

# Environmental Options

## Energy Efficiency - Lighting

Description	Details	Recommended for...	Points to note	Estimated payback
<b>Energy efficient light bulbs</b>	Use up to 80% less electricity than a standard light bulb (tungsten), but produce the same amount of light	Replacing blown standard light bulbs	A range of different sizes and dimming options are available	1 - 3 years
<b>T8 fluorescent light tubes</b>	Replacing older inefficient T12 fluorescent light tubes with more modern, efficient T8 tubes (or where possible T5s) to save energy	Replacing T12 tubes which need changing	T8s cost less than T12s	Immediate
<b>Lighting controls / sensors</b>	Help maintain correct lighting levels and provide optimum light output whilst minimising energy consumption	Large rooms where lights are left on unnecessarily	Various types of control are available, e.g. occupancy sensors help ensure lights only operate when the space is occupied	4 - 5 years
<b>Sun pipes</b>	A reflective natural daylight portal which brings natural light into a room	Poorly lit spaces where increased natural daylight would reduce the need for electric lighting	Can be retrofitted to benefit older properties	Dependent on site and lighting requirements

## Energy Efficiency - Heating

Description	Details	Recommended for...	Points to note	Estimated payback
<b>Energy efficient boiler</b>	Replace boiler with more energy efficient model	When boilers need replacing	Savings can be made by upgrading a boiler to a newer, more efficient model and also by changing the type of fuel used – such as changing from oil to gas, or using biomass	10+ years, dependent on size of boiler and if changing fuel used
<b>Heating zoning</b>	Zoning the heating system enables only the areas in use to be heated	Sites which would like to heat separate areas of a building, e.g. for after school clubs	More cost effective when a new boiler is being installed, however they can be retrofitted	4 - 5 years
<b>Heating control improvements, e.g. thermostatic radiator valves (TRVs), weather compensation, electronic controls</b>	Can be fitted on radiators or central boiler room controls. Enables the temperature in different areas to be effectively controlled	Wherever there are existing poorly controlled heating systems	TRVs can't be used on the older single pipe heating systems	4 - 5 years
<b>Radiator reflective foil</b>	Fitted behind radiators to reflect heat back into the room	Any accessible radiators	More effective when used on uninsulated external walls	6 months - 1 year
<b>Pipework insulation / valvewrap</b>	Uninsulated hot water pipes lose heat, therefore hot water reaches taps much faster if the pipes are properly insulated, reducing the amount of water wasted. Boiler room valves and flanges can also be insulated	Accessible uninsulated pipes	Accredited installers must be used for insulating boiler rooms where there is an asbestos risk	4 - 5 years
<b>Variable speed drives on pumps, fans and compressors</b>	Fans, motors and pumps rarely need to operate at full speed all of the time. The reduction in speed saves energy	Where fans, motors and pumps run unnecessarily	Only cost-effective for larger machinery	6 months - 5 years

## Energy Efficiency – Insulation

Description	Details	Recommended for...	Points to note	Estimated payback
<b>Double glazing</b>	Double glazing works by trapping air between two panes of glass, which creates an insulating barrier that reduces heat loss, noise and condensation	Single glazed windows	Double glazing cuts heat lost through windows by half. Secondary glazing is less expensive but still saves money by reducing heat loss and draughts	10+ years
<b>Window insulation/ draught proofing</b>	Strips of insulation tape can be used to reduce draughts around windows and doors	Single glazed windows and poorly fitting doors	Inexpensive and easy to fit	2 - 3 years
<b>Hot water tank insulation</b>	Fitting an insulated cylinder jacket to hot water tanks keeps the water hot for longer, therefore saving energy	If the cylinder is bare or the layer of foam is so thin that it gets hot	Take care to fit the jacket and pipe sleeves well to minimise heat loss	3 - 4 years
<b>Cavity wall insulation</b>	Insulation is used to fill the wall cavities of buildings to reduce heat lost through walls	Uninsulated cavity walls	Insulation types include, mineral wool, recycled paper (Warmcell) and sheep's wool e.g. Thermafleece	3 - 4 years
<b>Loft Insulation</b>	Loft insulation reduces heat loss. In many cases existing levels of insulation can be increased	Uninsulated or poorly insulated loft spaces	Loft hatches should also be insulated	3 - 4 years

## Other Energy Efficiency Measures

Description	Details	Recommended for...	Points to note	Estimated payback
<b>Powerfactor voltage reduction</b>	Where mains voltage is towards the higher end of legal limits there is the opportunity to reduce this and therefore the kWh used	Larger sites	A professional survey is required to determine if a site is suitable	3 - 4 years
<b>SMART metering</b>	A device added to the electricity or gas meter so consumption can be measured in order to identify any anomalies	Larger sites	Users can view their consumption records via a website	This is an information tool to identify where savings can be made
<b>Building energy management systems (BEMS)</b>	A central system which controls a building's energy use, when boilers come on and go off, control of pumps, fans, etc.	Larger sites where no BEMS is in place	Older BEMS can be upgraded to achieve higher savings	3 - 6 years
<b>Self closing devices on external doors</b>	Enables doors to be closed automatically to reduce heat escaping from buildings	All sites where external doors may be left open	Inexpensive and easy to fit	6 months - 2 years
<b>Time switches</b>	Simple controls that switch services on and off in response to programmed time settings	Vending machines, photocopiers and office equipment	Most commonly used are 24 hour and seven day timers	6 months - 3 years
<b>Industrial gas dryers</b>	In some cases, there is the potential for savings to be made from using gas dryers instead of electric	Where industrial electric dryers are used e.g. care homes	A gas supply is required	5 years

