manage climate risk* (2012), which aims to provide additional guidance for local governments. The report highlights five key drivers for improvement:

- Improving energy efficiency in existing buildings;

- Developing low carbon plans containing ambitious reduction targets, especially over actions the local authority has influence. Leadership, encouragement, and monitoring should complement these targets.

- Transportation, especially in rural areas, has a large impact on carbon emissions, and local authorities should focus on establishing low carbon transportation options (e.g., hybrid buses) and installing electric vehicle charge points.

- Planning is crucial to reducing greenhouse gas emissions. The following are important areas of focus:

    - Enforcing energy efficiency standards in new buildings and extensions;
    - Concentrating development in existing settlements; and
    - Low carbon infrastructure such as green infrastructure, Sustainable Drainage Systems (SuDS), and district heating networks.

Supporting the drive to increase district heating networks in the UK, DECC has published *The Future of Heating: A strategic framework for low carbon heat in the UK* (2012). This document recognises the importance renewable heat plays in reducing greenhouse gas emissions and sets out how to supply and use heat today. It also describes how heating infrastructure will need to evolve over time, and identifies the substantial economic changes required, and government's role in that change. One of the key recommendations in the framework, which this report will address, suggests that,

> *"Through heat mapping and energy planning and in line with emerging planning policies, local authorities should identify opportunities where energy can be supplied from decentralised, renewable, or low carbon energy supply systems and for co-locating potential heat customers and suppliers."*

With an understanding that the required changes will require incentives and funding, The Energy Act 2011 was enacted in December 2011 and provides improvements in the provision of energy efficiency measures to homes and businesses, and facilitates securing low carbon and renewable energy supplies and fair competition in the energy markets. The Act introduced the Green Deal (discussed in paragraph 0), which provides funding for the implementation of energy efficiency measures.

Following the release of the NPPF and complementing the Energy Act 2011, the Government released a draft Energy Bill. As it relates to renewable and low carbon energy, the Bill's main importance is its focus on electricity market reform (EMR). In this respect, new provisions have been created for:

- Contracts for Difference – long-term instruments to provide stable and predictable incentives for companies to invest in low-carbon generation;

- Investment Instruments – long-term instruments to enable early investment in prior to Contracts for Difference coming into force;

- Renewables Transitional – transition arrangements for investments under the renewables obligation scheme, and
- Emissions Performance Standard – to limit carbon dioxide emissions from new fossil fuel power stations.

2.3 Building Regulations

The Government has also announced its intention for Building Regulations to require that emissions are incrementally decreased towards 'zero carbon' in new residential development by 2016, with non-residential development expected to meet the zero carbon target by 2019. The enforcement of CO_2 reductions through Building Regulations, removes the emphasis somewhat from planning. Previously stand-alone policies for CO_2 reduction, such as 'Merton-style rules' for inclusion of certain percentages of renewable energy supply, have been used for new development, but such policies are likely to be superseded by proposals for changes to Building Regulations. However, LPAs can still require sites to go beyond Building Regulations.

The proposed residential Building Regulations correspond to the Dwelling Emission Rate (DER)[2] targets set out in the energy section of the Code for Sustainable Homes for levels 3 (25% reduction) and level 4 (44% reduction), however the definition of zero carbon is likely to differ from the level 6 of the Code. It is a common misconception that full Code levels will be required under the government proposals, but in fact it is just the mandatory CO_2 targets of the Code that will be applied through Building Regulations (the energy category is one of nine different categories in the Code).

2.4 Government Incentives

Feed-in Tariffs (FITs) were introduced in April 2010 to replace the support provided by the Low Carbon Buildings Programme and stimulate increased vigour in the take up of installation of small to medium scale renewable electricity generation.

The scheme includes:

- Fixed payment from the electricity supplier for every kWh generated (the "generation tariff").
- A guaranteed minimum payment additional to the generation tariff for every kWh exported to the wider electricity market (the "export tariff").
- Generators receiving FITs will also benefit from on-site use: where they use the electricity they generate on-site, they will be able to offset this against electricity they would otherwise have had to buy.
- Technologies included: wind, solar PV, hydro, anaerobic digestion and non-renewable micro CHP.
- Tariffs are tax free and will be paid for 25 years for new projects.

[2] The dwelling emission rate (DER) is the calculated maximum amount of carbon dioxide a dwelling is predicted to emit per square metre of floor area per year

- The tariff levels proposed have been calculated to ensure that the total benefits an investor can be expected to achieve (from the generation tariff, the export tariff and/or the offsetting benefit) should compensate the investor for the costs of the installation as well as provide financial return.

- The government intends to set tariffs at a level to encourage investment in small scale low carbon generation. The rate of return will be established between 5% and 8%.

The proposed tariff levels for new projects will decrease by predetermined rates each year ("degression"). The tariff rate agreed at the project outset will be maintained for the 20 year period providing guaranteed returns for each installation.

Since its introduction, however, the Government has mentioned that it will come under review in 2013. In March 2011, the coalition government cut the incentive for larger scale solar installations (greater than 50kW) by more than 50%. While this will not directly impact micro-generation installations, it does suggest that as a relatively new policy, FITs may continue to undergo changes going forward.

On 10 March 2011, the Government confirmed that the Renewable Heat Incentive (RHI) was to open for applications for the first phase of funding. Phase one was introduced on 28 November 2011. The first phase of funding focuses on supporting large emitters in the non-domestic sector. As part of this phase, the Government also initiated the Renewable Heat Premium Payments (RHPP) programme, which is a £15m pilot programme to test installing renewable heating systems in homes. The first phase of the RHPP closed on 31 March 2012; however, pre-registration for a second phase of funding is already underway. Phase 2 will run from 1 May 2012 to 31 March 2013.

The RHI represents over £850m of government investment. There is no upper limit to the size of heat equipment eligible under the Renewable Heat Incentive and anyone who installs a renewable energy system producing heat after July 15th 2009 is eligible. The following technologies are included in the scheme;

- Solid and gaseous biomass, solar thermal, ground and water source heat-pumps, on-site biogas, deep geothermal, energy from waste and injection of biomethane into the grid.

- Unlike FITs, tariffs will be paid not on the basis of a metered number of kWh generated, but instead on a "deemed" number of kWh, namely the reasonable heat requirement (or heat load) that the installation is intended to serve.

- Tariff levels will be calculated to bridge the financial gap between the cost of conventional and renewable heat systems at all scales, with additional compensation for certain technologies for an element of the non-financial cost and a rate of return of 12% on the additional cost of renewables, with 6% for solar thermal.

Starting in October 2012, the UK government will introduce the UK Green Deal to improve the energy efficiency of all properties in the country. The funding enables owners to install energy efficient improvements with no upfront cost. Instead loans will be provided which are paid back as a surcharge on the energy bills. The scheme is attached to the address, rather than a specific person, which means that there is no financial loss when selling a building. All energy efficiency improvements made to homes or businesses qualify provided that they meet the 'Golden Rule' where the lifetime financial savings outweigh the capital cost plus finance cost, resulting in lower overall energy bills.

2.5 Regional and sub-regional Policy

While the National Government has recently revoked Regional Spatial Strategies (RSS), the policies and baseline studies contained within them remain relevant. As such, they provide important context for South Downs.

Importantly, for local planning, the NPPF has been created in agreement with the Planning and Energy Act (2008), which enables LPAs to set requirements for energy use and energy efficiency in Local Plans, including:

- A proportion of energy used in development in their area to be energy from renewable sources in the locality of the development;
- A proportion of energy used in development in their area to be low carbon energy from sources in the locality of the development; and
- Development in their area to comply with energy efficiency standards that exceeds the energy requirements of building regulations.

The *South Downs Management Plan* is broadly in favour of renewable energy, with a particular emphasis on micro renewable forms of energy. The plan also supports the return of a local wood fuel economy based around the reintroduction of coppicing of the unmanaged woodlands. Larger scale renewable energy developments, such as large scale wind turbines and biomass crops are not "anticipated" to be part of the South Downs.

2.6 Local Policy

Although the SDNPA is the statutory planning authority for the National Park, the National Park covers an area that straddles 11 local authorities, three county councils and one unitary authority (Brighton and Hove). The local authorities and Brighton and Hove City will remain the local planning authority for the majority of planning applications within their boundaries, except for those that have an impact on the National Park. As such, it is important that the SDNPA have regard to the planning policy positions of each of these authorities. These are summarised in the table below. The county councils, as well as Brighton and Hove City, are however responsible for planning relating to minerals and waste; both of which can be related to energy planning. Again, the SDNPA will determine applications with an impact in the National Park, with the Counties and Brighton and Hove undertaking the day to day minerals and waste planning services. Their current position is also summarised below.

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Table 1: South Downs National Park's Local Authorities Energy Policies

	Adur and Worthing District Council (partnership)	Arun District Council	Brighton and Hove City Council	Chichester District Council	East Hampshire District Council
Current status of Local Plan	Gathering Evidence - Draft Local Plan due July 2010. AMR states It should be noted that Adur District Council are currently relying on an outdated Local Plan Worthing Core Strategy Adopted - 2001	Currently developing Local Plan. Not publicly available - due for publication 20th June. Arun District Local Plan 2003 Saved Policies	Local Plan 2005; LDF in progress		
Energy policy - New Development	All development meet and strategic development exceed the SE Plan target of 10% on site renewables	Not specifically linked to new development	No Policy		
Energy policy - Stand alone	No policy	Policy GEN21 Renewable Energy is broadly supportive over renewables where there is no adverse affects	Planning permission granted for energy from renewables, provided no significant impact on: - the environment - amenities of nearby occupiers - area character - aims of other policies	Aiming for core strategy Adoption December 2013; Local Plan April 1999. Interim note adds detail on current position.	Joint Core Strategy has been prepared jointly with the South Downs National Park Authority (SDNPA) - DRAFT
Energy policy - Energy efficiency	No policy	No policy	planning permission granted for proposals demonstrating high standard of efficiency of resource use. Such as: - reduce GHG - use of renewables - reduce water consumption - enable water recycling - min energy/ raw material inputs	Any development which would be harmful to AONB's quality or distinctive character will not be permitted, except in compelling circumstances. Interim note requires BREEAM Good / CfSH 2 and 10% onsite renewables for major developments.	Local Plan: Promotes energy reduction through efficiency, passive design and renewables. Emerging Core Strategy CP22 - Sustainable Construction: Planning permission granted for developments: a) meet FULL code levels in-line with Building regs timeline b) 10% energy from D/LCRE c) adequate funding for waste management infrastructure
Energy evidence base	South East Plan and West Sussex Sustainable Energy Study 2009	Included in the West Sussex Sustainable Energy Study 2009	council's Home Energy Efficiency Strategy; PPS22 'Renewable Energy'	No Policy	Local Plan: E2 supports renewable energy as long as there are no adverse impacts on the SDNP (previously AONB). No Policy in Core Strategy
Key opportunities identified	District Heating	District Heating	N/A	encourage energy conservation and energy efficiency, but no specific targets or measures are identified.	Related to Code for Sustainable Homes rating.

	Eastbourne Borough Council	Horsham District Council	Lewes District Council	Mid-Sussex District Council	Wealden District Council	Winchester City Council
Current status	Jan 2012 submitted the Eastbourne Plan: Core Strategy; Current: Eastbourne Borough Plan (2001-2011)	Core strategy adopted 2007	Emerging Core Strategy 2011	Consultation Draft District Plan 2011	Inspectors interim findings on core strategy reported March 2012 Adopted Wealden Local Plan 1998 and the Non Statutory Wealden Local Plan 2005	The Winchester District Local Plan Review (2006) Core Strategy Pre-Submission Plan
Energy policy - New Development	Sought when deciding planning application: - heat recycling, PV, passive solar - passive design		Encouraged in all development, particularly in areas identified as being advantageous; Developers will need to develop an energy strategy Currently FULL code in-line w/ BR	New developments decrease CO_2 by 20% through D/LCRE Large scale developments (500+ homes) to implement on-site 'community energy systems', such as CHP	No Policy - Reliant on tightening of Building Regulations. Emerging Strategic Sites DPD and Allocations DPD (due 2015) will investigate potential for uplift on standards but not expected to affect SDNP.	Local Plan - Code level 3, except for energy and water where code level 5 is required. Core Strategy Policy 11 - Energy equivalent for Code level 5 and from 2016 onward must achieve national standards for Zero Carbon Policy. BREEAM Outstanding from 2012 for all office buildings
Energy policy - Stand alone	Renewable energy projects permitted, assuming no impact on residential amenity; visual amenity; environmental amenity, or other policies. Special considerations when inside AONB		LCRE supported assuming it address - National Park purposes - landscape and visual impact - local amenity - ecology - heritage	Support LCRE schemes where they will not have a significant detrimental impact on the environment and is in accordance with other policies	1998 Local Plan - The Council will support the development of renewable forms of energy, particularly those which reflect the existing land use pattern of the area. Emerging Strategic Sites DPD will investigate appropriate siting of standalone renewables.	Preference for 1. CHP/DHN 2. 20% of energy demand produced on-site 3. Off-site generation to meet emissions reduction targets 4. Contribute to the District carbon reduction fund. Core Strategy Policy CP12 - Renewable and Decentralised Energy supportive except where there are adverse affects on the SDNP.
Energy policy - Energy efficiency	designs for new development schemes should incorporate energy efficiency. Appropriate/ compatible renewables should be considered	CP 2 - minimise waste generation and the consumption and use of energy, including fossil fuels and taking account of the potential to utilise energy sources		No Policy	HG 8 energy efficient and sustainable housing should be secured through layout, design, housing type, orientation and landscaping	Related to Code for Sustainable Homes rating.
Energy evidence base	Supplementary Planning Guidance on Energy Efficient Development		Renewable Energy & Low Carbon Development Study	West Sussex Sustainable Energy Study	'Housing Estate Design Guidance'	Council Renewable Energy Study and
Key opportunities identified	solar, and small scale energy		bio crops; district heating	N/A	N/A	CHP/DHN; biomass

West Sussex County Council

- Structure Plan 2001-2016 (approved 2004) - Includes Policy ERA7 Energy Generation and Supply to require local plans to allocate land where applicable for energy generation. It sets out support for community heating schemes. Although not necessarily focused towards renewable energy, it does recognise the spatial constraints of some renewable technologies and the need to balance environmental impacts with carbon reduction benefits. It should be noted that the Structure Plan has no formal status in the statutory development planning processes, but highlights the County's strategic position.

