

# **Sustainable Design and Zero Carbon Development Supplementary Guidance**





**Halcrow**  
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## SECTION 1 THE PURPOSE OF THE GUIDANCE PAGE

1.1	What is this guidance for?	6
1.2	Why is this guidance needed?	6
1.3	Who is the guidance for and what does it say?	7
1.4	How to use this document	8

## SECTION 2 SUSTAINABLE DESIGN AND ZERO CARBON STANDARDS IN PERTH & KINROSS

2.1	Sustainable Design Principles	10
2.2	Setting a Standard	10
2.2.1	Non-Domestic Development	11
2.2.2	Domestic Development	12
2.3	Sustainability Checklist	13
2.4	Sustainability Statement	13

## SECTION 3 BACKGROUND

3.1	What is meant by sustainable design and zero carbon development?	16
3.2	What are the benefits of sustainability?	17
3.2.1	What are we hoping to achieve?	17
3.3	Planning and Building Regulations	18
3.3.1	BREEAM and Ecohomes	18
3.4	Planning Policy Context	19
3.4.1	National planning policy	19
3.4.2	Local and regional planning policy	19

## SECTION 4      ACHIEVING SUSTAINABLE DESIGN AND ZERO CARBON DEVELOPMENT

4.1	What are the central themes of sustainable design?	24
4.1.1	Minimising energy consumption	25
4.1.2	Realising renewable energy opportunities	25
4.1.3	Encouraging the use of passive and inclusive design	27
4.1.4	Minimise the impact of pollution	30
4.1.5	Promote efficient use of water	31
4.1.6	Minimising surface water run-off	32
4.1.7	Realise opportunities for biodiversity	34
4.1.8	Maximise sustainable construction methods and practice	35
4.1.9	Maximise sustainable waste opportunities	36
4.1.10	Encouraging sustainable travel and reducing need to travel	37
4.2	Strategic Approach to Sustainability	39
4.3	Retrofitting Sustainable Design	39
4.3.1	The existing building stock	39
4.3.2	Previously developed land	40
4.3.3	The historic environment	41

## SECTION 5      IMPLEMENTATION, MONITORING AND REVIEW

5.1	Implementation	44
5.1.1	Pre-application discussions	44
5.2	Enforcement and Implementation	44
5.3	Monitoring	45
5.4	Review	45



# Section 1

## The Purpose of the Guidance

## 1.1 What is this guidance for?

This supplementary guidance (SG) expands on policies set out within the Perth & Kinross Local Development Plan 2013 (the LDP) and provides additional guidance on the integration of sustainable design and construction measures in new and existing developments.

The SG aims to ensure that sustainable development, and the contribution that sustainable design can have, is considered from the outset of the planning and design process. The guidance seeks to identify the various techniques that contribute to the delivery of low and zero carbon development. In this way, the SG aims to reduce the environmental footprint of developments in Perth & Kinross, whilst ensuring that new and existing buildings are economically, aesthetically and structurally viable for the foreseeable future.

As well as addressing the requirements of national planning policy the SG supplements TAYplan and more specifically **Policy EP1** of the LDP which states:

”Sustainable design and construction will be integral to new development in Perth and Kinross.

The provisions of this SG will be implemented primarily through development management and the determination of planning applications. The SG forms part of the Council's adopted Local Development Plan and is an important material consideration in the determination of planning applications.

As highlighted above, the aim of the SG is to complement existing national, regional and local policy rather than duplicate or replace other planning documentation, legislation and standards. Details of all planning documents that form part of the Perth & Kinross' Local Development Plan and a timetable for the production of new documents are set out in the Council's Local Development Plan Action Programme.

## 1.2 Why is this guidance needed?

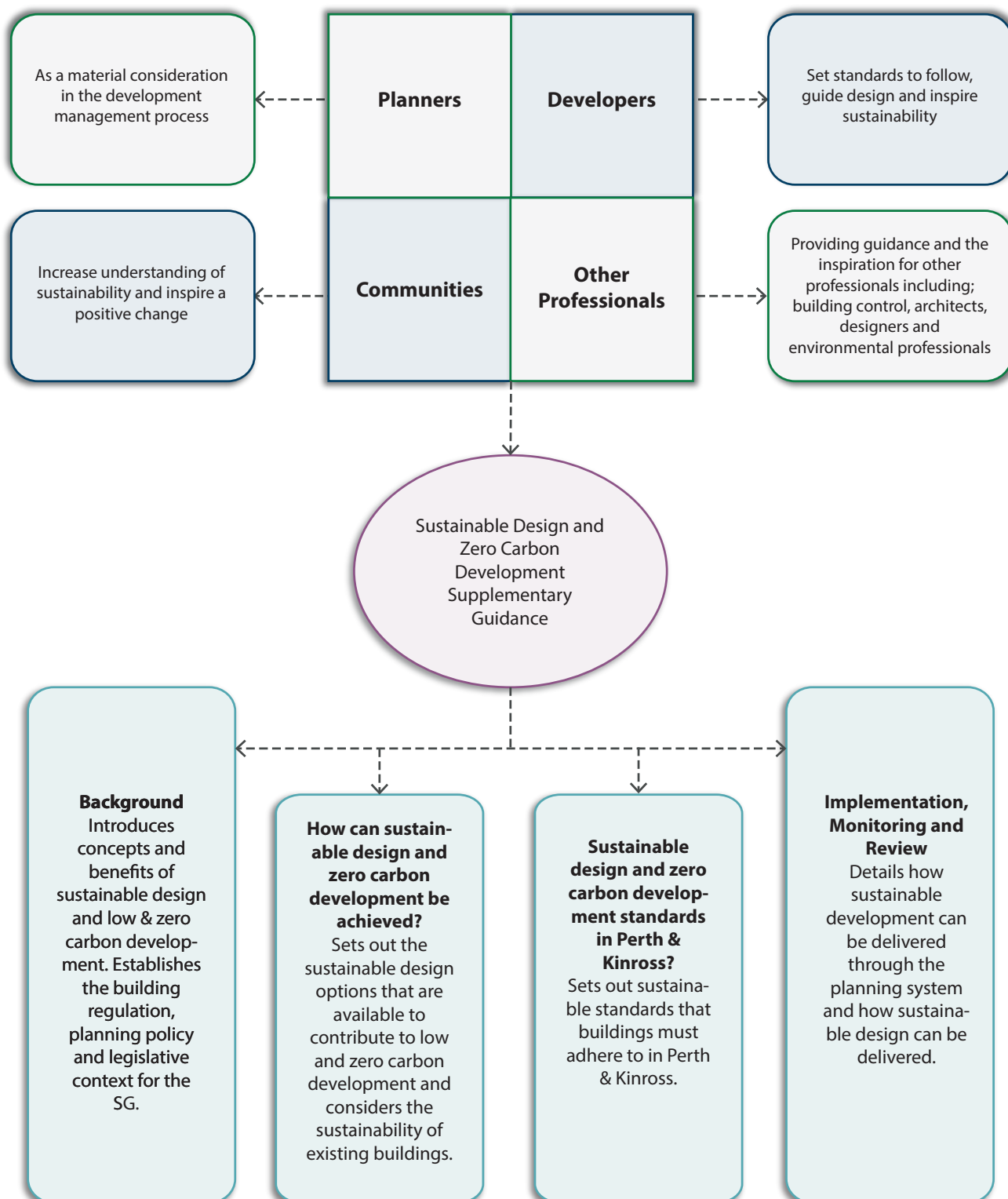
The impacts of climate change are becoming more and more prevalent in Scotland and throughout the UK. How we deal with these impacts now lies at the heart of the planning system.

Consideration of the impacts of climate change and the need to become more sustainable largely stems from the Kyoto Protocol drawn up in 1997, which committed nations to reduce carbon emissions across all sectors of activity. This has led to legislation from The European Union (European Performance of Building Directive 2002/91), the UK Government (Climate Change Act 2008) and the Scottish Government Climate Change (Scotland) Acts of 2008 and 2009 to require the reduction of carbon emissions.

Most recently, the Climate Change (Scotland) Act 2009 put in place a commitment of the Scottish Government to tackle the causes of climate change in Scotland. Reducing greenhouse gas emissions and transitioning to a low carbon economy stands at the heart of the Act and, as a result, runs through the planning framework for Scotland. Since this Act was published there has been a significant commitment in national policy to reduce carbon emissions and tackle climate change which has trickled down through regional and local planning policy.

As part of this commitment, Scotland has set the most demanding reductions, and the built environment has some challenging targets to reach. In all sectors an 80% reduction in carbon emissions has been set in law by 2050, with an intermediate target of a 40% reduction by 2020.

### 1.3 Who is the guidance for and what does it say?



**Diagram 1:** Supplementary Guidance outline

## 1.4 How to use this document

This guidance should be used as a reference point when compiling a planning application in order to determine possible sustainable design measures and identify the planning application requirements and sustainable standards which will apply to the proposed development.

A significant message from this guidance is to consider sustainability at the earliest possible opportunity in order to save costs and fully engage with the planning authority, ensuring that sustainability is integrated into schemes wherever possible.

Section 2 of the guidance provides clear advice on the requirements associated with sustainable design and how it can be delivered through the planning system. Section 2 also outlines the use of sustainability checklists and statements in development management.

Section 4 of this document provides practical suggestions for enhancing the sustainability of the construction, design and use of buildings in Perth & Kinross.

The sustainable design themes put forward in section 4 of this guidance should be fully considered as part of the design stage and integrated wherever feasible.

The final chapter of the guidance focuses on the implementation and how sustainable design can be delivered through the planning system and how sustainable standards will be enforced by planning and, subsequently, buildings standards.

The background of the slide is a blurred photograph of construction workers in a tunnel. Two workers wearing hard hats and high-visibility vests are visible in the background, working on a structure. The foreground is filled with dark, jagged rocks or debris. The overall scene is dimly lit, typical of an underground construction site.

# **Section 2**

## **Sustainable Design and Zero Carbon Development Standards in Perth & Kinross**



## 2.1 Sustainable Design Principles

While the practical application of sustainable design will vary between developments and disciplines, some common principles for sustainable design in Perth & Kinross can be identified:

<b>SCALE APPROPRIATELY</b>
Developments should be scaled so as to provide adequate space for users to go about their day-to-day life whilst not requiring too much energy to heat or construct.
<b>USE FREE ENERGY</b>
Orientate your development to make the most of the sun's energy and the other natural energy resources that are available.
<b>KEEP IT COOL</b>
Passive design can also keep a home cool through ventilation and effective insulation.
<b>USE RENEWABLE ENERGY</b>
Reduce reliance on fossil fuels through the use of alternative sustainable forms of energy production.
<b>CONSERVE RESOURCES</b>
The design of the building should consider how the end user will use it and how resources can be conserved.
<b>USE LOCAL SUSTAINABLE MATERIALS</b>
Wherever possible materials should be sourced locally in order to reduce use of energy to transport material long distances, as well as supporting a sustainable local economy.
<b>RECYCLE</b>
The use of sustainable waste management practices from construction and through the use of the building should be adopted. Any opportunity to re-use or recycle materials, waste and space should be grasped.
<b>ADAPT TO CLIMATE CHANGE</b>
Developments should consider their development in the context of the potential impacts of climate change, with particular reference to flood risk.
<b>BUILT TO LAST AND ADAPT</b>
Buildings should be built to last and be adaptable in terms of scale, design and use.
<b>MOVE AROUND SUSTAINABLY</b>
Developments should consider how people are going to travel to and from them. Opportunities for travel by sustainable means should be taken.

