Energy and Sustainability Statement

On behalf of:
Tesco Stores Ltd / Nestlé Waters UK Ltd

In respect of:
Station Road
Buxton

Date:
September 2011

Reference:
1075609 / R003m

Contents

Contents		**2**
1.0	**Executive Summary**	**3**
2.0	**Introduction**	**5**
3.0	**Tesco Approach to Sustainability**	**7**
4.0	**Policy Requirements**	**9**
5.0	**Sustainability Assessment**	**11**
6.0	**Management**	**12**
7.0	**Social & Economic Implications**	**13**
8.0	**Health and Wellbeing**	**14**
9.0	**Energy Strategy**	**15**
10.0	**Transport**	**26**
11.0	**Water**	**27**
12.0	**Waste and Materials**	**28**
13.0	**Land Use and Ecology**	**29**
14.0	**Pollution**	**30**
Appendix 1: Checklist for Sustainability Statement		**31**

1.0 Executive Summary

1.1 The Sustainability Statement is submitted in support of the hybrid application for a Tesco foodstore and additional mixed use development at Station Road, Buxton. This hybrid application is submitted jointly by Tesco Stores and Nestle Waters UK Ltd.

1.2 The statement recognises the policy imperatives at national and local levels to achieve high standards of sustainability performance, both in terms of the strategic fit of the proposal and the realisation of the development through its design and construction.

1.3 Tesco are committed to achieving a **BREEAM 2008 'Very Good' rating** for the development. The statement provides details of how this will be achieved, together with the Energy requirements of the development and the sustainable elements of the scheme.

1.4 The development proposals will have a direct positive economic impact through the creation of approximately 200 jobs. To help ensure the jobs are prioritised for local people, including the long-term unemployed, the roles would be recruited through a Local Employment Partnership (LEP) with Jobcentre Plus and other employment organisations. This includes targeting potential recruits by leafleting thousands of homes in the surrounding area, placing a series of local advertisements and manning a recruitment hotline.

1.5 The development demonstrates a total energy reduction of 24% is achievable against industry benchmarks, met through energy efficiency measures and low carbon technologies.

	Savings kWh/yr	Savings $kgCO_2/yr$
Site Baseline	6,656,712	2,754,723
Energy Efficiency	665,671	275,472
CHP	909,718	227,039
Total Savings	**1,575,389 (24%)**	**502,511 (18%)**

1.6 A number of sustainable initiatives have been incorporated into the design including:

- Transport considerations through a Travel Plan providing targets to enable the reduction in car use for both staff and customers including 57 cycle spaces and assistance for pedestrians;
- Energy efficient lighting, with external Passive Infra Red (PIR) sensors, LED and time

switches will be incorporated into appropriate areas;

- The provision of landscaping and ecological enhancements to provide opportunities for a range of wildlife;
- The Commitment to the Considerate Constructors Schemes will ensure all constructors on the approved supplier list must achieve the necessary criteria.
- On site monitoring of the construction site impacts with a comprehensive set of environmental impact and pollution measures will be recorded throughout the construction programme.
- The incorporation of glazing options within the design will result in a high quality environment for customers and staff, enabling natural daylight to filter down to the sales floor.

1.7 Tesco recognises the role it can play as a leading developer and has embarked on a series of initiatives to design and specify a new Tesco Environmental Format Store which is at the cutting edge of sustainable design.

2.0 Introduction

2.1 DPP has been commissioned by Tesco Stores Limited to prepare an Energy and Sustainability Statement for a development at Station Road, Buxton. The scheme will cover a hybrid application seeking full consent for a Class A1 retail foodstore with associated car and cycle parking, public realm works, access works and other associated works. In addition, outline consent is sought for flexible commercial uses (A3/A4/A1/B1/D2/C1) and student accommodation (sui generis) in the south-western corner of the application site. All matters are reserved for future determination with the exception of access.

2.2 This statement provides an assessment of the sustainability aspects that are relevant to the proposed development. The analysis provided identifies the sustainability objectives and indicators that are established within the planning and sustainability policy frameworks and demonstrates how the proposal will deliver these requirements; in addition to acknowledging the BREEAM requirements for the store.

2.3 The energy section of this report provides details of the scheme's energy requirements, based upon energy efficiency and a low carbon and renewables assessment to identify the most viable option. This section will meet with policy requirements for 10% energy from renewable and low carbon sources.

Proposed Development

2.4 The application site is located immediately north of Station Road, entirely within Buxton's defined town centre. The site covers an area of 2.51 hectares and is situated on land between the main passenger railway line to the northwest and a freight rail line to the northeast, and Station Road to the south.

2.5 The site is currently occupied by Nestlé Water UK Ltd and is the site for the Buxton Water Bottling Plant. Two large industrial units dominate the site (4846m^2 and 2515m^2), with a large space of hard standing for container lorries, pallet storage and for loading and unloading.

2.6 Land to the west of the application site is occupied by a car park which serves Buxton Train Station, under the ownership of Network Rail. The remainder of the town centre is located south of Station Road with a covered retail mall behind the high wall bounding the Spring

Gardens development. The site is bounded to the north, north-east and north-west by railway infrastructure. Beyond the rail infrastructure, and therefore beyond the town centre, residential areas can be found further to the north west and north east.