- Minerals and Waste Core Strategy and the Waste Local Plan - Formal preparation of the West Sussex Minerals and Waste Core Strategy was suspended last October due to uncertainties that have arisen in recent months. On 13 May 2011, a decision was made by Full Council to build on the work carried out as part of the preparation of the Core Strategy and commence work on separate minerals and waste plans, starting with the Waste Local Plan. The draft Waste Local Plan has been completed with the SDNPA to cover the period till 2031, and is currently open for consultation. It highlights the opportunities of generating energy from waste. Policy W13: Protected Landscapes prevents any development of major waste management within the SDNP or that might impact upon it, although small scale facilities might be allowed if benefits can be demonstrated and environmental issues mitigated.

- Climate Change – The County Council recognise the challenges to mitigate climate change through carbon reduction. The A local carbon budget for West Sussex (Small World Consulting, 2011) sets out assumptions for carbon emissions generated across different activities within the County. The Council has also a programme to reduce council related emission.

- Guide to Renewable Energy and Micro Generation (2006) provides guidance to householders on installing different micro-renewables.

East Sussex County Council

- Local Minerals and Waste Planning - Waste and Minerals Local Plans remain part of the Development Plan for the 'saved' period. They will gradually be replaced by Development Plan Documents (DPDs) jointly prepared by East Sussex County Council and Brighton & Hove City Council. The current saved plans highlight protection for valuable landscapes.

- Climate Change Strategy (2009) – Highlights local advantages from biomass and focuses on retrofitting energy efficiency improvements.

Hampshire County Council

- Draft Hampshire Minerals and Waste Plan (2012) – Promotes energy from waste in Policy 1 and heat capture in Policy 27. However, Policy 3 highlights the need to protect the SDNP and environs, as such minerals and waste development will not be permitted unless there is an overriding benefits and community and environmental impacts are acceptable.

- Energy - Hampshire County Council is currently in the early stages of developing an energy work programme. This work programme will be designed to improving energy security; reducing the exposure of Hampshire residents to the increasing volatility of fossil fuel prices; use renewable energy opportunities as a mechanism for facilitating low-carbon economic development; and, promoting both economic and climate resilience.

2.7 Building Regulations and the Trajectory to Zero Carbon

Following consultation, the Government's Building a Greener Future: Policy Statement announced in July 2007 that all new homes will be zero carbon from 2016. The Government later announced its ambition for all new non-residential buildings to be zero carbon from 2019 (with earlier targets for schools and other public buildings). Again, these improvements will be implemented through the Building Regulations.

There has been a great deal of debate as to what zero carbon means. As of March 2011, the Government defined zero carbon to include the 'as-built performance' of the building, including heating, fixed lighting and hot water (regulated emissions). Unregulated emissions from cooking and 'plug-in' appliances such as refrigerators, computers, and televisions have not been included within in the definition of zero carbon and it is expected that other regulations aimed at appliance efficiency will help improve these energy consuming sectors.

Prior to the introduction of the zero carbon requirements, the following intermediary step changes are proposed to the requirements of Part L of the Building Regulations for dwellings:

- 2010: 25% improvements in regulated emissions (relative to 2006 levels). This is expected to broadly correspond to the energy and CO_2 element (there are nine elements in total) of Level 3 of the Code for Sustainable Homes[3].

[3] It is a common misconception that all aspects of Code levels will be required under the government proposals, but in fact it is just the CO_2 targets of the Code that will be applied and are mandatory through Building Regulations (the energy category is one of nine different categories in the Code).

- 2013: 44% improvement in regulated emissions (relative to 2006 levels), corresponding to Level 4 of the Code for Sustainable Homes.
- 2016: Zero carbon (initially defined as regulated and unregulated emissions as in Code for Sustainable Homes Level 6, but under recent government announcements this has been revised down to just include regulated emissions).

In addition, a consultation on proposals for Part L 2013, which closed in March 2012, proposed the following relevant updates:

- Two emission reduction targets have been proposed for dwellings: an aggregate 8% or 26% improvement with some homes delivering less and some delivering more than this target. The targets are based upon a concurrent notional building. Government's preference appears to be an interim 8% reduction.
- Regulatory energy demand targets for heating and cooling. Fabric Energy Efficiency Standards (FEES) are 39 - 43 kWh/m²/yr for apartments and mid-terrace, 46 – 52 kWh/m²/yr for end-terrace, semi-detached and attached properties.
- There is more emphasis on limiting the heat gains in summer including the needs to insulate circulation pipes for domestic hot water to prevent overheating.

These planned revisions to the Building Regulations Part L and move towards 'zero carbon policy' are aimed at providing meaningful steps to significant reductions in carbon emissions whilst minimising the cost impact on developers. As part of this, and challenging previous convention for 'Merton' style policies that require a proportion of onsite renewable energy generation, 'zero carbon policy' is likely allow a proportion of carbon emissions generated by a development to be mitigated through offsite measure. Figure 2 reflects the Government's hierarchy for achieving 'zero carbon'.

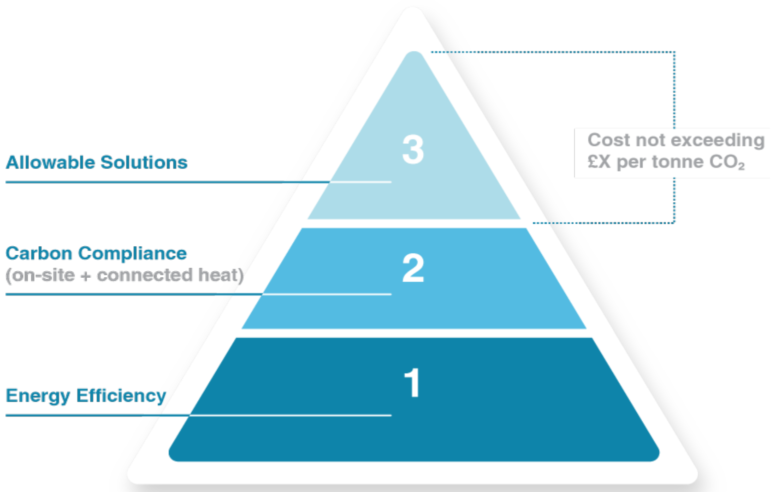

Figure 2: The Government's hierarchy for achieving 'zero carbon' development

Step 1 - requires a minimum energy efficiency standard such as the proposed FEES to be achieved though material selection, construction methods, and building layout. This is likely to account for approximately 20-25% reduction in carbon emissions.

Step 2 – renewable and low carbon energy must be supplied on-site to meet the CO_2 reductions required for Carbon Compliance (the levels proposed are based around the maximum viable savings which can be achieved across a range of developments). This level is yet to be defined.

Step 3 – once carbon compliance has been achieved onsite, further CO_2 reduction can be made either on-site, or though off site savings (known as Allowable Solutions). The third phase, the policy around allowable solutions, is still being developed by the Government but likely allowable solutions include:

- Further CO_2 reductions on and off-site;
- Energy efficient appliances;
- Advanced forms of building control system which reduce the level of energy use in the home;
- Exports of low carbon or renewable heat from the development to other developments; or
- Investments in low and zero carbon community heat infrastructure.

Research by the Zero Carbon Hub titled 'Allowable Solutions for Tomorrow's Homes' (July 2011) outlines the latest proposals and recommendations for how allowable solutions should be embedded in policy and administered. A key aspect of allowable solutions would be for the local planning authority (LPA) to collect allowable solutions financial contributions from developers. The Department for Communities and Local Government announced in August 2010 that they would implement a community energy fund, which would allow developers to make payments to the LPA or community. This would provide local councils with the ability to create policy which could determine how funds can best be used to meet government standards in a way that suits local circumstances. As in the absence of local policy, developer contributions would be delivered through a national list of allowable solution projects, the Zero Carbon Hub recommend that LPAs prepare for future allowable solutions by developing policies for contribution collection and identify potential allowable solution projects

2.8 Key Considerations Emerging from this Chapter

This chapter considered the wider policy context that should be considered in the development of local policies for SDNP, including:

- National legislation and policy sets out challenging carbon reduction targets, with particular emphasis on reducing emissions associated with building performance and in energy generation/distribution.

- There is a statutory duty on local planning authorities to take steps to address the effects of climate change through their plans and the NPPF makes provision for local authorities to support energy efficiency improvement measures and plan for low carbon and renewable energy technologies.

- Changes to building regulations with improve the performance of new buildings and it is expected that a future ‘zero carbon policy’ will provide a mechanism for developments that cannot reduce all regulated emission from a development to pay for allowable solutions managed in part by the local authority. In line with the Localism agenda, there is a focus on empowering local communities to implement renewable energy most appropriate for their circumstances.

- There is some regional and local understanding of renewable and low carbon technology capacity potential in the area. This provides SDNP with a valuable resource to build on and start to consider in developing its own policies.

- As allowable solutions will require developers to contribute to a centralised funding pot to support near and off-site renewable energy projects, the SDNPA has an opportunity to consider how such a fund can be best implemented locally to drive delivery of the most effective renewable and low carbon schemes in the area.

Learning from Best Practice

3. Learning from Best Practice

3.1 Learning from Best Practice

In order to develop the best low carbon and renewable energy policies within South Downs National Park, it is important to learn from the experience of other National Parks in the UK. The following chapter discusses the relevant experience of UK National Parks and from this develops best practices.

3.2 Northumberland National Park

Policy

Within Northumberland National Park Authority's Core Strategy (2009), Policy 25: Renewable Energy and Energy Efficiency, encompasses the majority of relevant issues. The Park focuses on microgeneration and energy efficiency measures to contribute to carbon reduction.

Low carbon renewable energy schemes adopted

Northumberland National Park represents what can be accomplished in a designated landscape, without supporting large scale energy projects. Since 2002, 33 projects, worth nearly £475,000, have been funded to improve renewable energy and low carbon living. Projects range from biomass and geothermal to hydro, wind and solar, as well as home insulation programmes and low carbon farming research.

Heating and Electricity

Northumberland's commitment to renewable energy is clear. Kielder Forest, within the park, provides a substantial amount of biomass. Working with North East Wood Fuels (NEWFuels), a wood fuel broker in North East England, Northumberland National Park has successfully established itself as part of a local supply chain. In addition, the Kielder Village District Heating Scheme supplies Kielder Castle visitor centre, six new 3-bedroom homes, a collection of Workshops, the local primary School and the youth hostel with heating and hot water. It is run as a community Energy Supply Company (ESCo) providing a return on the initial £600k investment in the system as well as permanent employment for the plant manager.

The Park has also installed electric car charging points partly to signify the importance of including rural areas for leisure and business. Some of the Park's other initiatives include:

- Seven geothermal installations;
- Retrofitting its own properties with renewable energy;
- Kielder Hydro (6MW) is England's largest hydro electricity system; and
- Investigating connecting farms currently off the grid to renewable energy sources;

Funding Partners

These achievements have only been possible through securing funding and forging partnerships. Energy Savings Trust, Northumberland WarmZone, Rural Development Programme for England (RDPE), One North East, and Office for Low Emission Vehicles among others, have all helped secure funding. Other partnerships have been forged in the delivery of projects, including:

- The Forestry Commission developed Kielder Bio-mass boiler – district-heating scheme;
- Developing biomass wood supply with NEWFuels;
- Ministry of Defence (MOD) invested in wind turbine at Cottonshope Farm; and
- Insulation and external cladding of 25 percent of MOD tenanted properties.

3.3 Yorkshire Dales National Park

Policy

Yorkshire Dales is currently in the process of developing a new Local Plan. While they have not saved some of their relevant policies from the 2006 Local Plan, Policy U6: Small Scale Renewable Energy Developments has been saved. This policy states that a small scale renewable energy scheme will be permitted provided it:

- Does not adversely affect the existing character of the natural or built environment, either individually or through cumulative impact; and

- Does not adversely affect the nature conservation value, archaeology interest, residential, or recreation of the area.

This policy has been saved until the new Local Plan is adopted.