## 2.2 Setting a Standard

This section provides details on how planning aims to deliver these principles and the policies, targets and measures outlined in this guidance. The Council has categorised development into scale and type in order to provide a rationalised approach to carrying out sustainable development.

It is intended that all new development in Perth & Kinross, including renovations, will have full consideration for sustainable design options and will be assessed using the Perth & Kinross Sustainability Checklist.

### 2.2.1 Non-Domestic Development

These are defined as:

- Non-domestic development\* with a gross floorspace up to and including 250 sqm
- Non-domestic development\* with a gross floorspace of over 250 sqm
- Non-domestic extensions, conversions and changes of use

\* Non-domestic development includes; *retail (Class 1), commercial and non-residential mixed use (2), office (4), leisure (11), restaurants and bars (3), industrial (4,5&6) and non-residential institutions (10).*

#### Recommended standards for non-domestic developments in Perth & Kinross

Development Type	Standard/Validation Requirements
<b>Non-Domestic:</b> New development, extensions, conversions or changes of use with a gross floorspace of 250 sqm and less	<ul style="list-style-type: none"> <li>• Submit a completed <b>Sustainability Checklist*</b></li> <li>• Planning application must demonstrate how energy consumption, water consumption and surface water run-off mitigation has been considered as part of the proposal and how this will benefit the existing development that is being altered.</li> <li>• Provide evidence of how a minimum of '<b>Bronze</b>' level will be achieved under Section 7 of the Building (Scotland) Regulations and/or a score of at least 50% in the energy and water sections of the relevant BREEAM assessment within a minimum overall rating of '<b>Good</b>' or equivalent.</li> </ul>
<b>Non-Domestic:</b> New development, extensions, conversions or changes of use with a gross floorspace over 250 sqm	<ul style="list-style-type: none"> <li>• Submit a completed <b>Sustainability Checklist*</b></li> <li>• Submit a <b>Construction Management Plan</b>, including a Code of Considerate Practice: Ensure construction emissions and impacts are mitigated by achieving a level of performance equivalent to that required under the Considerate Constructors Scheme</li> <li>• <b>Minimise 'heat island effect'</b> through strategic landscaping and/or off-site tree planting (<i>see sections 4.1.3 and 4.1.7</i>).</li> <li>• Provide evidence of how a minimum of '<b>Bronze-Active</b>' level will be achieved under Section 7 of the Building (Scotland) Regulations and/or a score of at least 60% in the energy and water sections of the relevant BREEAM assessment within a minimum overall rating of '<b>Excellent</b>' or equivalent.</li> <li>• Submit a <b>Sustainability Statement</b>; demonstrating measures considered to achieve a zero net annual CO<sub>2</sub> from energy use, how water consumption will be reduced and how surface water run-off will be minimised. The statement should also assess the feasibility of rainwater harvesting and grey water recycling.</li> <li>• Submit <b>Travel Plan</b> demonstrating sustainable transport considerations associated with the development with particular reference to commuting and/or delivery.</li> </ul>

### 2.2.2 Domestic Development

These are defined as:

- new residential development (including residential mixed use) (Class 9) and residential institutions (Class 8); and
- residential extensions, conversions and changes of use

#### Recommended standards for domestic developments in Perth & Kinross

Development Type	Standard/Validation Requirements
<b>Domestic:</b> New build, extensions, conversions and changes of use and new build residential developments of two dwellings or less	<ul style="list-style-type: none"> <li>• Submit a completed <b>Sustainability Checklist</b>*</li> <li>• Planning application must demonstrate how energy consumption, water consumption and surface water run-off mitigation has been considered as part of the proposal and how this will benefit the existing development that is being altered.</li> <li>• Provide evidence of how a minimum of '<b>Bronze</b>' level will be achieved under Section 7 of the Building (Scotland) Regulations.</li> </ul>
<b>Domestic:</b> New build or change of use residential development of more than two dwellings	<ul style="list-style-type: none"> <li>• Submit a completed <b>Sustainability Checklist</b>*</li> <li>• Provide evidence of how a minimum of '<b>Bronze</b>' level will be achieved under Section 7 of the Building (Scotland) Regulations.</li> <li>• Minimise 'heat island effect' through strategic landscaping and/or off-site tree planting (<i>see sections 4.1.3 and 4.1.7</i>).</li> <li>• Submit a <b>Sustainability Statement</b>; demonstrating measures considered to achieve a zero net annual CO<sub>2</sub> from energy use, how water consumption will be reduced and how surface water run-off will be minimised. The statement should also assess the feasibility of rainwater harvesting and grey water recycling.</li> </ul>

\*The Perth & Kinross Checklist can be used as an online tool which is available on the Council's website ([www.pkc.gov.uk](http://www.pkc.gov.uk)).

The Council will normally expect applications to be supported by evidence of how the development achieves certification under section 7 of the Building (Scotland) Regulations and/or BREEAM schemes or equivalent.

Minor auxiliary development such as advertising, border treatment and landscaping does not require the completion of a sustainability checklist. The advice of the Council's planning team should be sought.



## 2.3 Sustainability Checklist

Planning applications and projects are usually proposed because they will bring immediate benefits for the applicant. The Council has created a Sustainability Checklist which will help both the developer and the Council assess how sustainable the proposal is. The Sustainability Checklist measures the wider consequences of the development, now and for the future.

Section 2.2 outlines which development proposals will be required to complete the Checklist as part of their planning application. The Checklist has been designed so as to ensure that the level of detail that the applicant has to go into within the Checklist is commensurate to the scale of their development. The Checklist should not take longer than 20 minutes to complete. Guidance is provided online and within the checklist itself.

A sustainability checklist must be completed prior to the submission of a planning application. The Checklist will be completed online and will include a series of questions which relate to the sustainability of the proposed development.

The Checklist will form part of the planning application. This will assist the planning officer in identifying to what extent the applicant has considered sustainability. As well as this the checklist offers an opportunity to stimulate pre-application discussion of sustainability issues.

Appendix 1 contains an 'offline' version of the Sustainability Checklist. This should be completed and submitted to the Council for assessment if you are unable to complete the Checklist online.

As well as forming part of the planning application, the completion of the Checklist raises awareness of sustainability opportunities for developers and can suggest ways in which the proposal could be improved in sustainability terms.

Accordingly, each aspect of the Checklist will be assessed against this guidance as well as the policies within the LDP. On receipt of a planning application, officers will assess its sustainability based upon the details included within the application, including the checklist and statement.

## 2.4 Sustainability Statement

A sustainability statement should accompany applications for:

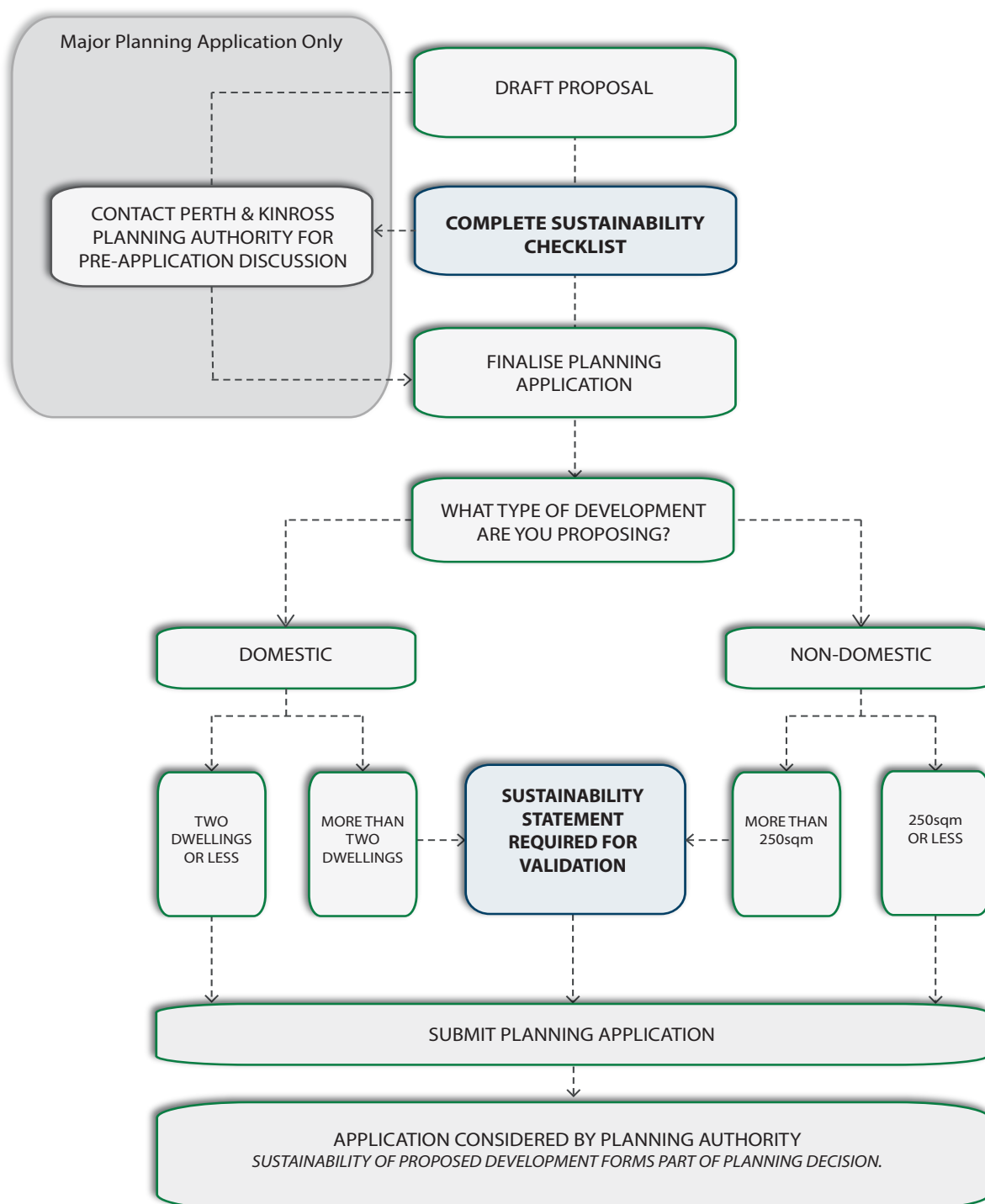
- Proposals for residential development of more than 2 dwellings
- Multi-occupation residential buildings
- Non-domestic development over 250sqm
- Domestic or non-domestic refurbishments, conversions and change of user for:
  - 2 or more dwellings, or
  - More than 250sqm of floorspace

The applicant will be expected to use the findings of the Sustainability Checklist to inform their Sustainability Statement and the level of detail is expected to be proportionate to the scale of their development.