2.7 The proposed development will comprise a mixed use scheme of the following:

	Gross Internal Area
	M^2
Supermarket	6,601
Student accommodation	3,073
Flexible commercial space	1,212
Proposed Total Gross Internal Floor Area	**10,886**

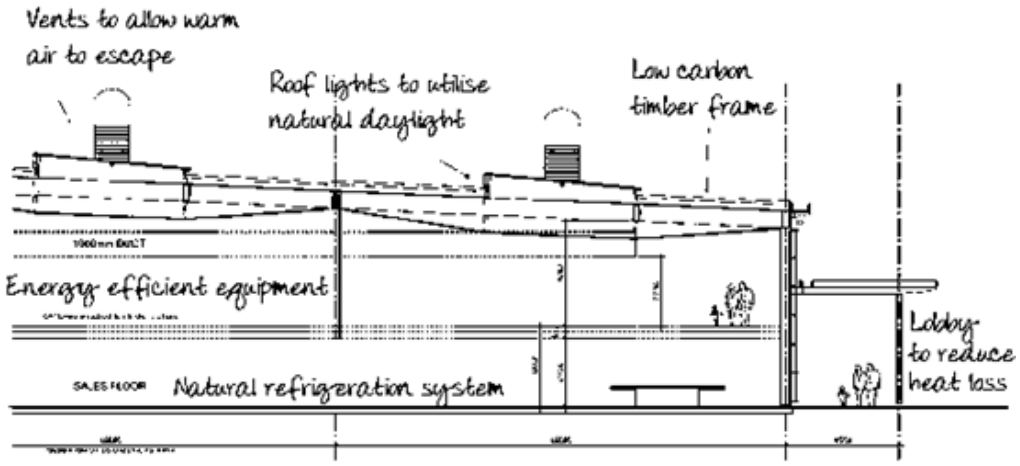
3.0 Tesco Approach to Sustainability

3.1 Tesco recognises the role it can play as a leading developer. On the 18th January 2007 Sir Terry Leahy, Chief Executive of Tesco Stores Limited said:

"Our [Tesco] verified carbon footprint includes all our existing stores and distribution centres worldwide. We [Tesco] will reduce emissions from these buildings by at least 50% by 2020. We will ensure that all new stores built between now and 2020 will emit, on average, at least 50% less carbon than an equivalent store built in 2006."

3.2 The Carbon Disclosure Project (CDP)'s 2010 UK FTSE 350 report and Global 500 report rank Tesco as the top retailer. The ranking comes from a high score in both the Carbon Performance Leadership Index (CPLI), which assesses strategy and action to reduce emissions and in the Carbon Disclosure Leadership Index (CDLI), which assesses the quality and completeness of reporting on carbon management.

3.3 To deliver this Tesco has embarked on a series of initiatives which has resulted in a new Tesco Environmental Format Store which is at the cutting edge of sustainable design.



3.4 The first Eco Store opened in January 2009 at Cheetham Hill in Manchester. Tesco cut the carbon footprint of the store by 70% compared to an equivalent store built in 2006. Lessons will be learnt from this prototype and the Tesco Eco Store will be available throughout the country to dramatically reduce the buildings build, operational and decommissioning impact on the environment. The technologies have been tried and tested and are robust. This is a major consideration for Tesco as they recognise that the reliability of equipment can have a large impact on its environmental life cycle, and in the worse cases could actually have an

overall negative effect.

3.5 Ramsey is Tesco's first zero-carbon store which was built in Cambridgeshire in 2009. It is designed to use as little energy as possible. The energy that is required is generated on site from renewable fuel, and any excess energy is exported to the National Grid. The store uses a mix of environmentally friendly design, materials and technologies, including:

- Sustainably-sourced timber frame.
- Roof lights and sun pipes that allow natural daylight into the sales floor and staff areas.
- Energy efficient heating and air conditioning systems.
- Rainwater collection to flush the toilets and run the carwash.
- Combined Heat and Power plant to generate electricity using renewable fuel.
- Refrigerant gases in the fridges, heating, ventilation and air conditioning systems that have virtually no environmental impact.
- Energy-efficient equipment such as low energy bakery ovens.
- Flooring tiles made from local materials.

3.6 Tesco have a series of Corporate Key Performance Indicators, reported annually. Those which will influence and provide sustainability benefits of the store from design into the operations include:

Tesco Corporate Key Performance Indicators	2010 Performance	2011 Target
Reduce CO_2e emissions from our 2006/7 baseline portfolio of stores and distribution centres by 50% by 2020. Annual target reported as percentage reduction against previous year	8.59%	5.5%
Reduce CO_2e emissions from new stores and distribution centres built after 2006 by 50% by 2020, compared to new stores and distribution centres built in 2006.	30.2%	30%
Reduce the amount of CO_2 used in our distribution network to deliver a case of goods compared to previous year.	12%	11.7%
Percentage of store waste recycled	100%	95%
Staff fund-raising (£)	£7.4m	£10m
Donate at least 1% of pre–tax profits to charities and good causes	1.94%	1.8%

4.0 Policy Requirements

National Planning Policies

4.1 **PPS1 Delivering Sustainable Communities** sets out the Government's overarching planning policies on the delivery of sustainable development through the planning system. The national guidance seeks to facilitate and promote sustainable and inclusive patterns of development.

4.2 Adopted **PPS1 Supplement Planning and Climate Change** sets out how planning should contribute to reducing emissions and stabilising climate change (through mitigation) and address its unavoidable consequences (through adaptation).

4.3 The UK Government's **Climate Change Act** has established legally binding targets for an 80% reduction in carbon dioxide CO_2 emissions by 2050, To support this target the UK Renewable Energy Strategy was launched in July 2009 to provide 15% of energy from renewable sources. Incumbent in both documents is the need for increased levels of energy efficiency and the development of low carbon and renewable energy technologies.

4.4 The Government has already established targets for 10% of all UK electricity to be generated from renewables by 2010 and 20% by 2020. **Planning Policy Statement 22** (PPS22), published in 2004 encourages local authorities to include renewable targets for new developments.

4.5 **PPS4 Planning for Sustainable Economic Growth Policy EC10.2** requires all planning applications for economic development to consider whether the proposal limits carbon dioxide and minimises vulnerability to climate change.

4.6 **PPS10 Planning for Sustainable Waste Management** (1999) aims to deliver a planning strategy and framework whereby waste is considered as a resource, with disposal seen as the last option.

