

## **8.0 Environmental Considerations**

A new Build or major refurbishment is the perfect opportunity to design in energy savings – savings that will last for the lifetime of the building. Decisions made at the design stage will have significant energy, environmental and cost implications over the life of the building.

### **8.1 Reducing the Environmental Impact of Building Services**

Building Services design impacts greatly on both the internal environment and environmental impact of a building. With buildings accounting for around 50% of all carbon emissions, building services engineers play a significant role in combating climate change.

The [Building \(Scotland\) Regulations](#) give guidance on the environmental aspect of building design.

When designing building services, for a design project tender submission, consideration must be given to renewable energy, sustainability, low carbon technologies and energy management in order to ensure that [The Environmental Impact](#) of a building is minimised.

### **8.2 Low Carbon design**

A fundamental requirement for making a new development low carbon is to design out any avoidable energy requirements. Demand reduction takes priority over covering energy requirements through low carbon or renewable sources.

There are some well-established over-arching principles of low carbon design –

- Understand energy use in the building type
- Use the form & fabric of the building to minimise energy demand
- Focus on insulation and air tightness
- Use high efficiency building services with low carbon fuel
- Manage energy within the building
- Use renewable energy systems

These principles are explained in greater detail within [RIBA's Climate Change Toolkit](#); Principles of Low Carbon Design & Refurbishment.

Scotland has various sources of low carbon design guidance; [The Sullivan Report](#), [Low carbon Scotland Report](#) and Low Carbon Engineering section of the [BRSIA website](#).

However, The Highland Council's Carbon Management Plan (CMP) also sets out a clear strategy and action plan for Highland Council to reduce energy costs and CO<sub>2</sub> emissions over the next three years. The plan includes a comprehensive set of energy and carbon reduction programmes throughout the Council; highlighting the need to reduce the councils energy consumption and therefore carbon consumption.

Due to the council's requirement to register for the [CRC Energy Efficiency Scheme](#) all design considerations need to encompass fabric energy efficiency, low carbon building services as well as site layout, infrastructure etc. when tendering for a council project. This is fundamental in reducing The Highland Council's energy expenditure and carbon credit cost.

### **8.3 Low Energy Design**

A low-energy building is a building that from design, technologies and building products uses less energy, from any source, than a traditional or average contemporary building of the same use. In the practice of sustainable low energy design, active solar and passive solar building design techniques and components are often used to reduce their energy expenditure.

Achieving low energy use levels within its buildings is a high priority for The Highland Council as detailed in the [Energy Management Performance Plan](#); not only is there an environmental benefit to reducing energy use as much as possible but there is also a cost benefit.

#### 8.4 Sustainable Design

This specification is intended to encourage the development of high quality and sustainably-designed buildings which will minimise impact on the natural environment, help counter the effects of climate change and also promote greater use of local and renewable materials.

In order to encourage sustainable design The Highland Council has created a [Sustainable Design Guide](#) along with their Development Plan Policy: [Designing for Sustainability in the Highlands](#).

These highlight the 3 interdependent principles of sustainability –

- Supporting the viability of communities
- Contributing to a prosperous and vibrant local economy
- Safe-guarding and enhancing the natural and built environment

The energy saving trust also have an environmental domestic design guide; [The Code for Sustainable Homes](#), highlighting the requirements for sustainability within domestic buildings.

All Highland Council design tender submissions must be sustainably designed.

#### 8.5 Climate Change Guidance

As a signatory of Scotland's [Climate Change Declaration](#), the Council is committed to producing an annual statement on local progress towards mitigating climate change and identifying how the local Authority should adapt to its likely effects.

The Highland Council is also governed by the [Public Bodies Climate Change Duties](#) which aims to assist public bodies in complying with the duties placed upon them by Part 4 of the [Climate Change \(Scotland\) Act 2009](#).

Through the Climate Change Working Group ([The Green Council](#)) The Highland Council aims to -

- Mitigate against climate change through the reduction of greenhouse gas emissions from its own estate and practices.
- Mitigate against climate change through the reduction of greenhouse gas emissions in the Highlands through the range of services provided by the Council and in partnership with other statutory, voluntary and private sector organisations.
- Adapt its services to deal with the impact of global warming and extreme weather events (considering both threats and opportunities) and in particular regarding impacts of large-scale flooding and community level.

These aims must be considered when designing building services for tender submission; accounting for carbon impact, energy use, sustainable design and overall environmental impact.

#### 8.6 Water Minimisation

Water minimisation is about reducing the amount of water we waste, not restricting the amount we drink or use for washing.

In order to adapt to climate change and the expected changes in the seasonality of our water supply, it is prudent to reduce our water use. This will also:

- Save money
- Reduce carbon emissions.
- Contribute to the continuing health of our valuable ecosystems.

The Highland Council's [Water Minimisation Policy](#) document details the steps that The Highland Council is taking to reduce its water use and the water saving measures which must be designed into any new or refurbished building.

Water minimisation is an important aspect of low energy, low carbon sustainable building design. Government documents such as the [Water Wise White Paper](#), [Water Wise Future Strategy 2010-2011](#) and the [Water Efficient Buildings](#) website offer additional guidelines on reducing the use of water.

### **8.7 Environmental Planning**

In Scotland, changes to permitted development rights for domestic micro generation technologies introduced in March 2009 have lifted the requirements for planning permission for most solar PV and solar hot water installations. Roof mounted and stand-alone systems can now be installed in most dwellings under the new [General Permitted Development](#) rules, as long as they respect certain size criteria; see The Highland Council's [Planning Permission](#) website for more information.

However, when considering the installation of such renewable technologies as wind turbines, air source heat pumps, wood pellet stoves and wood log burners the local planning office must be consulted and, where required, a planning application approved before installation commences.

During the initial design stage the location of the technology and fuel store (where applicable) should be thoroughly researched and considered; these locations should be clearly marked, in context, on both plans and elevations of the building with full dimensional information (DxWxH) of the product and it's distance from the building, boundaries and other surroundings clearly shown.

Additionally, noise information (preferably NR ratings) for each technology should also be included within the tender submission.

This information will be forwarded to the relevant planning department for consideration, comment and/or approval prior to the project being costed and going on site.

When proposing the installation of a wind turbine(s), in particular, location of the turbine should be carefully considered due to both health & safety and shadow flicker within adjacent buildings.

In many cases, the installation of renewable technologies in domestic premises will be quick and easy due to the introduction of [the Town and Country Planning \(General Permitted Development\) \(Domestic Micro generation\) \(Scotland\) Amendment Order 2009](#) which came into effect on 12<sup>th</sup> March 2009. This permitted development order grants the owner of domestic properties rights to carry out certain limited forms of development on the home, without the need to apply for planning permission; this includes the installation of certain renewable energy technologies on a micro generation scale.

### **8.8 Environmental Health**

The role of [Environmental Health](#) in building services is to protect and enhance the health, welfare, environment and safety of building occupants by ensuring that the building services designed and installed within a building are as energy efficient and sustainable as possible while providing a comfortable, healthy and safe internal environment.

Maintaining a good internal environment requires attention to the building's heating, ventilation, and air conditioning (HVAC) system.

The Highland Council requires the Environmental Health of building occupants to be considered when designing M&E building services.

Particular attention should be paid when designing and locating kitchen canopies; The Highland Council has found that the cleaning and maintenance requirements of canopies is not considered during the design process, resulting in unnecessary risk to workers while carrying out these tasks.