The Sustainability Statement should provide details of the sustainable design and construction measures included within the proposal showing how the applicant proposes to reduce the energy, water and materials used in design and construction.

The Statement should confirm the level of sustainability the proposed development hopes to achieve, referencing the relevant Scottish Building Standards that apply to their development. The proposal should clearly set out how the proposed development hopes to achieve this target through sustainable design and/or the use of low and zero carbon technologies.

*Diagram 2* outlines how sustainability will be delivered through the planning system by using the above standards, assessments and documents.



**Diagram 2:** Sustainability in the planning application process

An aerial photograph of a residential roof covered in grey tiles. Several large, rectangular solar panels are installed on the roof. There are also several antennas and small skylights. The surrounding area shows other buildings and a fence.

# **Section 3**

## **Background**



### 3.1 What is meant by sustainable design and zero carbon development?

It is important to understand what is meant by sustainable development. A definition of sustainable development is offered in the report 'Our Common Future' produced by the United Nations-Sponsored World Commission on the Environment and Development (WCED). This defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

In practical terms, this description is backed up by the Scottish Government's National Planning Framework 2 (NPF2), as well as the emerging NPF3, and a number of policies have been created to achieve sustainable development.

” The Scottish Government's commitment to sustainable development is reflected in its policies on matters such as climate change, transport, renewable energy, energy efficiency, waste management, biodiversity and public health.....Planning authorities have a duty to contribute to sustainable development through their development planning function.

The way in which buildings are designed, built, used, adapted and decommissioned has an impact on the environment. In the UK, the built environment is responsible for 50% of carbon dioxide (CO<sub>2</sub>) emissions and 24% of waste generation is from demolition and construction. Households are responsible for 25% of CO<sub>2</sub> emissions, over 50% of water consumption, and 8% of waste generation. Specifically, 40% of Scotland's carbon dioxide emissions, a major cause of climate change, come from the energy we use to heat, light and run our buildings. It is therefore clear that our current energy and resource use is not sustainable. As a result, future generations will be adversely impacted upon and will struggle to enjoy the same quality of life we do. It is therefore vital to ensure that new buildings are designed and built in a way that minimises these harmful emissions and that existing buildings are improved and refurbished so that their use results in lower carbon emissions.

Sustainability and sustainable development is central to the Scottish Government's approach to planning, development and regeneration. The Scottish Government supports the five guiding principles of sustainable development set out in the UK shared framework for sustainable development. The five principles are:

- living within environmental limits
- ensuring a strong, healthy and just society
- achieving a sustainable economy
- promoting good governance
- using sound science responsibly

Fuel poverty has been recognised as a significant issue by the Scottish Government. A person is living in fuel poverty if, in order to maintain a satisfactory heating regime, they would be required to spend more than 10 per cent of their household income (including Housing Benefit or Income Support for Mortgage Interest) on all household fuel use. The Scottish Government have pledged to ensure that by November 2016, so far as is reasonably practicable, people are not living in fuel poverty in Scotland.

Planning should be the driving force behind achieving sustainable development principles. The fundamental principle of sustainable development being that development integrates economic, social and environmental objectives. The aim is to achieve the right development in the right place. The planning system should promote development that supports the move towards a more economically, socially and environmentally sustainable society.

As specified in Scottish Planning Policy (SPP), decision making in the planning system should:

- contribute to the reduction of greenhouse gas emissions in line with the commitment to reduce emissions by 42% by 2020 and 80% by 2050, contribute to reducing energy consumption and to the development of renewable energy generation opportunities,
- support the achievement of Zero Waste objectives, including the provision of the required waste management installations,
- protect and enhance the cultural heritage,
- protect and enhance the natural environment, including biodiversity and the landscape,
- maintain, enhance and promote access to open space and recreation opportunities,
- take into account the implications of development for water, air and soil quality, and
- support healthier living by improving the quality of the built environment, by increasing access to amenities, services and active travel opportunities, and by addressing environmental problems affecting communities.

## 3.2 What are the benefits of sustainability?

Designing a good, environmentally sensitive new building or improving the environmental performance of an existing building during refurbishment can significantly:

- improve comfort which affects user satisfaction, morale and staff productivity
- reduce costs associated with energy and water use, maintenance and refurbishment
- reduce environmental impacts associated with energy and resource use
- improve a building's ability to cope with future changes in use and climate
- improve opportunities to let or sell in a competitive market

### 3.2.1 What are we hoping to achieve?

This guidance aims to achieve the following within the timeframes of the Climate Change (Scotland) Act (i.e. by 2020):

- Form part of a framework focused on the delivery of sustainable development in Perth & Kinross
- Set the standards for the delivery of zero and low carbon development in Perth & Kinross
- Provide practical guidance in line with development plan policies on how developments can become less energy intensive, assist in meeting CO2 emission targets, incorporate sustainable design measures and reduce their impact on the environment
- Provide practical advice on what zero and low carbon technologies are available, and how they can be incorporated into, and benefit new and existing developments
- Adapt to the predicted local impacts of climate change
- Encourage the sustainable use of resources and materials in the construction and operation of buildings

### 3.3 Planning and Building Regulations

Planning has an important role in encouraging and facilitating buildings that meet high standards of sustainability, in support of its statutory objective to contribute to the achievement of sustainable development. NPF2 and the draft NPF3 state that local planning authorities can contribute to sustainability through the application of appropriate planning, design and building policies which can achieve more sustainable urban forms and much higher energy efficiency and emission standards in new development.

Building Regulations set minimum standards in relation to a number of sustainability issues, such as energy efficiency and water consumption, as well as matters such as structural soundness. The building standards system in Scotland is established by the Building (Scotland) Act 2003.

The system is intended to ensure that building work on both new and existing buildings results in development that meets reasonable standards.

The standards are set out in the Building Regulations, which are intended to: -

- Secure the health, safety, welfare and convenience of building users or other people who may be affected by the building
- Further the conservation of fuel and power
- Further the achievement of sustainable development

One such part of legislation and guidance is the recently adopted Building Standards Technical Handbook 2013 which covers both domestic and non-domestic development. Section 7 of the handbook, in particular, sets out sustainability standards for new development in Scotland. The recently revised standards aim to:

- Recognise the level of sustainability already achieved by the building regulations. This will emphasise that a degree of sustainable design and construction is not a niche market but must be achieved in all new buildings.
- Encourage more demanding sustainability standards through enhanced upper levels.
- Encourage consistency between planning authorities that use supplementary guidance to promote higher measures of sustainable construction in their geographical areas. Levels of sustainability have been defined that must include a low or zero carbon generating technology, with reference to Section 72 of the Climate Change (Scotland) Act 2009.

#### Standard 7.1 - Mandatory

Every building must be designed and constructed in such a way that:

- (a) with regard to a dwelling or school building containing classrooms, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions, resource use, building flexibility, adaptability and occupant well-being is achieved
- (b) with regard to a non-domestic building other than a school building containing classrooms, a level of sustainability specified by the Scottish Ministers in respect of carbon dioxide emissions is achieved and
- (c) a statement of the level of sustainability achieved is affixed to the dwelling or non-domestic building.

The standard detailed above, taken from section 7 of the building standards technical handbook, outlines the mandatory requirement placed on new developments in Scotland.

Technology, materials and the Building Regulations regime will continue to evolve in the future. There are therefore opportunities for Perth & Kinross to anticipate levels of building sustainability and go beyond the current levels set out within the building regulations.

This guidance and the standards set out within Policy EP1 seek to emphasise the importance of considering sustainability through the planning stage and into building standards.

#### 3.3.1 BREEAM and Ecohomes

BREEAM and Ecohomes are managed by the Building Research Establishment (BRE) and these are both an environmental assessment tool and a non-mandatory, voluntary accreditation scheme. BREEAM can be applied to offices, retail developments and industrial buildings and Ecohomes is the version of BREEAM for residential development.

These assessments cover energy, water, materials, transport, pollution, ecology and health and give a rating of 'pass', 'good', 'very good' or 'excellent'.

## 3.4 Planning Policy Context

The Town and Country Planning (Scotland) Act 1997 as amended (the Act) sets out the framework for planning regulation in Scotland. The most recent amendment to the Act, actioned through the Planning etc (Scotland) Act 2006, contains a requirement that functions relating to the preparation of the National Planning Framework by Scottish Ministers and development plans by planning authorities must be exercised with the objective of contributing to sustainable development.

The Act requires planning authorities to have regard to guidance on this requirement issued by Scottish Ministers, as outlined in Part 2 section 3E of the Planning etc (Scotland) Act.

### 3.4.1 National planning policy

The principles of sustainable development outlined in this guidance are embedded in national planning policy. **The Scottish Planning Policy (SPP)**, a statement of the Scottish Government's policy on nationally important land use planning matters, states that:

” There is a statutory duty on development plans to contribute to sustainable development

The planning system has an important role in supporting the achievement of sustainable development through its influence on the location, layout and design of new development. The SPP states that the settlement strategy set out in development plans should promote a more sustainable pattern of growth for an area, taking account of the scale and type of development pressure and the need for growth and regeneration.

**National Planning Framework 2 (NPF2)**, a long term spatial strategy for Scotland's development, identifies that sustainable development has a social, economic and environmental dimension. NPF2 identifies that the Scottish Government's commitment to sustainable development is reflected in its policies on matters such as climate change, transport, renewable energy, energy efficiency, waste management, biodiversity and public health. There is a statutory requirement that the National Planning Framework should contribute to sustainable development and, furthermore, planning authorities have a duty to contribute to sustainable development through their development planning function.

A review of NPF2 commenced in autumn 2012 and the Framework will eventually be replaced by NPF3. Similarly, a review of SPP was announced autumn 2012. The review will update policy, focus policy towards sustainable economic growth and place more emphasis on place making.

**National Planning Framework 3 (NPF3)** continues the Government's support for sustainable development and, importantly, a growing sustainable economy. The vision for Scotland will seek to develop a built environment that is more energy efficient and produces less waste.

**The Scottish Planning Policy (SPP) review** supports the five guiding principles of sustainability set out in the UK's shared framework for sustainable development. A key component of this, put forward in the SPP, is creating a more successful economy for Scotland.

### 3.4.2 Local and regional planning policy

The relevant regional planning policy is the Strategic Development Plan (SDP) for Perth & Kinross, Dundee, Angus and Fife entitled 'TAYplan'.

