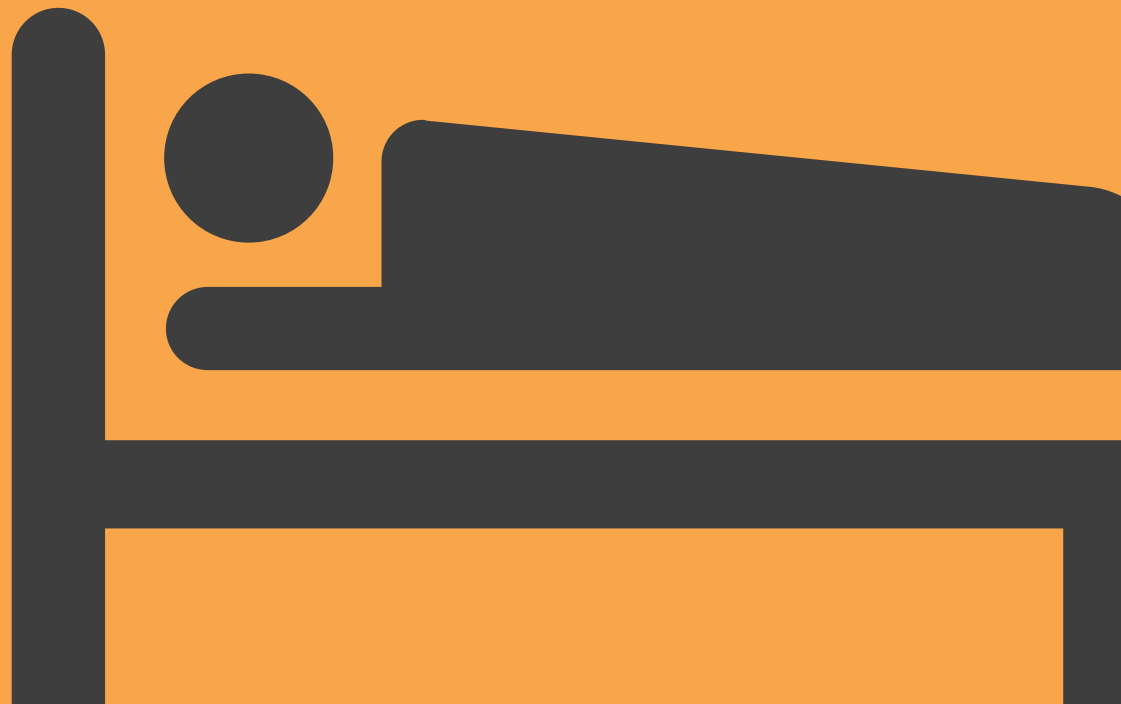


A Resource Efficiency Guide

for the Hotel Sector
in Northern Ireland





Pictures from top left clockwise:
Best Western White Horse Hotel
Corick House Hotel
Roe Park Hotel
Manor House Hotel

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1.0 Introduction to Resource Efficiency

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1. Introduction to Resource Efficiency

Resource efficiency for the hotel sector in Northern Ireland essentially means hotels getting the most value out of their resources such as energy, water and materials in order to maximise profit, improve their environmental performance and enhance their reputation amongst customers.

According to the Northern Ireland Tourist Board (NITB), one in three visitors to Northern Ireland (NI) would prefer to stay in accommodation that is striving to improve its environmental performance. On top of this 65% of hotels are already taking steps to reduce their carbon footprint. A significant portion of your guests care about the environment and by demonstrating to them that you care too, by implementing resource efficiency opportunities highlighted in this guide, you can strengthen repeat business and help attract new custom. Maximising resource efficiency in your hotel therefore makes perfect business sense!

While becoming a resource efficient hotel is an attractive goal, the reality is many businesses in Northern Ireland do not know where to start; or they may have exhausted all the opportunities they are aware of. This guide is designed to provide practical advice for your hotel to support you in identifying and implementing good practice resource efficiency opportunities.

Sections 2-4 of the guide cover the key areas of resource efficiency in the hotel sector including energy efficiency, water efficiency, material efficiency and waste minimisation with practical Northern Ireland based hotel examples identified throughout.

Section 5 of the guide discusses the options for having your hotel's resource efficiency efforts recognised formally through environmental certification.

Section 6 of the guide provides Northern Ireland hotel sector case studies to showcase some of the resource efficiency best practice and associated cost savings being achieved in the sector today.

Section 7 of the guide signposts to further support and information sources, complementing the opportunities discussed throughout this guide.

1.1 Northern Ireland Hotel Sector Overview

The Northern Ireland Hotel Industry Review and Prospects 2013 report (produced by ASM Chartered Accountants) provides the following useful Northern Ireland hotel sector overview findings.

- There were 138 hotels in Northern Ireland with 7,708 rooms in total in 2012.
- These 138 hotels are classified according to their NITB grading:
 - 34 five star/four star hotels
 - 49 three star hotels
 - 8 two star hotels
 - 1 one star hotel
 - 46 hotels awaiting grading or ungraded.
- In 2012 the average Northern Ireland hotel room occupancy was 73.2%.
- Repeat business (returning customers/guests) accounted for a third (33%) of hotel business in 2012.

| Hotel Size | Small (1-49 rooms) | Medium (49-99 rooms) | Large (>100 rooms) | NI Averages |
|---------------------------------|--------------------------|----------------------------|--------------------------|----------------|
| Average no. of rooms | 43 | 69 | 157 | 111 |
| Revenue per room | £62,656 | £57,941 | £34,076 | £40,738 |
| Gross operating profit per room | £15,544 | £12,053 | £8,552 | £9,659 |
| Food and beverage expenses* | £28,538 | £23,276 | £9,713 | £13,549 |
| Utility costs per room** | £3,423 | £2,823 | £2,158 | £2,365 |

* Food and beverage expenses include cost of goods sold (food and beverages), labour and related benefits and other operating expenses.

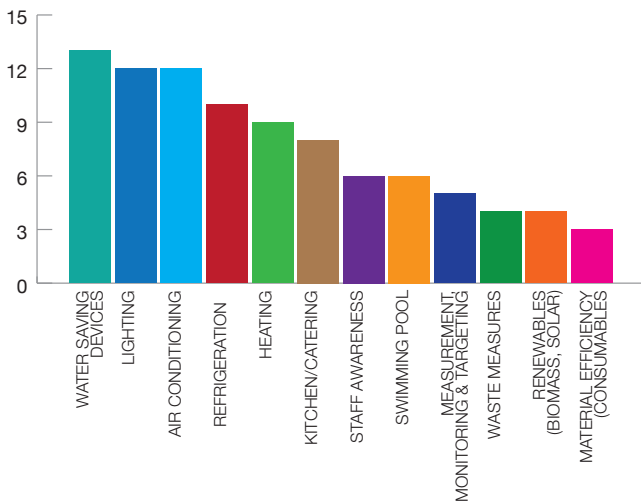
** Utility costs include electricity, fuel (oil, gas and coal), purchased steam and water, waste removal.

Invest NI Resource Efficiency Audit Findings

Invest NI delivers resource efficiency audits to qualifying companies in Northern Ireland. These audits are designed to identify resource efficiency opportunities that will improve the competitiveness, productivity and sustainability of local businesses. They are free and aim to identify and prioritise projects to reduce the cost of energy, water and materials. Invest NI has provided these audits to numerous hotels in Northern Ireland to date. The following information provides an overview of some of the main findings from these audits undertaken across a mix of small, medium and large hotels over the past two years.

- Invest NI has identified over £392,874 of resource efficiency savings across 20 Northern Ireland based hotels, an average of just under £20,000 for each hotel.
- The average cost saving for individual resource efficiency actions identified through these audits was just under £2,000 providing an estimated payback of 1.4 years.
- The most common areas of resource efficiency opportunities identified can be seen in the graph below.

Top Resource Efficiency Opportunities Identified by Invest NI



Invest NI’s resource efficiency audit findings have produced the following useful figures:

- The typical average annual electricity consumption per room (i.e. total kWh electricity consumption of the hotel divided by the total number of rooms) was 6,305 kWh at an annual average cost of £947.
- The typical average annual gas consumption per room (i.e. total kWh gas consumption of the hotel

divided by the total number of rooms) was 5,999 kWh at an annual average cost of £312.

- The typical annual water consumption per room (i.e. total water m3 consumption of the hotel divided by the total number of rooms) was 64m3 at a cost of £178 (excluding fixed charges).
- The typical average annual cost of waste per room was £55.
- The total utility (energy, water and waste) cost per bedroom was £1,492 based on the above findings.

The Northern Ireland Hotel Industry Review and Prospects 2013 report identified an average utility cost (energy, water, waste) of £2,365 per bedroom based on 2012 data.

These Invest NI and ASM findings are average figures and do not represent a good or best practice benchmark but rather provide an indication of how much the average Northern Ireland hotel is paying for these resources. There are a number of different resource efficiency benchmarks available from a number of different bodies. These are listed below as a further tool to help you compare your hotel’s performance.

Other Hotel Benchmarks

Benchmarks or key performance indicators (KPIs) give a measure of activity based on consumption data (e.g. raw material use, energy use, water use) which can be compared with either industry good practice benchmarks or internal targets to understand your site’s performance and consumption trends.

Your hotel can benchmark all of its resource use including electricity (kWh), gas (kWh or m3), oil (litres) consumables/ materials (kg or no. of units), water (m3) and waste (tonnes) against output over a set period of time, for example weekly or monthly. The main driving factors affecting resource efficiency benchmarks in the case of a hotel will be the number of visitors/occupied rooms in most cases. For gas or oil used for space heating purposes, however, external temperature as well as number of guests is a factor.

Resource efficiency benchmarks are published in Good Practice Guides for different hotel types. For a particular site, the performance indices are modified to take into account building occupancy, size, activities etc.

Energy Benchmarks

Green Tourism (<http://www.green-tourism.com>) provides a set of benchmarking information for the hotel sector on its website. The following table is sourced from the International Tourism Partnership and provides a benchmark for kWh consumption per bedroom.

| kWh Consumption / Bedroom | | | |
|---------------------------|-------------|-----------|-------|
| | Electricity | Gas/other | Total |
| Excellent | 135 | 150 | 285 |
| Satisfactory | 145 | 200 | 345 |
| High | 170 | 240 | 410 |

The Chartered Institute of Building Service Engineers (CIBSE) produces an energy performance benchmark for differing sizes of accommodation providers as shown in this table. To use this benchmark you must calculate your hotel's area (m²).

| CIBSE energy performance benchmark (kWh/m ² /yr) | | | |
|---|-------|---------|-------|
| | Good | Fair | Poor |
| Small hotels and guest house | < 240 | 240-330 | > 330 |
| Medium size hotels | < 310 | 310-420 | > 420 |
| Large hotels | < 290 | 290-420 | > 420 |

Water Benchmarks

The Construction Industry Research and Information Association (CIRIA) guide 'C657 - Water Key Performance Indicators and Benchmarks for Offices and Hotels' indicates typical average water consumption benchmarks for hotels with and without a swimming pool.

| Category | Hotel Rating | Benchmarks (m ³ per room per annum) | | |
|-----------------------------|--------------|--|---------|---------------|
| | | Best Practice | Typical | Above Average |
| <i>With a swimming pool</i> | | | | |
| Category 1 | 1 star | 9 | 25 | 60 |
| Category 2 | 2 or 3 star | 20 | 60 | 185 |
| Category 3 | 4 or 5 star | 60 | 130 | 220 |
| Other | No rating | 40 | 90 | 170 |

| Category | Hotel Rating | Benchmarks (m ³ per room per annum) | | |
|--------------------------------|--------------|--|---------|---------------|
| | | Best Practice | Typical | Above Average |
| <i>Without a swimming pool</i> | | | | |
| Category 1 | 1 star | 5 | 10 | 15 |
| Category 2 | 2 or 3 star | 10 | 20 | 50 |
| Category 3 | 4 or 5 star | 15 | 30 | 65 |
| Other | No rating | 10 | 30 | 70 |

1.2

Drivers and Barriers to Maximising Resource Efficiency

There are a number of drivers (benefits) and barriers to implementing resource efficiency opportunities within your hotel. One of the objectives of this guide is to support businesses in Northern Ireland to understand the drivers for and overcome the barriers to maximising resource efficiency.