Low carbon renewable energy schemes adopted

Heating

The Sunhill Conference and Activity Centre has installed a biomass boiler for its heating purposes. The installation has resulted in reduced heating costs. A local farmer supplies the fuel – his own wood – to heat seven buildings and an activity centre. All wood that is extracted for heating purposes is being replanted to keep the scheme carbon neutral and sustainable.

The Bower Bank Eco Barn is a bed and breakfast, which can accommodate 12 people. With funding from the Sustainable Development Fund, it was able to install geothermal heat pumps to provide hot water and floor heating for the building. Sheep's wool insulation has also been included to improve the building's efficiency, ensuring the heat produced is not wasted.

Electricity

While Yorkshire Dales National Park does not support large scale wind energy developments, the park authority does support smaller scale schemes. Located 2 miles from the nearest settlement, Foxup, the wind turbine at Cosh Farm is an example of effective smaller wind development. The farm is located within the conservation area, and has no access to the electricity grid. The 18-metre, 6 kW wind turbine was installed to provide power to the farm, reducing the need for a noisy generator in an otherwise tranquil landscape. The adjacent hillside hides the turbine mast from long views, mitigating its impact on the cherished surrounding landscape. Burying the powerlines removes the need for unsightly powerlines, which can intrude on the rural setting.

With funding support from the Sustainable Development Fund, Carperby Sports Pavilion installed solar PV panels, which provide all the electricity needed for the building. The building also serves an education purpose, as interpretation panels are mounted on the building to show the amount of renewable energy being produced.

3.4 New Forest National Park

Policy

With New Forest's Core Strategy, Policy CP5: Renewable Energy is the most relevant. The policy outlines the following criteria that renewable energy schemes must meet in order to receive planning permission:

- Are small-scale;
- Are located and designed to reduce visual impacts; and
- Do not have significant impacts on the special qualities of the National Park.

Policy CP4: Climate Change is broader in scope and also has relevance. It stresses the importance of adaptation through reducing travel miles, sustainable construction, resource efficiency, small scale renewables, and reducing carbon footprint. While it does not include details for low carbon and renewable energy, it does underline the New Forest's support of climate change mitigation and adaptation.

Low carbon renewable energy schemes adopted

The Sustainable Development Fund (SDF) has been critical to the implementation of low carbon and renewable energy schemes within the New Forest. The following are some of the initiatives that have been accomplished with the help of the SDF.

Heating

With funding help from SDF, a district heating network has been installed on the Ipley Manor Estate. The total cost of the project was £70,725 with 30% of it SDF funded. The network uses biomass for fuel supplied from the estate's woodlands using sustainable management methods. The scheme has used workshops and site visits as an opportunity to educate citizens on the benefits of using biomass energy.

A biomass heating scheme at Lyndhurst Community Centre (approximately 40% funded) has also been installed. District heating feasibility studies have also been undertaken at Foxlease Girl Guiding Centre and Chewton Glen Hotel in an attempt to reduce their respective carbon footprints.

Ferny Crofts Scout Centre has been retrofitted to heat the building using ground source heat pumps. This has been undertaken in combination with improvements in building insulation to reduce the amount of heat wasted.

Electricity

New Forest is located in the Solent area, which has a high potential for wave energy, the Park is undertaking a study to determine the opportunity to install tidal stream power. Half the study's £33,000 cost has been funded by the SDF.

South Baddesley Primary School has implemented a number of sustainability initiatives, earning it a bronze Eco-school. One of the larger initiatives undertaken has been the installation of solar PV panels on the school. These are linked to screens showing the electricity generated in real time. This provides renewable energy while also educating students about the importance of decreasing their carbon footprint.

Water

All Saints Church and Avon Tyrrell Activity Centre have both installed composting toilets. Composting toilets do not require water or treatment chemicals, and the waste is handled on-site. The added benefit is the opportunity to educate visitor about the virtues of composting toilets as a realistic alternative to conventional methods.

New Forest Outdoor Centre has taken a different approach, using rain water harvesting for toilet flushing purposes.

3.5 Peak District National Park

Policy

Peak District National Park has a few policies related to climate change, and renewable energy. Within their Core Strategy (2011), the most relevant policies are related to climate change mitigation and adaptation (CC1), and low carbon and renewable energy development (CC2).

Policy CC1 is a broad policy with high level ambitions around: efficient use of resources, the energy hierarchy, flood risk mitigation, carbon reduction measures, and water efficiency. Policy CC2 states that proposals for low carbon and renewable energy "will be encouraged" provided they do not adversely affect "landscape character, cultural heritage assets, other valued characteristics, or other established uses of the area." CC2 also mentions the need to consider cumulative impacts, and the ability of proposals to take into account the economic, social, and wider environmental benefits.

Low carbon renewable energy schemes adopted

The Peak District has a number of low carbon and renewable energy schemes. There are some projects devoted to energy generation and waste reduction; however, the majority of them are focused on community education programmes.

Electricity

Torrs Hydro, the UK's first community owned hydropower scheme, is situated on the site of a textile mill built in 1790, with the turbine sitting in the original mill pit where the water wheel would have been. Water flowing into the weir from the Rivers Sett and Goyt rotates the blades of the turbine with a maximum output of 63kW given a 3m head and a 3m/s flow. It is the ambition of Torrs Hydro to generate 240,000kWh (240MWh) of electricity which is around 43.5% of the maximum.

The Torrs Hydro scheme cost around £330,000, with the issuing of community shares generating around £125,000 and grant funding from East Midlands Development Agency, the Cooperative Fund and the Sustainable Development Fund provided a further £165,000. Torrs Hydro, New Mills Ltd, an industrial and provident society (IPS), runs the scheme. The IPS was created with the support from a social enterprise, Water Power Enterprises. The shareholders are mostly local people and businesses plus people from further afield who wish to support renewable energy schemes.

New Mills Town Council conceived of the idea with Water Power Enterprises. When the Council decided the project was too financially risky, Friends of the Earth along with others stepped in to keep the project alive. The IPS overcame funding issues using professional PR help, and offering tours of the site.

Education

Peak District is heavily involved in programmes which educate students and community members alike. With funding from the Sustainable Development Fund, education has been a focus of the National Park. Some of the projects include: a skills fair showcasing the ability to include sustainable retrofits into heritage buildings; partnering with Derbyshire Wildlife Trust to develop waste reduction strategies and education programmes for local schools; and a climate change project in the Staffordshire Moorlands to educate and promote carbon emission reductions through energy efficiency in homes and domestic scale renewable energy.

3.6 Lake District National Park

Policy

Lake District National Park Authority's (LDNPA) Core Strategy has a number of policies related to climate change mitigation. Policy CS14 discusses the need to reduce carbon emissions from transportation, emphasising the need for development proposals to design for more sustainable modes, minimising public parking, and maintaining rural character of roads. Policy CS15 looks to maximise energy efficiency, ensuring development considers location, building orientation, and site layout and design. Policy CS16 relates to the generation of renewable and low carbon energy, and supports all renewable energy that does not impact on the landscape character. The LDNPA has also included a requirement for carbon reduction targets specifically relating to energy provision. They require all developments of at least 200sqm to reduce energy related CO_2 emissions by 10% using renewable and low carbon energy sources. Policies requiring carbon reduction from renewable energy are now viewed as being outdated as effective reductions from energy efficiency are more effective, and very efficient buildings can make further carbon reductions from energy generation difficult.

Low carbon renewable energy schemes adopted

Within LDNP, hydro power is the renewable energy source that has been most exploited. However, the most progressive action the LDNPA has undertaken is an analysis of carbon emissions analysis, including a carbon budget, and reduction targets.

Electricity

With respect to hydro, 55 sites have been identified, and analysed for their potential to contribute to energy supply within the National Park. The majority of them show a payback period of less than 15 years. If all 55 sites were to be developed, they would contribute 37 GWh of electricity annually, and reduce carbon emissions by 16,000 tonnes per year.

Carbon Planning

Beginning in June 2008, LDNPA endeavoured to research how the Park could reduce its carbon emissions. With help from stakeholders, a target of reducing carbon emissions 1% per year (23,000 tonnes CO_2e) using 2010 as the baseline year. The National Park completed a carbon budget, including actions already taken, and considering how best to achieve the progressive carbon budget. From the calculations made, all actions underway or planned will result in carbon savings of up to 40% of the 23,000 tonnes CO_2e.

Low-carbon Lake District

Developing an effective action plan was a large undertaking. 15 experts from 23 partnership members were engaged, and with funding from Climate Change Local Area Support Programme (CLASP), a report, *A Carbon Budget for the Lake District*, was created to establish a baseline. Based on this report, the expert group decided on 1% carbon emissions reduction per year, as per national carbon budgets. The action plan, *A Carbon Budget for the Lake District: Action Plan for the Lake District National Park Partnership (2001),* has set carbon emission reduction targets in each of the following areas:

- Household fuel and electricity
- Renewable energy
- Travel to and from the Lake District
- Travel with the Lake District
- Tourism
- Public services
- Shopping
- Construction
- Land Management

3.7 Wales Countryside Council Policies

Countryside Council for Wales (CCW), the national statutory advisor on sustaining natural beauty and wildlife, supports the Welsh Assembly Government (WAG) in their drive to expand renewable energy. CCW have stated,

We strongly support the need for a large increase in renewable energy and recognise its global benefits in addressing the causes of climate change… It is imperative that the UK manages this revolution in its energy infrastructure – for the national good – whilst continuing to meet statutory obligations on nature conservation and the environment, minimising local adverse environmental impacts where they arise and building public confidence in renewable energy developments.[4]

The CCW goes further, and recognises that "a key element of [our] activity will be to allow, or even encourage, economic progress and only to intervene when there is a clear case for protection." WAG does recognise that "there should be no significant change in landscape character as a result of wind turbine development within National Parks (or the AONBs). However, they mitigate this issue by suggesting that transmission cables should be set underground.

Low carbon renewable energy schemes adopted

In August 2011, RWE npower renewables presented plans to install 32 large scale wind turbines of up to 96MW in Clocaenog Forest in North Wales. This proposal follows quickly on the footsteps of the proposal to erect 12 large wind turbines in Brechfa Forest in southwest Wales on 270ha of land. This proposal went to public consultation in February 2011. Both projects have become contentious and a lightning rod for criticism from locals and activist groups against large scale projects in designated landscapes.

While protecting designated landscapes' character is important, these wind farms are being considered due to the reduced visibility of turbines in forested areas. The experience of similar projects in Germany has shown that turbines in forested areas have little impact on the surrounding forest and its fauna. Reducing the size of the clearings, and planning projects with the relevant authorities can help mitigate the potential impact of developing wind farms in forested areas.

[4] Countryside Council for Wales (2010) *Using LANDMAP for Landscape and Visual Impact Assessment of Onshore Wind Turbines*

3.8 Lessons learned from Best Practice

Drawing on the experience and developed best practices in other National Parks is an important action for SDNPA. While developing a bespoke strategy for the National Park will require determining its key issues, a task which is undertaken in the next chapter, this chapter provides a number of lessons that can be learned in delivering renewable energy and low carbon projects in similarly sensitive landscapes. :

- National Parks have an important role to play in implementing climate change mitigation and adaptation measures. Retrofitting existing housing stock to be more energy efficient; encouraging significant amounts of small scale technologies; retrofitting their own properties with sustainable technologies; implementing sustainable infrastructure, such as electric vehicle charge point, and district heating networks; reducing emissions from transportation; and taking on a leadership role in facilitating the delivery of energy schemes are a few of the ways that National Parks can work towards reducing their environmental impact.

- Taking a leadership role in retrofitting their own properties can help National Parks establish low carbon and renewable energy sources as effective alternatives. This is especially important for district heating networks that require an investment in infrastructure.

- Establishing partnerships with local organisations is essential to capitalising on the potential for low carbon and renewable energy schemes. As with many partnerships, establishing what benefits the National Park can offer potential partners has been cited as an important component to enticing organisations to work with National Park authorities.

- Education and promotion of low carbon and renewable energy is another important role for National Parks. Delivering on the potential for these technologies in National Parks requires community involvement. Parks that have been successful in delivering these schemes have an active and engaged community on whom they can rely. Fostering this type of community begins with education and promotion.

- Where possible, energy schemes should look to benefit the community financially. Establishing an industrial and provident society can be challenging, but its profits can enable investment in additional renewable energy schemes.

- An open approach to planning is important. While large scale low carbon and renewable energy schemes may not be appropriate to all areas, capitalising on a National Park's renewable resource without sacrificing their landscape obligations is critical to reducing carbon emissions. For example, some National Park Authorities that do not support large scale wind turbines believe that small wind turbines should be standard on all farmsteads. Experience in Wales suggests that appropriate landscapes might exist even in National Parks; the National Park authorities should not reject these applications without consideration.

- Many properties within National Parks are off-grid and therefore do not have access to energy. Small scale renewable energies may offer an effective way to deliver basic energy needs in a low carbon way. Small scale wind turbines have been particularly effective. Similarly, once buildings have been retrofitted with sufficient insulation, off grid rural housing, especially, can convert to biomass heating to substantially reduce emissions.

- Properties looking to use biomass in a renewable heating scheme need to consider how it can be sourced in a low carbon manner. Whether it is through an established local supply chain, or a local wood supplier.