Policy 2: Shaping better quality places of TAYplan seeks to ensure that new development is resilient to the effects of climate change and is integrated into existing community infrastructure. New developments should encourage sustainable travel and ensure that the need to travel, particularly by the private car, is reduced. Policy 2 also seeks to ensure that new development contributes to the aim of the Scottish Government's Zero Waste Plan and that high resource efficiency is incorporated within development through the orientation and design of buildings, the choice of materials and the use of low and zero carbon energy generating technologies are incorporated to reduce carbon emissions and energy consumption.

The adopted local plan is the Local Development Plan for Perth & Kinross.

This SG should be read in conjunction with the Local Development Plan and specifically Policy EP1 which is detailed on the following page.

## Policy EPI: Climate Change, Carbon Reduction and Sustainable Construction

Sustainable design and construction will be integral to new development in Perth and Kinross. Applications for development may require a Sustainability Statement to demonstrate how developments will uphold sustainable construction principles and contribute to mitigating and adapting to climate change and to meeting targets to reduce carbon dioxide emissions. New buildings should also include low and zero-carbon generating technologies (LZCGT) to off-set a proportion of emissions arising from the use of the buildings, as specified in the table below. Some relevant buildings must be accompanied by a sustainability statement and all buildings must receive an appropriate sustainability label as per the Building Standards Technical Handbook Section 7 – Sustainability.

The specified level of sustainability for a dwelling or non-domestic property should be selected from the following table which also shows standard expected by which date.

	Domestic	Non-Domestic
2012	<b>Bronze- Active</b> This is the baseline level for sustainability achieved where the dwelling meets the functional standards set out in Sections 1-6 of the Technical Handbook and includes a minimum 2% carbon dioxide emissions abatement through the use of Low and Zero-Carbon Generating Technology.	<b>Bronze - Active</b> This is the baseline level for sustainability achieved where the building meets the functional standards set out in Sections 1-6 of the Technical Handbook and includes a minimum 2% carbon dioxide emissions abatement through the use of Low and Zero-Carbon Generating Technology.
2016	<b>Silver - Active</b> Where the dwelling complies with the Silver Active level in each of the 8 aspects below and includes Low and Zero-Carbon Generating Technology:  Aspect 1 - Carbon dioxide emissions; Aspect 2 - Energy for space heating; Aspect 3 - Energy for water heating; Aspect 4 - Water use efficiency; Aspect 5 - Optimising performance; Aspect 6 - Flexibility and adaptability; Aspect 7 - Wellbeing and security; Aspect 8 - Material use and waste  New buildings should include a minimum 3% carbon dioxide emissions abatement through the use of Low and Zero-Carbon Generating Technology.	<b>Silver - Active</b> Carbon Dioxide emissions equivalent to a 50% improvement on the 2007 standards. A minimum 3% of this emissions improvement should come from the use of Low and Zero-Carbon Generating Technology.
2020	<b>Gold</b> Where the dwelling complies with the Gold level in each of the 8 aspects below: Aspect 1 - Carbon dioxide emissions; Aspect 2 - Energy for space heating; Aspect 3 - Energy for water heating; Aspect 4 - Water use efficiency; Aspect 5 - Optimising performance; Aspect 6 - Flexibility and adaptability; Aspect 7 - Wellbeing and security; Aspect 8 - Material use and waste New buildings should include a minimum 5% carbon dioxide emissions abatement through the use of Low and Zero-Carbon Generating Technology.	<b>Gold</b> Carbon Dioxide emissions equivalent to a 75% improvement on the 2007 standards. A minimum 5% of this emissions improvement should come from the use of Low and Zero-Carbon Generating Technology.
2022	<b>Platinum</b> Carbon Dioxide emissions equivalent to a 100% improvement on the 2007 standards including a minimum 6% carbon dioxide abatement through the use of Low and Zero-Carbon Generating Technology.	

All new Xj Ycch Ych will be required to provide satisfactory arrangements for the storage and collection of refuse and recyclable materials as an jkY(fU part of its design. Major developments should include communal facilities for waste collection and recycling where appropriate. New homes and workplaces should allow for the provision of high-speed broadband access to enable provision of next generation broadband.

Note: Supplementary Guidance will expand on the above requirements including:

- identifying the type of development which will require to submit a sustainability statement;
- where combined heat and power technologies may be appropriate.



The following policies are also relevant to this SG:

- **Policy TA1B** states that all development must be easily accessible to all modes of transport, in particular, the sustainable modes of walking, cycling and public transport. The aim of all development should be to reduce demand by car, and ensure a realistic choice of access and travel modes.
- **Policy NE3** seeks to protect and enhance all wildlife and wildlife habitats.
- **Policy ER1A** states that proposals for the utilisation, distribution and development of renewable and low carbon sources of energy will be supported where their need can be justified.
- **Policy EP3C** seeks to ensure that all new development employs Sustainable Urban Drainage Systems (SUDS) measures.
- **Policy EP8** states that there will be a presumption against the siting of development proposals which will generate high levels of noise in the locality of existing or proposed noise sensitive land uses.
- **Policy EP11** states that development proposals which would adversely affect air quality within or adjacent to designated Air Quality Management Areas may not be permitted.

#### CASE STUDY: SUSTAINABLE DESIGN IN PERTH & KINROSS



##### Springbank Road, Alyth

19 new council houses offering:

- High insulation. 20% above current Building regulations
- High airtightness
- Breathable walls
- Whole house ventilation
- Gas central heating
- Sustainable Urban Drainage



##### Duneaves Place, Letham, Perth

The development provides six family sized dwellings, ranging from 3 bedroom to 5 bedroom houses on a brownfield site in the centre of an existing, Local Authority housing estate. The development;

- offers contemporary, flexible living space which will adapt to the needs of residents;
- defines a positive street realm, where residents could colonise their immediate surroundings;
- maximises solar gain and circulates warm air through the use of double height space; and
- provide energy efficient homes in which annual heating and hot water bills would be less than £250.00.



##### Retrofitting: Perth Fire Station, Perth

Fire station upgrade aimed to improve energy efficiency and sustainability of the building through measures including;

- Insulating existing walls
- Air tightness targets
- Lighting control and low energy lamps
- Ground Source Heat Pumps
- District heating from neighbouring fire training centre.
- Combined Heat and Power Unit



# Section 4

Achieving sustainable  
design and zero carbon  
development?

## 4.1 What are the central themes of sustainable design?

This section sets out the sustainable technologies and design options that are available to developers in order to reduce carbon emissions and improve sustainability. All applicants seeking to undertake development in Perth & Kinross should fully consider incorporating the following measures wherever possible in order to reduce the carbon footprint of their development.



## ENERGY

### 4.1.1 Minimising energy consumption

” increase energy efficiency in new and existing property in Perth & Kinross in order to reduce overall energy use

Energy used to provide heat, light and hot water to our homes accounts for some 40% of Scotland's greenhouse gas emissions. The Government is keen to support their renewable energy commitment with improvements in energy efficiencies.

'Minimising energy consumption' and 'realising renewable energy opportunities' (section 4.1.2) should be read in conjunction and contribute to the overall principle to reduce energy demand and carbon emissions.

Improving the energy efficiency of new and existing development, as well as providing opportunities to link to low carbon or renewable technologies, provides significant carbon savings.

#### Energy Efficiency Measures

Energy savings can be achieved by incorporating energy efficiency measures into new development or retrofitting to existing development. Measures can include:

- Wall insulation
- Cavity insulation
- Solid wall insulation
- Loft insulation
- Floor insulation
- Double and triple glazing
- Water tank and pipe insulation
- Draft proofing

#### Sustainable Consumption of Energy

Reducing the need for consumption of energy in the household can dramatically contribute to the reduction in CO2 emissions in Scotland. Part 6.1 of the Building (Scotland) Regulations 2004 requires that every building is designed and constructed in such a way that energy is conserved, in accordance with the Building Standards Circular on Energy 2004.

### 4.1.2 Realising renewable energy opportunities

” realise opportunities to utilise renewable energy supply and use to reduce reliance on unsustainable energy sources

The production of energy is paramount for all types of development to operate and be habitable on a day-to-day basis. However, the production of energy through fossil fuels, still the predominant energy source for Scotland, releases harmful greenhouse gases (such as CO2) into the atmosphere.

There is an increasing amount of evidence to back up that these emissions are beginning to have an effect on our climate and the Scottish Government has responded to this. The Climate Change (Scotland) Act 2009 sets a target of an 80% reduction in emissions by 2050 and an interim target of 50% for 2020. Key elements of the strategy for achieving a substantial reduction in emissions are making the most of Scotland's renewable energy potential and encouraging power and heat generation from clean, low carbon sources.

There are a number of technologies that can be used to provide heat for a building, emitting low or no net CO2 emissions. These are outlined in *Diagram 3*.

More information can be found on the Council website: <http://www.pkc.gov.uk/article/1932/Renewable-energy>

#### Impact of Renewable Energy Production

The production of renewable energy can have potential detrimental impacts on the local environment and community. Impacts such as noise pollution, smell emissions, limited air pollution, waste production and visual impact should be fully considered as part of the design and planning process.

The Perth & Kinross Environmental Health and Development Management teams should be fully consulted at the earliest possible opportunity in order to fully consider any potential impacts when selecting renewable energy options.