## Water Conservation

Description	Details	Recommended for...	Points to note	Estimated payback
<b>Dual flush / slimline toilets</b>	Dual flush toilets provide the option of a short or long flush. The average slimline toilet cistern has a 4.5 litre flush	Replacement of older toilet systems	Older systems can have up to a 9 litre flush	7 - 10 years
<b>Save-a-flush</b>	Fitting a Save-a-flush (a bag of harmless crystals) in the toilet cistern can save up to 1 litre per flush	Toilet cisterns with a 9 litre flush or greater	Toilet cisterns installed since 1999 should already be water efficient and therefore do not need any type of cistern device	2 - 6 months
<b>Hippo bags</b>	A Hippo is a small plastic bag which can be easily fitted into the toilet cistern. Water is retained in the bag, helping to save up to 3 litres of water per flush	Toilet cisterns with a 9 litre flush or greater	Toilet cisterns installed since 1999 are already designed to use less water per flush. Fitting a Hippo may reduce the flush too far so the toilet is not cleaned properly	2 - 6 months
<b>Urinal controls</b>	Water consumption can be significantly reduced with urinal controls, which are used to detect and control water supply to suit activity in an area	Men's / boys' toilets	Urinal controls like cistermisers, PIR sensors and occupancy sensors can be mains or battery operated. Regular checks are required to ensure they are operating correctly	1 year
<b>Flush-per-use urinal systems</b>	Single urinal bowls with pressure-flushing valves that use less than 1.5 litres per flush	Men's / boys' toilets - smaller sites / low usage areas	The valves need to be checked regularly to ensure they are operating correctly	5 - 7 years
<b>Waterless urinals</b>	Systems use no water but some models require a chemical solution to operate	Men's / boys' toilets	Regular cleaning, inspection and maintenance required	6 months - 5 years
<b>Non concussive taps</b>	Taps that self-close after a set period of time, which reduces water wastage and avoids the risk of taps being left on accidentally	Can be used for most sites	If taps are heavily used risk of damage to self-closing mechanism	2 - 4 years
<b>Tap sprays / aerator</b>	Can save up to 50% of water consumption. However the slow rate on hot water taps can mean a long wait for warmer water, resulting in lower savings	Can be used for most sites	Regular inspection and maintenance required to ensure the spray head is not blocked	18 months - 3 years
<b>Flow restrictors</b>	Reduces the tap's flow rate	Can be used for most sites	Regular inspection and maintenance required	1 - 2 years

There are a range of options available to help reduce energy and water consumption as well as save money and cut carbon emissions.

## Renewable Energy\*

Description	Details	Recommended for...	Points to note	Estimated payback
<b>Solar photovoltaic panels (PV)</b>	Convert sunlight into electricity	Buildings with south facing roofs, not overshadowed by buildings or trees, etc.	Scaffolding may be required to access some roofs. Displays can also be purchased which provide information to building users and visitors about the number of kWhs produced by the solar panels	50 years (with grant funding 0-10 years)
<b>Wind turbines</b>	Generate energy from wind	Windy, rural, hilly sites with open aspect	Planning issues may arise in some cases e.g. due to the potential noise and visual impact	10-15 years (with grant funding 0-10 years)
<b>Solar water heating</b>	Uses sunlight to heat water	South facing buildings which have an all summer demand for hot water. Suitable for large hot water demands such as care homes and swimming pools	Scaffolding may be required to access some roofs. Displays can also be purchased which provide information to building users and visitors about the number of kWhs produced by the solar panels	20-25 years (with grant funding 0-10 years)
<b>Ground source heat pumps</b>	An alternative to traditional heating systems. The pump takes hot water from underground pipes, which is then generally used for central and underfloor heating	New builds that have the space to install the appropriate pipework, although can be retrofitted in certain cases	The pump is often electrically powered however it can be powered by a photovoltaic panel	50 years (with grant funding 0-10 years)
<b>Small-scale hydro</b>	Hydro-power systems work by converting the energy created from water turning a turbine into electricity	Limited use for public buildings although if streams or rivers are close by there may be some potential	Environment Agency approval is required before the system can be installed to ensure there will not be a negative impact on the environment	20-25 years (with grant funding 0-10 years)
<b>Biomass / biofuel</b>	Biomass is the term used to describe a low carbon emitting fuel, such as wood chips or pellets. The CO <sub>2</sub> released when energy is generated from biomass is balanced by that absorbed during the fuel's production	Sites which have a high demand for heating and / or a change of boiler system is being considered	Good access to the site is required for fuel delivery lorries as well as storage space for the fuel. If additional costs are incurred due to boiler room modifications these will not be covered by a grant	10-20 years (with grant funding 5-10 years)

\*Grants of up to 100% for schools and 50% for local authority buildings are available for renewable energy projects

Many of these options pay for themselves within a short timeframe from the savings they achieve. Energy and water saving projects with a financial payback of less than five years can be funded from KCC's Energy & Water Loan Funds.

For further information and advice about funding opportunities contact:

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