- Retrofitting low carbon and renewable energy schemes can be completed successfully and tastefully to emphasise cultural heritage assets. These projects can breathe new life into older assets, helping them serve the community's new needs, while maintaining their cultural significance.

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Scoping the Key Issues for the SDNP

4. Scoping the Key Issues for the SDNP

4.1 Key Issues

The focus of this first phase of the SDNP Renewable and Low Carbon Energy Study is to identify and prioritise key investigations through which a robust evidence base can be built. As there are a plethora of possible permutations for data collation and analysis, it is essential that this scoping exercise indentifies the most appropriate convergence of issues, spatial information and detail of data on which to make decisions and to monitor success. As such, this scoping exercise has been structured around four themes:

- Establishing a carbon profile of the South Downs National Park;
- Determination of the appropriateness of deploying different renewable and low carbon technologies;
- Improving the energy performance of existing building stock;
- Establishing the potential for delivering low carbon and renewable technology

Establishing the SDNP Energy Profile

5. Establishing the SDNP Energy Profile

5.1 Overview

The first step in developing effective policies to manage development related carbon emissions, is to establish the energy profile for the National Park. Understanding how much, where and how energy is used is the basis for establishing the baseline from which progress can be measured. Energy use, and associated carbon emissions, from development arise in two principle ways; direct emissions from buildings arise from the burning of fossil fuels (e.g. natural gas) for heat; and through the use of electricity generated from the combustion of fossil fuels (e.g. coal, gas and oil). Combined, electricity generation and heat for commercial and residential properties accounts for around 40% of all total carbon emissions as highlighted in figure 3.

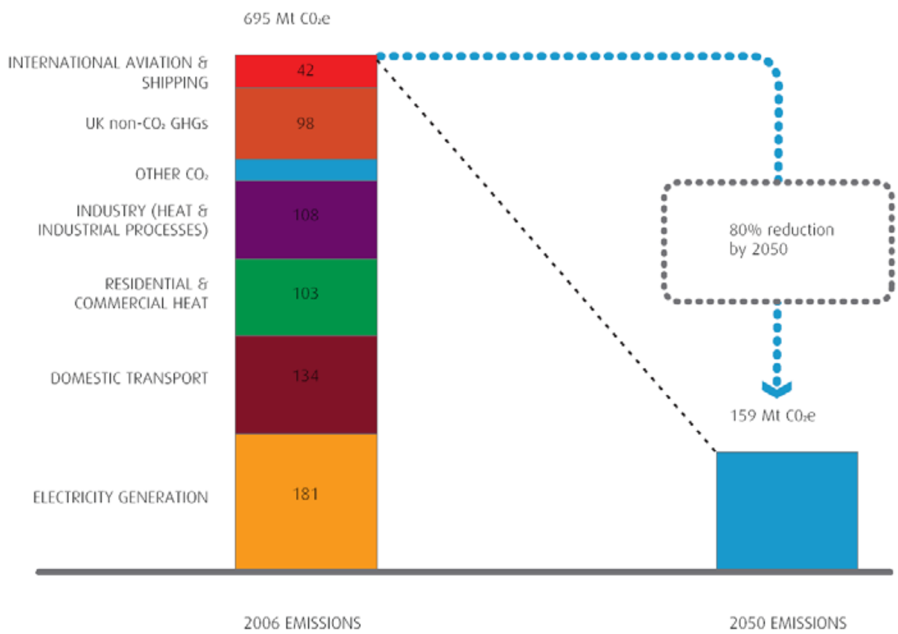

Figure 3: UK carbon emissions by use and the step change needed to reduce total emission by 80% on 2006 levels[5]

Most energy companies supply energy to individual homes and business via the national electricity and gas grids. Energy companies using the grid meter the amount used by each property for billing purposes. They are required to report this energy demand back to Government annually, however, due to privacy restrictions over the identifying individual energy users, these figures are collated to Lower Level Super Output Area (LLSOA) for domestic uses and Mid Level Super Output Area (MLSOA) for non-domestic uses. Furthermore, as we know the mix of technologies and fuels used to supply energy; electricity

[5] UK National Atmospheric Emission Inventory (2008)

generation is 43% gas, 31% coal, 14% nuclear and 5% renewables, and we know how carbon intensive each of these fuels is, it is possible to estimate the energy related carbon used in the built infrastructure.

Rural areas, however, such as the South Downs, generally have a larger proportion of properties that are 'off-grid' i.e., they do not use the nationally distributed gas for their space and water heating or for cooking. In these instances, it is most likely that the alternative fuels used are likely to be more carbon intensive, such as oil and coal. Sometimes heat demand is met through electricity which is also more carbon intensive than using the national gas grid. Wood fuel is also a useful heating fuel and with emission concerns is becoming increasingly attractive as it is considered to be carbon neutral when associated with sustainable forestry management, as are other micro renewable technologies.

Although carbon reduction is a national priority and different areas are able to accommodate different amounts of renewable and low carbon technologies (see section 7), an interesting benchmark and useful target setting tool is to understand how much renewable and low carbon energy is produced within the area from which there is demand. In this case it would be to understand how much renewable and low carbon energy is used by the population of the South Downs.

5.2 Lessons learnt from best practice

- Investigating bespoke low carbon and renewable energy opportunities is important as each National Park will have different types and degrees of opportunity. This is the first step to developing a tailored plan to reduce greenhouse gas emissions.
- Many properties within National Parks are off-grid, and therefore do not have access to energy. Small scale renewable energies can be effective way to deliver basic energy needs in a low carbon way. Small scale wind turbines have been particularly effective in a number of UK National Parks.

5.3 Key investigations for the South Downs National Park

In order to establish a clear understanding of the SDNP's energy profile, through which carbon reduction measures can be targeted, they will need to:

- *Develop an evolving spatial understanding of domestic / non-domestic gas and electricity usage* - Understanding where there is particularly high energy use identifies the area where further investigations as to the most appropriate carbon reduction mechanisms can be focused. It will also be important to take into consideration likely changes over time. Although new development within the Park is likely to be limited, any new development will have an impact on the energy demands. Understanding the likely scale and location of buildings, coupled with and understanding of current building performance levels assumptions as to future energy demands can be made. Assumptions as to demolitions rates, uptake of efficiency improvements and appliance electricity demand can also be built into models.

- *Profile off-grid users* – Understanding the level of off-grid demand will establish whether tackling network coverage is worth further investigation. Understanding the number of users and their demand spatially will also help tailor responses. As oil is the most commonly used off-grid fuel source, which has sharp price fluctuations, there is often a link between off-grid properties and fuel poverty.
- *Estimating contribution from the existing renewable supply within the Park* – Estimating the Park's current renewable and low carbon energy generation will not only help to understand their relative contribution to the national targets, but also help to understand what is suitable within the Park's special character.
- *Establish the SDNP's Carbon profile* – From understanding how much energy is consumed in Park and by what means, it will be possible to establish a baseline energy and carbon profile from which to measure the success of reduction interventions.

5.4 Availability of evidence/information, its limitations and gaps

Appendix 1 provides a summary table of the evidence identified, key findings are highlighted below.

Develop an evolving spatial understanding of domestic / non-domestic gas and electricity usage

- As highlighted above, DECC collates data from energy supplies from which it reports annualised domestic gas and electric usage to LLSOA. This gives a spatial understanding down to an average of 600 homes or 1500 people. Non-domestic gas and electricity use is only provided to MLSOA due for confidentiality issues. However, combining this with data from the National Land Use Database allows for a greater level of granularity to be achieved. This is of a suitable scale to inform the SDNP Renewable and Low Carbon Energy Study.
- The SDNPA currently do not have specific domestic and non-domestic development targets. The South Downs National Park Housing Requirements Study (2011) does however highlight the need for greater supply of affordable and family housing, setting out both housing demand and need against supply. It could be used to set out scenarios for highlighting the carbon emissions from new domestic dwellings. Furthermore, the emerging SHLAA (due end of 2012) should provide further details that could support scenario testing. Similarly, the South Downs National Park Employment Land Review (2012) highlights that there is sufficient employment land available and that there is unlikely to be significant demand for new non-domestic development.

Profile off-grid users

- DECC hold annualised data on the domestic and non-domestic 'other fuels' such as oil and coal (carbon tonne equivalents). This can be used to estimate the energy consumption of oil and coal for heating. As oil and coal are the primary off grid heating sources they are likely to have a relatively significant presence in a rural area such as the SDNP. DECC data also includes an estimate of renewables and waste which includes biofuels such as wood, although the assessment of supply set out below is a more sophisticated way of understanding potential supply.
- The DECC data is only broken down by Local Authority, so it would not be directly spatially relevant to the SDNP area. Although the data is from 2003, the Centre for Sustainable Energy provides data on Hard to Treat Homes and the Fuel Poverty Indicator. These include an evaluation of the number/proportion of homes by SOA (down to 40 houses) that are not on grid. This could be used in conjunction with the DECC information to evaluate the spatial distribution of off-grid energy demand. This is of a suitable scale to inform the SDNP Renewable and Low Carbon Energy Study.

Estimating contribution from the existing renewable supply within the Park

- Currently, an up-to-date, comprehensive database of existing renewable energy installations does not exist in the UK. For this reason, an audit of renewable energy installations in the SDNP required consulting with a variety of public databases. Combining outputs from each of these databases provides a robust baseline of existing renewable energy, including:
  - Department of Energy and Climate Change;
  - Renewable Energy Statistics for the UK (RESTATS);
  - RenewableUK; and
  - International Small Hydro Atlas.

- As micro-renewables are permitted development and are, therefore, not recorded in public databases, an estimate had to be used. While installations of micro-renewable technologies have historically been low, the introduction of the Feed-in Tariff (FiT) in April 2010 stimulated the industry, particularly the solar PV installations. The FiT database provides an accurate portrait of the amount of renewable energy installed since its introduction for each local authority area. Prior to FiT, calculating the amount of renewable energy installed in local authority required a population based estimation, using the 100,000 national microgeneration schemes[6]. As these assessments are only structured by local authority area assumptions would need to be made to tailor them to the SDNP area.

[6] Environmental Change Institute. Oxford University. Available from: http://www.eci.ox.ac.uk/research/energy/downloads/bmt-evidence-micro-generation.pdf

Furthermore, permitted development rights are more restricted in National Parks and Areas of Outstanding Natural Beauty. Normally in these areas planning permission would need to be sought for building scale renewable installations. As such, it is potentially possible to cross compare the planning permissions with FiT to understand the scale of micro-renewable uptake in the park.

5.5 Recommendations for SDNP

- Use the LLSOA and MLSOA data on electricity and gas use, along with combined SOA data on off grid properties and DECC other fuels data to provide a spatial understanding of energy consumption in the SDNP area.
- Make assumptions as to the level of new development and establish evolving energy demand baseline.
- Undertake an assessment of existing renewable and low carbon technology within the Park boundary.
- Combine the findings to estimate the current carbon profile for the SDNP from building related energy.

Improving the Energy Performance of the Existing Building Stock

6. Improving the Energy Performance of the Existing Building Stock

6.1 Overview of key Issue

England's housing stock is relatively old, with around 38% of dwellings (or 8 million homes) built before 1945, of which almost 5 million were built before 1919. These older properties are relatively energy inefficient, particularly when compared to Europe[7]. Furthermore it is estimated that 80% of buildings in the UK will still be in use by 2050. Given the rural nature of the SDNP and likelihood of proportionally significant profile of older properties it is predicted that buildings across significant parts of the SDNP will have comparatively high heating demand, indicating that there are opportunities to increase building energy efficiency.

Nationally, improved energy efficiency has increased the average SAP rating (which provides a standardised assessment of energy performance and carbon emission standards) over time from 41 in 1996 to 54.5 by 2010. The social housing sector achieved the highest improvement in SAP rating (of over 60) by 2010. This higher rating reflects the younger age profile of the social housing sector, and local authority actions to improve energy efficiency for its tenants. However, given that the social housing sector (which also comprises housing association stock) only accounts for around 17% of all residential housing, and that SAP ratings for the majority of properties are well below the average for new homes of around 80, there still remains significant scope to reduce emissions from the existing housing stock.

Recent research into existing building stock has suggested that existing measurements for dwellings' efficiency, such as SAP, can be inaccurate[8]. The inaccuracy only impacts dwellings using older construction methods. The research suggests that calculations are most efficient when the building materials and the type of construction are similar to modern methods. However, without measuring every building individually, modelling of the type used in SAP ratings are the best estimate for a building's efficiency. Despite these reported inaccuracies, modern construction will still be more efficient than older ones.

Furthermore, as highlighted in the previous section, rural areas generally have a significant proportion of homes that are not connected to the gas network, and are instead reliant on more carbon-intensive means of heating by using electricity, propane, oil or coal. As such it is likely that addressing the energy performance of existing buildings will be a priority for the SDNPA.