It is easy to take your everyday resources (materials, energy and water) for granted, but these natural resources cost your hotel money and are a key asset for all hotels. Whether you are a micro business or a large business there are many benefits of being resource efficient. These include:

- **Saving Money:** Improving the efficiency of the resources you use not only means reduced material bills but reduced 'hidden' costs surrounding the requirements of energy, labour, transport and waste bringing added benefit to your bottom line!
- **Reduced Carbon Footprint:** Maximising resource efficiency directly and indirectly reduces your hotel's carbon footprint helping you achieve carbon reduction targets. For further information on conversion factors for resources, see: www.gov.uk/government/uploads/system/uploads/attachment_data/file/69554/pb13773-ghg-conversion-factors-2012.pdf.
- **Good for the Environment:** Preserving natural resources supports your corporate social responsibility efforts in protecting the environment for future generations to enjoy.
- **Supply Chain Pressure:** Through improved resource efficiency your hotel can demonstrate to existing and future customers its commitment to being a green business.

Despite these clear benefits, many businesses do not have an active resource efficiency programme. Often there are perceived barriers to becoming resource efficient, which include:

- **Lack of Commitment:** Resource efficiency implementation will only be successful if everyone involved is motivated and committed. Involving everyone from the start will encourage ownership and increase the likelihood of success. Consider the tips given in Section 1.3 to engage and get buy-in to resource efficiency from both staff and management.

- Lack of Understanding:** Many businesses lack a basic understanding of their resource costs (material, energy, water, transport and waste) but more importantly how they can use this knowledge to realise potential cost savings. This guide provides advice on understanding your bills (Sections 2, 3 and 4) to help you identify and prioritise resource efficiency cost saving opportunities.
- Lack of Financial and Human Resource:** The current economic climate requires businesses to be even leaner than before and so your hotel may lack the necessary resource (financial, manpower and/or expertise) to support and implement resource efficiency opportunities. **The Invest NI Sustainable Development Team is here to assist and can provide free expertise through resource efficiency audits and implementation support to eligible companies to identify and realise resource efficiency benefits.** Please see Section 7 for further information on the services provided by the Invest NI Sustainable Development Team.

1.3 Taking a Systematic Approach to Resource Efficiency

Developing a more structured approach to resource efficiency will help you to maximise your efforts. Consider the following step-by-step plan to guide you through the key considerations when implementing resource efficiency in your hotel.

Get Top Management on Board

Leadership and buy-in from the top management will set the framework for action and will provide a mechanism to support improvements and provide feedback which may have resource or capital expenditure impacts. Make the business case to management for change. See the business case template below as an example.

Set Up an Environmental Committee

Setting up an environmental committee or ‘green team’ to assist will not only share out the workload, but will help spread the message throughout the hotel. Positive engagement, motivation and enthusiasm go a long way to getting results. If possible, team members should be selected from all levels in the hotel e.g. reception, maintenance, kitchen, cleaning and dining/restaurant/bar staff. Tell each other what you are doing so you have a joined up approach.

The City Hotel in Londonderry has trained its staff in energy efficiency and environmental awareness issues, culminating in the creation of a green team and energy champions. See case study 6.6 for more details.

Select Green Champions!

Training, supporting and empowering staff to assist in specific tasks will be essential. This could be activities such as checking the recycling is in the correct bin, completing a monitoring activity or perhaps undertaking a detailed review of a guest/staff habits. This doesn’t have to be limited to only those on the environmental committee.

Carry Out an Environmental Baseline Review

Changing staff and guests’ attitudes to resource efficiency may take time and will definitely need factual basis as well as your enthusiasm. This is why you need to quantify hotel resource costs and to present this information clearly and factually to top management and the workforce. Carry out an environmental baseline review to include analysis of resource consumption and costs using relevant KPIs. The areas and items to review are discussed in Sections 2–4. Analyse your review results and data to understand where your priority opportunities lie.

| Action Number and Title | Estimated Annual Saving | | | Implementation Cost £ | Payback Period (Years) |
|-------------------------|-------------------------|--------|-----------------|--------------------------|---------------------------|
| | £ | tCO2e* | Environmental** | | |
| 1. | | | | | |
| 2. | | | | | |
| 3. | | | | | |
| 4. | | | | | |
| 5. | | | | | |
| TOTAL | | | | | |

* tCO2e relates to the tonnes of carbon saved as a result of the action.

** Environmental relates to the units of saving e.g. kWh electricity, litres of oil, tonnes of waste etc.

Set Your Resource Efficiency Targets and Action Plan

Agree on a list of targets to achieve in the year ahead for your hotel and prioritise them into an action plan. Focus on one or two actions first and, once implemented, use their savings and success story to motivate management and the workforce to implement the next actions on your list.

Review and Report on Your Performance

Review the hotel's progress towards targets and report back to top management and the workforce on performance. Remember to recognise the teams' efforts, and don't forget to say 'thanks' and acknowledge input and ideas, no matter where these originated. Consider updating your website or publicising some of the resource savings within your hotel to obtain recognition for your efforts from existing and future guests and customers.

2.0 Energy Efficiency

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2.1 Energy Use in Your Hotel

Improving energy efficiency makes perfect business sense; it saves money, enhances your business reputation and helps everyone in the fight against climate change. We use the term ‘energy efficiency’ in this guide because it is important to get the most out of the energy we use on a daily basis. It is not enough to say ‘we’ll reduce energy use’ because this is largely dependent on occupancy numbers among other factors. As we strive to increase our occupancy numbers we’ll inevitably use more energy but it’s how efficiently we use that energy that dictates where the savings are made!

The first step after receiving the necessary commitment from the senior management team is to begin to identify where energy use occurs in your hotel. Consider the following typical example areas, types and uses.

Understanding Your Consumption

In order to identify efficiency improvements and cost savings it is essential to know how much energy your hotel is consuming. This information can be accessed through your energy bills including electricity, gas, and oil supplier bills. In addition, where your property has a metered electricity, gas and oil supply you can track your own consumption by taking regular meter readings.

All businesses in Northern Ireland consuming energy will have a number of supplier options for their main energy uses including electricity, gas and oil. Energy bills can be confusing with a number of different charges to come to terms with. Most energy suppliers will provide guidance on their websites on how to navigate your energy bills, and helplines to call to obtain further business specific explanation too.

| Typical Areas of Energy Consumption in Your Hotel | | |
|---|------------------------|----------------------|
| Reception area | Dining area | Kitchen area |
| Bar/restaurant facilities | Office areas | Material store rooms |
| Elevators/stairwells | Corridors | Guest bedrooms |
| Meeting rooms | Cleaning store areas | Gym areas |
| Swimming pool/leisure area | Lounge areas | Plant rooms |
| External roof areas | Waste management areas | External yard areas |

| Typical Energy Types and Uses in Your Hotel | |
|--|---|
| Electricity (Grid or renewable sourced) | Air conditioning, lighting, IT (computers etc.), elevators, kitchen/catering appliances, restaurant/bar chillers, refrigeration, guestroom appliances, space heating, ventilation |
| Natural gas, Liquid Petroleum Gas (LPG) | Hot water requirements (guestrooms, kitchen, swimming pool, leisure facilities etc.), space heating, cooking |
| Oil | Space heating, hot water |
| Biomass | Used within biomass boilers to provide space heating and hot water to the hotel Typically biomass fuel will be wood chips or pellets |
| Petrol/ Diesel | Company fleet vehicles, generators |

Energy Management Hierarchy

The Energy Management Hierarchy is a framework for prioritising the most preferable options for energy management and efficiency and should be at the heart of your hotel’s energy efficiency considerations. Levels of the hierarchy from the highest to the lowest in terms of the priority for energy efficiency include:

- **Elimination or reduction of energy use – can energy consuming equipment be turned off altogether?** Consider lights left on in an area supplied with adequate daylight or a kitchen extraction fan left on with no cooking occurring.
- **Energy efficacy – is the energy use providing the desired effect?** For instance, the heating is on but guests are not comfortable, lighting is too bright or too dim, equipment is more powerful (over-sized) than required.
- **Use energy efficiently – is the energy consuming equipment you are using considered an energy efficient or low energy model?** Can you upgrade to get more out of the energy you are consuming? Look out for energy labels as shown below to help identify energy efficient equipment.

- **Low carbon energy and renewable energy technologies – these options can significantly reduce the carbon footprint of your hotel. However, they should be the final consideration in your efforts to save money having approached elimination/reduction, efficacy and efficiency first.**

Hotels in Northern Ireland that apply this energy management hierarchy to their energy using activities will improve their energy efficiency and save money.



2.2 Energy Efficiency Opportunities

Heating

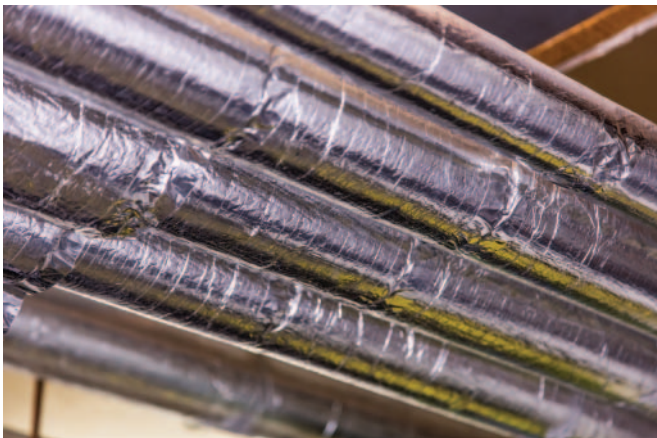
According to the Carbon Trust, heating can account for more than 40% of energy use in non-domestic buildings. This makes heating a key area for reviewing energy efficiency opportunities. Heating comes in the form of two main requirements, space heating and hot water requirements.

Most hotel businesses appreciate the importance of keeping customers and guests comfortable. However, it is important to note that improving the energy efficiency of heating doesn't have to conflict with this comfort and can save the hotel money.

Space Heating

Boiler Pipework Maintenance

Boilers, hot water tanks, pipes, flanges and valves should be insulated to prevent heat escaping. The most common area of poor insulation is the absence of insulation on valves and flanges. Velcro fastened jackets are a quick and easy way to remove and reapply insulation on valves and flanges. Payback can usually be expected within a few months of installation. An un-insulated valve can be the same as not insulating a metre of pipework. See an example of good practice pipework insulation below at the Roe Park Resort, Limavady.



Boiler Servicing

Ensure your boilers are serviced regularly by a reputable supplier. Oil-fired boilers should be serviced twice a year and gas-fired boilers should be serviced once a year. Up to 5% on annual heating costs could be saved through regular boiler servicing. As part of the servicing, you should ask your supplier to conduct a combustion efficiency test. This will show how well the fuel is being combusted by the boiler and if your boiler needs replacing.

Good Practice Temperature Settings

Space heating costs can be optimised by maintaining good practice room temperatures.

Recommended good practice hotel area temperatures

| Room Type | Temperature (°C) * |
|--|--------------------|
| Reception, lounge areas, bars, restaurants | 20-22 |
| Corridors | 19-21 |
| Guest bedrooms | 19-21 |
| Guest bathrooms | 26-27 |
| Kitchens | 16-18 |
| Laundries | 16-19 |

* Source: Adapted from Environmental Design CIBSE Guide A, 2006.

In order to maintain this good practice it is essential that space heating equipment and controls are operated and managed correctly by staff.

It is estimated that up to 20% space heating cost savings can be made through the implementation of some simple energy saving measures. These are listed below.

Heating Controls

It is all well and good having an efficient boiler but if space heating is not well controlled (using either manual or automatic controls) then energy can be wasted. Some typical examples of poor controls include:

- Heating being on in unoccupied areas such as guest bedrooms or dining areas. This can often be as a result of incorrect timer settings. A common oversight is when controls remain the same throughout the year even though seasonal changes alter typical external temperatures.
- Heating being set too high. This can occur as a result of staff or guests tampering with controls whilst unaware of the heating control temperature settings and good practice use. Poor location of thermostats can also cause inefficiencies, e.g. placed too close to cold or hot temperature sources.

A thermostatic radiator valve (TRV) is a simple control valve with an air temperature sensor, used to control the heat output from a radiator by adjusting water flow. A thermostat is another form of control which is usually wall mounted and regulates heating according to the temperature setting chosen. Thermostat temperature setting is more straight forward to understand than TRVs. TRV advice for hotel staff is provided below.

| Setting | Temperature | Suggested Suitability |
|---------|-------------|--|
| 0 | 0 | Off position |
| * | 7-8oC | Frost protection |
| 1 (I) | 12oC | Use in mild weather conditions |
| 2 (II) | 16oC | Standard default setting for all bedrooms after cleaning |
| 3 (III) | 20oC | Default for reception areas. Could be set as default for bedrooms in colder months |
| 4 (IV) | 24oC | May be required for very cold winter months |
| 5 (V) | 28oC | Should not generally be used by hotel staff |

The Manor House Country Hotel in Irvinestown recently installed TRVs on its radiators to provide a better level of control for staff and guests. The hotel cleaners are now advised to use these TRVs at settings 2 or 3 depending on the external temperature, thereafter allowing guests to turn the heating up or down on arrival. This avoids heating the rooms excessively when they are unoccupied. The installation of TRVs on guest bedroom radiators has identified savings of over £400 per annum in the Old House section of the hotel.



