

# The Highland Council

## Planning Development and Infrastructure Committee

11 May 2016

Agenda Item	13
Report No	PDI 30/16

### Energy Efficiency Action Plan

#### Report by Director of Development and Infrastructure

##### Summary

This paper sets out the requirement for energy efficiency action in Council buildings and also identifies various improvements and proposals required to reduce annual energy consumption and costs.

## 1. Background

1.1 The Council has set challenging targets for energy savings in the budget savings plan for 2016-17. There is a requirement to reduce the overall cost of energy use in buildings as follows:

- schools energy incentives to save £531,221; and
- offices and other buildings to save £250,000.

The overall target of £780,221 represents a saving of less than 10% of the total energy expenditure of the Council. This is a challenging target, but a combination of procurement, cultural change, and efficiency measures can result in this target being achieved.

## 2. Energy Efficiency Options

2.1 There are a range of measures that can be implemented to assist with both awareness of energy costs and potential savings across the property portfolio. These measures will be a mixture of engineering and behavioural interventions that will achieve savings.

2.2 It is essential that building users, responsible officers and Services are engaged in the savings process and it is proposed that the following energy information will be made available on a regular basis:

- bills received for each utility and energy supply;
- budget and spend on energy; and
- profile of energy requirements for each Council site.

The Council's energy database has a facility that will be used as an online portal for users to access the above information and this will be provided to all property managers, portfolio holders and Service management teams.

### **3. Energy Efficiency Proposals and Draft Energy Efficiency Action Plan**

- 3.1 The draft energy efficiency action plan has outline themes and timescales along with the estimated effect of each action. The plan will be monitored through existing reporting structures to Service Committees so that Services can take responsibility for the delivery of site specific savings.
- 3.2 It is proposed that the Green Ambassador programme is revitalised and an emphasis put on the positive input of volunteers in making energy savings to buildings. Further, a new 'Junior Ambassador' programme is proposed that will capture the enthusiasm of school pupils in an effort to maximise the benefit of behavioural change. This brings additional benefits for households as learning and actions should translate to domestic energy savings.
- 3.3 A formal strategy is to be determined for the control of heating systems and the guidance attached to this paper at **Appendix 2** outlines the requirements for thermal comfort in buildings. It is proposed that this will generally be used in all Council premises.
- 3.4 Heating control systems will be checked and set to provide the most efficient operation in accordance with the guidance in section 3.3. Building management systems are to be provided to control and monitor the heating. These will, where possible, be linked to the Council network to allow remote monitoring, management and analysis of the energy use.
- 3.5 Heating systems are to be programmed for optimised weather related use so that they will only be used when required. All systems will be set-back or off for holiday periods and a general agreement is to be made on extended use.
- 3.6 Heating systems are to generally be switched off May to September as the weather allows, with arrangements made to ensure that any unseasonal conditions are effectively managed.
- 3.7 Heating and energy systems are to be reviewed to ensure that the most economic service is provided at each building. Heating fuel types and supply arrangements are to be checked and renewable energy options are to be installed with on-site generation where possible. The integration of biomass and PV systems is to be accelerated to ensure the maximum savings and income opportunities are achieved ahead of planned changes to Government energy incentives.
- 3.8 Lighting systems in buildings are to be checked and reviewed for good operation and control and where budgets are available will be improved. Ensuring that fittings are clean and have adequate switching arrangements will be prioritised.
- 3.9 A programme of energy audits and data analysis is to be undertaken to identify the significant loads, savings possible and improvements required.
- 3.10 The Council will join with the Scottish Cities Alliance in the implementation of a behavioural change toolkit that can be used with school curriculum activity to make effective savings to energy in buildings. The toolkit has been developed

by Glasgow City Council and Glasgow University along with software SME “Twenty Squares” to encourage behavioural change among school children and records actual savings made. Pilots have shown quantifiable results in schools and this can be used to help achieve carbon and energy targets.

- 3.11 The Council is to implement a formal energy management process in accordance with ISO 50001 so that actions can be clearly measured and monitored. Additional automated metering is to be installed where possible/practical and cost effective. These actions will prepare the Council for future legislation changes in relation to energy in buildings.

#### **4. Management of the Energy Efficiency Action Plan**

- 4.1 It is proposed that a focus group involving appropriate officers, stakeholders, parent groups and head teachers is formed that will help to establish and oversee the Action Plan. This will assist both building users and staff to ensure that targeted energy saving benefits are accepted and achieved.

#### **5. Implications**

##### **5.1 Resource**

There will be resources required to deliver this programme and staff time will be required to be spent in the various activities of the Green Ambassadors programme which are proposed to be absorbed by each Service. The management and direction of the programme is to be by the Councils Energy & Sustainability Team and the cost of this along with the various minor improvement measures are to be funded from existing energy capital and spend to save budgets.

Any identified new measures are to be costed and proposed on an individual business case basis and funding is to be sought for these as they arise.

##### **5.2 Legal**

There are no legal implications.

##### **5.3 Equalities**

There are no equality issues.