The Committee on Climate Change predict that direct buildings emissions have increased by 2% relative to 1990, reflecting an overall increase in the number of buildings, with some evidence of improved energy efficiency of the housing stock. They suggest that implementing efficiency measures in existing building stock could reduce emissions in 2020 by 32% relative to 2010 levels (31% on 1990). These measures include:

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[7] Committee on Climate Change (2012)

[8] Rye, Dr. Caroline (2010) The SPAB Research Report 1. U-value Report. Available from: http://www.spab.org.uk/downloads/TheSPABU-valueReportFINAL.pdf

- **Insulation** to improve the fabric efficiency of buildings, reducing the heat demand, Measures include, where appropriate, cavity wall insulation which could reduce emission from domestic properties by around 6% and solid wall insulation which could provide a 5% saving. As around a quarter of heat is lost through the roof of properties, loft insulation is also critically important[9].
- **Boiler upgrades** to more energy efficient condensers are required by Buildings Regulations when a boiler is replaced as older boilers are much less efficient.
- **Energy efficient domestic appliances** used in an efficient way will reduce demands for electricity. These savings are often outweighed however by increasing use of a wider range of electrical products in the home, such as larger TVs.

6.2 Lessons learnt from best practice

- Taking a leadership role in retrofitting their own properties can help National Parks establish low carbon and renewable energy sources as effective alternatives. This is especially important for district heating networks that require an investment in infrastructure.
- Retrofitting low carbon and renewable energy schemes can be completed successfully and tastefully to emphasise cultural heritage assets. These projects can breathe new life into older assets, helping them serve the community's new needs, while maintaining their cultural significance.
- Once buildings have been retrofitted with sufficient insulation, converting to biomass heating can substantially reduce emissions, particularly for off-grid, rural housing. Properties looking to use biomass in a renewable heating scheme need to consider how it can be sourced in a low carbon manner. Whether it is through an established local supply chain, or a local wood supplier, reducing carbon emissions from transportation is important.

6.3 Key investigations for the South Downs National Park

Identifying priority areas through which to target resources and tailor interventions will require investigation of a number of key issues to be considered in conjunction with one-another, including:

- *Establishing a spatial understanding of the performance of the existing housing stock* – There are a number of factors that can affect the energy performance of a property, and therefore identifying and targeting the most cost effective way of improving efficiency, including:

[9] Energy Savings Trust

- The **type** of property will affect the buildings performance, particularly the proportion of adjoining or exterior walls; for example [like flats or terraced housing] are more efficient due to reduced heat loss.
- The **age** of stock is a key factor in efficiency with more recent dwellings in general having a higher level of thermal efficiency. The main transitions in efficiency occurred around 1920-1930 when there was a move from solid walls to cavity walls (and also a general reduction in the size of dwellings), and then again from 1980 when Building Regulation started to make large improvements. These changes in construction techniques not only affect the thermal performance of buildings, but also the potential retrofit improvement measures. Understanding the spatial arrangement of these different build types can help target different improvement activities.
- The **tenure** of the stock can also have an impact. In general (as seen in national datasets such as the English House Condition Survey), housing owned by private landlords has the worst levels of thermal efficiency, private housing has a very large range from poor to excellent, and social housing is all reasonable (but not exceptional) due to schemes such as Decent Homes mandating minimum levels of performance for social housing providers.

- *Coverage of energy efficiency improvement schemes* – There have been a number of high profile schemes to attempt to improve the energy performance of the existing building stock. Deployment of these schemes has however been spatially sporadic. An understanding of which are likely to be least efficient buildings and where needs to be cross-referenced with information as to where energy efficiency measure have already been delivered to ensure that improvements can, in the first instance, be targeted at the most cost effective 'low hanging fruit' before other measures are considered.
- *Off grid areas* – As highlighted above, buildings not connected to the national gas grid generally utilise more carbon intensive means of heating space and water. As such, it is particularly to reduce energy consumption in these buildings through efficiency measures, or where cost effective, connect them to the grid.
- *Fuel poverty priority areas* – Fuel poverty is said to occur when 'in order to heat its home to an adequate standard of warmth a household needs to spend more than 10% of its income to maintain an adequate heating regime (usually 21 degrees for the main living area and 18 degrees for other occupied rooms)'. As such, fuel poverty is not tied to the total income of household but the relative proportion spent on heating the home. In this definition fuel poverty therefore covers a range of social as well as carbon issues such as those in areas of deprivation on low incomes unable to afford homes, inefficient properties incurring a significant heating cost as well as those off-grid properties sensitive to fluctuations in the price of oil. As such, analysis of fuel poverty areas needs to be couched in these wider issues.

- *Council social housing and Registered Social Landlord (RSL) performance* – Highlighting properties that accommodate more vulnerable households not only helps target energy efficiency measures towards those potentially in or at risk of falling into fuel poverty, but also identifying areas of single ownership/management building stock where economies of scale can make improvement measures more cost effective.
- *Energy performance of large estates* – As with council and RLS housing, large estates have the potential to use the single ownership of a number of properties to capitalise on the opportunities presented by scale. Furthermore, as estates often come with significant land holdings, there may be opportunities to developed closed-loop biomass energy supply chain whereby the estate manages its land to grow crops/wood that can be used on site in boilers to heat the estates built assets. As there are a number of large estates in the SDNP, this is likely to be a specific opportunity for this area.
- *Energy performance of public buildings* – Local authorities should be leading by example by improving the energy performance of their capital assets. Reducing the energy costs of these buildings is not only in the public interest, but can also act as demonstrator projects or instigate change as in the connection of public buildings to initiate the development of district heating networks.

6.4 Availability of evidence/information, its limitations and gaps

Appendix 1 provides a summary table of the evidence identified, key findings are highlighted below.

Establishing a spatial understanding of the performance of the existing housing stock

- West Sussex has commissioned Marksman Consulting and the Energy Savings Trust who are finalising a study that compiled age, tenure, type, and SAP rating with intelligence on building efficiency improvement activities that have been undertaken and roof orientation. This has been collected to postcode/LLSOA area and is currently being finalised. Currently available to the LAs at ward level. West Sussex, with Climate Energy also have a record of all improvement made to properties thought their grant schemes.
- Similar information for the Local Authorities in Hampshire and East Sussex has not been specifically identified.
- The Home Energy Efficiency Database managed by the Energy Saving Trust provides data on the scale and composition of the housing stock (e.g. how many cavity walls filled under policies such as the Carbon Emission Reduction Target). It is not a complete dataset but contains 1 piece of date-stamped information for approximately 51% of the UK's homes. There are eligibility criteria that need to be met before the information can be access, although this should not be a problem for the SDNPA. In light of no other datasets, this may be able to supplement data for Hampshire and East Sussex.

Coverage of energy efficiency improvement schemes

- Insulate Hampshire is an area based cavity wall and loft insulation scheme which is being managed by Hampshire County Council on behalf of all of Hampshire's district authorities. As at the end of March 2012, 3446 installations had already been made, this has saved Hampshire's residents £161,000 and 1900 tonnes of CO_2 to date. The scheme is due to end in December 2012.
- Warmer West Sussex surveyed and targeted the most vulnerable groups to focus retrofit in the areas most needed in the County. Records of all the homes targeted and the measures implemented have been recorded.
- The Heat Seekers campaign combing thermal imaging with discounted insulation was targeted to Horsham town Residents (700+ measures over 2 years). General cavity wall and loft insulation discounts targeted to rest of district through partners HCL energy. Mainly focussed in Billingshurst, Storrington, Henfield and Steyning.
- Lewes District is currently offering loft and cavity wall insulation support. As part of this they have undertaken basic mapping based on local knowledge of SAP ratings, fuel poverty and demographics to target areas for improvement.

Fuel poverty priority areas

- There are three available sources of information to identify areas likely to be in fuel poverty
  - DECC – the most recent and nationally recognised data of fuel poverty was compiled for DECC for the period from 2003-2010, although DECC report on fuel poverty trends up to 2012. This data uses information from the English Housing Survey, energy price information and an assessment of household income to identify those potentially at risk. This is reported at LLSOA and as such is of a suitable scale to inform the SDNP Renewable and Low Carbon Energy Study.
  - Centre for Sustainable Energy – although older, 2003, the Central for Sustainable Energy has developed a very detailed Fuel Poverty Indicator based on combining data from three sources: the 2001 Census, the 2003 English House Condition Survey (EHCS); and the national property database, RESIDATA. Although this data is older and CSE acknowledge that fuel poverty has probably doubled since 2003 due to increasing fuel prices, they have also undertaken detailed analysis of Hard To Treat Homes, which include analysis of off-grid properties, the type of heating system and level of insulation. This can be combined with the DECC data to identify particular issues. This is of a suitable scale to inform the SDNP Renewable and Low Carbon Energy Study.
  - CERT - Schemes such as the Energy Efficiency Commitment (EEC) and its successor, the Carbon Emissions Reduction Target (CERT), require utility companies to promote and facilitate energy efficiency improvements with the aim to increase adoption rates of renewables. The original CERT

programme, which ran from 2008 to 2011, was recently extended to run until December 2012. CERT (2011-2012) is more ambitious than the previous programme, requiring greater carbon reduction from 185 Mega-tonnes carbon dioxide (Mt CO_2) to 293 Mt CO_2. At least two-thirds of the increase in the target must be achieved through professionally installed housing insulation. The expectation is for this measure to lead to energy supplier investment of approximately £5.5bn between 2008 and 2012. CERT identifies priority areas to target spending and can be used as a good proxy for areas at risk of fuel poverty.

Council social housing and RSL performance

- The Housing Contracts Manager holds records of the SAP ratings and retrofit improvements made to all council housing stock.
- The location of social housing is known for Lewes and Chichester (Petersfield). Although Chichester (Midhurst) hold records of the number of properties per parish, they do not hold specific locational data as all the stock is in RSL ownership. A data request has been sent to the main RSLs.
- There are a number of RSLs operating in the area. Hyde Martlet (Chichester) and Radian (East Hampshire) hold significant levels of social housing stock. Radian has recently been successful as one of the first RSLs to receive European Regional Development Funding to retrofit housing stock and as such have been undertaking detailed stock condition surveys. Requests for data from both these organisations have been submitted.

Energy performance of large estates

- Estates identified. Further engagement will be needed to understand their specific energy requirements and biomass opportunities.

Energy performance of public buildings

- DECC hold information on energy performance rating and location of all publically owned buildings

6.5 Recommendations for SDNP

- Develop an energy efficiency plan which compiles priorities based upon the current understanding of household typologies, fuel poverty, single ownership properties and public buildings. Ideally a complete picture of housing typologies for Hampshire and East Sussex (or at least the areas within SDNP) should also be developed to complement that from West Sussex. This spatial understanding will help prioritise specific actions in specific areas.

- Understand the scale of opportunity and appetite of large estates to develop district heating networks fuelled by biomass grown onsite (see section 8).
- Identify and target poor performing local authority buildings.

Determining the appropriateness Different Renewable and Low Carbon Technologies

7. Determining the appropriateness of Different Renewable and Low Carbon Technologies

7.1 Overview of key Issue

The generation of electricity from fossil fuels accounts for around 27% of the UK's carbon emission. Although a shift in electricity generation from coal-fired to gas-fired power stations reduced emission levels by around 23% since 1990, significant additional savings could be made by switching to renewable and low carbon forms of electricity generation such as wind power and solar photovoltaics. Similarly, as highlighted above, direct emissions from energy used to heat space and water within properties is also relatively carbon intensive. As such, there are also opportunities to move to less carbon intensive methods of generating and distributing heat using renewable and low carbon technologies.

There are a wide range of renewable and low carbon technologies, each with their own specific requirements and varying degrees of appropriateness for differing scenarios. For example, some technologies can only supply either electricity or heat whereas combined heat and power can supply both. Scale is also an important consideration. Larger systems can often benefit from economies of scale, such as wind turbines which have been estimated to deliver 100 times the carbon saving for a threefold increase in height and length of rotor blades. Furthermore, larger systems can sometimes plug into the national grid or power a significant section of a community rather than a single building. However, as with needing different criteria for effective operation, different renewable and low carbon technologies have different impacts on their surroundings. This is particularly applicable for the SDNP as it is specifically designated for its high quality landscape. Balancing the need for environmental protection by reducing carbon emissions with the recognised need for protection of the intrinsic physical nature of the place is therefore a delicate act for the SDNPA. It is therefore essential that work is undertaken to not only understand where the physical conditions might present opportunities for deploying different types of renewable and low carbon technologies (i.e. wind speed), but to also understand the acceptability of impacts on other physical assets, the natural environment, the historic environment and communities. Although DECC has produced regional guidance on estimating regional capacity of different renewable and low carbon technologies, the assessment criteria are focused on specific physical assets (such as infrastructure and buildings) and designated sites. Other issues, such as landscape character are less easy to define and include an element of subjectivity – and as has been seen from other sensitive landscape there may be areas which can accommodate different technologies. The Countryside Agency Guidance on Landscape Character Assessment (2002) advises that in such circumstances that for any subjective elements, it is important that judgements are made in transparent and systematic manner. It is therefore important that these issues along with the benefits and constraints of different technologies are investigated openly. The SDNPA have recently updated their Landscape Character Assessment which includes analysis of landscape sensitivity to change for each landscape type.