Advanced Control Options

Some modern heating controls can adjust the heating system in line with the external weather.

- A compensator control is a form of control for heating systems which automatically regulates the heating temperature based on the external weather conditions.
- An optimum start controller learns how quickly the building reaches the desired temperature and brings the heating on at the optimum time prior to building occupancy, again depending on the weather.

Night setback controls can also be used to effectively reduce temperatures during specific time periods. A typical example is where common areas temperatures are allowed to drop to 16°C between say midnight and 5am. These areas can include halls, corridors, bars/lounges and stairwells.

These additional controls in the right environment can help save on unnecessary heating costs and pay back relatively quickly.

Zoning Controls

Your hotel may require different levels of heating in different areas or 'zones'. A common solution to this issue is zonal heating control. This allows separate time and temperature controls in different zones of your hotel. Zonal heating controls could be considered in the following instances:

- Different temperature requirements. Areas of activity (leisure or kitchen activities) may require little heat whereas areas of rest or relaxing (bars or lounges) may require more heat.
- Different occupancy patterns. For example, only your first two floors are occupied by guests one evening thus allowing you to turn down or off the other levels which are not occupied. Zoning to match building occupancy can reduce operating costs.

Building Occupancy Tips

- Ensure your space heating controls match your building occupancy where practical. Get your cleaning staff to turn down thermostats/TRVs in winter for rooms which are not to be used the same day, and in summer months bedroom heating could be turned off.
- Requirements will vary throughout the day. Install and use programmable time switches to help automate the required changes.
- Review timed settings every month to check that they remain correct. Staff can forget and therefore manual heating controls should be avoided where practical.

Air Conditioning and Ventilation

Adequate ventilation is not only a health and safety requirement in some parts of your hotel (e.g. kitchen areas to deal with smoke) but also necessary to maintain a comfortable environment for guests and staff. Consider the following opportunities to save money and use your systems more efficiently.

Regular maintenance

Over time the build-up of dirt and/or faults in system fans, air ducts and components can reduce the efficiency of the system, increasing running costs and the likelihood of breakdowns. The performance of the whole system should be reviewed annually. Ensure any checks or repairs are carried out by a qualified supplier. The Carbon Trust advises that regular maintenance cleaning of ventilation systems can increase efficiency by as much as 25% compared with unmaintained systems.

Set a 'dead band' between heating and cooling

By setting a temperature 'dead band' – a gap between the temperatures at which heating and cooling cut in – your hotel will ensure it does not have both heating and cooling systems operating at the same time. For example, heating should switch off when a temperature of 19°C has been reached and cooling should not come on until the temperature exceeds 24°C. In this case the dead band is 19–24°C.

Air conditioning and mechanical ventilation requires energy to heat or cool air to optimum temperatures and therefore any air loss results in a system having to work harder and use more energy. See advice in the building fabric section.

Building Energy Management System (BMS)

A BMS is based on a network of controllers and offers closer control and monitoring of building services performance, including heating, ventilation and air conditioning. This is shown on a computer screen in real time and allows settings to be changed quickly and easily. A BMS can reduce total energy costs typically by 10% or greater in the right setting.

The Park Avenue Hotel, Belfast recently installed a new BMS and a gas-fired boiler to replace a 15 year old oil-fired boiler. The old controls were not easily accessible to staff who were unable to adjust time and temperature settings. The upgraded controls provide staff with a user friendly front-end to the new BMS. See case study 6.7 for more details.

Hot Water

Set appropriate hot water temperatures

The optimum temperature for stored hot water is 60°C which is adequate to kill legionella bacteria and is sufficiently warm for staff and guests to use. Most hot water systems will have a temperature control indicator. Ensure this is not tampered with by staff and is working correctly. Excessive heating of hot water in your hotel is wasteful and could scald staff or guests.

Water saving devices – save water, save energy!

Inefficient use of heated water will cost your hotel money. There are a number of good practice water saving devices and techniques to consider for your hotel. These are discussed in detail in Section 3.

Lighting

Correct levels of lighting are an important health and safety requirement, however, the hotel sector should take other requirements into consideration. These include efficacy (is it doing the right job?), efficiency (is the lamp an efficient model?) and attractiveness (is the lighting providing the desired effect or atmosphere?). Consider the following opportunities to make savings on lighting costs in your hotel.

Switch-off Policies

Raise awareness amongst staff to switch off lighting in areas of low occupancy e.g. meeting rooms, offices, back of house areas and store rooms. The application of automatic lighting controls is an effective way to reduce this wastage and is discussed below.

Maintenance

Ensure lighting systems including the lamp, luminaires, automatic sensors etc. are cleaned regularly to remove dust and other debris which will reduce their effectiveness.

Replacing blown lamps is also important as in many cases these will still be consuming a small amount of electricity.

Remember! Most lamps are considered hazardous waste and must be disposed of as such using a licensed waste contractor. See Section 4 on waste management.

Energy Efficient Lighting Upgrades

Lighting efficiencies have come a long way in recent times and there is a range of modern low-energy lamps that will be available to your hotel. In general the following lighting upgrades are recommended for consideration:

- Upgrade your lamp to a more efficient lamp. For instance, replace tungsten light bulbs with compact fluorescent lamps (CFLs) or light emitting diode (LED) bulbs to achieve up to 80% cost savings. CFLs and LEDs have the added benefit of longer lifespan reducing replacement costs and providing additional savings.

Low energy lighting can look the part as well as saving your hotel money. The Manor House Country Hotel upgraded all their hotel lighting to LED lamps and have reported an improved atmosphere as well as reduced electricity costs.



- Upgrade to high frequency lighting. For instance, replace any T12 CFLs or standard frequency T8 CFLs with high frequency T8 or T5 CFLs. When upgrading to high frequency lighting you will have two options: using a retro-fit kit or replacing the whole fitting.
- Upgrade to a lower wattage lamp. For instance, replace standard T8 lamps with the same model but in a lower-wattage (e.g. replacing an 18W, 36W, 58W or 70W CFL with 16W, 32W, 51W or 63W CFL respectively).
- De-lamp – in some instances you may be able to remove one lamp from an array of several lamps without any noticeable reductions in light levels.

- Replace flickering, dim or failed fluorescent lamps with triphosphor coated lamps. This lamp coating provides a more natural, brighter light. Flickering and failed lamps continue to consume energy so remove or replace them immediately.
- Ensure external security or floodlights are timed correctly, motion sensed or on photocell (daylight) controls. Ensure these are energy efficient models such as LED lamps.

It's common for businesses to not factor in the lifespan of bulbs when making purchases. As an example CFLs and LEDs may be more expensive to purchase than traditional tungsten bulbs but factor in their reduced operating costs and longer lifespan and the business case stacks up.

Where possible, specify lighting that appears on the 'Energy Technology List' to ensure it is efficient. See the website <http://etl.decc.gov.uk/etl/> for more details.

Automatic Controls

Automatic lighting controls can help your hotel avoid the cost of lighting left on in unoccupied areas. Relying on staff awareness can't be guaranteed, with issues such as staff turnover to contend with. Typically automatic lighting controls can achieve savings of 30% to 50% on lighting costs.

The Valley Hotel in Fivemiletown installed automatic lighting controls as can be seen below.



Consider the following areas for automatic lighting controls.

| Occupancy Sensors | Photocell (Daylight) Sensors |
|---|--|
| <ul style="list-style-type: none"> ➤ Staff or shared toilets ➤ Back of house stores, keg rooms ➤ Walk-in chillers ➤ Function rooms and banqueting suites ➤ Guestroom corridors ➤ Staff areas (canteen etc.) | <p>Photocell controls can be considered for any space well lit by natural daylight including:</p> <ul style="list-style-type: none"> ➤ External lighting ➤ Reception areas ➤ Breakfast dining areas ➤ Leisure facilities |

Always maintain minimum light levels so as not to compromise health and safety standards.

Consider guest bedroom occupancy linked controls such as key-card systems. Automatic controls exist to switch the energy supply to a bedroom on or off depending on occupancy. Some systems can be controlled from the reception for when guests arrive.



It is often the case that occupancy controls are fitted with a longer running time than required. For instance, many occupancy sensors have the option to leave the light operating for 5, 10 or 15 minutes after activated. In some areas the setting may be too long for the activity required. Review the timer settings on your hotel’s occupancy sensors.

Building Fabric

It is estimated that around two thirds of heat from a typical hotel building can be lost through the building fabric – ceilings, floors, walls and windows. Consider the following building fabric opportunities to reduce heat loss in your buildings.

- Insulate any roof spaces and unfilled external cavity walls. Loft insulation is the most cost-effective energy efficiency measure and one of the easiest to install. Standards of loft insulation have increased in recent times. Some previously insulated lofts should be ‘topped-up’ as building regulations now specify a minimum of 250mm-thick insulation for new builds.
- Close internal and external doors to limit heat escaping. Install automatic closing mechanisms where practical.
- Close curtains and blinds to retain as much heat overnight as possible.
- Check window and door seals – implement draught-proofing.
- Consider double or triple glazing for windows. The payback for retro-fitted glazing is typically not attractive so consider this as part of a big package of improvements or for new builds.
- Consider a draught lobby i.e. a space between outside and the main reception to capture draughts. These can be effectively controlled with automatic door sensors.



Kitchen and Catering Activities

Consider the following energy efficiency checklist for your hotel’s kitchen and catering activities.



- Switch on equipment only when necessary – avoid switching all equipment on at the start of a shift unnecessarily. For example, switch off extraction fans when they are not being used.
- Regular cleaning of extraction ventilation systems can increase efficiency by as much as 25% compared with unmaintained systems.
- Use the correct equipment for the job – utensils, pots and pans must be of appropriate size for the heating ring or oven.
- Avoid over-filling saucepans and kettles and use lids and covers to retain heat, steam and fumes.
- When pans come to the boil, turn hobs down to the minimum to simmer (boiling does not speed up the cooking process).
- Switch off grills, fryers and hobs immediately after use.
- Make a note of cooking equipment preheat times and keep these on display.
- Keep hot storage of cooked food to a minimum, both to reduce energy use and to retain the quality of the food.
- Use microwave ovens to reheat relatively small amounts of food.
- Check the door seals on refrigeration units are effective, especially walk-in chillers/freezers.

- Defrost chillers regularly according to manufacturer’s guidelines and check for ice build-up on the evaporators. Ice build-up is a sign of water leaks and makes the chiller work harder, consuming more energy.
- Avoid over-cooling food. Consider the following good practice temperatures:

| Produce Requiring Chilling | Product Temperature |
|---------------------------------------|----------------------|
| Canned and bottle drinks | Between -1°C & +10°C |
| Produce and canned and bottled drinks | Between +1°C & +10°C |
| Processed meat and dairy products | Between -1°C & +7°C |
| Meat and dairy products | Between -1°C & +5°C |
| Poultry and meat | Between -1°C & +4°C |
| Frozen foods | Below -12°C/-18°C |
| Ice cream and frozen foods | Below -15°C/-18°C |

This table is only a guide and food safety regulations, manufacturers’ recommended operating temperature settings and food suppliers should be considered too. If the cooling temperature setting can be increased by 1°C it is generally considered that 2-4% savings can be made on refrigeration equipment running costs.

Spa, Pool and Leisure Facility Management

- Install a pool cover covering the entire pool surface to reduce evaporation. These can make huge savings by reducing heating and ventilation requirements.
- Ensure that pool hall air temperature is maintained at 1°C above the water temperature to limit evaporation from the pool surface.
- Maintain good practice water temperatures. Swimming pool water is usually heated to 28–30°C. Spa and hydrotherapy facilities are generally maintained at a higher temperature but should not exceed 40°C.
- Ensure heating is turned off in steam rooms and saunas when unoccupied e.g. overnight.

- Ensure leisure facilities are switched off when not in use. Consider a plug-in timer to ensure machines are not on standby overnight.
- Consider installing variable speed drives for pool pumps to match the motor power with the demand.
- Review the existing filtration system. Traditional sand filtration systems can be replaced with lower energy, water alternatives. These alternatives also have the added benefit of reducing waste sand.