4.7 The overarching objective of **PPG13** is the continued integration of planning and **transport** at the national, regional, strategic and local level. Main objectives of this guidance aim to promote more sustainable transport choices.

High Peak Borough Council Local Plan

4.8 The Council expects 10% of the predicted energy demand of major developments to be generated on site by renewable means. Maximising the energy efficiency of new buildings will mean that less investment in renewable energy will be needed, in order to meet the target. The basis for setting an aspirational target is taken from the Supplement to Planning Policy Statement 1: Planning and Climate Change.

4.9 **Sustainable Design and Construction** The Local Plan Policy requires the completion of a sustainability checklist and provision of a sustainability statement to respond to the checklist questions. A BREEAM rating is also encouraged, although there is no requirement to provide a certificate or demonstrate the store will meet any specific rating.

Summary

4.10 For the purposes of this report the application of a 10% energy saving across the site will be applied in additional to a BREEAM pre-assessment. This is in line with both PPS1 and the High Peak Borough Council expectations.

5.0 Sustainability Assessment

5.1 **The Local Plan** requires the completion of a sustainability checklist to demonstrate the benefits the development will have. In addition, Tesco have performed a BREEAM pre-assessment for the store to highlight its sustainable nature.

5.2 The following sections provide an overview of the sustainability benefits and inclusions within the development for the planned retail store, student accommodation, and additional facilities captured against the national and local policies within a BREEAM framework. The completed Sustainability Checklist is available in Appendix A.

5.3 The proposed Tesco store has been assessed to achieve a **BREEAM 2008 Retail 'Very Good'** rating. At this early stage in the development cycle, many of these required credits are to be incorporated into the later specifications.

5.4 The table below shows the summary scores as percentages for the BREEAM pre-assessments for the Retail Store. A score in excess of 55% is necessary to achieve a Very Good rating or higher. It can therefore be seen that the minimum score has been achieved and a BREEAM Very Good rating gained.

Category	Maximum	Achievable	Weighting	Achievable Credits
Management	10	9	0.12	10.80%
Health & Wellbeing	9	4	0.15	6.67%
Energy	25	13	0.19	9.88%
Transport	13	9	0.08	5.54%
Water	8	6	0.06	4.00%
Materials	13	4	0.125	3.85%
Waste	8	7	0.075	6.56%
Land Use and Ecology	10	6	0.1	6.00%
Pollution	13	7	0.1	5.38%
Overall Percentage	**109**	**64**	**1**	**58.68%**

6.0 Management

6.1 Tesco have incorporated good sustainability management practices as part of a standardised approach to the delivery of new stores. They ensure the criteria forms part of the agreement with the approved constructors to achieve the highest possible standards. This ethos is applied to the existing building stock to meet with Tesco stated ambitions to be ultimately a zero waste and zero carbon business together with providing sustainable stores. This approach will also be applied to the delivery of the proposed development at the Station Road site.

6.2 In relation to management of the proposed development, commissioning is a standard requirement of Tesco Stores Ltd for all new stores at both handover and during the first year of operation to ensure the building operates as efficiently as possible. Again this commissioning standard will apply to the new retail development on the site.

6.3 Commitment to the Considerate Constructors Schemes is also a Tesco standard requirement whereby all constructors on the approved supplier list must achieve the necessary criteria.

6.4 Monitoring construction site impacts also occurs with each new store, with a comprehensive set of environmental impact and pollution measures recorded throughout the construction programme.

6.5 Together with the commissioning, a simple building user guide for the additional areas within the retail operating areas will be provided to ensure the buildings operate to maximum efficiency.

7.0 Social & Economic Implications

7.1 The Government has identified environmental, social and economic implications as the key principles underpinning sustainability. The focus of **PPS1** seeks to further promote sustainable economic development. The underlying sustainability policy at the national level also supports development which promotes social inclusion in the development process whilst working towards safe, liveable, and inclusive communities.

7.2 The development proposals will have a direct positive economic impact through the creation of approximately 200 jobs.

7.3 To help ensure the jobs are prioritised for local people, including the long-term unemployed, the roles would be recruited through a Local Employment Partnership (LEP) with Jobcentre Plus and other employment organisations. This includes targeting potential recruits by leafleting thousands of homes in the surrounding area, placing a series of local advertisements and manning a recruitment hotline.

7.4 A Statement of Community Involvement accompanies this submission. It details that throughout the pre-application process the local community and key stakeholders were able to express opinions related to the quality and value given to the new proposals and also it investigates the potentials of the development from a user point of view. This actively targeted the community to ensure the scheme progressed in consultation.

7.5 A number of Officer discussions were held to fully understand the local issues, together with keeping the Local Elected Members informed on progress. A presentation was also provided to CABE's East Midlands Design Review Panel to outline the scheme. CABE were broadly supportive of the design. In addition, two exhibitions were held to provide the local community with the opportunity to view and comment on the proposals.

7.6 Reviewing the public consultation feedback it is possible to observe a positive response towards the proposed development.

8.0 Health and Wellbeing

8.1 Linkages exist between the store and surrounding areas, particularly the Spring Gardens Centre and other town centre uses. These provide good, safe and comprehendible pedestrian routes to the entrance point of the store. In order to assist pedestrian crossing movements in the vicinity of the site, signal controlled crossings are provided on Station Road to the east and west of the site.

8.2 Access for cyclists is via a series of cycle network facilities adjacent to and across the site. National Cycle Route number 68 passes through Buxton and provides a designated on-road route through the town. There is also a section of off-road cycle path along Broad Walk, which passes through Pavilion Gardens. Additional cycle routes are proposed in close proximity to the site, providing links to the east of Buxton.

8.3 The incorporation of glazing options within the design will result in a high quality environment for customers and staff, enabling natural daylight to filter down to the sales floor. In addition there are extensive views out for staff.