Table 2: Technologies likely to be of key interest in the SDNP include:

<table>
<tr><td></td><td>Electricity</td><td>Heat</td></tr>
<tr><td rowspan="3">Stand alone or community scale</td><td>Large scale wind - commercial scale wind turbines and wind farms. These typically comprise turbines of 1 MW or more with hub heights of circa 100m or more. To be considered commercially viable, wind speeds greater than 6.0m/s at 100m are need.</td><td>District Heating Network (DHN) – DHNs are a distribution network rather than a renewable or low carbon technology in their own right which deliver beneficial carbon savings through more efficient distribution of heat. Heat can be generated from a number of fuel sources including natural gas, as well as low carbon sources such as biomass and waste heat from industrial processes</td></tr>
<tr><td>Solar Farms – With the introduction of the Feed-in-Tariff, commercial scale solar farms have become more viable.</td><td></td></tr>
<tr><td colspan="2">Combined heat and power - CHP is most cost effective at a large scale, connected to a district heating network and serving a mix of building types with relatively consistent electricity and heating demands. CHP systems are generally coupled with district heating networks; however, these are typically only cost effective on developments of high density as the length of pipes required is low relative to the energy being distributed. Although densities in the National Park are generally quite low limiting opportunities for CHP. However, other drivers, such as fuel poverty, supply security and new development might help increase options. As with DHN, can be biomass powered for greater carbon savings.</td></tr>
<tr><td rowspan="2">Building/development scale</td><td colspan="2">Anaerobic Digestion – using wet biomass, such as farm slurry or food waste anaerobic digestion is a series of processes in which microorganisms break down the biodegradable material in the absence of oxygen. The microbes produce methane that can be burnt to produce heat and electricity.</td></tr>
<tr><td>PV - To operate effectively, panels need to face South at a 30 degree pitch. PV is well suited both to residential and non-residential installations as all building types require electricity and generation and demand profiles are not an issue as excess electricity can be sold to the national grid. PV have a high capital cost; however, they are becoming more competitive with other low carbon technologies and this position has only improved since the introduction of Feed in Tariffs.</td><td>Heat pumps – There are a number of different types of heat pump including ground source and air source. They use heat exchange technology to capitalise on heat differentials. Ground source heat pumps potentially have greater potential for deployment, they have limited spatial impacts as they can be buried vertically and have particular potential in commercial buildings as they can meet both heating and cooling loads. They do however compete poorly against other technologies that offer greater efficiency and have lower capital costs.</td></tr>
</table>

	Medium scale wind - These are turbines which operate in a stand-alone mode and not mounted on a building. They may provide electricity to a single customer (for example a farm) or be connected directly to the grid for export. Turbine sizes vary widely, and medium scale could include single or a small number of community owned which are approaching commercial scale. Indeed community schemes often use second hand commercial turbines with systems of around 225 kW being popular based on a common Vestas turbine design. **Micro wind -**Feedback from field trials (by BRE, Carbon Trust and EST) has shown limited energy outputs from small turbines installed in urban and sub-urban locations where wind conditions are turbulent.	**Biomass heating -** well suited for low density housing as this type of development has relatively high heating demands and most likely will have sufficient space to accommodate solid fuel storage. This technology can generally achieve Code Level 4 for Energy/ CO_2 on its own without need for additional renewable technologies.
	Hydro - Small scale hydro turbines can generate electricity from rivers with less environmental harm and disruption to water flow than large scale hydro schemes. A 100kW facility can power about 100 homes.	**Solar thermal** – Uses the suns energy to heat water.

7.2 Lessons learnt from best practice

- While many areas of National Parks will not be appropriate for large scale low carbon and renewable energy projects, the experience in Wales suggests that appropriate landscapes might exist, even in National Parks. National Park authorities should not reject these applications without consideration.
- National Parks can still be heavily involved in climate change mitigation and adaptation measures without supporting large scale renewable energy schemes. Encouraging significant amounts of small scale technologies; retrofitting their own properties with sustainable technologies; implementing sustainable infrastructure, such as electric vehicle charge points, and district heating networks; educating and promoting the use of renewable energies and low carbon living; and taking on a leadership role in facilitating the delivery of energy schemes are a few of the ways that National Parks can work towards reducing their environmental impact.
- Open approach to planning is important. While large scale low carbon and renewable energy schemes may not appropriate areas all areas, capitalising on a National Park’s renewable resource without compromising the quality of the landscape is critical to reducing carbon emissions. For

example, some National Park Authorities that do not support large scale wind turbines believe that small wind turbines should be standard on all farmsteads.

7.3 Key investigations for the South Downs National Park Authority

- *Establish the potential renewable and low carbon resource potential within the SDNP* – This will estimate the total amount of energy that could be sourced from renewable and low carbon technologies within the Park.
- *Identify constraints* - Once the renewable and low carbon resource potential capacity has been established it can be refined by identifying physical, environmental, social and political constraints. Many of these constraints will be related to specific assets with spatial implications that can be mapped, others however might be less tangible and assumptions will need to be defined with key stakeholders to establish where technologies might or might not be appropriate.
- *Understanding the impacts from National Strategic Infrastructure Projects* - The Rampion offshore wind farm is a large (700MW) proposed development located close to the coast near Brighton and Hove. Offshore wind energy developments, such as Rampion, are delivered on Crown Estates and as such do not contribute to local authority targets. As a 'nationally significant infrastructure project', the proposals for development such as Rampion are submitted to the Infrastructure Planning Commission (IPC) for determination. However, the construction, operation and management of such infrastructure might have an impact on the surrounding area, including the National Park, and as such, it is important for SDNPA to understand how these impacts might affect the area in order to make robust representation to the IPC and support appropriate mitigation activities. Similarly, the infrastructure needed to bring the energy to shore and distribute it might have visual, landscape and environmental impacts that will need to be balanced with the employment and low carbon, secure energy benefits.

7.4 Availability of evidence/information, its limitations and gaps

Appendix 1 provides a summary table of the evidence identified, key findings are highlighted below.

- DECC methodology 'Renewable and low-carbon energy capacity methodology for the English regions (2010) sets out a number of steps for a resource assessment and provides detailed assumptions and calculations for some of these steps along with recommended data sources. The methodology is based around a sequential constraint methodology, where constraints are progressively applied to reduce the natural resource (i.e. the maximum theoretical potential) to what is practically achievable. The stages in the methodology are numbered from 1 to 7, with stages 1 to 4 representing physical, technical, and regulatory constraints that would be assessed in figure 4.

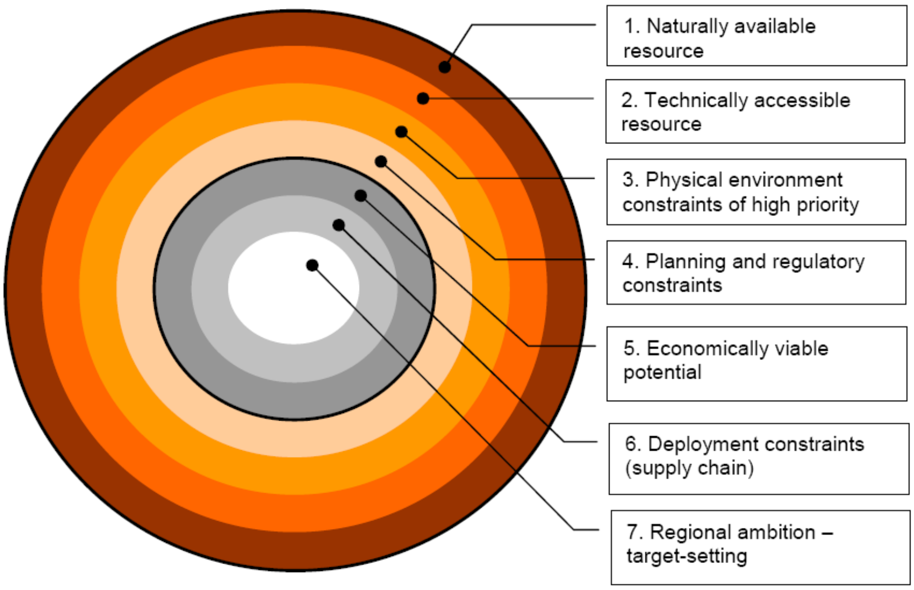

Figure 4: Stages for developing a comprehensive evidence base for renewable energy potential (Source: Renewable and Low-Carbon Energy Capacity Methodology for the English Regions, SQW Energy, January 2010)

- The Review of Renewable and Decentralised Energy Potential in South East England provides a high level assessment of the technical capacity for the South East of England to accommodate different types of renewable energy technology following the DECC methodology. It was used to inform policy in the South East Plan. Although the study identified the technical capacity of renewable and low carbon energy across the South East and for each of the constituent Local Authorities, it does not present these opportunities spatially on a consolidated energy opportunities plan. Also, the study only offers a technical resource potential capacity; it does not take the delivery context into consideration which will affect the deployment of different technologies.
- West Sussex Sustainable Energy Study provides a similarly high level assessment of capacity on a range of renewable technologies. There has also been a high level assessment of impact on sensitive receptors. Areas of heat priority are identified spatially (relating to heat density which has now been updated by the national heat map). It does not however cover the complete suite of constraints identified by the DECC regional capacity study stages 1-4. The study also looks at potential development scenarios for four of the authorities (not Chichester) to see where strategic development might contribute greater carbon savings.
- Lewes and Eastbourne have developed Energy Opportunity Plans
- Brighton and Hove and Winchester have also produced energy studies although these are not spatial.

Establish the potential renewable and low carbon resource potential within the SDNP

- Wind – National wind speed data is available from the Met Office.
- Hydro – mapping undertaken by the Environment Agency.
- Biomass
  - Wood
    - The Forestry Commission (FC) have recently undertaken a South Downs Wood Fuel Study based on the National Inventory of Woodland and Trees (NIWT) (1995, updated 2011). The study found that the current woodland assets (both in and outside of FC control) should, if managed effectively, generate 60,000m^3 of wood fuel capable of generating 140GWh of heat. This is the equivalent of heating 9,000 homes and, at current rates, would save £8m per annum if the wood replaced oil for heating.
    - Wood waste assessments from the FC and an assessment of wood fuel potential has been analysed by the Partnership for Urban South Hampshire.
  - Bio crops – Agricultural land classification can help priorities the most appropriate land to grow biocrops, usually ALC grades 3 and 4 are chosen as they limit impact on the most productive land for food but are still suitable for most biocrops. This will need to be tempered with understanding of the market, competing uses and environmental impacts. Demand is addressed in the next section.
  - Defra farm survey provides details of livestock numbers from which wet waste assumptions can be drawn.
- Anchor loads – Some information held on public building energy use. Location of schools, leisure centres etc needs to be identified. Where not available from LAs or Counties, the Centre for Sustainable Energy (2009-10) publication of Energy Performance Certificate for all public buildings could be used to identify high demand buildings.
- National Heat Map (2012) – Provides data on heat density and key anchor loads.

Identify constraints

- Most physical and environmental constraints available from national sources such as Magic
- Landscape Character Assessment for SDNP – provides some high level indication of sensitivity. Landscape character, as with other political and social constraints have an inherent level of subjectivity attached. Stage 2 will need to work with stakeholders to establish an appropriate level

of acceptance. The DECC methodology highlights that the 'landscape assessment can provide a useful tool for indicating the relative ability of different areas to [renewable energy] development'. However 'it cannot indicate how much development can be accommodated in the landscape. In addition, it should not be interpreted as a definitive statement on the suitability or otherwise of a particular landscape for [renewable energy]'[10]. The guidance also suggests that, although landscape character assessment can feed into a renewable energy capacity study at any stage, feeding the landscape character assessment in too early in the process can constrain resources constrained to the extent that national renewable energy targets could not be met. As such, landscape character should be considered after the total technical potential has been established in order to make balanced decisions when considering the benefits and impacts of renewable development. Given the exceptionally important nature of the SDNP, however, it is likely that landscape character will be a key topic in shaping the likely delivery of different types of renewable and low carbon technologies and fuel sources.

- Other social and political constraints will need to be defined through stakeholder consultation.

7.5 Recommendations for SDNP

- Using the DECC methodology, supplemented with guidance from stakeholder consultation, to develop a comprehensive assessment of resource potential within the SDNP. This will build on and update the SEE, West Sussex and locally produced renewable and low carbon energy studies. This should be represented spatially through the development of an Energy Opportunities Plan which illustrates where the main opportunities for deploying different types of renewable and low carbon technologies are in the SDNP. This should also be supplemented with the information on energy efficiency priority areas where district heating schemes might offer potential (for example in estates).
- Stakeholder liaison should include representation from:
  - Energy developers
  - Housing developers
  - Land owners, farmers and estate managers
  - RSLs
  - Community and interest groups
  - Public sector asset managers

[10] Renewable and Low-carbon Energy Capacity Methodology for the English Regions (DECC, 2010). The original wording (replaced by square brackets). is tailored to wind development, however other renewable technologies such as solar farms, as well as low carbon fuel sources can have landscape impacts that need to be taken into consideration.

- Local authorities
- Natural England

Establishing the potential for delivering low carbon and renewable technology

8. Establishing the potential for delivering low carbon and renewable technology

8.1 Overview of key Issue

Traditionally, energy studies have focused on setting targets based on the local authority area's technical potential to deliver low carbon and renewable energy. This approach is beneficial in understanding the maximum theoretical capacity for renewable energy, and the opportunity for each technology, it does not however account for the local context and capacity to deliver that potential. The variety of delivery routes for deploying these technologies, as well as the numerous delivery partners required is as diverse as the technologies themselves. As such, it is equally as important to investigate the delivery context as it is to understand technical feasibility.