Invest NI recommended that the Best Western Plus White Horse Hotel install a pool cover to help reduce energy and water costs at its swimming pool. It was estimated that the resulting combined water and energy savings would be over £3,000 per annum providing an identified payback of just over three years. See case study 6.2 for more details.



Alternative Energy and Renewable Technologies

Combined Heat and Power (CHP) systems use an engine usually run on natural gas that generates electricity and produces heat as a by-product. The feasibility of CHP systems is greatly improved if there is a large heat demand (space heating or hot water) for the heat by-product. In the hotel sector CHP is often successfully employed where there is a heated pool.

Heat Pumps provide a means to access and use the thermal energy that is contained naturally in air, water or the ground. Ground-source, air-source or water-source heat pumps do require a power supply to drive them so are considered low carbon technologies as opposed to a renewable energy technology. Electricity bills will increase with heat pumps, while gas bills will decrease. Therefore, the business case from heat pumps depends on the difference between electricity and heating prices as well as the coefficient of performance (COP) of the system i.e. how much heat you get for the increase in electricity use.

Renewable Energy refers to energy that occurs naturally and repeatedly in the environment. This can be energy from waves, wind, the sun and geothermal heat from the ground. Renewable energy can also be produced from plant sources, such as wood or crops.

As well as reducing carbon emissions, using renewable energy sources can make financial sense for your hotel. The list below is an overview of the renewable technologies that you could consider installing. It is worth pointing out that any decision on investing in renewable energy technologies for your hotel should be made following detailed investigation based on your site specific conditions.

This guide does not provide an in-depth look into these technologies but instead provides comment on the general suitability of the main renewable technologies to the sector. For further information see the Carbon Trust's publication 'Making Sense of Renewable Technologies' www.carbontrust.com/media/63632/ctg011-renewable-energy-technologies.pdf.

Biomass Energy is the use of organic materials such as wood, straw and dedicated energy crops, for the generation of heat, electricity or motive power. Biomass boilers can be installed to replace older oil or gas-fired boilers to significantly reduce the carbon footprint of your hotel and in many cases reduce the energy costs of providing heat and/or hot water to your hotel. The main factors to consider when assessing the feasibility of a biomass boiler for your hotel include the existing cost of heating (the business case for replacing oil is typically much better than gas), space (for the boiler and biomass fuel supply), availability and cost of biomass fuel, and planning (in certain urban areas there can be restrictions on biomass boilers due to emission limits).

For more information on this technology see Invest NI's Biomass Best Practice Guide.

The Valley Hotel in Fivemiletown made significant cost savings with the installation of a biomass boiler. See case study 6.3 for more information.



Solar Photovoltaic (Solar PV) installations convert sunlight into electricity. Solar PV, like solar thermal, is an intermittent renewable energy technology and requires the user to obtain electricity from an alternative source during the night when it cannot generate electricity. Solar PV is typically suitable on any unshaded south-facing area (typically the roof) which can support the weight of the panels. Electricity generated by PV is eligible for Northern Ireland Renewable Obligation Certificates (NI ROCs) support.

For more information on this technology see Invest NI's Solar Photovoltaics Best Practice Guide.

Solar Thermal (or solar hot water) systems use solar collectors to absorb energy from the sun and transfer it, using heat exchangers, to heat water. Solar thermal systems can be used to provide hot water at temperatures of between 55°C and 65°C. Solar thermal systems will be suitable for most businesses with a significant hot water demand. The optimum location is an unshaded south-facing area (typically on the roof) at an angle of 30°. Renewable heat generated by solar thermal is eligible for Renewable Heat Incentive (RHI) payments.

Wind turbines produce electricity by capturing the natural power of the wind to drive a generator. Generally wind speeds are higher and less turbulent in rural areas, meaning that there is greater energy in the wind and typically more of this can be captured. In urban, built-up areas the wind speed is generally more turbulent resulting in a longer payback. Therefore, if your hotel is in a rural setting wind power may be worth investigating. There are many other factors to consider regarding planning issues such as visual impact, noise impact, shadow flicker, residential impact, air traffic impact and environmental conservation areas.

Financial Support for renewable technologies is available in the form of the NI ROCs for renewable electricity technologies and the RHI for renewable heat technologies. Both financial incentives are similar in that your hotel will receive a payment based on the renewable electricity/heat your renewable technology generates. For more information contact the Department of Enterprise, Trade and Investment www.detini.gov.uk/deti-energy-index.htm.

3.0 Water Efficiency

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3.1 Water Use in Your Hotel

Water use in the hotel sector is essential for a number of activities; however, it is not always obvious where it is being used. Do you know where and for what you use water in your premises? Here are some examples.

| Typical Water Uses in Your Hotel | | |
|----------------------------------|-----------------------------|---------------------------|
| Cooking/ food preparation | Restaurant/ bar ingredients | Leisure/ pool facilities |
| Handwashing | Toilet and urinal flushing | Showers/ baths |
| Cleaning | Refrigeration | Ice machines |
| Laundry | Grounds maintenance | General external cleaning |
| Sprinkler systems | | |

Once you identify where you are using water the next step is to ask yourself how much you are using.

Understanding Your Water Consumption

In order to identify efficiency improvements and cost savings it is essential to know how much water your hotel is consuming and how much is being sent to sewer. This information can be accessed through your water bills assuming your property has a metered supply. If it doesn't, then sub-metering would be required to track water use.

All businesses in Northern Ireland using mains water will be supplied by Northern Ireland Water (NI Water), a government owned company set up in April 2007 to provide the water and wastewater services in Northern Ireland.

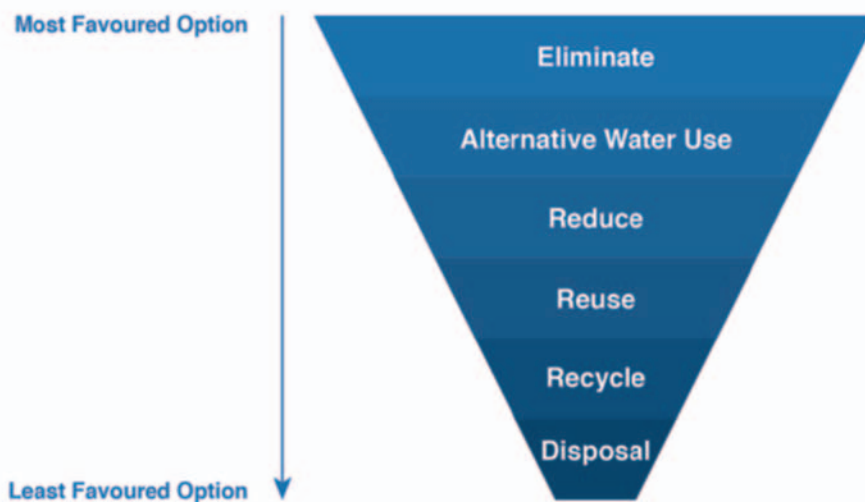
Generally, all businesses using mains water (referred to as 'non-domestic' premises) will be charged based on the following:

- **Measured Charges:** Applicable to companies that have a water meter fitted.
- **Unmeasured Charges:** Applicable to companies that do not have a water meter fitted.
- **Trade Effluent Charges:** Applicable to companies that are consented to discharge liquid waste, other than surface water and domestic waste, to sewer.

For more information on water charges see Invest NI's Maximising Efficiency Guide – A Practical Water Efficiency Guide for Businesses in Northern Ireland.

Water Management Hierarchy

The water management hierarchy is a framework for prioritising the most preferable options for water management and efficiency and should be at the heart of your hotel's water efficiency considerations. Levels of the hierarchy from the highest to the lowest in terms of the priority for water efficiency include: elimination, alternative water supply, reduction, reuse, recycle and disposal. Businesses that apply the water management hierarchy to their water using activities will improve their water efficiency.



| Water Hierarchy Level | Items to Consider |
|-----------------------|--|
| Eliminate | Educate your staff to avoid using water where appropriate. Consider if the water using activity is actually required. |
| Alternative water use | Eliminate the inappropriate use of mains (potable) water. Can you hygienically use an alternative water source in the activity? |
| Reduce | Consider options to improve water efficiency. Can existing fittings be upgraded to improve water efficiency? |
| Reuse | Can water efficiency be increased through its reuse? Consider if the reused water needs to be treated prior to reuse? |
| Recycle | Can water be recycled for use in another water using activity? |
| Disposal | Always dispose of water in a legal and environmentally responsible manner to avoid flooding, pollution or inconvenience to others. |

3.2

Water Efficiency Opportunities

The following section provides typical water efficiency opportunities to consider for your hotel. They include water saving devices as well as water use techniques to reduce water use in your hotel.

| | |
|---|---|
| Guest Bedrooms and Common Area Toilets | <ul style="list-style-type: none"> • Install water saving shower systems which minimise water use by automatically closing the shower and/or by minimising the flow rate of water through the shower using a flow limiting device. • Install water saving taps which minimise water use by automatically closing the tap and/or by minimising the flow rate of water through the tap using a flow limiting device. For example, non-concussive, passive infra-red aerated or flow-regulated taps. • Install low flush toilets. Older style toilets can use up to 13 litres of water per flush. There are a number of efficient toilets available which only use up to 4.5 litres per flush potentially saving over 50% of water used per flush. • Use low flush retrofit devices. There are a number of water saving toilet devices available which minimise water use in existing toilets by restricting the volume of water used per flush. These include retrofit dual flush conversion kits, cistern dams and cistern bags. • Install urinal flush controls which use occupancy or water pressure to control water usage in urinals, e.g. non-concussive, occupancy detection, and hydraulic valve. These will avoid continual passing of water when the urinals are not being used. |
|---|---|



| | |
|--|--|
| <p>Guest Bedrooms and Common Area Toilets</p> | <p>The Manor House Country Hotel recently installed urinal flush motion sensor controls to reduce the flushing of urinals overnight and other times they are not being used by guests. This not only saves money on water charges but also on wastewater charges, making a double saving.</p> <ul style="list-style-type: none"> • Consider waterless urinals to reduce water use. It is important that the operating and cleaning costs are considered in any investment decision. Poor management and maintenance of these devices can lead to odour problems which should also be guarded against. • Consider flow limiting devices such as a pressure reducing valve. This is a flow limiting device that can be used to control the incoming water pressure to a building or a floor in a building. As pressure is related to flow, a reduction in pressure will lead to a reduction in flow. |
| <p>Kitchens/ Catering Areas</p> | <p>Minimise the amount of water used in the kitchen and catering areas by:</p> <ul style="list-style-type: none"> • defrosting produce overnight in a fridge rather than using a running tap; • checking automatic potato peelers are set at the minimum flow of water; • operating dishwashers and glass washers on a full wash and optimise cycle times and temperatures; and • looking for water use information on the European Water Label, when buying new machines; • maximising dishwasher loads by fully loading and correctly stacking; • ensuring that taps are turned off after use and that food and utensils are not washed under running water; • using the correct size of pots and pans for cooking to avoid over-filling with water; • keeping equipment well maintained – ensure heating elements, jets, sprays, thermostats and drains are clean and unclogged; • using the economy setting on dishwashers where practical; • asking staff to report leaking washers or taps; • using low temperature sanitising/cleaning liquids to reduce requirement for hot cleaning water. <p>Minimise fats, oils and greases (FOG) being washed to the local sewer with the use of FOG traps. This will help reduce your trade effluent charges if you have a trade effluent charge consent with NI Water. See the Roe Park Resort case study in Section 6.4.</p> |
| <p>Laundry</p> | <p>Minimise the amount of water used in the laundry by:</p> <ul style="list-style-type: none"> • operating washing machines on full loads and at minimum temperatures; and • when buying new machines looking for water use information on the European Water Label. |
| <p>Swimming Pools</p> | <p>Minimise the amount of water used in the swimming pool by:</p> <ul style="list-style-type: none"> • checking if the automatic water top up system is functioning correctly and not overflowing the pool; • optimising the swimming pool hall’s conditions to minimise rate of evaporation from the pool by keeping the air temperature up to 1°C greater than that of the water, but no more than 30°C, keeping the relative humidity at around 50% to 70% and installing a pool cover when not in use; • reviewing the existing filtration system. Traditional sand filtration systems can be replaced with lower water use alternatives. These alternatives also have the added benefit of reducing waste sand too. The White Horse Hotel in Londonderry made significant savings modernising their pool filtration system. See case study 6.2 for more details. |



Grounds Maintenance

Minimise the amount of water used for grounds maintenance by:

- planting drought tolerant plants (e.g. holly, geraniums);
- applying mulching (gravel or bark) around plants to minimise evaporative losses;
- installing water butts to reuse rainwater for grounds maintenance; and
- irrigating during early morning or late night to minimise evaporative losses.