#### Relevant Policies

##### TAYplan

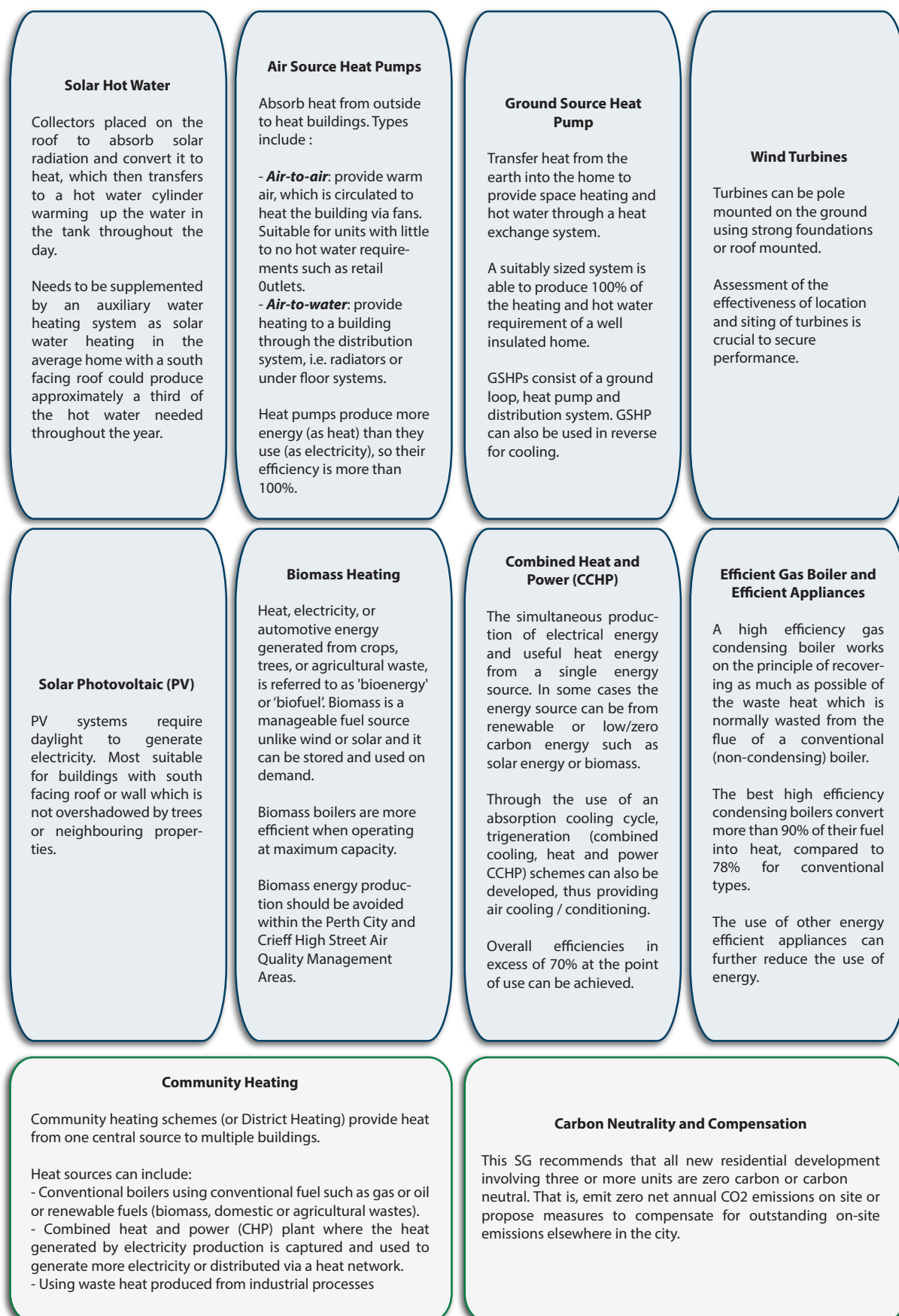
Policy 6: Energy and Waste/Resource Management Infrastructure

##### Local Development Plan for Perth & Kinross

Policy HE2: Listed Buildings

Policy ERT: Renewable and Low Carbon Energy Generation

Policy EP1: Climate Change, Carbon Reduction and Sustainable Construction



**Diagram 3:** Low and Zero Carbon Technologies



## ORIENTATION AND PASSIVE DESIGN

### 4.1.3 Encouraging the use of passive and inclusive design

”incorporate the principles of sustainability in the design, layout and orientation of new development

Passive and inclusive design can form a key contributor to sustainable development and the principles should flow through all stages of building design.

#### Passive Design

Passive design responds to the local climate and site conditions to maximise a building users' comfort and health while also minimising energy use.

It achieves this by using free, renewable sources of energy such as sun and wind to provide household heating, cooling, ventilation and lighting, thereby reducing or removing the need for mechanical heating or cooling. Using passive design can reduce temperature fluctuations, improve indoor air quality and make a home drier and more enjoyable to live in.

#### CASE STUDY

##### THE GREENHOUSE, BARRATT

Architect: Gaunt Francis Associates/ARUP

- 100% renewable energy sources to achieve zero net carbon emissions in use.
- Incorporates a renewable energy supply.
- Total water strategy using greywater recovery.
- First CfSH Level 6 zero carbon home by a volume house builder.
- Aerated concrete panels for walls, wrapped with insulation and specialist render.
- Motorised solar blinds and automated secure passive ventilation - achieving excellent daylight levels.
- Solar thermal and air source heat pump, with a whole house mechanical ventilation system with heat recovery.

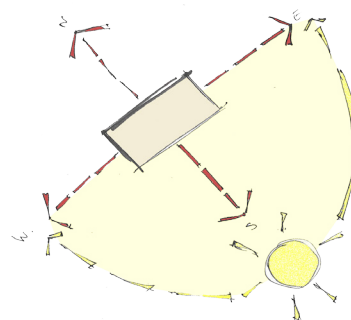


#### Building orientation for solar gain...

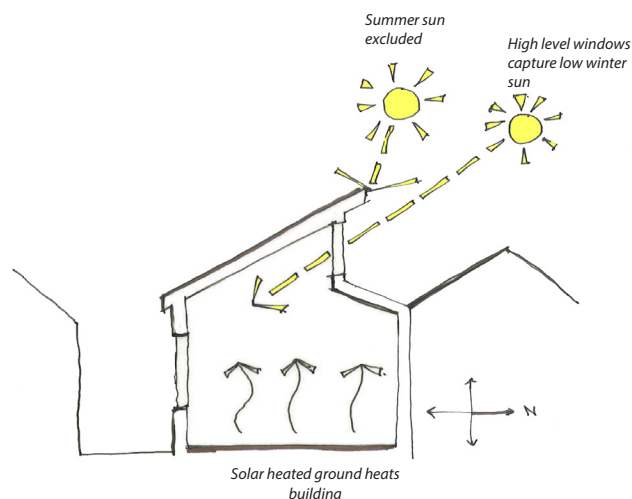
A building can be sited to maximise opportunities for solar heat gain, natural ventilation and daylighting throughout the year.

Here are a few things to consider when orientating buildings:

- The sun travels east-west making southern exposure the best physical orientation feature for capturing natural heat and light (passive solar energy).
- The sun is lower in the sky in winter than in summer requiring shading devices that allows for capture of heat in winter while avoiding heat in summer.
- Placing the most frequently used rooms on the south side of the building and the less used rooms to the north of the building can help to capture natural heat and light and minimise the demand for heating and lighting.



*Orientating buildings along solar axis with a south facing facade will increase the capture of solar energy and solar gain*



#### Thermal mass...

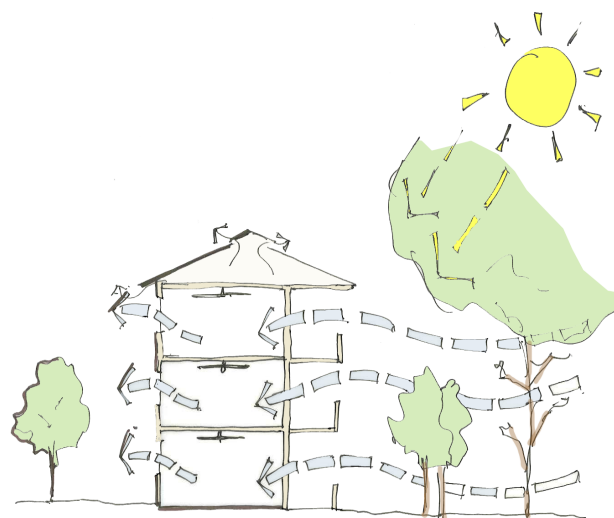
Materials such as stone, concrete, ceramic bricks and water have the ability to store heat. Incorporating these materials into floors, walls, and fireplaces will help absorb and later release thermal energy within premises which can help maintain comfortable indoor temperatures without the use of active heating or cooling.

## Passive ventilation and cooling...

Design approaches that address sustainable street layout can allow for natural ventilation to cool the building/s or development in order to improve air quality and reduce the need for mechanical cooling.

Here are a few things to consider when designing ventilation in buildings:

- Encouraging air flow throughout the development can help keep down ambient temperatures by preventing heat being trapped in urban spaces and facilitate the cooling effect of wind and night-air. Design choices that can help encourage air flow include orientation with respect to the wind direction and relative heights and density of buildings.
- Requires knowledge of prevailing wind direction and pressure fields around the buildings.
- Passive night cooling can be used in combination with thermal mass to reduce peak cooling loads during the day inside buildings.
- Water features such as lakes, ponds and fountains can help to cool air temperature through evaporation.



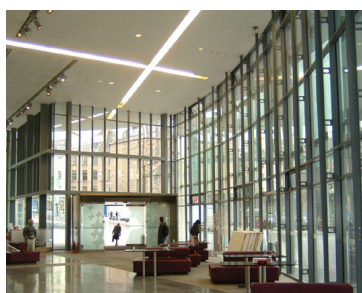
*Ventilation allows a building to cool in summer months by allowing cool winds to pass through a building and out of higher points. Landscaping should be utilised to block warmer high winds and allow lower, cooler winds to pass into a building.*

## Natural lighting...

Increasing natural light in buildings can reduce the need for artificial lighting within developments. These can include skylights, light monitors, clerestories, light shelves, light tubes, atria, courtyards, and glass or glass-block partitions and doors.

Appropriate use of overhangs, awnings and shutters, and venting is also crucial in order to avoid glare and overheating.

Street widths and building placement should ensure that there is good daylight exposure to building frontages and key public spaces. Wider east-west streets will expose south-facing buildings, allowing for good day lighting and natural heating.



### CASE STUDY

#### LION HOUSE, ALNWICK - DEFRA

- Flagship ultra low emissions office
- 'Outstanding' BREEAM rating.
- Delivering a low carbon building and including wind turbines, photovoltaic cells, solar heating and a biomass woodchip boiler





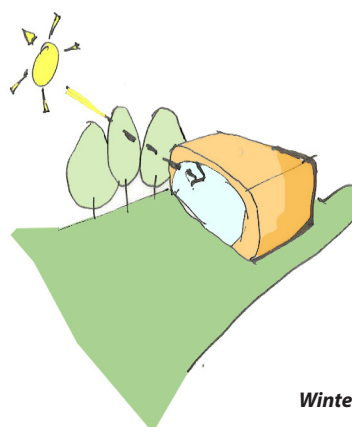
### Landscaping and Planting...

Deciduous trees can be planted near buildings to provide shade in the summer, whilst allowing heat and light through in the winter. Wind should also be considered in site layout. Planting can also reduce exposure to wind which may result in heat loss from buildings.

Boundary treatment can also contribute to sustainability. Shelter belts can be planted on the edge of sites to shield from prevailing winds and cold northerly winds. With good design breezes can also be used to assist energy efficiency, providing natural ventilation in buildings. 'Wind cowls' can be placed on the roof of buildings which respond to breezes and circulate air through the building.

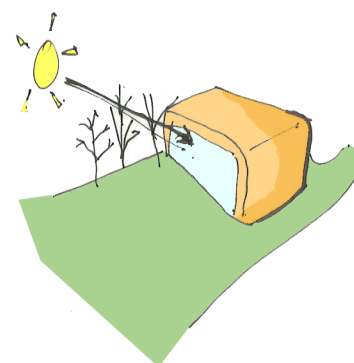
These measures can mitigate what is known as the 'urban heat island effect' through cooling urban areas which experience higher temperatures than more rural areas.

