

A Practical Water Efficiency Guide for Businesses in Northern Ireland



Executive Summary

Becoming a water efficient business in Northern Ireland is an attractive goal, but in practice, many companies do not know where to start. This simple and practical guide is designed to be a first stage towards your company becoming water efficient by working through a simple ten-step process.

Through improving the water efficiency of your business, you will realise benefits such as: saving money, reducing your carbon footprint, preserving natural resources for future generations and becoming a green supplier.

Invest Northern Ireland (Invest NI) is committed to supporting your business become water efficient through the use of water efficiency good practice techniques including state-of-the-art technologies. Invest NI offers free water efficiency audits and implementation support to eligible companies.

Please do not hesitate to contact us if we can be of further assistance to support your business on the journey to become water efficient.

**Invest Northern Ireland
Energy & Resource Efficiency Team
Telephone: 0800 181 4422**

Pictures from top left clockwise:

Bakery representing the food and drink sector

Victoria Square representing the construction sector

Welder representing the engineering sector

Dunluce Castle representing the hospitality & leisure sector

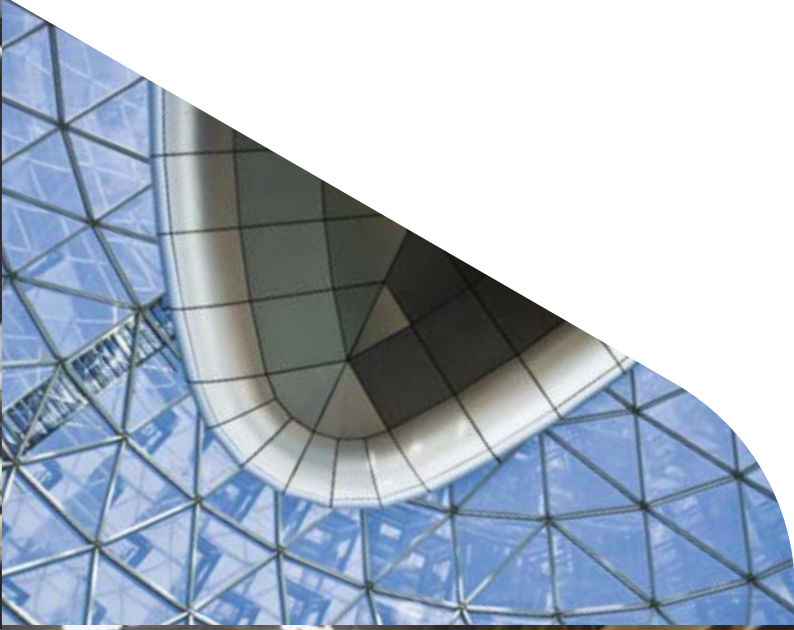


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1.0 Introduction to Water Efficiency

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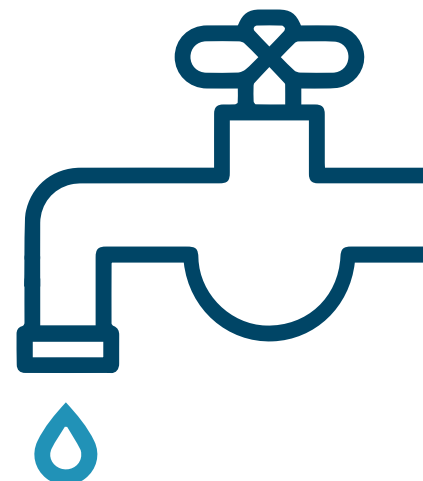


1.1 Background

Reducing water use makes perfect business sense; it saves money, can enhance the reputation of a business and preserves natural resources. While becoming a water efficient business is an attractive goal, the reality is many businesses in Northern Ireland (NI) do not know where to start.

This guide is designed to be a first practical stage towards your company implementing a water efficiency programme and saving money by working through a ten-step process to become water efficient (See Appendix A).

Four sector specific supplements accompany this guide and cover: food and drink, tourism and leisure, construction and engineering.