Alternative water sources to mains water may be available to your hotel to reduce water charges. The purpose of alternative water is to provide a different option to mains water that can be used for processes, or appliances that do not need such a high water quality, such as toilet flushing, irrigation systems, vehicle washing and other uses where the water is not for drinking or ingested. Alternative water covers a wide variety of sources from boreholes, surface water, rainwater harvesting and reclaimed water. The main alternative water opportunities include:



Borehole Groundwater Abstraction

A borehole is simply a deep well providing access to ground water. Consider investigating the available groundwater sources within your locale and review the water quality and the costs of pumping and treating the groundwater before use.

Greywater Recovery and Reuse Equipment

Greywater is the wastewater from baths, showers, washbasins or laundries. After appropriate treatment, greywater may be used for non-potable applications such as toilet flushing, garden or landscape watering or laundry use.

Greywater recovery and reuse equipment is purpose-designed containing one or more treatment processes with associated storage, pumping and control systems. Greywater can reduce the demand from your hotel for mains water to save you money.

Rainwater Harvesting Equipment

Increased mains water charges and increasing water supply risks have led to renewed interest in a wide range of technologies for the collection, storage and treatment of rainwater. Rainwater can be useful in non-potable applications such as cooling, laundry, garden or landscape watering and cleaning.

Rainwater harvesting equipment is purpose-designed consisting of collection, storage, pumping, control and treatment system(s) as appropriate. Rainwater harvesting can reduce the demand from your hotel for mains water to save you money.

In addition to the water efficiency opportunities identified above, other potential water saving techniques can be applied to reduce water use in your hotel.

Staff Awareness Training

To help your hotel become water efficient, it is vital that your staff are aware of the benefits of water efficiency and the importance of using and maintaining water saving technologies. As well as including water efficiency in staff induction training, it is important to remember that existing staff will require refresher training to reinforce the water efficiency message in relation to current costs, planned targets and the activities involved to meet the set targets.

Preventative Maintenance Plan

Implement a preventative maintenance programme to inspect and repair faulty water using equipment (e.g. overflow outlets, tanks, pipework and valves), water saving equipment, as well as managing leaks and overflows in the distribution network.

**Staff
Suggestions**

Water is generally used by staff and guests and not in the boardroom so reach out to your staff and get feedback from guests to ask for suggestions on how the hotel can improve its water efficiency. Consider providing an incentive to staff and guests for the best suggestions received and implemented.

**Insulation of
Pipework**

Where water has picked up heat from the built environment, it is often wasted by continually running it until it is at an acceptable temperature. In doing so, a significant amount of water will be wasted. The use of insulation on water pipes will minimise heat gain in cold water pipes as well as heat losses (wasted energy) in hot water pipes.

4.0 Materials Efficiency and Waste Minimisation

| | | |
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4.1 Materials Use and Waste Generation in Your Hotel

Using materials efficiently and reducing waste are sometimes seen as completely different areas, but in fact they are directly linked. In general, if your hotel becomes more efficient with your material use, you will create less waste. This guide hopes to strengthen your understanding of that link by combining these two resource efficiency topics side by side in this section.

The first step to identifying your material efficiency and waste minimisation opportunities is to know exactly what materials you are using within your hotel. Below is a list of typical materials and wastes associated with the sector.



| Typical Examples of Material Use in Your Hotel | | |
|--|---|------------------------|
| Guest bedroom materials | Bed-linen | Towels |
| | Toiletries | Tea/coffee consumables |
| | Napkins | Menus |
| Kitchen/Catering materials | Food ingredients | Drinks |
| | Paper towels | Cleaning chemicals |
| | Cooking oil | Cleaning instruments |
| Office materials | Electrical and electronic equipment (IT equipment, printers, telephones, keyboards, display screens etc.) | Office stationery |
| | Marketing materials | |
| Restaurant/Bar | Packaging | Disposable cutlery |
| Maintenance materials | Oils and lubricants | Fluorescent tubes |
| | Paints | Batteries |
| | Refrigerant gases (for chillers, A/C units) | |

| Typical Examples of Waste Arisings in Your Hotel | | |
|---|---|---|
| General (non-hazardous) waste | Cardboard from packaging | Plastics |
| | Office paper | Food waste |
| | Wood, pallets | Metals |
| Hazardous waste | Oils and oil-contaminated waste | Fluorescent tubes |
| | Solvents, thinners and solvent-containing paints | Aerosol cans and pressurised containers |
| | Refrigerant gases containing ozone-depleting substances | Used chemical and oil containers |
| Waste which has to be separately collected (not mixed with other wastes – and it may or may not have hazardous properties) | Waste electrical and electronic equipment (waste IT equipment, printers, telephones, keyboards, display screens etc.) | Personal hygiene waste |
| | Batteries and accumulators | Edible oil (cooking oils) |
| Other forms of waste | Heat losses, leaks | Effluent and liquid residues |
| | Smoke/fumes/dust and air emissions | |
| Waste banned from landfill | Liquid waste | Tyres (except bicycle tyres) |
| | Batteries | Hazardous wastes* |

*Unless the landfill has a specific permit to dispose of hazardous wastes.

Material Efficiency and the

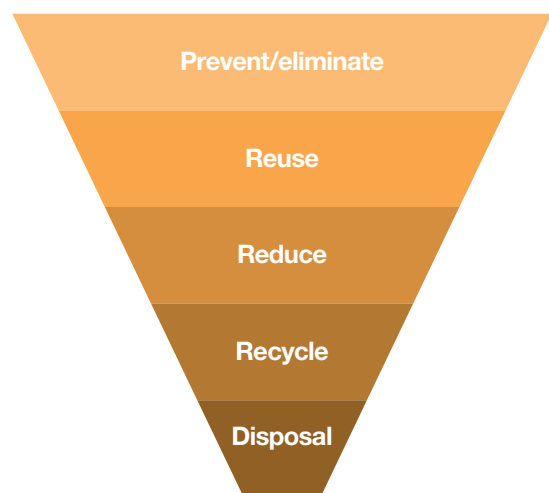
Waste Hierarchy

The waste hierarchy identifies waste management options and ranks them in terms of sustainability. As mentioned previously, material use and waste generation are directly linked. All businesses should aim to prevent or eliminate waste by using materials efficiently from the outset, wherever possible, as this will almost always save money as well as environmental impact.

The Waste Hierarchy

Most Favoured Option

Least Favoured Option



- **Prevention** – the most effective means of waste minimisation with the lowest environmental impact. Preventing waste has been estimated to save up to 10 times the actual disposal cost, due to the hidden costs of waste such as lost labour time, energy costs, lost materials and so on.
- **Minimise/Reduce** – if elimination or prevention is not practicable, consider how the waste can be reduced. Often this is linked with reduction of a raw material.
- **Reuse** – reusing materials which would have otherwise become waste and extending their useful life.
- **Recycling** – taking a waste no longer of any use in its present form, and processing this in some way to change its form for further use. Recycling consumes energy – energy to transport the recycle and energy to change its form.
- **Disposal to landfill** – should be considered as a last resort once you have exhausted the other stages of the waste hierarchy. Disposal often represents the highest cost option and environmental impact. Therefore, it is more productive to aim to ‘move up’ the waste hierarchy so that you can save money, raw materials, water and energy. Your environmental performance will improve as well!

For more information see Invest NI’s maximising efficiencies publications:

- Waste Minimisation: Efficient Management for Cost Saving
- A Packaging Optimisation Guide for NI Food and Drink Businesses.



The Hospitality and Food Service Agreement

This is a voluntary agreement to support the sector in reducing waste and recycling more. Research by WRAP (Waste and Resources Action Programme) indicates that more than 1.3 billion meals are wasted annually in the UK’s hospitality and food service sector.

The Agreement is flexible to allow any size of organisation to sign up, from multi-national companies to smaller

businesses, from sector wholesalers/distributors to trade bodies. There are different ways of signing up depending on the size of business.

WRAP has worked closely with interested and relevant organisations and individuals to determine the targets for the Agreement. The targets will be owned by WRAP and collectively delivered by signatories. WRAP will deliver this Agreement across the UK through its national programmes, including Zero Waste Scotland.

The Hospitality and Food Service Agreement targets are:

- **Prevention target:** Reduce food and associated packaging waste by 5% by the end of 2015. This will be against a 2012 baseline and be measured by CO2e emissions.
- **Waste management target:** Increase the overall rate of food and packaging waste being recycled, sent to anaerobic digestion or composted to at least 70% by the end of 2015.

The benefits of signing up are considered to include:

- More efficient use of resources saving your hotel money;
- Meeting clients’ and consumers’ growing expectations to reduce food waste;
- Cost savings for your guests/customers;
- Reducing the carbon footprint associated with products and operations;
- Driving innovation in the sector with support from all UK Governments; and
- Consistency with Government policy and regulation.

How to sign your business up

Large businesses (with more than 250 full time employees): Formal letter to WRAP from senior director at your company confirms sign-up. Your WRAP Key Account Manager arranges a scoping meeting once you have signed up to set your baseline and develop your implementation plan.

Smaller businesses (with fewer than 250 full time employees): Work through WRAP’s online resource centre to help identify areas for improvement for your business in waste prevention and waste management. Alternatively, businesses working within existing aligned accreditation and certification schemes can sign up automatically, provided that your scheme meets the required standards.

Supporters: Submit your request, to be agreed by WRAP, to join the supporters group, with details of the pledge being made to support the Agreement.

4.2

Material Efficiency and Waste Minimisation Opportunities

| | |
|-----------------------------|--|
| Green Procurement | <p>Green procurement considers the environmental aspects, potential impacts and costs associated with the life cycle assessment of goods and services being acquired. It focusses on the practice of procuring products and services that are less harmful to the environment (land, air and water). Green products purchased should be those that are made with less harmful materials or which, when produced or used or consumed, would have a minimal impact on the environment. This includes buying local and reducing your carbon footprint.</p> <p>A short list of common 'green' options of products used in hotels includes:</p> <ul style="list-style-type: none">• Printing and writing paper• Envelopes• Toilet paper, tissues, and paper towels• Office supplies• Office electronics (computers, printers, copiers)• Toner cartridges• Cleaning products• Appliances and furniture. |
| Office Consumables | <ul style="list-style-type: none">• Set all printer default settings to double-sided and black and white printing.• Promote electronic filing as opposed to printed copies.• Send customers electronic invoices or information as opposed to hard copy. This has double savings when postage materials and costs are avoided.• Email staff their payslips instead of providing printed copies.• Purchase paper with recycled content.• Consider multi-functional devices to reduce the number of printers, scanners, photocopiers etc. to one central machine. These machines can be fitted with a keycard system whereby prints will only be processed when the staff member swipes their card at the printer.• Install paper-monitoring software to track and report on individuals' paper use.• Provide a 'scrap paper' tray to reuse paper.• Ask suppliers if they can deliver materials in returnable packaging (e.g. plastic totes) that will not be left on site, to avoid the disposal costs of single use packaging such as cardboard boxes.• Remove general waste desk bins and replace with a centrally located recycling station. |
| Bedroom consumables | <ul style="list-style-type: none">• Replace single use toiletry containers with refillable containers. On average only 30% of toiletry products are used. This will save both on packaging and delivery costs as well as waste disposal costs.• Ask cleaners to reuse half-used toilet rolls in canteen or communal toilets if removed from guest bedrooms. |
| Cleaning Consumables | <ul style="list-style-type: none">• Reduce the quantity of smaller containers by purchasing in bulk. For example, bulk cleaning fluids for a contracted cleaning company, decanting the required volumes into reusable smaller containers (e.g. spray-bottles) for use on site. This reduces the disposal of multiple spray-bottles and also may bring a reduced cost per unit volume by purchasing in bulk. |

| | |
|---|---|
| <p>Kitchen/ Catering Consumables</p> | <ul style="list-style-type: none"> • Consider reviewing restaurant portion options and introducing new menu options e.g. small, medium, large which are costed appropriately. The appetite can differ dramatically from age, size and gender as well as time of day and this could make significant savings for the business, especially in terms of wasted food. It will also show guests that their personal preference is being considered. Discuss with the head chef on how this could be managed effectively. • Ask suppliers to use reusable or returnable packaging where possible to reduce disposal of single use packaging such as cardboard boxes. Good examples are daily delivery of vegetables or bread in reusable plastic crates. • Replace single use cutlery and disposable cups with washable reusable cutlery and mugs or glasses. • Consider cutting down on numerous single use cereal and other consumable packaging waste by using dispensers which can be topped up with bulk containers. • Donate unserved food to a local food bank. The food bank will provide the hotel with guidelines for packing and storing the food donations. • Ensure waste cooking oil is uplifted by an oil recycling firm and not disposed of to sewer or general waste. Store your waste oil in a safe manner to avoid spills and prevent pollution. |
| <p>Maintenance</p> | <ul style="list-style-type: none"> • Consider donating old unwanted furniture or IT equipment to a charity rather than disposing to landfill. |
| <p>Waste Management Area</p> | <ul style="list-style-type: none"> • Can you replace single use hand towels in toilets and kitchen/cleaning areas with hand driers? This may prove to be a much cheaper and more hygienic option as both hand towel costs and waste costs are reduced. • Improve segregation of waste through additional waste receptacles, signage and staff training. Can you provide cleaning staff with trolleys with separate bins/receptacles for segregating wastes? • Using colour coded and graphics led signs will help maximise segregation rates. This is particularly helpful for international staff for whom English is not their first language. • Reduce void space in skips and bins. Balancing the requirements of uplift frequencies and space available may mean that the hotel could consider options to reduce volumes of waste or number of waste uplifts, such as a compactor or baler for solid waste, or bulk tank for waste oil. Avoid paying for void space and extra transport charges! Making sure bins and skips are as full as possible before uplift will maximise efficiency and will help reduce costs. • Use clear bags in your waste bins to improve visibility of poor recycling practices so these can be addressed. |

5.0 Environmental Certification

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| 5.2 | Environmental Management Systems | 34 |

Obtaining an Environmental Certification can help your hotel business adapt its practices to improve efficiency, with many certified hotels reporting significant savings on resource costs. In addition to improved resource efficiency, independent verification of how you manage and reduce your environmental impacts can help your hotel to tap into a growing market of consumers who are seeking out hotels which are environmentally and socially aware. Some of the more popular environmental certification options in the hotel sector are detailed below.