8.4 It is a Tesco design standard to install high frequency lighting on all fluorescent and compact fluorescent lamps. It is also a Tesco design standard to specify internal and external lighting that is compliant with the maintained illuminance levels recommended by CIBSE.

8.5 Thermal comfort is highly regarded by Tesco; a feasibility study aimed at optimising thermal comfort will be carried out using software compliant with CIBSE AM11 to ensure that the scheme will meet standards specified within the Retail BREEAM 2008 manual. VOC emissions will also meet best practice levels.

9.0 Energy Strategy

9.1 For the purposes of this report the application of a 10% energy reduction decentralised, renewable or low-carbon sources across the site will be applied in line with the High Peak Borough Council aspirations.

Proposed Development Baseline

9.2 The likely annual energy consumption and associated CO_2 emissions from the proposed development are based on modelled industry benchmarks for energy use obtained from CIBSE Guide F. The data sets in CIBSE Guide F are becoming out of date due to the changing building regulation requirements. The Merton Rule policy guidelines suggest that benchmark figures should be reduced by 8% to compensate for the reductions.

9.3 The energy consumption, CO_2 emissions for the proposed development based on current industry benchmarks can be seen in the table below:

CIBSE Benchmark	Area (m^2)	Energy (kWh/yr)	Emissions ($kgCO_2$/yr)
Supermarket	6,601	5,861,886	2,550,841
Flexible Commercial Space	1,212	171,437	47,801
Student Accommodation	3,073	623,389	156,081
TOTAL	**10,886**	**6,656,712**	**2,754,723**

Energy Efficiency Measures

9.4 As outlined in Section 3, Tesco have set themselves a number of long term targets for store construction specification and are considering the implementation of a number of these at the Buxton store. These measures are aimed at reducing the energy consumption and carbon emissions of the site. The reduced building form (i.e. exclusion of cycle hub and incubator space) has been arrived at following a market testing exercise through which no clear evidence of viable market demand was secured, and this will result in a smaller carbon impact both in construction and operation.

9.5 It is expected that through the inclusion of these measures buildings on site will exceed the

current building regulations. An anticipated increase of 10% for the various buildings has been applied to the baseline. It is recognised that it is easier to improve the efficiency of dwellings than retail supermarkets and other commercial spaces.

9.6 These include the following list that explains measures likely to improve the overall energy efficiency improvements of the store and student accommodation:

Internal Lighting

- Energy efficient lighting which has external Passive Infra Red (PIR) sensors or time switch controls that switch off the lights when they are not needed;
- Low energy LED lighting in refrigeration units to reduce energy consumption;
- The removal of the colonnade will enable more light to enter the store leading to more energy efficiencies.

External Lighting

- Zoned car park lighting scheme to reduce unnecessary lighting when the store is less busy;
- Energy efficient luminaires that provide a more even light distribution thus reducing the number of lights required and so reducing the energy requirement across the site;

Building Integrated Measures

- Draught lobbies between the exterior and interior of the store and also between the sales area and storage area to reduce heat loss when doors are opened;
- Low Pressure Hot Water used for Door & Warehouse Heating to reduce demand from mechanical heating;
- Damper controlled louvers to be integrated into north lights for natural ventilation.

Power Management

- Energy Efficient Small Power Items to reduce unnecessary waste;
- Improved monitoring & metering of energy use to optimise consumption;

Refrigeration Measures

- Low energy LED lighting in refrigeration units to reduce energy consumption;
- Refrigeration systems that are cooled with carbon dioxide rather than more harmful traditional refrigeration gases.

9.7 The anticipated adjusted energy baseline will be:

	Energy (kWh/yr)	Emissions ($kgCO_2/yr$)
Site Baseline	6,656,712	2,754,723
Energy Efficiency Saving	665,671	275,472
Adjusted Baseline	5,991,041	2,479,251
10 % Site Target	**599,104**	

9.8 Baseline

Building type	Use	Class	Gas (kWh/m2/yr)	Electricity (kWh/m^2/yr)	M^2	Total Gas (kWh/yr)	Total Electricity (kWh/yr)	Total Energy (kWh/yr)	Gas CO_2 (kg/CO2)	Elec CO_2 (kg/CO2)	Total CO_2 (kg/CO2)
Supermarket	Retail	A1	265	623	6,601	1,749,001	4,112,885	5,861,886	323,303	2,227,539	2,550,841
Flexible Commercial	Offices	B1	104	37	1,212	126,278	45,159	171,437	23,343	24,458	47,801
Self catering/flats	Education	C2	166	37	3,073	508,889	114,500	623,389	94,068	62,013	156,081
TOTAL					**10,886**	**2,384,168**	**4,272,544**	**6,656,712**	**440,713**	**2,314,010**	**2,754,723**

9.9 Adjusted Baseline with % reduction

Building type	Use	Class	Gas (kWh/m2/yr)	Electricity (kWh/m^2/yr)	M^2	Total Gas (kWh/yr)	Total Electricity (kWh/yr)	Total Energy (kWh/yr)	Gas CO_2 (kg/CO2)	Elec CO_2 (kg/CO2)	Total CO_2 (kg/CO2)
Supermarket	Retail	A1	238	561	**6601**	1,574,101	3,701,597	5,275,697	290,973	2,004,785	2,295,757
Flexible Commercial	Offices	B1	94	34	**1212**	113,650	40,643	154,294	21,008	22,012	43,021
Self catering/flats	Education	C2	149	34	**3073**	458,000	103,050	561,050	84,661	55,812	140,473
TOTAL					**10,886**	**2,145,751**	**3,845,290**	**5,991,041**	**396,642**	**2,082,609**	**2,479,251**

Low and Zero Carbon Technology Options

9.10 An assessment of the various technologies was performed to understand their commercial and carbon benefits for the proposed development at Station Road. Certain technologies are only suitable for certain applications. The viability of each technology to be used at the Station Road is scored against a traffic light system to focus attention on where greatest benefits can be gained:

- Red – not viable
- Amber – not currently viable but potentially in the future
- Green - viable.