##### **5.4 Climate Change/Carbon Clever**

The proposed energy efficiency measures will reduce emissions from Council buildings and will help towards tackling climate change and make a significant contribution in developing a **Low Carbon Highlands**.

##### **5.5 Risk implications**

The required reductions in energy costs will not be achieved without the full engagement of stakeholders to implement all of the actions outlined in this report. Should schools not be able to deliver their required share of the saving it has been agreed that this will not impact adversely on their devolved budgets and any ensuing budget pressure will be managed within the overall Care and Learning budget.

5.6 Gaelic  
There are no Gaelic implications.

**Recommendation**

Committee is asked to approve:

- the Energy Efficiency Proposals as set out in section 3 of this report; and
- the Draft Energy Efficiency Action Plan contained in **Appendix 1**.

Designation: Director of Development & Infrastructure

Date: 18 April 2016

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## Appendix 1

### Energy Efficiency Action Plan (Draft)

Action	Theme	Timescale	Estimated Impact
<b>Green Ambassadors Programme</b>	Behaviour Change	July 2016 – March 2017	Medium
<b>Junior Green Ambassadors</b>	Behaviour Change	August 2016 – March 2017	Medium
<b>Gamification Toolkit</b>	Behaviour Change	August 2016 – March 2017	Medium
<b>Energy Viewer</b>	Management & Awareness	May 2016	High
<b>Heating Control Strategy</b>	Control and Management	May 2016	High
<b>Heating Control Management</b>	Control and Management	May 2016 – March 2017	High
<b>Heating Control Upgrades</b>	Control and Management	May 2016 – March 2017	High
<b>Heating Optimisation</b>	Control and Management	May 2016	Medium
<b>Heating Season Switch Off</b>	Control and Management	May 2016 – September 2016	Low
<b>Heating &amp; Fuel System Change</b>	Infrastructure	May 2016 – March 2017	High
<b>Lighting Cleaning &amp; Control</b>	Maintenance & Control	May 2016 – March 2017	Medium
<b>Lighting Upgrades</b>	Infrastructure	May 2016 – March 2017	Medium
<b>Energy Audits</b>	Energy Management	May 2016 – March 2017	High
<b>ISO50001</b>	Control and Management	May 2016 – March 2017	Medium

## Housing & Property Service

# GUIDANCE ON THERMAL COMFORT IN THE INDOOR WORKPLACE

### SCOPE

This guidance applies to all premises in Highland Council with the specific information relating to school premises referred to by [Appendix 1](#).

### BACKGROUND

Each year, especially when the weather is very hot or cold numerous enquiries are received as to what is a comfortable temperature for people to work in and whether maximum or minimum temperatures are laid down in health and safety legislation.

This document aims to provide information on the legal position, guidance on standards for thermal comfort and steps that can be taken to ensure comfortable working temperatures.

### LEGAL REQUIREMENTS

The Workplace (Health, Safety and Welfare) Regulations 1992 require that the temperature during working hours must be reasonable and that a sufficient number of thermometers shall be provided to enable persons at work to determine the temperature in any workplace inside a building. The associated Approved Code of Practice, (ACOP) recommends a minimum temperature of at least 16°C, or 13°C if much of the work involves severe physical effort. No maximum temperature is stated.

**It should be noted that these Regulations apply only to the employer controlled workplace and not to the domestic premises in which some staff have to work.**

There is specific legislation relating to minimum temperatures that apply to schools. This is the 'School Premises (General Requirements and Standards) (Scotland) Amendment Regulations 1967-1979'. (See [Appendix 1](#) for details).

Additionally a Health and Safety Executive guidance document on thermal comfort in the workplace advises that an acceptable zone of comfort for most people in the UK lies roughly between 13°C and 30°C.

### THERMAL COMFORT CONDITIONS

Thermal comfort is very difficult to define as it is dependent on a number of interacting factors such as temperature, relative humidity (RH), ventilation, air movement, airborne dust and personal metabolism, etc. What is considered to be comfortable will vary from person to person due to any number of these and other factors. However when conditions are inside the comfort limits set out below it is estimated that approximately 80% of occupants will find the thermal conditions acceptable; dissatisfaction will increase as temperatures move outside these ranges.

Where staff have control over the heating and ventilation of a workplace they must reach agreement on what is the most comfortable thermal environment for all.

In the absence of any specific legislation the best guide on suitable conditions for thermal comfort is contained within BS EN ISO 7730:2005 which recommends:

Season	Temperature	Relative Humidity
Summer conditions (cooling period)	23° C - 26° C	30% - 70%
Winter conditions (heating period)	20° C - 24° C	30% - 70%

The RH limits above are set to decrease the risk of unpleasantly wet or dry skin, eye irritation, static electricity, microbiological growth and respiratory diseases. However other guidance recommends RH of between 40% - 60% and these are better target parameters to ensure comfort in the modern IT based office.

### Summer Conditions

During summer conditions the main sources of heat in an office are;

- direct sunlight through windows
- conduction through the fabric of the building and fittings
- electrical lighting and equipment.