5.1

Northern Ireland Tourist Board

NITB – Green Tourism Business Scheme (GTBS)

With more than 2,200 members across the UK, Ireland and Canada, GTBS is the largest and most established sustainable national grading programme in the world. In 2009, GTBS became the first green certification scheme to be endorsed by the International Centre for Responsible Tourism and was successfully revalidated in 2012. The scheme has been running since 1997 as a not-for-profit organisation. GTBS offers clear guidance materials and support systems for members. It is available for all types of tourism businesses including accommodation, attractions, restaurants and transport.

NITB – Sustainable Tourism Certification

Sustainable tourism certification is an optional tool which enables high standards of sustainability in the tourism sector to be recognised through independent verification of a business's environmental and social credentials. Certification can also provide businesses with the advice and tools to access a growing market and improve business efficiency. There are a number of different companies that can provide sustainable tourism certification, for further information contact NITB. Sustainable tourism certification schemes are sometimes referred to as green tourism certification schemes, eco labels or green award schemes.

While every scheme is different, there are often three stages associated with sustainable tourism certification:

- Visit to the hotel to survey sustainability processes;
- Advice and guidance on improving processes;
- Assessment of the hotel's sustainability credentials usually culminating in certification or award: some schemes offer different levels of award e.g. gold, silver or bronze depending on the level achieved.

For further information contact the NITB.

5.2

Environmental Management Systems

An Environmental Management System (EMS) is a structured framework for systematically managing an organisation's significant environmental impacts. The structure of the EMS follows the Deming Cycle of:

- **Plan** what you're going to do – produce an environmental policy, set objectives and targets, create procedures to control and manage your significant aspects, assign roles and responsibilities.
- **Do** what you planned to do – train your workforce, measure and monitor your performance, communicate the EMS requirements to staff, comply with EMS procedures.
- **Check** to ensure that you did what you planned – conduct internal audits of the EMS, identify preventative and corrective actions to improve the EMS implementation.
- **Act** to make improvements – conduct a management review and discuss how you have performed and what the next year's objectives and targets to achieve continual improvement will be.

There are internationally and nationally recognised EMS approaches which your hotel can follow with the option of gaining third party certification. This certification can bring enhanced implementation and effectiveness of your EMS, as well as helping to meet certain customer requirements. Two common routes within Northern Ireland are ISO 14001:2004 and BS 8555:2003.

ISO 14001:2004 is an internationally recognised EMS standard held by over 250,000 businesses worldwide. The three key pillars of ISO 14001 are prevention of pollution, legal compliance and continual improvement. ISO 14001 helps achieve these by requiring your business (among other requirements) to produce an environmental policy, understand its environmental legal responsibilities and evaluate compliance, set environmental objectives and targets, and assign roles and responsibilities. The 2004 standard is currently being updated and a revised version of the standard is expected to be in place by late 2015.

BS 8555:2003 is a British Standard which offers a phased approach to ISO 14001 certification. There are six phases, with the final phase obtaining EMS acknowledgement (either second part/supply chain acknowledgement or third party certification). This approach allows a business to implement the ISO 14001 standard at a more manageable pace where resource can be an issue.

For more information on EMS and how Invest NI can help, contact the Invest NI Sustainable Development Team.

6.0 Good Practice Northern Ireland Hotel Case Studies

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6.1 Corick Country House Hotel and Spa

The Company

Situated in the heart of Clogher Valley, the 17th-century Corick Country House Hotel and Spa offers 4- star, award winning facilities. The hotel has 43 bedroom suites, the Carleton Restaurant, the Blackwater Grill Bar, seven conference suites and a new spa facility providing a hydro pool, sauna, steam room, outdoor hot-tub, Rasul, Vichy shower, and eight treatment rooms.

The Challenge

The hotel set out to complete a 24-bedroom and leisure facility extension whilst minimising the additional operating costs through the use of 'passive' construction and design techniques.

In addition to this, with support from Invest NI, the hotel is currently investigating energy efficiency opportunities within the existing building including a review of:

- Hotel benchmarking to include a monitoring and targeting system;
- Building fabric improvements;
- Heating system efficiencies including plant insulation and heating controls;
- The benefits of a BMS;
- Lighting upgrades.

The Solution

The hotel enlisted the support of building contractor Moffit and Robinson Construction Ltd to design and build the 24-bedroom extension. As a result of the work the following resource efficiency improvements were implemented.

Building Fabric

- Roof insulation thickness was increased by 40%
- Triple glazed windows (40% better than double glazing) were put in.
- Wall insulation was increased by 20% and thermal looping was reduced in the cavities.
- Floor insulation was increased by approximately 60% with the insulation fitted between floor levels to reduce heat transfer.
- Thermal bridging has been reduced to almost zero in all sections of the building.
- Thermal insulation was installed between the pool area and the beauty spa due to the difference in temperatures and humidity requirements.

Lighting

- Low energy lighting (PL, CFL and LED lights) was used.
- Motion sensor lighting controls were installed in communal areas.
- High light reflective décor maximises light from low energy fittings.
- A card-key system was installed for each bedroom to reduce energy wastage by guests leaving lighting, TV etc. running.

Heating

- Motion sensors were installed in the guest bedrooms to control the heating whereby they only activate if someone is in room. The rooms are also thermostatically controlled to prevent overheating.
- A heat recovery ventilation system was installed which recovers 90% of waste heat extracted through the guest bedroom bathroom. This is then used to heat the fresh air blown into the bedrooms.



- A wood chip boiler was installed to reduce the carbon footprint and cost of heating. The use of electric water heating has since been eliminated in the spa and pool areas by using the wood chip boiler system.
- A specialised heat recovery ventilation system in the pool area was installed which suited the high humidity requirements.

Water

- A borehole provides all hotel water used.
- Bedroom toilets have been fitted with low-flush cisterns to save water.



The Benefits

The hotel is currently analysing the cost savings, however, it was evident to the hotel that the addition of 24 new bedrooms has barely been noticeable in respect of increases in hotel energy bills. The type of energy saving measures applied within the extension bedrooms eliminates cold surfaces and therefore increases the comfort levels for the residents. The air tightness and triple glazing eliminates the convection currents within the rooms leaving a uniform and stabilised temperature throughout. The heat recovery unit ensures excellent levels of indoor air quality as it supplies fresh, filtered air.

“The hotel is delighted with these energy saving measures and more so that all of these energy saving benefits do not detract from the comfort of our guests.”

Avril Robson, Corick House Hotel.



6.2

Best Western Plus White Horse Hotel

The Company

The Best Western Plus White Horse Hotel, an Invest NI client, is situated on the outskirts of Londonderry close to the City of Derry airport. The hotel offers a variety of facilities including 58 en-suite bedrooms, conference and wedding facilities, a leisure complex and the awardwinning 68 Clooney Restaurant.

The Challenge

With increasing energy and water costs combined with both an ageing, inefficient heating system and some water intensive leisure facilities, the hotel was keen to reduce operating costs by increasing its resource efficiency. The hotel approached Invest NI for support to identify cost saving opportunities through energy and water efficiency audits. These audits established that the following challenges were top priority for reducing energy and water consumption and costs at the hotel:

Water

- Operation of a 20m swimming pool with no pool cover.
- An energy hungry sand-based pool filtration system.

Energy

- An old, inefficient space and hot water heating system.
- Corroding and leaking heating system pipework in need of improved insulation.
- Seized and burnt out water pumps.

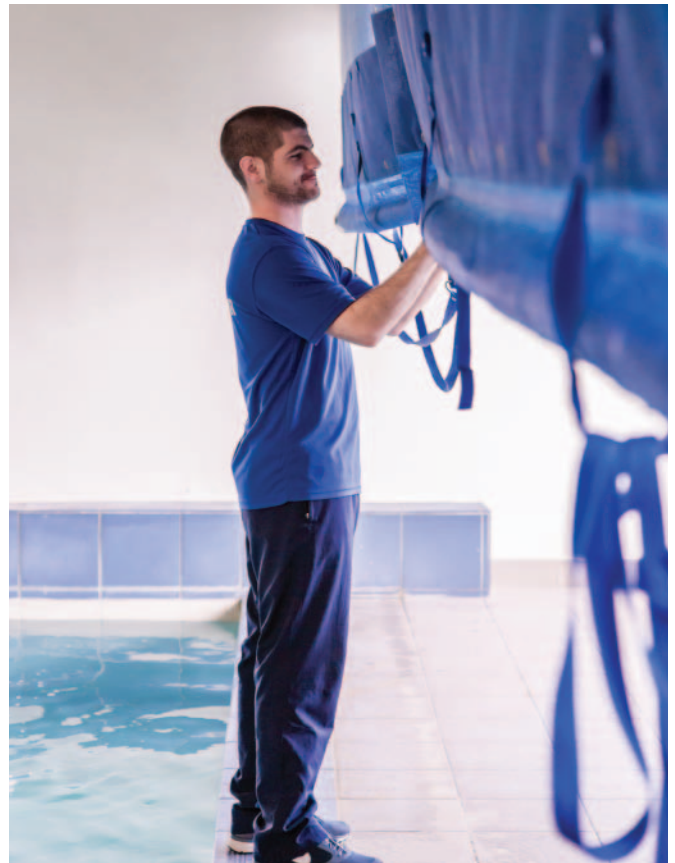
The Solution

The following solutions, recommended through the Invest NI resource efficiency support, were implemented by the hotel:

- Installation of a pool cover meant reduced energy and water costs for the hotel as a result of minimising evaporation losses and ventilation requirements.
- Installation of a new pool filtration system, which not only increased water filtration performance but saved the hotel energy (no need for backwashing), filtration chemical costs and filtration media waste disposal costs.

- Installation of ‘push button’ activated shower heads reducing the volume of water wasted during shower operation.

The installation of the pool cover and new filtration system were part funded through the Invest NI resource efficiency grant scheme. See section 7 for more details on the scheme.



The Benefits

The installation of a pool cover identified combined water and energy savings of over £3,000 per annum providing an identified payback of just over three years. The hotel's newly installed pool filtration system identified combined energy, water and waste savings of nearly £8,000 providing an identified payback of just over five years.

The hotel's next steps are to action the energy saving recommendations identified in the next six to twelve months. The hotel has submitted an application to Invest NI's interest free energy efficiency loan scheme to support this implementation.

"This project has enabled the business to save money, save energy and provide a better product to our customers. This would not have been possible without the financial and consultative support from Invest Northern Ireland. Having seen the benefits of this work, the company has been encouraged to proceed with further energy saving projects."

Ramona Wylie, Best Western Plus – White Horse Hotel.



6.3 The Valley Hotel

The Company

The Valley Hotel located in Fivemiletown is a modern 3-star hotel that is managed by a family dedicated to excellent service and superb food. The hotel has a central location in Northern Ireland close to counties Fermanagh, Tyrone and Monaghan. The current facilities include:

- 22 en-suite bedrooms;
- Bordeaux, a 75-seat restaurant;
- A multi-purpose function room accommodating approximately 250 seated, 500 unseated;
- Two bars, Marbles and Loco, accommodating 40 and 120 people respectively.