		Applicability Assessment				
Renewable Technology	**Description**	**Design Constraints**	**Application**	**Indicative costs**	**Emission Reduction Potential**	**Viability at Buxton**
Small Scale Wind Turbines	Produce electricity by using the natural power of the wind to drive a generator capable of 6kW to 50kW	Small scale turbines require clear access to wind flow and wind speeds need to be at least 6m/s. Urban areas are not ideal.	Can be installed on the development site. Wind speeds at the development will be variable	Medium capital costs with long paybacks.	Average – offsets electricity which has a high CO_2 content. Wind speeds may not produce large amount of electricity.	Would not be appropriate for energy demand of site.
Large scale wind turbines	Produce electricity by using the natural power of the wind to drive a generator capable of 250kW to 5MW	Large structures up to 100m in height and need to be away from housing and in areas of high average wind speeds.	Limited location within the development site.	High – wind turbines can cost significantly	High – potentially a large producer of electricity	Suitable free-standing location unavailable due to adjacent buildings and proximity to key roads/rail.

		Applicability Assessment				
Renewable Technology	**Description**	**Design Constraints**	**Application**	**Indicative costs**	**Emission Reduction Potential**	**Viability at Buxton**
Photovoltaics (PVs)	Modules of semi conductor cells that convert daylight into electricity. Generates approximately 850kWh/yr for a 1kW System	Southerly orientation necessary for optimum performance.	Can form part of the roof or wall structure.	High – efficiencies and costs have fallen but still very expensive.	High – potentially a large producer of electricity	Not enough roofspace available to meet demand for site, unviable financially as single solution.
Solar water heating	Energy from the sun heats fluid in a collector, which then heats water, stored in building. Collectors generate on average 550kWh/m^2/yr	Southerly orientation best for optimum performance and a good hot water demand.	Can form part of the roof structure, sized to meet a proportion of the hot water demand.	Low – additional equipment required minimal and can be easily installed	Limited to the amount of hot water stored. Lower CO_2 reductions than electricity offsetting technologies.	Insufficient demand to be an appropriate technology for retail store, suitable for top floor student accommodation.
Biomass heating	Utilises energy from boilers or local district scheme	Connection to existing grid network to access district heating scheme	Biomass boilers can be used commercially for district heating	Medium – removes the need for a gas supply in some cases. Cost to connect to the grid can be expensive	High – low carbon fuel used	Space on site is limited for storage, proximity to residential dwellings mean potential air quality issues.
Gas Combined Heat and Power	CHP generates electric and thermal energy in a single system, satisfying two energy demands. Gas CHP converts natural gas into usable energy (e.g., steam and electricity).	Needs to serve a high electrical and heat demand all year round. Running hours of over 6,000 are desirable.	Due to the nature of the scheme, CHP will need to be available to each unit.	Medium – cost savings can be considerable if the system operates for most of the year.	High – using natural gas as the fuel input results in large amounts of electricity and heat produced and high emission savings	Most suitable when buildings have high electrical and gas usage patterns.
Biomass CHP	As above biomass CHP converts organic matter either directly from plants or indirectly from	Needs to serve a high electrical and heat demand all year	Can be applied to district heating schemes on a	High – biomass CHP is relatively new and based on large systems.	High – fuel input is normally low carbon and produces heat and	Technology is not used widely. Space for storage of fuel

		Applicability Assessment				
Renewable Technology	**Description**	**Design Constraints**	**Application**	**Indicative costs**	**Emission Reduction Potential**	**Viability at Buxton**
	industrial, commercial, domestic or agricultural products	round. Running hours of over 6,000 are desirable. Storage space limited.	commercial level	Fuel supply is more complex	electricity efficiently	limited and potential for local air pollution issues.
Heat pump (ground or air)	Heat pumps transfer heat from the ground or air into a building to provide space heating and, in some cases, to pre-heat hot water.	Can only serve under floor heating. Ground conditions may affect viability. Noise impacts from air source	Can serve the site providing winter heating	Medium – ground works can be costly and savings determined by unit prices. High electricity prices affect payback.	Medium to High – requires electricity to run the heat pump put does produce emission savings.	Use limited to space heating. An aquifer limits the use of ground, but air is viable on the residential.

Technology Review

9.11 This section provides a detailed review on the application of viable technologies in the development to meet with the 10% policy target.

Solar water heating

9.12 An option to meet the required 10% target is through the provision of solar hot water heating. This technology is most appropriate for buildings where there is a constant annual demand for hot water.

9.13 Solar hot water systems use the sun's heat to warm water all year round and it is not necessary to have direct sunlight for the system to be effective. A conventional immersion heater or boiler can be used to top up the temperature of the water when necessary.

9.14 Solar hot water collectors can provide up to 60% of the annual hot water demand of a building and cost in the region of £2,500 per 4m^2 of collector installed. The 10% target for the site is 599,104kWh/yr.

9.15 The hot water demand for the site that is available for heating by solar thermal collectors is only 362,043kWh/yr. As a single technology, solar thermal is unable to meet the 10% target and will need to be combined with an alternative technology.

9.16 The table below outlines the key factors for solar collectors at the site:

Technology	Roof space (m2)	Approximate Capital Cost	Renewable Energy (kWh/yr)	Carbon Savings ($kg/CO_2/yr$)	% of site Energy	% of Energy Target
SHW	658	£550,000	362,043	66,924	6.0%	60%

Heat Pumps

9.17 Heat pumps are capable of working with a range of heat sources that include the ground, air and water. In each case they transfer heat from the natural source into a building to provide space heating. They are best suited to applications where a lower grade of heat is required

such as underfloor heating and in some cases, as a pre-heat to hot water supplies.