To take advantage of the inherent cooling properties of a building, where applicable the following should be ensured;

- all heating appliances are turned off
- all thermostatic controls are set below 20° C
- where practicable all windows can be opened and are used
- any mechanical ventilation system is working at design capacity and switched on
- any extract fans are working on extract
- blinds are fitted to all windows subject to direct sunlight and are used, particularly overnight to reduce thermal gain prior to the room being occupied
- all electrical equipment when not in use is switched off, particularly overnight to reduce the heating and drying effect
- adequate drinking water is available
- if external temperatures exceed room temperatures consider closing windows

### Winter Conditions

During winter conditions the main sources of discomfort are;

- inadequate heating
- excessive temperature variation between floor and head height
- draughts
- proximity to cold radiant surfaces

To achieve suitable temperatures and minimise discomfort, where applicable the following should be ensured;

- all heating appliances are turned on and heating surfaces/vents are not obstructed by furniture etc
- all thermostatic controls are set to a suitable temperature
- all heating systems are working to design specification and are timed to operate over suitable periods
- draughts are controlled or eliminated without restricting natural ventilation
- no one is located adjacent to a cold radiant surface
- there are no excessive variations of temperature within a room
- in consultation with the Housing & Property Service or the Facilities Management Team, local top up heating may be provided

## HEATING MANAGEMENT SYSTEMS

Many of the Council buildings have heating or Building Management Systems (BMS) and these are intelligent controls that constantly monitor the inside and outside conditions and adjust the heating accordingly. The systems are centrally monitored and provide alerts on heating failures as well as low and high temperatures. Other functions such as humidity and air quality can be monitored. The Facilities Management team or Energy & Sustainability team can access the systems for all buildings and will be able to alter and advise on settings.

## IDENTIFYING COMFORT RISK

There may be situations where there is a particular issue with the temperature at your workspace and on these occasions a risk assessment should be made. The HSE have information available on their website on how this can be carried out (please visit <http://www.hse.gov.uk/temperature/thermal/fivesteps.htm>) and you should, in conjunction with your line manager or with technical help, undertake a risk assessment.

## ACTION ON IDENTIFIED ADVERSE TEMPERATURES

After following the good practice detailed above and when it is considered that suitable temperatures for thermal comfort cannot be routinely maintained, line managers should report, with supporting evidence and via their Line Manager or Head Teacher, to the Housing & Property Service or Facilities Management Team and the Health and Safety Section after which the situation will be investigated.

If temperatures of 16° C or less or 30° C or more are recorded on 3 or more days in a two week period line managers should report, with supporting evidence and via their Line Manager or Head Teacher, to the Property Management Section and the Health and Safety Section, the situation will be investigated as a priority and short term remedial action advised.

## BUILDING TEMPERATURE SETTINGS

The temperature settings to your premises are to be set in agreement with the following criteria;

<b>BUILDING NAME</b>	<b>*INSERT BUILDING NAME*</b>	
<b>Responsible Premises Officer</b>	<b>*INSERT RPO NAME*</b>	
<b>Seasonal Condition</b>	<b>Temperature</b>	<b>Relative Humidity</b>
<i>Summer (cooling period)</i>		
<i>Winter (heating period)</i>		
Signed		
Date		



## Appendix 1 – School Environment

The School Premises (General Requirements and Standards) (Scotland) Amendment Regulations 1967-1979 page 1127 Table X (shown below) provides the following specific guide to minimum temperatures for certain types of accommodation.

Type of Accommodation	Air changes per hour to be heated by heating system	Temperature °C (Min)
Medical inspection room, changing room, bathroom, water closet and shower room	3	18.5
Teaching space, dining room, nursery room common room and staff room	2	17.0
Assembly area, lecture hall, theatre and cinema	1.5	15.5
Sickroom	3	14.5
Cloakrooms and corridors	2	13.0
Gymnasium	1.5	13.0
Games hall	1	10.0

The majority of new schools throughout Scotland have generally been designed in accordance with the *DfES Building Bulletin 87: Environmental Design Guidelines for Schools (BB87)*. Most environmental control systems for classrooms were designed on the basis of the following criteria: Winter 18°C and summer 28°C (not to be exceeded for more than 80 occupied hours throughout the year). Although winter conditions of 18°C are stated in *BB87*, currently this temperature would be considered cold by many users.

For the summer operating condition, overheating is said to occur if the number of hours above 28°C exceeds 80 occupied hours. This is equivalent to approximately 15 days (3 school weeks) with temperatures above 28°C (based on 9.00-15.30 with a one hour lunch break). No maximum temperature is stipulated within *BB87*.

The *DfES Building Bulletin 101: Ventilation of School Buildings (BB101)* has now revised the summer overheating criteria to read as follows:

Operating Condition	Temperature	Notes
Summer	28°C	Not to be exceeded for more than 120 hours during the occupied period of 09:00-5:30, Monday to Friday, from 1 May to 30 September
Summer	32°C	Maximum internal temperature
Operating Condition	Temperature difference	Notes
Summer	5°C	The average external to internal temperature difference should not exceed 5°C during occupied hours