The targets established in the regional study help to set aspirations, but technical potential only indicates what is technically possible, rather than is likely to be feasible. Achieving maximum potential requires setting goals for various stakeholders and organisations and co-ordinating their actions. While establishing technical potential as the local potential would be ideal, it is important to tailor goals to local realities to ensure delivery partners see goals as achievable rather than overwhelming.

With this in mind, a relationship between technical and delivery potential can be seen. As shown in figure 5 the technical potential, calculated using the DECC methodology, is evocative of a 'top-down' approach. An examination, on the other hand, of delivery partners and their ambitions can define what is realistically deliverable from the 'bottom-up.' Setting targets should aim to push delivery potential as close to technical potential as possible, but understand that the technical potential might not ever be reached.

Figure 5: Finding the balance between technical and delivery potential

This is particularly relevant in the context of localism and the NPPF move to encourage locally determined approaches to delivering carbon savings. Furthermore, there are a number of evolving and emerging support mechanisms for stimulate the uptake of renewable and low carbon technologies on which SDNPA will need to take a position and potentially involve itself in administering, such as:

- **Green deal** – The Energy Act 2011 included provision for a new 'Green Deal', which intends to reduce building related carbon emissions by providing finance for investment in energy efficiency measures at no up-front cost to the householder. Starting in October 2012 finance will be able to be secured as a charge on the property to be repaid through a surcharge on the electricity bill over a period of up to 25 years. The scheme is attached to the address, rather than a specific person, which means that there is no financial loss when selling a building. All energy efficiency improvements made to homes or businesses qualify provided that they meet the 'Golden Rule' where the lifetime financial savings outweigh the capital cost plus finance cost, resulting in lower overall energy bills. The Committee on Climate Change highlights that local authorities, or in this instance the SDNPA, might play one of two roles:
    - **Provider** - The local authority would take the lead in delivering the Green Deal, procuring a partner to deliver the scheme and possibly raising finance. Birmingham City Council has opted for this approach, suggesting that this would best enable it to achieve objectives to create jobs, alleviate fuel poverty and improve health, while earning an income stream
    - **Partner** - Delivery and finance of the scheme is undertaken by a commercial partner, with the local authority helping to deliver the scheme. For example, local authorities could coordinate different Green Deal providers in their area, raise awareness amongst consumers, offer joint branding and marketing, provide information about the local housing stock, and provide access to social housing.

West Sussex County Council is currently the most advanced out of the 15 authorities that the National Park covers in developing proposals for the Green Deal. In addition to undertaking survey work on the condition of the housing stock, they are also developing the business case for becoming a Green Deal Provider. They are currently preparing a series of business case scenarios together to present to their Cabinet for approval in November. These proposals include options such as potentially working with constituent local authorities and the SNDPA to facilities the scheme. As such, they invite collaboration and are looking for commitment before early October 2012.

- **Energy Company Obligation** – Replacing the Carbon Emissions Reduction Target CERT and Community Energy Saving Programme (CESP) areas from 2013, the Energy Company Obligation (ECO) sets a new legal obligation on energy suppliers to deliver emissions reductions to vulnerable and low income groups, and through implementation of energy efficiency measures. The ECO will integrate with the Green Deal, allowing supplier subsidy and Green Deal Finance to come together into one seamless offer to the consumer.

- **Feed-in Tariffs (FITs)** - Introduced in April 2010 to replace the support provided by the Low Carbon Buildings Programme and stimulate increased vigour in the take up of installation of small to medium scale renewable electricity generation. The scheme includes:
  - Fixed payment from the electricity supplier for every kWh generated (the "generation tariff").
  - A guaranteed minimum payment additional to the generation tariff for every kWh exported to the wider electricity market (the "export tariff").
  - Generators receiving FITs will also benefit from on-site use: where they use the electricity they generate on-site, they will be able to offset this against electricity they would otherwise have had to buy.
  - Technologies included: wind, solar PV, hydro, anaerobic digestion and non-renewable micro CHP.
  - Tariffs are tax free and will be paid for 25 years for new projects.
  - The tariff levels proposed have been calculated to ensure that the total benefits an investor can be expected to achieve (from the generation tariff, the export tariff and/or the offsetting benefit) should compensate the investor for the costs of the installation as well as provide financial return.
  - The government intends to set tariffs at a level to encourage investment in small scale low carbon generation. The rate of return will be established between 5% and 8%.

  The proposed tariff levels for new projects will decrease by predetermined rates each year ("digression"). The tariff rate agreed at the project outset will be maintained for the 20 year period providing guaranteed returns for each installation.

  Since its introduction, however, the Government has mentioned that it will come under review in 2013. In March 2011, the coalition government cut the incentive for larger scale solar installations (greater than 50kW) by more than 50%. While this will not directly impact micro-generation installations, it does suggest that as a relatively new policy, FITs may continue to undergo changes going forward.

  Through the studies recommended above, the SDNPA will develop a position as to the type and location of renewable within the SDNP. This can be used to control larger renewable and low carbon technologies that might benefits from FITs. Micro-renewables eligible for FITs are however generally allowed under permitted development rights. However, as a sensitive environment many AONBs and National Parks have revoked permitted development of these technologies to avoid impacts on character. SDNPA will need to take a position on the permitted development of building scale renewables to ensure that cultural heritage and landscape characteristics and features are safeguarded within related energy policies.

- **Renewable Heat Incentive** - On 10 March 2011, the Government confirmed that the Renewable Heat Incentive (RHI) was to open for applications for the first phase of funding. Phase one was introduced on 28 November 2011. The first phase of funding focuses on supporting large emitters in the non-domestic sector. As part of this phase, the Government also initiated the Renewable Heat Premium Payments (RHPP) programme, which is a £15m pilot programme to test installing renewable heating systems in homes. The first phase of the RHPP closed on 31 March 2012; however, pre-registration for a second phase of funding is already underway. Phase 2 will run from 1 May 2012 to 31 March 2013.

  The RHI represents over £850m of government investment. There is no upper limit to the size of heat equipment eligible under the RHI and anyone who installs a renewable energy system producing heat after July 15th 2009 is eligible. The following technologies are included in the scheme;

  - Solid and gaseous biomass, solar thermal, ground and water source heat-pumps, on-site biogas, deep geothermal, energy from waste and injection of biomethane into the grid.
  - Unlike FITs, tariffs will be paid not on the basis of a metered number of kWh generated, but instead on a "deemed" number of kWh, namely the reasonable heat requirement (or heat load) that the installation is intended to serve.
  - Tariff levels will be calculated to bridge the financial gap between the cost of conventional and renewable heat systems at all scales, with additional compensation for certain technologies for an element of the non-financial cost and a rate of return of 12% on the additional cost of renewables, with 6% for solar thermal.

  The RHI might be of particular relevance in the SDNP for establishing biomass district heating associated with estate management and in new development schemes.

- **New development, Zero Carbon and Allowable Solutions** - As highlighted above, new development will be expected to deliver incrementally more stringent carbon reduction through Building Regulations. The Government has published a hierarchy for how CO_2 emissions should be reduced to achieve the zero carbon emissions standard (see Figure 6).

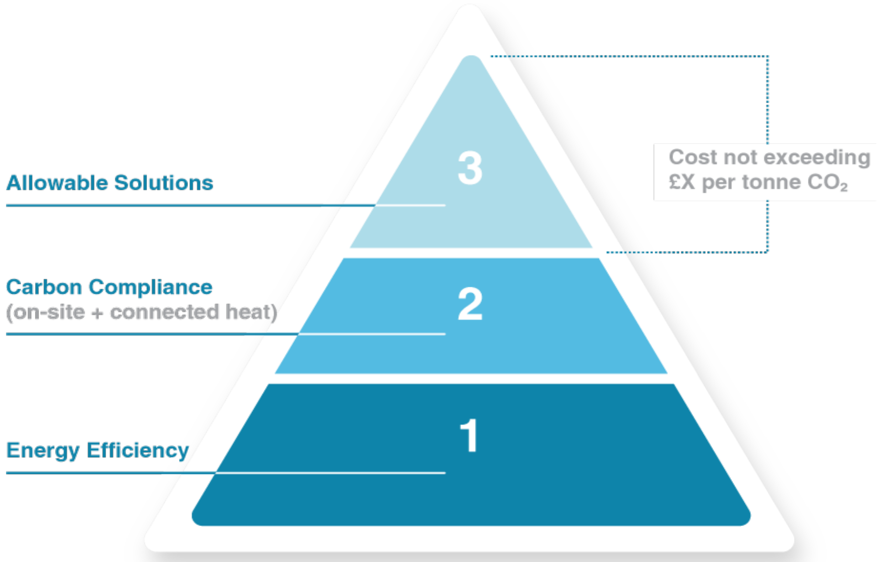

Figure 6: The Government's hierarchy for reducing CO_2 emissions

The hierarchy in Figure 6 shows the proposal that a minimum energy efficiency standard should be achieved for fabric and services. Following this, renewable and low carbon energy must be supplied on-site to meet the CO_2 reductions required for Carbon Compliance (the levels proposed are based around the maximum viable savings which can be achieved across a range of developments).

Above carbon compliance, further CO_2 reduction can be made either on-site, or though off-site savings (known as Allowable Solutions). Depending on the scale and location of new development, there may be opportunities to capitalise on site specifics to deliver greater carbon savings. The PPS1 Climate Change Supplement recognised this by requiring LPAs to investigate the potential of strategic sites to deliver an uplift in energy performance. Furthermore, there may be opportunities arising from new development to deliver infrastructure that can support energy performance improvements in existing development, such as delivering a CHP that could be sized to support extending a district heating network (DHN) into an area of social housing. The SDNPA currently do not have development targets and it is likely that both residential and non-domestic development will be small scale; however, an understanding of the quantum and location of development might help shape, or be shaped by the renewable and low carbon technology opportunities.

The policy around Allowable Solutions is still being developed by the Government but likely allowable solutions include:

- Further CO_2 reductions on and off-site;

- Energy efficient appliances;
- Advanced forms of building control system which reduce the level of energy use in the home;
- Exports of low carbon or renewable heat from the development to other developments; or
- Investments in low and zero carbon community heat infrastructure.

Research by the Zero Carbon Hub titled 'Allowable Solutions for Tomorrow's Homes' (July 2011) outlines the latest proposals and recommendations for how allowable solutions could be embedded in policy and administered. The document highlights the key role of local authorities in the process, and options for developing policy that will ensure allowable solutions funds are directed towards locally approved projects. In the absence of local policy, developer contributions will be delivered through a national list of allowable solution projects.

A key aspect of allowable solutions will be for the LPA to collect allowable solutions financial contributions from developers. Communities and Local Government announced in August 2010 that they would implement a community energy fund, which would allow developers to make payments to the LPA or community. This provides local councils with the ability to create policy which determines how funds can best be used to meet government standards in a way that suits local circumstances.

As such, post 2016, Allowable Solutions will place emphasis on local authorities to identify and support delivery of community scale solutions. It may therefore be more productive for planning to begin to focus on identifying and delivering community scale energy opportunities which go beyond site boundaries, and obtaining an appropriate financial or delivery contribution from developers towards this. Although the level of development in the SDNP is not likely to be significant, the SDNPA may wish to collect and administer Allowable Solutions from development within their boundary. Furthermore, as these opportunities do not need to be delivered in association with new development (although not mutually exclusive), the SDNPA could work with their LPA partners to enable Allowable Solutions monies collocated from development from one part of an LPA outside the Park to be delivered against opportunities that are identified within the Park.

Large cost savings can often be made by planning in low carbon and renewable infrastructure at the start of the design process. This approach could also reduce the burden on developers at a later date, when the zero carbon requirement is introduced, since coordination of community and large-scale renewable and low carbon energy opportunities would enable them to access a broader range of Allowable Solutions for Building Regulations compliance. The level of funding that will arise from Allowable Solutions is unknown, however, DCLG's latest assumptions (noting that this is liable to be revised) is that there will be a cap on the cost of carbon of £46 per tonne (in present day values, discounted from £97 per tonne) over a 30 years period; equating to this is an income of around £966 per dwelling.

- **Delivery Vehicles / Energy Service Companies (ESCo)** -

  Delivery vehicle models range from fully public, through partnerships between public, private and community sectors to fully private. In general, the greater the involvement of third parties, the lower the risk to the authority, but importantly, the less control the authority will have. Whichever model is chosen, putting the delivery vehicle in place as early as possible is important. This ensures that technical and financial requirements can be understood prior to negotiations with potential customers. An ESCo, a company operating as generator, distributor, supplier and/or regulator, of an energy system is a key opportunity. An exciting opportunity is the possibility of the SDNPA setting up a delivery vehicle. The skills needed to do this will likely need development, but this is not an insurmountable barrier. A growing number of local authorities are engaging in similar activities in energy as well as other areas. The key to success is likely to be leadership: from senior local authority management or, at least initially, from committed individuals in planning or other departments. Ultimately, a change in mindset from executives and likely within the finance department, will be required for a delivery vehicle to be established successfully.