9.18 A full geological study would need to be carried out by a qualified specialist to determine the suitability of the area for ground source heat pumps. In addition, a ground source heat pump approach could have implications for the protected spring source which is found within the immediate vicinity of the site and therefore this ground source approach is rejected as it could have ramifications for a highly important local employer.

9.19 ASHP's could be fitted individually to the proposed student accommodation at the site. The underfloor heating systems they work best with are traditionally more expensive than radiator based systems and may make the technology less viable overall. A full backup natural gas or electrically based system will need to be installed to ensure continuity of service across the year and should be factored into the capital cost of the technology.

9.20 Air source heat pumps have associated noise emissions of 55db from 1m which reduces to 41db at a distance of 5m. In addition snow or ice blocking the units will need to be cleared to maintain optimum efficiency.

9.21 Appropriately sized air source heat pumps could provide energy savings of approximately 458,000kWh/yr to meet the demand in the student accommodation and so cannot meet the site renewable energy target alone.

9.22 The table below outlines the key factors for Air Source Heat Pumps at the site that have been sized to meet the available demand. The capital cost applies only to the heat pump system and not to ancillary distribution systems, installation or back up boilers that may be needed:

Technology	Size / Output	Estimated Capital Cost	Renewable Energy (kWh/yr)	Carbon Savings ($kg/CO_2/yr$)	% of site Energy	% of Energy Target
ASHP	350kW	230,000	458,000	84,661	7.6%	76%

Combined Heat and Power (CHP)

9.23 The preferred option to meet the 10% energy target is through the installation of a combined heat and power energy centre which could provide both space heating and electricity to the

retail store and cycle centre, typically provided by a fossil fuel with the potential to export excess electricity to the grid for revenue.

9.24 The total gas demand for the retail store is 1,574,101kWh/yr, which equates to 290,973kgs/CO_2. The electricity generated by such a system will further displace carbon emissions. Power generated by the national grid network is more carbon intensive than a locally based CHP centre thus further increasing rather than decreasing the emissions

9.25 A net reduction of 909,718kWh/yr is achievable from a gas CHP unit, which equates to an energy saving of 15%

	150
Fuel Input (kW)	474
Electrical Output (kW)	150
Heat Output (kW)	231
Annual running hours	7,300
Annual Electrical Output (kW)	1,094,940
Annual Heat Output (kW)	1,686,208
Efficiency (%)	89%
Operational CO_2 emissions (kg)	639,583
CHP CO_2 savings (kg)	866,622
Net CO_2 savings (kg)	227,039

9.26 The table above describes the total savings that can be achieved from an appropriately sized unit for the retail store. Whilst the retail store forms only a proportion of the site, they make up 88% of the site energy demand.

Conclusion

9.27 The CHP shown is expected to meet 15% of the whole site demand. As can be seen in the table below the inclusion of CHP and the energy efficiency site savings overall are expected to be significant.

	kWh/yr	$kgCO^2/yr$
Site Baseline	6,656,712	2,754,723
Energy Efficiency	665,671	275,472
CHP	909,718	227,039
Total Savings	**1,575,389 (24%)**	**502,511 (18%)**

10.0Transport

10.1 Tesco have produced and submitted a Transport Assessment with this application to help to reduce travel demand, traffic growth and congestion at the store.

10.2 The proposed Travel Plan provides targets to enable the reduction in car use for both staff and customers and emphasises the benefits for both the store and the health of its staff and customers and is in line with BREEAM requirements. Home shopping, car sharing and the organisation of staff shifts, are promoted.

10.3 Linkages exist between the store and surrounding areas, particularly the Spring Gardens Centre and other town centre uses. These provide good, safe and comprehendible pedestrian routes to the entrance point of the store. Access for cyclists is via a series of cycle network facilities adjacent to and across the site.

10.4 Measures to promote public transport, measures to promote and facilitate cycling and walking and a Travel Plan Coordinator are also proposed. The Travel Plan Coordinator will help to encourage the use of sustainable transport methods by staff when accessing the store. These measures aim to provide potential elements which will help to shift travel modes away from the private car.

10.5 Cycle parking will be provided at various locations, in close proximity to pedestrian access points, via the use of Sheffield stands. Parking for 24 cycles (12 stands) will be provided for use by the store, with a further 22 cycle parking spaces (11 stands) provided within the vicinity of the student accommodation and pub/restaurant buildings for general use. These cycle parking spaces will ensure secure, covered cycle parking is provided for customers and staff at the foodstore, in close proximity to the store entrance. A further 11 cycle parking spaces will be provided for the dedicated use of the student accommodation, and these spaces will be securely located within buildings to allow longer term (i.e. overnight) storage of cycles.

11.0Water

11.1 **PPS1** states design solutions that maximise the use of sustainable and renewable resources in the construction of development and resource and energy conservation (including water) in developments should be expected.

11.2 The development site is located in Flood Zone 1 'Low Probability', and therefore cannot be considered to be in an area at risk of flooding from fluvial sources. In addition the site can be considered not to be at risk from coastal and high tide flooding as the site does not lie near or adjacent to the coast.

11.3 Surface water from the development site will be restricted to a runoff rate in line with a 1:100 year + 30% climate change event. This rate is a 20% reduction of the existing 1:100 year rate from the development site. The proposed development will discharge to the site's existing outfall. The necessary attenuation will be provided using a below ground Geolight modular attenuation system designed to accommodate all storms up to and including the 1 in 100 year + 30% climate change event.

11.4 With regard to the irrigation of landscaping and planting at the site, it is a Tesco design standard to specify native plant species which rely solely on precipitation therefore irrigation systems will not be required.