The Challenge

The hotel has made great progress with environmental improvements, achieving a Gold Award under the Green Tourism Business Scheme and winning first place Best for Energy Saving SME in the Action Renewable Awards. The challenge for the hotel is to continually seek efficiencies to combat the increasing prices of oil for space heating and hot water. In addition the hotel wanted to improve its water efficiency to reduce water bills as well as the hidden oil costs of heating the water consumed.

The Solution

With the help of Invest NI an energy consultant was appointed to carry out a detailed biomass boiler feasibility study to include advice on system sizing, installation, capital costs, potential savings and project payback. Once this study was completed, the hotel set about visiting different biomass boiler suppliers and after a considered selection process it chose a local biomass supplier.

To improve water efficiency, Invest NI recommended the installation of water saving devices on top of raising staff awareness of water efficient practices. As a result, the hotel undertook a review of all toilet cistern and water tank ballcock and float valve condition, fixing several including the main water tank which was leaking water. The hotel also installed water efficient shower heads in guest bedrooms, timer controls for urinals and sensor controls on sink taps.

The Benefits

The fully operational biomass boiler has been a great success. Heating cost savings have been identified in the region of £17,000 per annum with the system accredited for RHI payments.

The hotel has also seen a 25% reduction in water consumption since installing water saving devices, monitoring water use and promoting staff awareness of water efficiency.

“The benefits to the hotel are excellent with a clear increase in customer satisfaction as the hotel always has a warm and comfortable environment. The savings with wood pellets versus oil is good, however, adding the RHI payments and savings make it a very worthwhile investment. Overall the project cost was £46,000 which was supported through a Carbon Trust interest free loan. This greatly helped from a cash flow perspective. As a result of these heating and water use cost savings, the hotel has been able to become more competitive in the market place due to this reduced overhead.”

Greg Williamson, General Manager at The Valley Hotel.



6.4 Roe Park Resort

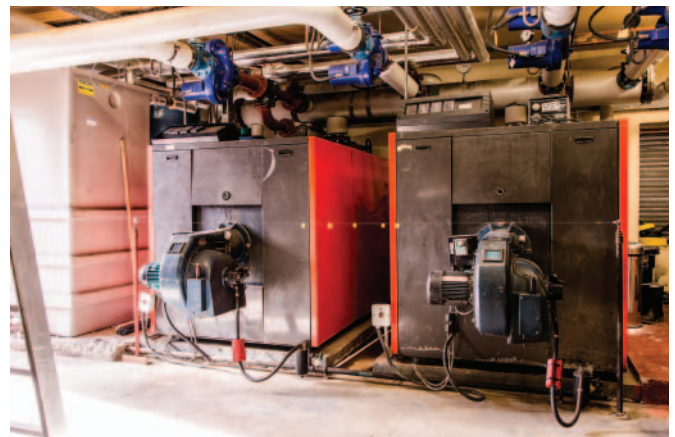
The Company

The Roe Park Resort is situated on the outskirts of Limavady on the north coast of Ireland. Having been ancestral home of the Ritter Family then a care home for the elderly since the 1950s, the house was converted and extensively extended into a hotel in 1995. The Resort has 118 en-suite bedrooms, two restaurants, two bars, a spa and 21 holes of golf, a golf academy and an indoor and outdoor driving range.

The Challenge

The Roe Park Resort has a dedicated pumping station within its grounds that is owned and operated by NI Water. NI Water identified an ongoing problem with the accumulation of fats, oils and greases (FOG) in the pumping station leading to the pumps burning out on a regular basis. This FOG accumulation is common in the downstream effluent from catering establishments, and often leads to high costs for clearance and parts replacement. An increase in cleaning costs of £7,000 per annum to meet NI Water requirements was a concern for the hotel and it engaged Invest NI to help it identify a more cost-effective solution.

Space heating, hot water and cooking requirements for the hotel are comparatively expensive compared to others in the hotel sector, as the hotel has traditionally used oil and LPG respectively. The hotel discussed alternative energy supply approaches with Invest NI that would reduce these operating costs.



The Solution

Invest NI carried out a desk based study for the hotel to investigate treatment technologies to minimise the FOG issue and any potential effluent treatment charges from NI Water. This included assessment of financial benefits, system specification and identifying suppliers. The selected solution involved bio-augmentation, a proven method of reducing Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Suspended Solids (SS) and FOG in hotel effluent. A dosing system was installed upstream of the FOG wastewater source from the kitchens.

With the support of Invest NI, the hotel is in the final stages of having a natural gas supply installed by Firmus Gas. The conversion of the site to natural gas firing involves the relatively simple process of converting the two existing oil-fired boilers to gas firing, with an estimated payback within one year. In addition, the Invest NI report recommended the conversion of all cooking and laundry equipment to natural gas.

The introduction of natural gas also allows the site to consider alternative methods of energy generation. Combined heat and power is a solution that is particularly suited to the hotel where it has a high base load heating demand (with the use of the swimming pool). The introduction of combined heat and power will have significant paybacks and make significant savings relating to both thermal and electrical energy costs on site.

The Benefits

With the avoidance of additional FOG cleaning costs through the use of dosing, the project identified annual savings of over £3,700 per annum. In addition, changing to trade effluent billing through NI Water identified

potential savings of over £7,000 per annum. The identified combined savings of the oil and LPG conversion to natural gas is over £100,000 per annum providing a payback of just over three years. This will significantly reduce the hotel's carbon footprint and impacts on the environment.

“Invest NI has enabled the resort to investigate various changes to its infrastructure in a relatively short period of time giving the resort the opportunity to invest in new technologies that will stand the resort in good stead over the next years. Without Invest NI this process would have been much longer and the benefits would have been in the long term rather than the short term. Invest NI has really played a major part in the ongoing success of the resort.”

George Graham, General Manager, Roe Park Resort



6.5

Manor House Country Hotel

The Company

The Manor House Country Hotel is a 4-star luxury country house hotel situated outside Enniskillen on the shores of Lough Erne. The hotel has 81 guestrooms ranging from family rooms to luxury premier suites. Additional facilities include two bars, a restaurant, a bistro, a number of conference facilities, and a large banquet room. The hotel also has a spa and leisure centre which is comprised of a fitness room, gymnasium, swimming pool, Jacuzzi, hot tub, sauna and steam room.

The Challenge

The Manor House Country Hotel was keen to maximise resource efficiency without compromising the comfort levels and 4-star experience provided to their guests. Having previously installed a biomass heating system to serve the new extension, and aware of the significant savings this investment had made, the hotel was keen to investigate the potential to extend the system to the older part of the building. The hotel also wanted to consider options for upgrading inefficient lighting and some other smaller resource efficiency measures. Whilst the hotel management was eager to implement these resource efficiency projects they needed to be confident of the technical and financial feasibility of the actions being considered.

The Solution

To ensure the hotel was confident in its project choices it approached Invest NI for support. The hotel used the Invest NI-funded energy efficiency loan scheme to finance the installation of replacement lighting with lower energy LED lights. This 0% loan managed by the Carbon Trust was paid back using the savings made from the project. A free resource efficiency audit provided by Invest NI also identified a number of other measures to improve the control of some operating costs. These included:

- Installation of TRVs on all bedroom radiators to ensure there is a better level of control available to staff and guests. Cleaners are now advised to use these TRVs at settings 2 or 3 depending on the external temperature, thereafter allowing guests to turn the heating up or down on arrival. This avoids heating the rooms excessively when they are unoccupied.
- Installation of urinal flush motion sensor controls to reduce the flushing of urinals overnight and at other times they are not being used by guests. This not only saves the hotel on water charges but also on wastewater charges, making a double saving.

Invest NI provided the Manor House with specialist consultancy to investigate the feasibility and economic case for extending the biomass heating system to the older part of the hotel. This has provided a basis for the hotel to move forward.

The Benefits

Lighting replacements in the hotel have led to as much as 90% reduction in lighting electrical costs and have saved the Manor House over £15,000 per annum, with a project payback of just over two years. The hotel has also reported enhanced lighting levels with the introduction of the new LEDs. The installation of TRVs on guest bedroom radiators has identified savings of over £400 per annum in the Old House section of the hotel and the installation of urinal flush motion sensor controls has identified savings of £250 per annum.



6.6 The City Hotel

The Company

The City Hotel is a four-star hotel on the banks of the River Foyle in the centre of Londonderry/Derry. The hotel was built in 2002 and caters for business and leisure guests in its 158 bedrooms, as well as functions such as weddings and conferences. There is also a bar, restaurant, fitness gym and pool/spa (which is open to membership of local residents). The site is a detached building with eight floors and a basement garage. The building footprint is about 1,600 m² (36.5 x 44 metres). Hence, the gross floor area is approximately 14,400 m².

The Challenge

As part of Chardon Management environmental management system, a review of all energy and waste streams was initiated in late 2007. The hotel set an annual target of 3% reduction in CO₂ emissions and 10% for reduction in waste. Its ultimate goal is zero carbon emissions and zero waste to landfill.



The Solution

Initial contact was made with the Carbon Trust in 2007, which carried out an audit of the hotel, revealing many energy and resources issues with which Invest NI through its framework agreement and Carbon Trust could assist. The benefits of energy audits were soon realised through further engagement with Invest NI and the Carbon Trust at a workshop later in the year. The developing relationship has given City Hotel access to current energy efficient measures and to local, sustainable resource outlets. This helped it to reduce its carbon footprint, and resulted in significant cost savings. The City Hotel is also using Invest NI to continually seek the most cost beneficial methods of reducing all its energy and waste streams.

The Benefits

As a result of this engagement with Invest NI and the Carbon Trust, the City Hotel has achieved a reduction in CO₂ emissions from utilities of over 31%, equating to 580 tonnes per annum. By recycling and having the food waste converted to compost, the City Hotel now avoids sending over 90 tonnes of material to landfill.

CO₂ savings have been achieved by various energy efficiency measures, such as conversion of the site to run on natural gas, installing LED lighting, updating its building management system and the installation of automatic window openers. The hotel has also been training its staff in energy efficiency and environmental awareness issues, culminating in the creation of a green team and energy champion. Staff segregate all the waste for recycling; this minimises the cost of disposal of the remaining material.

The impact of these actions has delivered annual savings of over £67,000 from reductions in utilities and waste. A continual review of energy efficiency best practices and the process of waste reduction, including water, has helped minimise the impact of utility price rises. These measures will further reduce the company's carbon footprint and increase its profitability, sustainability and environmental credentials

“Engagement with Invest NI’s carbon and waste reduction programmes, is becoming increasingly beneficial and necessary in the current economic climate. This has assisted us towards our goal of zero carbon emissions and has helped us achieve zero waste to landfill. For our efforts we have been awarded the Green Tourism Gold Award and the Zero Waste Gold Award for 2013.”

Clare Campbell, Energy Champion, The City Hotel

6.7 Park Avenue Hotel

The Company

The Park Avenue hotel is an independently owned and operated business employing 70 personnel close to the centre of Belfast.

The 4-star hotel underwent major refurbishment in 2008/2009 and now has 56 fully air conditioned bedrooms and 16 function rooms over three floors. There is a busy food and beverage operation operating 16 hours a day with up to 900 covers per day.

The Challenge

The existing oil-fired boilers were 15 years old and the lead boiler was in poor condition and showing increasing signs of corrosion manifesting as water leaks. The back-up boiler had insufficient capacity to satisfy the heating and domestic hot water (DHW) demand at peak. The control system was hardwired to a local panel in the boiler house and personnel were unable to adjust timers and set points which ultimately resulted in unnecessary heating and runtime.