  There is also significant experience within the SDNP to build upon, particularly founded around the Transition Town Lewes movement and the activities of the Ouse Valley Energy Services Company (OVESCo). OVESCo is an Industrial and Provident Society for community benefit dedicated to localising energy generation in Lewes District since 2007. The presence of a local ESCo (Energy Services Company) has ensured that local renewable projects have gained delivery traction, and its presence is a major advantage to carbon reduction delivery in Lewes District. They have achieved substantial delivery of micro-generation in existing homes through targeted grant funding in partnership with Lewes District Council. Several other flagship projects in schools and new development also exist in the District.

  The diagram below highlights different partnership arrangements including examples of existing ESCos, and following table below highlights the relative merits of the different delivery models.

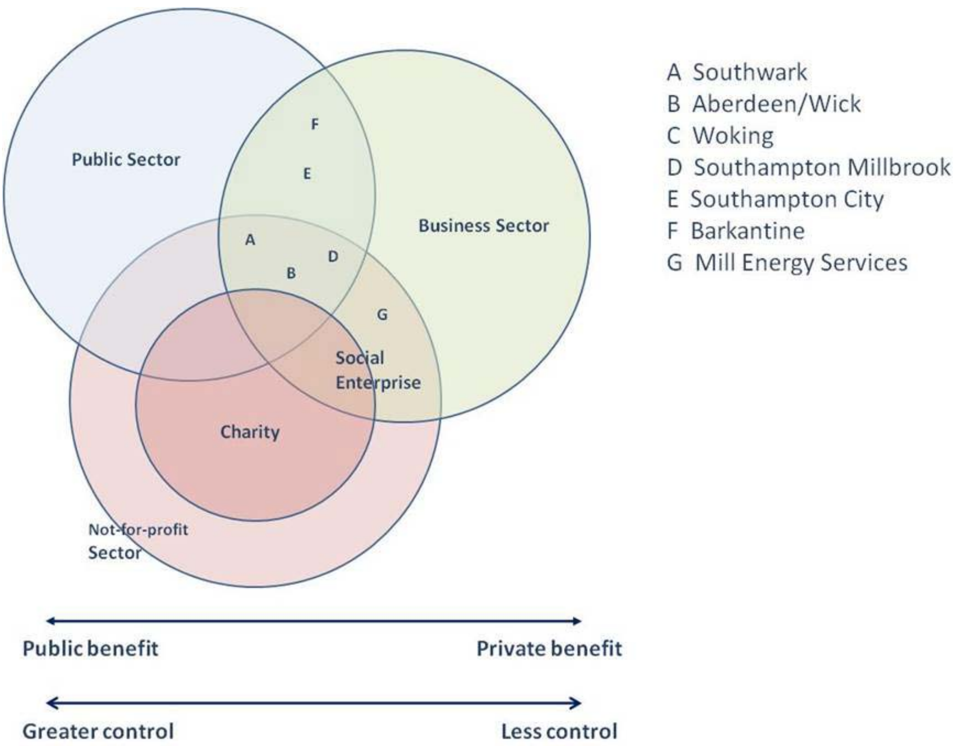

Figure 7: Spectrum of ESCo/delivery vehicle (Source: Making ESCos Work)

Partnership arrangements will need to be specific to the context of the ESCo. Depending on the relative roles of the partnerships various responsibilities, opportunities and relative risks need to be agreed including:

- Technical issues – such as the type and scale of facility. Connection to the grid or private network;
- Construction risk – who will be responsible for ensuring the construction is appropriate, build to time;
- Operational risks – who will be responsible for running and maintaining the facility and network;
- Future proofing – what are the long term financing plans, what are the opportunities to expand;
- Funding – different funding arrangement have various requirements stipulated
- Legal issues – such as public contract regulations

8.2 Lessons learnt from best practice

- Establishing partnerships with local organisations is essential to capitalising on the potential for low carbon and renewable energy schemes. As with many partnerships, establishing what benefits the National Park can offer potential partners has been cited as an important component to enticing organisations to work with National Park authorities.
- Where possible establishing energy schemes should look to benefit the community financially. Establishing an industrial and provident society can be challenging, but its profits can enable investment in additional renewable energy schemes.
- Education and promotion of low carbon and renewable energy is an important role for National Parks. Delivering on the potential for these technologies in National Parks requires the community involvement. National Parks that have been successful in delivering these schemes have an active and engaged community on whom they can rely. Fostering this type of community begins with education and promotion.

8.3 Key investigations for the South Downs National Park

- *Understand the key delivery partners* and their respective roles and appetite for delivering renewable and low carbon technology in the Park, including:
    - Energy developers
    - Housing developers
    - Land owners, farmers, woodland managers and estate managers
    - RSLs
    - Community and interest groups
    - Public sector asset managers
    - Local authorities
- *Understand the local economic conditions* - for delivering renewable and low carbon technologies and their contribution to the wider economy, i.e. the role of biomass grown in SDNP for use outside the park is likely to compete with carbon savings from biomass use within the Park.
- *Understand the delivery mechanisms available and the role SDNPAs including*:
    - Green Deal
    - Role of permitted development rights and FITs/RHI

- SDNPA as a partner in or deliverer of an ESCO
- Allowable Solutions, S106 and CIL

- *Understand the impact of new development* on the carbon profile and assess the scale and spatial nature of new development for opportunities to be able to deliver higher levels of energy performance and lever these benefits into the wider community.

8.4 Availability of evidence/information, its limitations and gaps

Appendix 1 provides a summary table of the evidence identified, key findings are highlighted below.

Understand the key delivery partners

- A few key delivery partners have been identified, including local authority partners, RSLs and some community groups. Further work is needed to understand the wider delivery partners and their aspirations.

Understand the local economic conditions

- Although the regional capacity study and the West Sussex study provide some rationale as to delivery potential, an understanding of the key delivery issues, the market, viability and economic assessment of potential is still not largely understood. Some initial work on wood fuel markets, particularly around south Hampshire has been identified.

Understand the delivery mechanisms available and the role of SDNPA

- The Housing Stock Condition work currently being undertaken by West Sussex is to support the County's position on Green Deal deployment. Similarly, Hampshire are also starting to research opportunities arising from the Green Deal.
- Most authorities agree that Allowable Solutions will be an important mechanism for the future to reduce carbon from development related energy; however, few have started thinking through implications for their authority. This is largely due to the lack of certainty around the Government's position on Zero Carbon Policy and how Allowable Solutions is to be administered.

Understand the impact of new development

- There is no planned strategic growth within the Park
- There are currently no defined development targets for the Park

- Focus of development is likely to be around the larger settlements of Lewis, Petersfield and Midhurst. Apart from the Employment Land Study there is limited information on sites available, although further information will emerge as the SDNPA SHLAA nears completion towards the end of 2012.

8.5 Recommendations for SDNP

- Establish a position on permitted development for FITs and RHI projects based on the assessment of renewable and low carbon technology opportunities and constraints.
- Identify opportunities within the Green Deal
- Undertake a market appraisal for biomass fuels taking into consideration both local supply and demand as well as influences on demand and supply from outside the National Park boundaries.
- Identify potential projects where the SDNPA could participate in / act as ESCo; establish SDNPA's appetite for developing delivery vehicles.
- An understanding of the scale and location of development is fundamental to understanding the scale of potential for integrating renewable and low carbon technologies. In the absence of specific information on the scale and location of development SDNP could develop a suite of typical development scenarios that could be used to test different delivery feasibility and viability options.
- Once the Government's consultation on Allowable Solutions has been released there should be greater certainty on how the proposed framework will be administered. SDNPA can then consider setting up a working group with LPA partners to identify a suite of projects to be funded through Allowable Solutions.

Managing and Using the Evidence

9. Managing and Using the Evidence

9.1 Developing planning policy and recommendations

The study recommendations highlighted throughout the previous sections and summarised in section 10 would present a comprehensive evidence base on which to develop policy for inclusion in the SDNPA Local Plan to enable:

- Consequential improvements for the energy performance of existing developments;
- Set a target for and help shape the spatial deployment of different renewable and low carbon technologies; and
- Identify opportunities for new development to improve on national standards and extend benefits into existing areas of development.

However, there are also a range of issues which are not related to, or are not wholly driven by planning; progressing these issues will assist the SDNPA to set out its approach to reducing development related carbon emissions, specifically:

- Setting a strategic approach to improving the energy performance of existing dwellings and other buildings;
- Working with and enabling a wide range of delivery partners, including estate managers, housing developers, RSLs and energy developers to engage in energy performance improvement activities; and
- Identifying specific actions with other local delivery partners that help to unlock barriers to delivery and stimulate low carbon energy markets such as for biomass.

These wider aspirations cut across a range of SDNPA services and will require input from stakeholders including the 15 partner authorities. The SDNPA should therefore develop and take ownership for driving an action plan of wider activities.

9.2 What to monitor?

Key to delivering an effective area-based low carbon and renewable energy strategy is successfully drawing on all of the available opportunities and understanding how well they are being capitalised upon. Monitoring is central to this. Ultimately the most important figures will be on reduced energy usage figures supplied by DECC annually at LLSOA. However, as these are dependent on a number of variables outside of SDNPA's control, such as the carbon intensity of the grid, a number of sub-indicators could be useful to monitor. Without knowing the exact extent of proposed policies and action plan, it is difficult to assess how best to monitor, however, the Committee on Climate Change highlights a number of criteria that should be included in monitoring, including for;

- Domestic buildings, though measures such as the Green Deal
    - o Solid wall insulation (cumulative, million homes)

    - Loft insulation (<=100 mm)
    - Loft insulation (>100 mm)
    - Cavity wall insulation
    - Uptake of EE boilers
    - Uptake of EE appliances – Cold A++ rated (% of stock)
    - Uptake of EE appliances – Wet A+ Rated (% of stock)
    - Every house offered whole-house energy
- Non-domestic buildings
    - Percentage of DECs and EPCs taken out for all non-residential buildings
    - Minimum EPC rating of F for all non-residential buildings
- Standalone and community scale renewable and low carbon energy generation infrastructure
    - Capacity entering planning (MW)
    - Average planning period (months)
    - Capacity entering construction (MW)
    - Capacity operational (MW)

Other areas which should also be monitored include

- Uptake in FITs and RHI

Summary of Recommendations

10. Summary of Recommendations

10.1 Establishing the SDNP Energy Profile

- Use the LLSOA and MLSOA data on electricity and gas use, along with combined SOA data on off grid properties and DECC other fuels data to provide a spatial understanding of energy consumption in the SDNP area.
- Make assumptions as to the level of new development and establish evolving energy demand baseline.
- Undertake an assessment of existing renewable and low carbon technology within the Park boundary.
- Combine the findings to estimate the current carbon profile for the SDNP from building related energy.

10.2 Improving the Energy Performance of the Existing Building Stock

- Develop an energy efficiency plan which compiles priorities based upon the current understanding of household typologies, fuel poverty, single ownership properties and public buildings. Ideally a complete picture of housing typologies for Hampshire and East Sussex (or at least the areas within SDNP) should also be developed to complement that from West Sussex. This spatial understanding will help prioritise specific actions in specific areas.
- Understand the scale of opportunity and appetite of large estates to develop district heating networks fuelled by biomass grown onsite (see section 8).
- Identify and target poor performing local authority buildings.

10.3 Determining the appropriateness of different Renewable and Low Carbon Technologies

- Using the DECC methodology, supplemented with guidance from stakeholder consultation, to develop a comprehensive assessment of resource potential within the SDNP. This will build on and update the SEE, West Sussex and locally produced renewable and low carbon energy studies. SDNP should be represented spatially through the development of an Energy Opportunities Plan which illustrates where the main opportunities for deploying different types of renewable and low carbon technologies are in the SDNP. This should also be supplemented with the information on energy efficiency priority areas where district heating schemes might offer potential (for example in estates).
- Stakeholder liaison should include representation from:
    - Energy developers
    - Housing developers
    - Land owners, farmers and estate managers

- RSLs
- Community and interest groups
- Public sector asset managers
- Local authorities
- Natural England

10.4 Establishing the potential for delivering low carbon and renewable technology

- Establish a position on permitted development for FITs and RHI projects based on the assessment of renewable and low carbon technology opportunities and constraints.
- Identify opportunities within the Green Deal
- Undertake a market appraisal for biomass fuels taking into consideration both local supply and demand as well as influences on demand and supply from outside the National Park boundaries.
- Identify potential projects where the SDNPA could participate in / act as ESCo; establish SDNPA's appetite for developing delivery vehicles.
- An understanding of the scale and location of development is fundamental to understanding the scale of potential for integrating renewable and low carbon technologies. In the absence of specific information on the scale and location of development SDNP could develop a suite of typical development scenarios that could be used to test different delivery feasibility and viability options.
- Once the Government's consultation on Allowable Solutions has been released there should be greater certainty on how the proposed framework will be administered. SDNPA can then consider setting up a working group with LPA partners to identify a suite of projects to be funded through Allowable Solutions

Appendix 1: Summary of Information and Data Sources

Summary of Information and Data Sources

The table below highlights the data and information sources identified during this scoping study that might be useful to the SDNPA in developing their renewable and low carbon energy evidence base. Topics have been colour coded as follow:

Green: Directly relevant and spatially applicable

Orange: Relevant context but not spatially tailored to the SDNP

White: Emerging formation / no information available