Summer

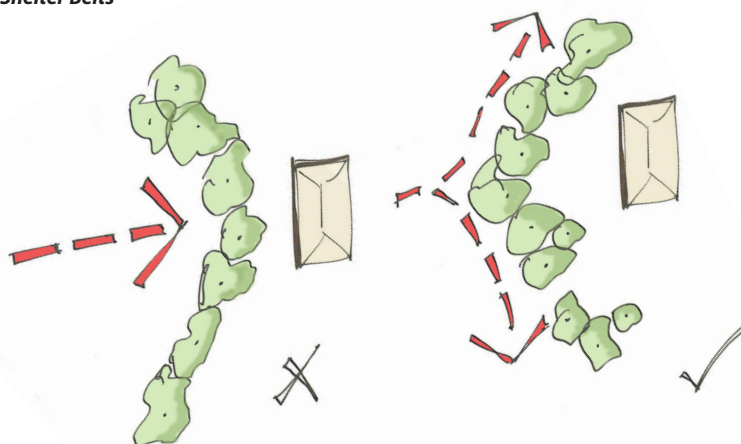


*Landscaping can be used to shade buildings from hot winter sun and also allow low winter solar energy to enter buildings.*

Winter



Shelter Belts



### Solar shading...

Overhanging eaves, deep reveals, light shelves, pergolas and shutters can prevent internal overheating and reduce the need for energy heavy air conditioning units. Shading is required particularly if windows face south.

Public realm with sunlit spaces should have some areas of shade to sit in and footpaths should be shaded to create cooler and more pleasant environments for walking.

### Other measures...

The colour of buildings, building materials, glazing distribution, shading and urban vegetation should also be considered to design effective low energy buildings.

### Inclusive Design

Every design decision has the potential to include or exclude users. Inclusive design should ensure all property or public space is accessible to all sectors of society and promotes a diverse and inclusive community.

### Relevant Policies

#### TAYplan

*Policy 2: Shaping better quality places*

#### Local Development Plan for Perth & Kinross

*Policy PM1: Placemaking*

*A Guide to Place Making in Perth & Kinross SPG*

## POLLUTION

### 4.1.4 Minimise the impact of pollution

” minimise and mitigate emissions from new and existing development and minimise noise and light pollution

Proposals for residential development and other sensitive uses within the locality of sources of air and noise pollution are required to demonstrate that appropriate design or locational solutions have been utilised to mitigate pollution levels and reduce amenity impacts for future occupiers.

Planning policies at all levels seek to minimise air, noise and light pollution whilst trying to balance the need to provide ever-increasing demand for development with the protection of the environment.

#### Noise

The mitigation of noise is generally focussed on residential development due to the potential impact on day-to-day life. The design of a new development needs to fully consider the impact of noise, particularly when located in the vicinity of busy roads, railway lines or other noise generating activity. As well as location and orientation, design considerations can include landscaping, fencing and reduced window coverage on effected façades.

Equally, as outlined in Policy EP8 of the LDP, the Council will have a presumption against the siting of development proposals which will generate high levels of noise in the locality of existing or proposed noise sensitive land uses.

A Noise Impact Assessment will be required for those development proposals where it is anticipated that a noise problem is likely to occur.

#### Air

Air quality impacts can be significant during and after construction. Developers and operators are required to assess the emissions that would result from making their property habitable as part of the planning and design process.

The environmental impact of new developments can extend far beyond the site, most especially in relation to traffic movements and related air pollution. Transport

impacts should be mitigated through the development of traffic reduction measures and the promotion of more sustainable modes of transport. This may be calculated using the 'Proximity Principle' in sourcing raw materials and waste disposal sites.

Policy EP11 of the LDP designates Air Quality Management Areas within Perth & Kinross. Development proposals which would adversely affect air quality within these areas may not be permitted.

#### Light

Light pollution has emerged as a significant issue in populated areas. Light pollution obscures the night sky, is wasteful of energy and can also be disruptive to those living in and beside any new development. In the interests of designing out crime and improving safety, however, there is a requirement that highways and other public spaces are illuminated. Light pollution can be reduced by the use of directional lighting and dimming.

#### Relevant Policies

##### TAYplan

*Policy 2: Shapes better quality places*

*Policy 6: Energy and Waste/Resource Management Infrastructure*

##### Local Development Plan for Perth & Kinross

*Policy ER4: Minerals and Other Extraction Activities - Supply*

*Policy EP1: Climate Change, Carbon Reduction and Sustainable Construction*

*EP5: Nuisance from Artificial Light and Light Pollution*

*EP8: Noise Pollution*

*EP9: Waste Management Infrastructure*

*EP11: Air Quality Management Areas*

## WATER

### 4.1.5 Promote efficient use of water

**”conserve water resources, enhance water quality, incorporate water-sensitive design and realise water recycling opportunities**

An average 4 person household uses 150 litres of water per person per day (Water Research Council) this generates 219,000 litres of potable water consumption per year. Sustainable use of water, both domestically and commercially, can have dramatic implications on energy and utility costs as well as conserving water resources. Simple measures such as preventing dripping taps can save approximately 1,200 litres of water per year (source: Environment Agency – Water Wise).

The Council will expect applications for major development to incorporate a range of water conservation measures designed to reduce mains water usage. The simplest way to do this is through the installation of efficient water fitting and plumbing, such as:

- Dual flush toilets
- Low flow shower fittings
- Low water consuming white goods and other appliances such as washing machines
- As well as the use of more durable plumbing, which can prevent leakages

Where this cannot be achieved, evidence will be required to demonstrate that full consideration has been given to the potential for the use of water saving measures including the use of reclaimed water through rainwater harvesting and grey water recycling.

### Rainwater harvesting

There are opportunities to harvest rainwater falling on roofs rather than allow it to be diverted to sewers or the ground. Rainwater harvesting can also contribute to mitigating against flood risk during heavy rainfall and contribute to carbon emission reduction through energy saved by not using highly processed tap-water.

The simplest way to undertake rainwater harvesting is through the provision of water butts and/or community storage facilities to collect rainwater in a simple and low cost way. These may include:

- Water Butts to all downpipes
- Underground water storage tanks that could be used for grey water uses
- Retention ponds as a rainwater storage facility

### Grey water recycling

Grey water is water from personal and clothes washing. Grey water machines clean water from baths, showers, basins and washing machines to a level suitable for toilet flushing. Grey water can be used more simply for watering the garden, collected by using simple diversion kits that enable you to channel grey water from your downpipes into the garden.

#### Relevant Policies

##### TAYplan

Policy 2: Shapes better quality places

##### Local Development Plan for Perth & Kinross

Policy EP1: Climate Change, Carbon Reduction and Sustainable Construction

References: <http://www.environment-agency.gov.uk/homeandleisure/beinggreen/118948.aspx>

#### CASE STUDY

##### VLA STORES, SURREY - DEFRA/VLA

Two-storey Stores building incorporating:

- Vertical axis wind turbines
- Bio fuel boiler
- Compact building envelope with good thermal insulation
- Solar shading
- Surface water run off from roof via 'weir' cascade into underground storage and attenuation tank
- Rainwater harvested and used for toilet flushing
- Good thermal insulation and airtightness. This also provided added noise reduction benefits given sites relatively exposed and noisy location next to the M25 allowed for noise reduction through the building fabric.



## SURFACE WATER RUN-OFF

### 4.1.6 Minimising surface water run-off

” conserve water resources, enhance water quality, incorporate water-sensitive design and realise water recycling opportunities

Reducing the risk of flooding to property is a key driver in sustainable development. As well as locating inappropriate development away from areas that are at risk from flooding the Council will seek to ensure that new development does not contribute to flooding and increased surface water run-off.

As outlined in Policy EP3C in the LDP, the Council will require all new development to incorporate Sustainable Urban Drainage Systems (SUDS) measures. SUDS are an alternative to traditional drainage systems, and attempt to reduce the total amount, flow and rate of surface water run-off. SUDS fall into three main groups:

- *Source Control Techniques* – reduce the quantity of run-off at source
- *Permeable Conveyance Systems* – slow the velocity of the run-off to allow settlement, filtering and infiltration
- *Passive Treatment Systems* – ‘end-of-pipe’ systems provide passive treatment to collected surface water before discharge into a storm sewer or watercourse

Diagram 4 outlines the SUDS opportunities available to developers.

Not all SUDS techniques will be appropriate for individual sites; however a SUDS approach should be taken wherever possible on any site. The effectiveness of SUDS type systems will depend on many factors, including run-off rates, ground conditions and typography in relation to size, type and density of the development. It is therefore important that SUDS are designed to match the context in which it is proposed. It is also essential that the ownership and responsibility for maintenance of every sustainable drainage element is clear and that long term management is put in place.

#### Relevant Policies

##### *TAYplan*

*Policy 2: Shaping better quality places*

*Policy 6: Energy and Waste/Resource Management Infrastructure*

##### *Local Development Plan for Perth & Kinross*

*Policy EP2: New Development and Flooding*

*Policy EP3: Water Environment and Drainage*

#### CASE STUDY

##### BUCKSHAW VILLAGE, CHORLEY

- A mixed-use development on a 324ha brownfield site.
- SUDS have been fully integrated into the development in order to ensure that surface water runoff from the site is restricted to existing rates and that the development does not contribute to an increased risk of flooding.
- Swales have been installed adjacent to the highway.
- Rainwater retention ponds are also incorporated.
- Previously culverted watercourses on the site opened up and developed as landscape features.
- Surface water runoff from each group of residential properties filtered by a reedbed system prior to its discharge to the watercourse in order to remove pollutants and safeguard against the contamination of watercourse.



## Sustainable Urban Drainage System Measures

**Pervious Pavements**

The use of permeable concrete blocks, crushed stone, asphalt or other materials allows water to infiltrate directly into the subsoil, or be stored in underground reservoirs.

This will reduce the need for surface water drains and off-site sewers.

**Infiltration Trenches and Filter Drains**

Infiltration trenches comprise stone filled reservoirs to which storm water run-off is diverted, from which the water gradually infiltrates.

A filter drain filters water through soil into underground pipes.

**Swales and Basins**

Grassed depressions which lead run-off to temporary storage channels for storm waters, reducing peak flows

Associated grasses and vegetation filters run-off by trapping organic materials and minerals, providing nutrients and reducing water levels within destination waterway.

Can be installed alongside roads to replace conventional kerbs or as features within landscaped areas.

**Green Roofs**

As well as increasing biodiversity (see section 4.1.7), green and brown roofs can provide temporary storage of storm water and reduce the speed and volume of run-off.

**Ponds and Wetlands**

Ponds and wetlands can be fed by trenches, drains, swales or pipes to act as a natural soak away. This allows time for the removal of solids and provides nutrients to the wetland/pond.

The pond or wetland can also provide significant visual and environmental amenity for the locality.

**Grey Water**

Correctly collected and stored, rainwater can meet a significant proportion of a buildings water requirement (see section 4.1.5).

**Diagram 4:** SUDS opportunities



## ECOLOGY

### 4.1.7 Realise opportunities for biodiversity

” contribute to the biodiversity of Perth & Kinross by incorporating habitats and planting in development

New and existing development should seek to maintain and enhance the overall level of biodiversity, either through the provision of new on-site habitats or through the enhancement of existing environmental resources.