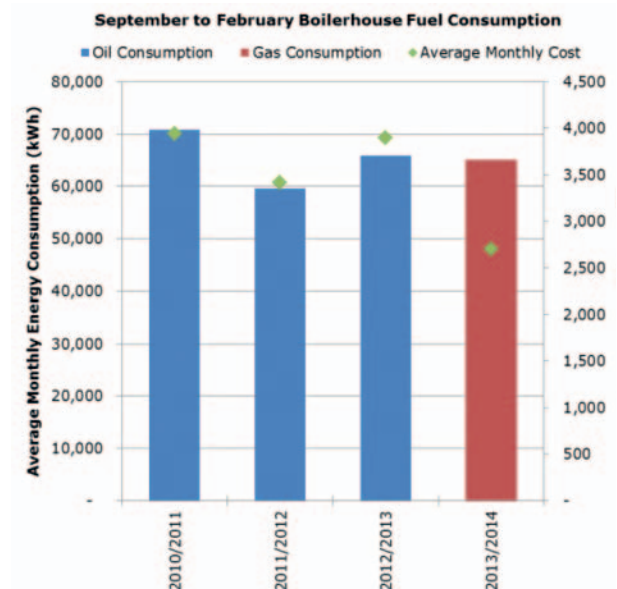
The Solution

Following on from a 2011 resource efficiency audit through the Invest NI Framework Agreement, the condition and inefficiency of existing systems were highlighted. Follow-up engagement provided a specification for the works and confirmed the main aims of the project:



1. To provide security of supply to satisfy space and DHW heating demand whilst at the same time improve the efficiency of the existing heating and DHW system; thereby reducing running costs and carbon emissions at the Park Avenue hotel.
2. Critical to optimising the performance of heating systems at the hotel was to upgrade controls and provide a user friendly front-end to the new Building Management System.

A Carbon Trust Loan to fund the project was approved in April 2013 and a new 600kW Buderus gas-fired condensing boiler was installed in July 2013 alongside a new VSD pump set and a new Struxeware Building Management System.



The Benefits

When drawing comparisons with energy consumption, it is important to take account of weather and occupancy within a given hotel. Comparing the period from September 2013 to February 2014 to the previous year, occupancy at the hotel has shown a 7.7% increase whilst the calculated degree days show an 8.1% reduction during this period indicating that this year, from a temperature only perspective, was marginally warmer than the same period last year.

Taking both into account over the six month period, electricity consumption has reduced by 6.9kWh per room sold at the hotel. Heating oil/gas consumption has reduced by 4.3kWh per room sold for 2013/14 compared to a year earlier.

In terms of heating oil/gas alone, this has resulted in a financial saving of £7,172 in these six months. The project is on schedule to deliver a payback of 3.2 years. The projected carbon saving is 71.2TCO₂e per annum.

The Director's View

“The technical assistance from the Invest NI Framework Agreement was highly valuable in defining the business justification and indeed in ensuring we specified and tendered the project to ensure best value for money. In the current economic climate, the financial assistance offered via the Carbon Trust Loan Scheme was an important element.

Our original boiler was at the end of its effective life and the original controls were locked up in the boiler house away from key staff which meant they were not used.

This project has delivered an efficient, cost effective condensing boiler with a state of the art control system and front end which enables our reception staff to optimise heat output at minimal costs.

It is only when you experience the benefits of modern systems and controls that you can truly appreciate how poor the previous systems were. The savings experienced in fuel costs each month more than pay for the interest free loan, an excellent result.”

Mandy Patrick, Director Park Avenue Hotel

6.8 The Tower Hotel

The Company

The Tower Hotel has 90 standard en-suite bedrooms and three luxurious suites over four floors. The hotel offers a comprehensive range of function rooms and can cater for up to 230 guests for banqueting or wedding events. The basement provides limited underground car parking and the leisure facilities include a fitness suite and a sauna.

The Challenge

The existing boiler room in the roof void had very poor ventilation and contained three 12 year old wolf boilers each matched with Riello two stage oil fired burners.

The wet radiator system was split into five heating zones; each area supplied from the same weather compensated circuit and controlled by zone valves with three-port control.

Two constant temperature circuits supplied heating batteries in air handling units etc. A third constant temperature circuit supplied a 600kW plate heat exchanger for instantaneous hot water with an 800 litre buffer cylinder.

The heating and hot water system was controlled by a 12 year control system. The equipment within the boilerhouse was in a very poor condition with reliability and inefficiency a cause for concern.

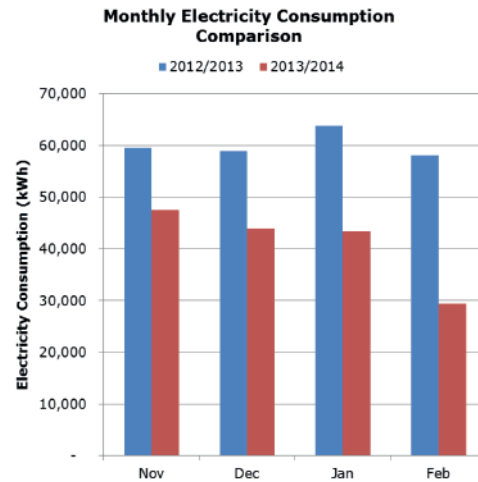
Catering equipment was all powered via electricity and was aged. Lighting throughout the corridors, bar, restaurant and catering areas was inefficient.

The Solution

Following audits carried out with support from Invest NI and the Carbon Trust the condition and inefficiency of existing systems were highlighted. Follow-up engagements provided a specification for the works and confirmed the main aims of the project:

1. To refurbish the boilerhouse and convert to natural gas, thereby providing security of supply to satisfy space and domestic hot water (DHW) heating demand whilst at the same time improving the efficiency of delivery; reducing running costs and carbon emissions at the Tower Hotel.
2. To upgrade controls and provide a user friendly front-end to the new Building Management System.
3. To upgrade the catering equipment to enable the kitchen to meet increased covers planned and to do so whilst reducing energy consumption and cost.
4. To upgrade lighting throughout main thoroughfares in the hotel to modern energy efficient LED luminaires.

A Carbon Trust Loan was approved in November 2012 to fund the entire project cost.



The Benefits

All aspects of the project were commissioned by October 2013.

Between November 2013 and February 2014, electricity consumption reduced by 76,007kWh compared to the same period in the previous year. This equates to a cost saving of £10,489 based on 2012 electricity rates.

What is even more impressive is that during this winter period occupancy at the hotel was up 23.9% relative to a year earlier yet the cost of energy for space heating and DHW only increased by 4.4 %.

During the summer months, the space heating boilers will be switched off since the DHW system is totally separate further accelerating the fuel savings associated with heating. Therefore, the project is on track to deliver a financial return on investment of less than four years.

General Manager's View

“The new equipment establishes best practice at the hotel in terms of relating energy consumption to occupancy and of reliability of supply. The fact that this was achieved with the project fully funded by the Carbon Trust Interest Free Loan Scheme is a testament to the saving potential in terms of cost savings and environmental savings.

I am delighted to confirm that we are on track with delivery of these savings, giving the project a payback of less than four years with an environmental saving of 320TCO₂e per annum. This is a tremendous performance given the level of capital investment involved and establishes a terrific platform in which the business can trade for the next 15 years.

Assistance from Invest NI and the Carbon Trust greatly supported the business case and project delivery aspects of this essential infrastructure upgrade.”

Mike Gatt, General Manager, Tower Hotel



6.9

White Horse Hotel (Industrial Symbiosis)

The Company

The Best Western Plus White Horse Hotel, an Invest NI client, is situated on the outskirts of Londonderry close to City of Derry airport. The hotel offers a variety of facilities including 57 en-suite bedrooms, conference and wedding facilities, a leisure complex and the award-winning 68 Clooney Restaurant.

The Challenge

Following an extensive £850,000 facilities upgrade to the hotel it had some furniture and bedroom fixtures that were no longer needed but were still in good condition. It also had a regular quantity of packaging waste and was looking for alternative outlets to landfill.

The Solution

Following a visit from a practitioner from the Industrial Symbiosis Service the Assistant Manager attended a Synergy Workshop at the nearby Invista plant in September 2010. At the workshop the hotel was introduced to several companies offering solutions for resource streams like food waste, cardboard, mattresses, glass, tins and furniture. Within days the hotel finalised a deal with LCDI Greenshed, which took 2.5 tonnes of furniture and sold it through its charity shops.

The Benefits

This is an ongoing synergy between the Best Western Plus White Horse Hotel and LCDI Greenshed and demonstrates what can be achieved when implementing corporate social responsibility and environmental policies in smaller businesses. With the support of the Industrial Symbiosis Service other areas are being looked at to see where cost savings can be made and waste reduction strategies can be introduced. The hotel is also implementing a programme of staff training and awareness in resource efficiency and waste reduction.

Although the financial benefits of this synergy are small the potential for replication in other business settings is significant.

- Landfill diversion: 2.5t
- CO2 reduction: 7t
- Cost savings: £78
- Additional sales: £500

“We are very pleased to have been introduced to LCDI Greenshed through the Industrial Symbiosis Service provided by Invest NI. We have other resource streams for recycling and are hopeful of finding solutions other than landfill for them all. The Industrial Symbiosis Service is helping us achieve our targets for carbon reduction and resource efficiency.”

Jane Phillips, Assistant Manager Best Western Plus White Horse Hotel



7.0 Signposting to Further Support and Information

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7.1

Invest Northern Ireland Sustainable Development Team

Invest NI is committed to supporting your hotel to implement resource efficiency. Please do not hesitate to contact us if we can be of further assistance.

Invest Northern Ireland – Sustainable Development Team

Telephone: 028 9069 8868

Email: sustainabledev@investni.com

Invest NI offers the following support to businesses in Northern Ireland:

- Impartial advice and information is delivered by Technical Advisors (Invest NI and external) and also through the Invest NI website (www.investni.com) and the Northern Ireland business information portal www.nibusinessinfo.co.uk, Invest NI can provide tailored support to qualifying businesses to assess and reduce energy, packaging and materials costs.
- Invest NI provides a wide portfolio of support for Northern Ireland businesses with a total annual expenditure of more than £30,000 on packaging, energy, waste and raw materials. The aim of this support is to improve the competitiveness, productivity and sustainability of local businesses through identification and achievement of cost savings in the consumption of packaging, energy and raw materials.
- A free audit can identify and prioritise projects to reduce the cost of energy, water and materials in qualifying companies. These companies can also access up to five days of further free technical consultancy to help them take forward projects that will realise cost savings in a timely and cost-effective way.
- This technical support can address a wide range of questions to help firms progress suitable projects to the point of implementation and can include for example: identification of cleaner processing technologies; opportunities for using renewable energy or improving energy efficiency; accessing more sustainable packaging sources; minimising product losses; reviewing packaging requirements or use; environmental or energy management systems; equipment specification and identification of suppliers of more efficient equipment.
- Finance from Invest NI to help companies install new equipment is also available: **interest-free energy efficiency loans of between £3,000 and £400,000 are available through Carbon Trust**. The size of loan available will depend on the energy saving potential of any particular project – please see: <http://www.carbontrust.com/client-services/northern-ireland> for further information.
- Invest NI also provides industrial symbiosis services, which generate opportunities to identify and match excess resource in one business – like waste, transport, storage, skills, production capacity or energy – with another where it could be profitably used. Industrial symbiosis activities include business workshops to identify potential matches between business participants along with follow-up visits and engagements with individual businesses to progress matches.
- Invest NI will periodically open calls for applications for **capital grants of up to £40,000 to support those SME businesses already being supported by Invest NI** to purchase/install new equipment to reduce their material, water and waste costs.
- Support is mostly provided on a “De Minimis Aid” basis. This is aid that may be provided to businesses by EU member states without the member states having to notify the EU of the provision of the aid. Under the current rules an upper threshold of €200,000 of aid can be provided to any business in a rolling three-year period. For further information see Commission Regulation (EC) number 1998/2006 of 15 December 2006 or visit the EU Europa website www.europa.eu.

7.2

Other Information Sources

- The Carbon Trust administers an interest free loan scheme for energy efficient projects, funded by Invest NI: www.carbontrust.co.uk
- The Energy Saving Trust offers advice and support on energy related matters to the domestic sector: www.energysavingtrust.org.uk
- Love Food, Hate Waste has a wealth of information on how to better manage your food waste including recipes, hints and tips and portion planning: www.ni.lovefoodhatewaste.com
- nibusinessinfo.co.uk is a web resource providing practical advice for businesses including tips on environmental management: www.nibusinessinfo.co.uk
- NI Water provides information and advice about reducing water use. Download the 'Dirty Dozen' poster and request a free HIPPO bag: www.niwater.com
- NITB operates the Green Tourism Business Scheme.
- Sustainable Northern Ireland assists district councils, the community and voluntary sector, central government departments and agencies, non-departmental public bodies, the business sector and the public in understanding, promoting and encouraging the adoption of sustainable principles in all aspects of our lives: www.sustainableni.org
- WRAP (Waste and Resources Action Programme) offers advice and support on how to manage waste. It encourages businesses to prevent landfill waste by efficient resource use, maximising reuse and increasing recycling streams: www.wrap.org.uk



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If you require this brochure in an alternative format (including Braille, disk, audio cassette or in minority languages to meet the needs of those whose first language is not English) then please contact:

Invest NI's Equality Team

T : 028 9069 8273

Textphone : 028 9069 8585

E-mail : equality@investni.com