11.5 With regard to potable water minimisation, it is a Tesco design standard to specify taps, urinals, WCs and showers which consume less potable water in use than standard specification for the same type of fittings.

11.6 A water meter with a pulsed output is also proposed in addition to the implementation of a leak detection system on the building's water supply.

11.7 Proximity detection shut-off will be provided to the water supply through the installation of solenoid valves for each toilet area in the building.

12.0Waste and Materials

12.1 Materials used for the major building materials and external hard standing areas will meet with the Green Guide to Specification A or A+ status where possible. These materials such as concrete, metals, brick, stone, glass, composites and plastics used within the roof, frame, floors, foundations, doors and windows are responsibly sourced with a high recycled content where possible.

12.2 The external material for the store will be larch timber, which has been specifically chosen due to its hard wearing nature and ability to naturally weather over time. The timber is a native species and therefore has a significantly lower carbon footprint and environmental impact compared to other materials.

12.3 A site waste management plan will be produced by the main contractor at post planning stage. This will control the waste produced by the development and minimise waste to landfill. The main waste arisings will include the demolition waste from the existing buildings, earth excavation, and material off-cuts. It is anticipated that much of this will be maintained and used on site and any remaining diverted from landfill.

12.4 The Tesco 2010 target states that 100% of waste produced in 2009 was diverted away from landfill. Tesco will continue to work with recycling providers to find new ways to recycle waste from their operations. Each Tesco store has waste targets that are reviewed and reported against every week.

12.5 A compactor baler will be specified for the store and provision for the storage of recyclable waste also. Dedicated space will also be provided for organic waste to be stored prior to removal and compositing at an alternative site.

12.6 A customer recycling centre has been included to the entrance road to encourage additional recycling by customers.

13.0 Land Use and Ecology

13.1 **PPS1** concerns the use of previously developed land, whilst recognising potential biodiversity value and promoting good, well-designed, quality mixed use developments.

13.2 It is a Tesco design standard to specify features to prevent damage to vulnerable parts of the building, and to make sites fit with the local vernacular.

13.3 The site is dominated by buildings, hardstanding and close mown grassland, which remained in active use. Accordingly, these habitats were recorded to be of negligible ecological value and their loss to the proposals would be of no ecological importance. The only taller vegetation is in the form of areas of amenity landscape shrubs, trees and colonising, scattered scrub which are similarly of low value, whilst new landscape planting under the proposals will fully compensate for any losses.

13.4 A number of ecological enhancements have been incorporated into the proposals, which will provide biodiversity benefits at the site, including new landscape planting, albeit the nature and location of the site is such that potential enhancement opportunities are limited. Nonetheless, it is recommended that new habitats at the site be managed following ecological principles in order to maximise their value in the long term.

- **Landscape planting:** new planting to comprise native species, including trees and shrubs common to the local area. Such areas would provide potential cover, foraging and commuting opportunities for a range of wildlife;
- **Bird sensitive timing** of any vegetation clearance; and
- **Long term ecological management** of landscape planting to ensure this benefit is maximised in the long term, such that the proposals will result in long-term opportunities.

13.5 Post planning works will be carried out to ensure that any loss of biodiversity during construction will be minimised and where possible enhanced. The aim will be to increase the number of species found on the site and provide a maintenance programme to maintain the biodiversity into operation.

14.0 Pollution

14.1 A number of national policies require the need to provide a positive environment for the well-being of people in the region.

14.2 A Noise Assessment has been submitted with this application by Mouchel which identified that noise generated by the proposed superstore development will subjectively be out of 'character' for the area and as such any subjective noise impact of the development is likely to be reduced.

- Less than marginal significance impact on sensitive receptors close to the site due to the operation of the proposed store;
- Good resting conditions achieved inside all of the noise sensitive receptors at night time
- Any increased traffic noise on roads close to the site has found a negligible impact from the change in noise levels
- Noise assessment covering the proposed student accommodation blocks concludes that subject to the provision of appropriate façade constructions and, glazing and ventilation provisions, appropriate internal noise criteria can be met.

14.3 It is a Tesco design standard to specify external lighting designed in compliance with ILE guidance.

14.4 It is a Tesco design standard to specify the use of separators, interceptors or filtration for areas at risk of pollution.

14.5 It is a Tesco design standard to ensure that systems using refrigerants are contained in a moderately airtight enclosure and a refrigerant leak detection system is in place for high risk parts of the plant.

Appendix 1: Checklist for Sustainability Statement

Content of Local Plan policy	Comments on how policy met by development proposal
Land use	
Does the proposal improve vacant or derelict brownfield land?	The proposed scheme will be built on existing developed land and therefore does not involve any additional land take.
How does the location widen transport choice for people and goods?	The proposed scheme provides for additional goods and services to be delivered from the foodstore. This in turn will enable a wider variety of food and non-food services, together with the proposed café.
Landscape protection	
How is building design appropriate to the character of the landscape?	The proposed building sits within an area of high historic impact. The proposals include a new store, cycle hire facility, student accommodation and an active frontage. The urban design principles of the proposal follow the framework set out in the Buxton Design and Placemaking Strategy which is a Supplementary Planning document to the High Peak Local Plan.
Heritage management	The development is for a foodstore, student accommodation and additional facilities and therefore this question is not applicable.
How do proposals reflect the local heritage features?	The site lies just outside two of the four conservation areas in Buxton; Hardwick to the south and Buxton Central to the west. The High Peak Local Plan (2005) states that designation of a conservation area acknowledges an area's special character. The scheme will be sensitively designed to acknowledge the proximity of the site to the conservation areas and listed buildings and this will include material selection, scale and proportion of architectural elements, sight lines and views.
How are external materials sympathetic to the character and appearance of the area?	The provision of larch wood will provide a natural finish to the building. Its long term nature will enable the wood to weather naturally, in keeping with the surroundings to the area.
Layout	
Does the development include a mix of dwelling size, type and affordability?	The development is for a non-domestic uses and therefore this question is not applicable.
Does the development relate well to existing settlement patterns and traditions?	The proposals are appropriate in terms of scale and design and do not have any adverse impact on the surrounding area. The proposed development sits within the local vernacular.