Existing valuable trees and vegetation should be retained wherever possible and linkages into the existing network of green and open spaces should be maintained or enhanced in order to provide “buffer” habitats and corridors for wildlife. The shading and insulating benefits of landscaping described elsewhere in this chapter can contribute to this habitat creation.

#### Green Walls

As well as providing valuable habitats, green walls offer insulation and wind protection to building facades. They can also protect masonry from extreme temperatures, air pollution and rainfall.

The walls normally incorporate permanent trellis work, spaced off the masonry, to support non-clinging climbers. Climbing plants should be planted at least 40cm away from the wall in an irrigated plant pit stocked with nutrient-rich topsoil.



#### Green Roofs

Green roofs are constructed to provide a habitat for vegetation. Intensive living roofs, with soil depths of over 350mm can support trees, shrubs and even water features. Intensive roofs add a significant additional load to the roof structure and usually require substantial maintenance.

Extensive living roofs have substrate depths of between 25mm and 125mm. They can support a range of plants and growing mediums and add much lower loading to the roof structure than intensive roofs. Extensive roofs can be planted with Sedum spp. or a range of native grassland plants, using locally sourced growing mediums.



In addition to ecological and aesthetic improvements, green roofs can provide a range of other benefits.

- a typical green roof can hold 55% of its volume in water, they can slow storm runoff and reduce flood risks
- help to cool urban areas in summer and promote energy efficiency
- improve the acoustic performance of buildings
- enhance air quality by absorbing carbon dioxide and other pollutants and lowering temperatures around buildings (reducing the heat island effect)
- attract media interest and create a positive company image
- provide local amenity for public and commercial buildings
- lower maintenance costs than conventional flat roofs because the roof itself is protected from UV radiation, frost and other mechanical damage

## Brown Roofs

Brown roofs are intended to reduce the adverse effects associated with the loss of wildlife sites from development. A brown roof involves covering the roofs of new developments with a thin layer of crushed rubble and/or gravel, ideally obtained as residual material from the development process. The roofs provide habitat for insects and, subsequently, a feeding site for birds.



## Nest Boxes and Bat Boxes

Developers should investigate opportunities to include nest boxes for birds and bats. Suitably located boxes can provide valuable habitat and maintain/increase the nature value of the site.

### Relevant Policies

#### TAYplan

Policy 3: Managing TAYplan's Assets

Policy 6: Energy and Waste/Resource Management Infrastructure

#### Local Development Plan for Perth & Kinross

CF1: Open Space Retained Provision

CF2: Public Access

NE1: Environment and Conservation Policies

NE2: Forestry, Woodland and Trees

NE3: Biodiversity

NE4: Green Infrastructure

NES: Green Belt

ERS: Prime Agricultural Land

ER6: Managing Future Landscape Change to Conserve and Enhance the Diversity and Quality of the Area's Landscape

#### The Tayside Biodiversity Action Plan

## CONSTRUCTION AND MATERIALS

### 4.1.8 Maximise sustainable construction methods and practice

„maximise the use of materials from sustainable resources and the use of sustainable construction methods

Whilst the practices and technologies designed into a development and the operation of new buildings are important in terms of the sustainability of a building, it is also important to consider the sustainability of a building from the outset during the construction process.

#### Sustainable Materials

The materials used in the development process can have a significant impact on a buildings carbon emissions. This can be in terms of the materials performance within the building, the embodied energy (energy used in obtaining the raw materials, manufacturing and transport to the development site) and the suitability of the material for the purpose.

The Council is keen to ensure that the materials to be used in construction projects are responsibly sourced and are, wherever possible, sourced from local suppliers. This not only supports the local economy but also reduces transport distances, saving money and reducing emissions. The use of local material can also contribute to the retention of local character and identity. The Council will also encourage the use of recycled materials on site.

#### Considerate Constructors Scheme

The Considerate Constructors Scheme is the national initiative set up by the construction industry to improve its image.

Construction sites and companies that register with the Scheme are monitored against a Code of Considerate Practice, designed to encourage best practice beyond statutory requirements.

The Code of Considerate Practice outlines the Scheme's expectations and describes those areas that are considered fundamental for registration with the Scheme.

## Construction Waste

On a construction site as much as 20% of materials can be wasted and burning surplus materials is common practice which is not only wasteful, but also causes pollution and nuisance. By re-using these materials developers can reduce their environmental impact and can also save on the now significant costs of landfill.

On-site waste can be minimised by:

- Design that utilises whole units of construction materials
- Appropriate storage of materials on site - minimises loss of re-usable material
- Separate out waste materials at source to aid re-use on site or recycling
- Wood or natural materials can be utilised for composting and/or biofuel energy generation.

The production of a Site Waste Management Plan (SWMP) for a proposal can help reduce the amount of waste produced during the construction phase and manage site waste more efficiently. More information can be found here: [http://www.netregs.org.uk/library\\_of\\_topics/waste/storage\\_handling\\_\\_transport/site\\_waste\\_management\\_plans.aspx](http://www.netregs.org.uk/library_of_topics/waste/storage_handling__transport/site_waste_management_plans.aspx)



## Noise and Air Pollution

The construction process can generate significant amounts of noise and air pollution. Consequently, the Council will welcome development proposals that seek to minimise the impact of construction activities on its neighbours.

The issues outlined above should be considered within a 'construction management plan' which will generally be covered by planning condition for major developments.

### Relevant Policies

#### TAYplan

Policy 6: Energy and Waste/Resource Management Infrastructure

#### Local Development Plan for Perth & Kinross

PolicyER4: Minerals and Other Extractive Activities – Supply

Policy EP1: Climate Change, Carbon Reduction and Sustainable Construction

Policy EP10: Management of Inert and Construction - Waste

## WASTE

### 4.1.9 Maximise sustainable waste opportunities

” minimise waste and maximise reuse and recycling both during construction and after occupation

The way a development (both residential and commercial) is designed and planned can have a critical influence on successful waste management, encouraging high recycling rates and resulting in less waste sent to landfill.

Waste and recycling bin storage and collection points need to be designed so that they, have appropriate space, are conveniently located and ensure that recycling is an easy option.

The following principles for waste and recycling bin storage should be considered:

- Recycling facilities should be as easy and straightforward to use as general waste bins
- Storage areas should be appropriate for access by both users and collection crews
- Provision should be made for segregated waste streams including dry mixed recyclates, food waste and colour separated glass
- New commercial developments should comply with Waste (Scotland) Regulations 2012.

### The Perth & Kinross Waste Management Plan and Zero Waste Scotland

Ongoing recycling initiatives in Perth & Kinross include the Kerbside Recycling Service, more Recycling Points including local mini glass recycling points and upgraded Recycling Centres allowing residents to recycle a large range of household materials. All these initiatives have sought to make it easier to recycle in Perth & Kinross. This has led to recycling rates rising from 18% in 2002/03 to 52.3% in 2010/2011, and the amount sent to landfill reducing from 78,890 tonnes in 2002/03 to 38,034 tonnes in 2011.

The Zero Waste Plan for Scotland, launched in 2010 by the Scottish Government, has set ambitious targets for Scotland including a 70% recycling/composting rate for all waste by 2025. This means that there is still work to do in Perth & Kinross if we are to meet these targets.

More information is available here: <http://www.zerowastescotland.org.uk/>



## TRAVEL

### 4.1.10 Encouraging sustainable travel and reducing need to travel

”reduce reliance on the private car and encourage the use of more sustainable modes of transport

The way people travel to and from a development is an important consideration when proposing new development. At the moment there is an over reliance on the private car and there is a need to influence a shift to more sustainable modes of transport.

By encouraging the uptake of more sustainable forms of transport, such as cycling and walking, reliance on the private car can be reduced, reducing emissions, improving air quality, reducing congestion and address safety and social inclusion issues.

#### Incorporating Facilities for Cyclists

In order to encourage cycling in Perth & Kinross it is important to support a network of cycling facilities. These facilities should include:

##### Cycle parking

Provision of cycle parking is essential to ensure cyclists are able to safely secure their cycles and make cycling a practical option. The minimum standards for cycle parking are set out in the Council's Roads Development Guide. Cycle parking should be considered for multi-occupancy domestic developments and for non-domestic developments and should include:

- Incorporate Sheffield stands (or the equivalent) or wall mounted bars
- Be protected from the weather with a roof over the stands
- Be positioned where it would be overlooked by the public or staff; or at least CCTV, in order to maximise the actual and perceived level of security
- Be positioned where it can be easily reached from access routes and where its use would not conflict with pedestrians
- Be appropriately lit in order to discourage crime and improve visibility for users.
- Long stay parking facilities should consider the use of lockable gates to provide further security

##### Cycle Lanes

An integrated network of cycle lanes or tracks can help ensure that cyclists can travel safely and quickly through an area, promoting the mode of transport and making it more convenient for users. Developers should consider incorporating facilities for cycling where changes to the highway network are proposed and links to existing routes and cycle lanes should be explored to ensure their development is served by a sustainable network.

Where possible, cycle ways should be separated from the road carriageway and designed to minimise crime to ensure safety for cyclists.



#### CASE STUDY

##### STAITHES SOUTH BANK PHASE 1, GATESHEAD HEMINGWAY DESIGN/TAYLOR WIMPEY

- Residential scheme comprising 697 units, including flats and houses.
- A national cycle route runs along the river, and this is linked through the site by two local cycle routes.
- The development incorporates cycle parking into the homes and apartment blocks of the residents
- Provision is made within the scheme for visitor cycle parking.



## Facilities for Pedestrians

Patterns of development and the location, scale, density, design and mix of land uses is a key influence upon the need to travel and the convenience of walking as a viable alternative to travel by private car. For example, the provision of a mixed use community will reduce the need to travel large distances to work and/or to shop.

Facilitating movement to/from and around developments includes, for example, providing pedestrian routes to/from the public highway, pedestrian improvements to the local highway, incorporating pedestrian crossings and ensuring that pedestrian environments are safe, accessible, free from barriers and attractive.

This is particularly relevant where journeys are made by public transport, since walking is always the first and last element of such journeys. New developments should have full consideration of existing and proposed sustainable transport routes, ensuring that safe and convenient access is available to existing bus or train stops where possible.



Perth & Kinross Council has produced supplementary planning guidance on Place Making which should be considered, along with this guidance and other relevant planning policies, when proposing a new development.

## Sustainable Public Realm

It is important that as well as considering the sustainability of buildings we consider the design of the spaces which people move through, use and interact with. Sustainable and inclusive public realm can have environmental, social and economic benefits for urban communities.

Public realm can increase sustainable movement through encouraging safe and attractive space to move through a space under our own steam. Successful public space can facilitate this.

Designers should consider the sustainability, longevity and appearance of a space when approaching the physical design of the space. Materials should be sourced locally where possible and provide a durability which reduces energy heavy maintenance.