Does the development include principles from "Secured by Design"?	The development is located to the north of the town centre, next to the train station to avoid concealment opportunities.
How does the development meet the National Playing Fields Association "Six Acre Standard"?	The development is for a foodstore and therefore this question is not applicable.
Travel and transport	
Has a travel plan been submitted?	A Transport Assessment and outline Travel Plan have been submitted by Transport Planning Associates.
How does the site encourage access by alternatives to a private car?	A number of initiatives are in place to promote the use of sustainable modes of transport including being adjacent to the train station, a bus stop, location being close to the town centre for pedestrians and provision for cyclists. Further details are available in Section 10.
How do proposals meet parking standards?	It is proposed to provide a total of 372 standard car parking spaces for the foodstore. Based on a total GFA of 5,742m2, this equates to a parking ratio of 1 space per 15.4m2. This parking provision is consistent with the standards specified within PPG13 and DCC guidance which state a maximum parking provision of 1 space per 14m2.
If development is over 100m2, have three secure bicycle parking spaces been provided?	Parking for 57 bicycles is available at the development across the various buildings.
Energy efficiency	
Do siting and orientation make maximum use of sunlight and wind protection?	The site has maximised the use of daylight and natural ventilation across the development whilst maintaining the local vernacular.
Does the development meet level 3 of the Code for Sustainable Homes or the BREEAM standard of Very Good?	Tesco foodstores are designed to meet the requirements of BREEAM Very Good. A number of the various criteria and parameters can be seen in this report.
Renewable energy	
What percentage of on-site energy generation will be met from renewables?	The development will provide 15% low carbon energy generation through the provision of an on-site CHP.
What is the total capacity of all renewable energy technology installed on site (in MW)?	A 150kWe / 231kWth CHP system is to be installed
Pollution control	
If the site is known to be unstable or contaminated, has an assessment of effects been undertaken?	The site is not contaminated or unstable and therefore no assessment is necessary.

How will the development be designed to reduce the impacts of noise and light?	A noise impact assessment has identified the site will have a limited impact upon the surrounding areas during day and nigh time. Lighting has been selected to be directional and with the ability to be turned off when not in use. This will reduce the amount of lighting escaping and being used unnecessarily.
How will the site be managed to reduce pollution to water, air and land during construction or demolition?	A standard requirement for Tesco construction projects is monitor construction site impacts with a comprehensive set of environmental impact and pollution measures recorded. This will be managed through a Construction Environmental Management Plan.
Waste management	
If the proposal is for a residential development of 100 or more houses, or a commercial development of1,000m2 or more, has a statement been submitted detailing how waste generated from construction and occupation will be managed?	A Site Waste Management Plan will be provided following planning approval to capture and detail waste arisings and how these will be managed. Across the business Tesco divert over 90% of construction waste from landfill.
Does the development include internal and / or external waste recycling facilities?	Waste recycling facilities are included as part of the development. A compactor and composting facility is provided together with a customer recycling centre.
Water management	
If the development affects an area liable to flood, has a risk assessment been submitted?	A flood risk assessment by Pinnacle is submitted which confirms the site is located in Flood Risk Zone 1 – the site falls within a Flood Zone 1 'Low Probability' area.
How has consideration been given to the impact of surface water? Is there use of permeable paving material / sustainable urban drainage systems on site?	The FRA does consider the impact on surface water and provides for additional attenuation to mitigate the impacts of heavy rainfall and surface run-off.
How does the development include rainwater-harvesting opportunities and / or facilitate minimising water use by occupants?	Rainwater harvesting is included in the development. Additional water efficiency measures within the store include low flow taps and showers, WCs and urinals.
Biodiversity and open space	
How does the design maintain, contribute to and enhance open space?	The proposals do not impact on any protected landscape or designated open spaces. As part of the proposals, Station Terrace provides a large high quality public square with contemporary seating, ornamental shrub planting, specimen tree planting and a green open space, with visual connectivity to Buxton town centre to the south. The proposals have been designed to integrate with future public open space within adjacent High Peak land, if and

	when such proposals come forward in the future.
How does the development create functional linkages within the current network of open space and help to promote green corridors?	The proposals promote improved linkages with the existing footpath networks and landscape features, enhancing movement routes for both pedestrians and cyclists. New planting enhances the visual qualities of the pedestrian links whilst providing a safe environment by avoiding concealment opportunities, particularly linkages with Charles Street. The introduction of an avenue of street trees along Station Road, forms part of a 'Green Gateway' to Buxton, enhancing the character of Station Road, a key movement corridor, improving the quality of existing linkages between the proposals, railway station and town centre. The scheme also provides additional planting to existing green corridors associated with the railway to the north and east, supplementing existing native planting and improving biodiversity.
Does disturbance occur to a protected species and if so, does the development provide adequate alternative habitats to sustain at least current levels of the population?	No anticipated impact on protected species resulting from the landscape proposals. Tree works to be undertaken outside the bird nesting season to avoid destroying any nests, eggs or young.
How does the layout maintain and contribute to trees and woodland?	Native hedge and tree planting along the northeast and northwest boundaries contributes to existing green corridors associated with the railway. Proposed tree planting to Station Road creates a greener streetscene, improving the visual quality of the road corridor and increasing the number of trees within the area.
Have landscaping proposals been submitted and how are selected trees and shrubs suitable for the chosen site?	Local native shrub and tree species have been specified within the submitted landscape proposals. Street tree selection references tree species within the High Street, creating visual connectivity.