Creating spaces where people meet, businesses thrive and create identity all contribute to reinforcing community and economy. This should be embraced in Perth & Kinross within all new urban space.

### Relevant Policies

#### **TAYplan**

*Policy 2: Shaping better quality places*

*Policy 6: Energy and Waste/Resource Management Infrastructure*

#### **Local Development Plan for Perth & Kinross**

*Policy TA1: Transport Standards and Accessibility Requirements*

## 4.2 Strategic Approach to Sustainability

Adopting a strategic, community wide approach to sustainability can have benefits in terms of delivering sustainable design and zero carbon development. Adopting a holistic, joined-up approach to sustainability where all aspects of living are considered can significantly increase sustainability, as well as reinforce community integration. Such approaches as district heating can enhance sustainability for whole communities.

Such initiatives will be supported by Perth & Kinross and proposals for sustainable communities will be looked upon favourably should they support other policies within the Local Development Plan.

### CASE STUDY

#### BO01 DISTRICT, MALMÖ, SWEDEN

- First phase of a long-term development plan for the area. A derelict industrial zone in the western harbour of Malmö has been redeveloped into a mixed-use urban quarter with approximately 1000 dwellings, shops, offices and other services.
- High-density layout, making it efficient in its use of land.
- Served exclusively by locally generated energy from renewable sources.
- Incorporated 120m<sup>2</sup> of photovoltaic panels and 1400m<sup>2</sup> of solar collectors.
- Includes a 2MW wind turbine and a ground source heat pump to harness geothermal energy.
- Energy systems coordinated with waste systems in order to generate biogas to provide power for community energy systems for heating, cooling and electricity.



#### PORTOBELLO - TRANSITION TOWN

- Scotland's first transition town encompassing community action to tackle climate change.
- Produced their own Energy Descent Action Plan.
- Organised events such as Car Free Days and developed a community led wind turbine project, a community orchard and a Transport & CO2 Reduction Plan.



## 4.3 Retrofitting Sustainable Design

### 4.3.1 The existing building stock

New build development represents approximately 1% of the total housing stock each year, highlighting the importance of addressing the sustainability of the existing housing stock. There are a number of technologies that can contribute to the reduction of carbon emissions from the existing housing stock. These technologies are generally focussed around energy efficiency in premises through increasing the thermal efficiency of a building so that less energy is required.

Improving efficiency falls to a combination of improving insulation and using the most efficient way of producing heat and energy. Measures such as cavity wall insulation, micro Combined Heat and Power (CHP), solid wall insulation and ground source heat pumps have the potential to achieve large carbon savings and some funding streams are available for such initiatives\*. Despite a high up-front cost their are long term economic benefits for the property owner through energy cost savings.

The Scottish Government produced an Energy Efficiency Action Plan (the Action Plan) for Scotland in 2010 which sought to address these opportunities.

The Action Plan introduces a headline target to reduce Scottish final energy consumption by 12% by 2020 and outlines a number of priority areas for energy efficiency in Scotland.

By improving household energy efficiency, Scottish residents could save an estimated £2 billion by 2020 from smaller energy bills.

\* The following websites provide information on the possible funding available for energy efficiency improvements to households: <http://www.scotland.gov.uk/Topics/Built-Environment/Housing/warmhomes/uhi> and <http://www.scotland.gov.uk/Topics/Environment/funding-and-grants>.



## The Green Deal

The Green Deal, launched in January 2013, is an innovative financing mechanism that lets people pay for energy-efficiency improvements through savings on their energy bills.

The Green Deal applies to both the domestic and non-domestic sector and replaces current policies such as the Carbon Emissions Reduction Target (CERT) and the Community Energy Saving Programme (CESP).

There are 45 measures approved to receive funding under the Green Deal, covering:

- insulation
- heating and hot water
- glazing
- microgeneration (generating your own energy)

For the non-domestic sector lighting, mechanical ventilation and heat recovery measures can also be covered. More areas may be added as technology develops.

For more information visit the following website: <https://www.gov.uk/green-deal-energy-saving-measures/how-the-green-deal-works> and energy saving advice is provided by Perth & Kinross Council at the following link: <http://www.pkc.gov.uk/article/1929/Energy-efficiency>

### 4.3.2 Previously developed land

Developments located on brownfield sites can contribute to sustainability as they make the most efficient use of previously developed land. Retaining heritage developments and existing buildings can be more sustainable than demolishing and rebuilding, which has associated embedded carbon emissions. Further, sustainable design and construction lends itself easily to refurbishment schemes, offering cost effective opportunities for development.

Previously developed land also tends to be well served by an existing sustainable transport and utilities network, reducing the need to redirect services and the energy needed to do this.

Contamination, however, is a key consideration when developing on brownfield land and sites must be fully assessed for potential contaminants prior to development.

## CASE STUDY

### CRICHTON CASTLE, MIDLOTHIAN HISTORIC SCOTLAND

- 14th Century castle near Edinburgh
- PhotoVoltaic panels placed on a discreet area of the Castle roof.
- PV panels provided power for lights and visitor computers in Castle, replacing the need for a diesel generator.



### BOWKER STREET REFURBISHMENT, SALFORD CONTOUR HOMES

- Refurbishment of vacant Victorian terraced properties on Bowker Street in central Salford.
- Sought to make them as energy efficient as possible - maximising sustainability in order to benefit future residents.
- Refurbishment will reduce energy use and carbon, water and waste.
- All external surfaces re-insulated (heat and sound) and air tightened.
- Use of renewable energy technologies (PV and solar thermal).
- Low flow and water-saving features.
- Energy consumption is predicted to be cut by more than 80% in the houses - saving energy running costs of just under £250 per year.



### 4.3.3 The historic environment

Approximately 19% of Scotland's housing stock was built before 1919, long before Carbon Emissions Reduction Targets, Building Regulations and Energy Performance Certificates were thought of. It is therefore important to consider the energy efficiency of historic buildings to discover possibilities to reduce their carbon footprint.

At the same time it is important to consider the conservation of the character and appearance of historic dwellings. The question arises, then, of how older homes can cut their carbon emissions without destroying their visual character. The Council would expect all proposals to update or renovate historic buildings to consider the energy performance of the building. Developments should seek to address any inefficiency where opportunities exist that would not have a detrimental impact on the character of the building.

Historic Scotland have recognised the importance of improving the efficiency of Scotland's historic building stock and provided guidance on the subject. Historic Scotland published "Conversion of Traditional Buildings – Application of the Scottish Building Standards" and, more recently, "Information for Historic Building Owners – Improving Energy Efficiency in Traditional Buildings" which contain energy efficiency upgrade guidance.

Further information can be found on Historic Scotland's website: <http://www.historic-scotland.gov.uk/index/heritage/technicalconservation/conservation-research.html>



*Green roofing and solar panels can enhance energy efficiency and sustainability for existing and historic buildings.*





A photograph of a modern building interior, likely a library or community center. The space features large glass windows and doors, track lighting on the ceiling, and a polished floor. A person is visible in the background near a large white display or screen. The image is overlaid with a semi-transparent blue bar at the top and a teal bar on the right side.

# Section 5

## Implementation, Monitoring and Review

## 5.1 Implementation

The guidance set out within this SG will be implemented primarily through the development management process and the determination of planning applications for planning consent or prior approval.

### 5.1.1 Pre-application discussions

As with any form of development it is important that the applicant engages with the Council at the earliest possible opportunity to ensure their planning application is fully informed and can move through the planning system as quickly as possible. This document provides a structure for designers and developers to discuss issues at pre-application stages with both clients and planning representatives.

The Sustainability Checklist is also an excellent pre-application discussion tool which can inform ideas and designs at an early stage.

## 5.2 Enforcement and Implementation

It is important that the sustainability aspirations of the developer and the applicant are realised in the delivery of the proposed development. This can be done through the following means:

### Planning Conditions

Planning conditions can be used to enforce particular sustainable design measures or for assessment to take place at certain identifiable stages. In all cases the Perth & Kinross planning team will satisfy themselves that any condition is appropriate to the particular circumstances of the proposed development and local area.

Conditions will be required to comply with Circular 4/1998 and the long-established tests that they should be necessary; relevant to planning; relevant to the development to be permitted; enforceable; precise; and reasonable in all other respects.

### Building Control

A developer will need to obtain a building warrant to ensure that the minimum of standards have been met for their construction. As part of this assessment the Council will assess the sustainability of the development, with reference to the aspirations set out within the Sustainability Checklist and Sustainability Statement.

### Training for Industry

In order to meet the objectives and targets set out within this guidance, as well as national and regional policy, it is important that the relevant industries have the appropriate skills necessary to realise the sustainability requirements for the proposed development.

Training is available from several industrial and professional bodies including the BRE Group, the Royal Town Planning Institute and the Royal Institute for Chartered Surveyors.

### Awarding Best Practice

Perth & Kinross Council will seek to recognise exemplary sustainable design and development by awarding developments in the area which have shown best practice in sustainable design. The award will recognise all sectors of sustainable design from minor interventions through to major sustainable developments.

This will not only outline developer's skills in sustainable development and design, it will also help establish a positive image for developers who have a commitment to sustainability in the area.

### Educating Individuals and Groups

As well as the design standards and measures set out within this guidance, the overall operation and use of development within Perth & Kinross must adopt best practice when it comes to sustainability. Owners, leaseholders and users must be fully aware of how their day-to-day use of a property can aid sustainability and the efficiency.

Developers should consider adopting user manuals/guides for incoming leaseholders and owners outlining how to use their property in a sustainable way. These manuals/guides should clearly spell out the benefits of sustainability and ways of achieving sustainability.

### Achieving the Standards

Planning applications will be required to clearly set out how they intend to meet sustainability targets set out within this guidance and Policy EP1 in order to comply with local policy.

However, the standards which are set within this guidance and Policy EP1 are set as a minimum requirement and developers are expected to achieve the maximum possible sustainability level for their development.

## 5.3 Monitoring

The effectiveness of the SG will be assessed each year in the Perth & Kinross Annual Performance Report. This will identify whether there have been any problems in implementing the SG and assess whether it is effective in the context of the aims and objectives set out within the guidance. The key indicators will be:

- % of development proposals that have achieved the standards set out within Policy EP1 and this guidance
- % of new developments that incorporate measures to generate energy through renewable sources
- % of waste that is turned into compost or recycled.
- % of new residential developments within 30 minutes public transport travel time of various key facilities.

The Sustainability Checklist provides an opportunity to supply the basic means for the assessment of effectiveness and compliance with regard to the above through providing rudimentary data for the sustainable performance of planning applications.

## 5.4 Review

The assessment of the SG's performance in the Annual Performance Report will help to test the success of the SG against these aims and identify whether there is a need to review the SG in line with new guidance or an under-performing development industry. If a review is required a timetable for this process will be included within the Perth & Kinross Development Plan Scheme and/or Action Programme.





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