1.2 Drivers and Barriers

There are a number of drivers (benefits) and barriers to implementing a water efficiency programme in your business. One of the objectives of this guide is to support businesses in NI understand the drivers and overcome the barriers to becoming water efficient.

It is easy to take water for granted but this precious natural resource is a key asset for almost any business in NI. Whether you simply use water for domestic use (e.g. flushing toilets, washing hands, etc.) or have a more complex process use (e.g. transfer of material, cooling of product, etc.) there are many benefits of being water efficient that include:

- **Save Money:** Cutting water use automatically reduces your direct water charges if you have a water meter. Furthermore, if you reduce your water use you will directly reduce the amount of wastewater you generate bringing a double benefit to your bottom line!
- **Reduced Carbon Footprint:** Cutting water use directly reduces your carbon footprint helping your business achieve carbon reduction targets.

For further information on conversion factors for water, see: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2018>.

- **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 water efficiency your business can demonstrate its commitment to being a green supplier.

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

- **Lack of Commitment:** A water efficiency programme will only be successful if everyone involved is motivated and committed. Involving everyone from the start of a water efficiency programme will encourage ownership and increase the likelihood of success. This guide provides advice on engaging staff to support your water efficiency programme.
- **Lack of Understanding:** Many businesses in NI lack a basic understanding of their water and wastewater costs but more importantly how your business can use this knowledge to realise potential cost savings. This guide provides information on water and wastewater costs and takes you through the ten-step process to become water efficient.
- **Lack of Resource:** The current economic climate requires businesses to be even leaner than before and so your business may lack the necessary resource to support a water efficiency programme.

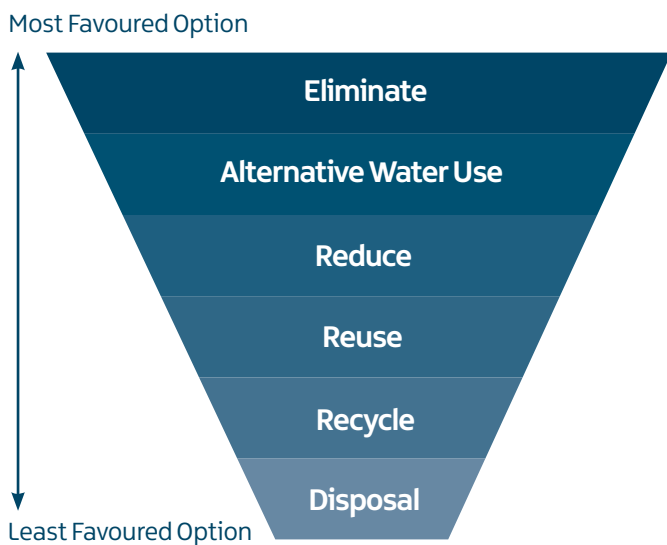
The Invest NI Energy and Resource Efficiency Team is here to assist and can provide free water efficiency audits and implementation support to eligible companies to identify and realise water efficiency benefits.

Please see Section 7.1 for further information on the services provided by the Invest NI Energy and Resource Efficiency Team.

1.3 Water Management Hierarchy

The Water Management Hierarchy is a framework for prioritising the most preferable options for water management and efficiency and is at the heart of any water efficiency programme.

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 in NI 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 (see section 2.0)	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.

1.4 Obtaining Commitment

Step 1

Engage all staff and senior management in your water saving programme.

The critical first step to become a water efficient business is to gain commitment from your staff and senior management team. This is required to ensure you have the necessary authority (or access to it) to commit company resources to the water efficiency programme as well as a team of motivated staff to support your water efficiency programme become an ongoing success.

Involving all of your staff and senior management from the start encourages ownership and increases the likelihood of the water efficiency programme success.

Nominating or asking for volunteers to become a water efficiency programme 'Champion' to co-ordinate activities, provide information and updates to staff and senior management will provide a focus for your business.

If your business is large or complex consider building a team to support the Champion across the company and include staff from senior management, shop floor, environment and facilities.

Motivating your staff to actively participate in a water efficiency programme will maximise its success. Consider implementing a staff suggestion and incentive scheme for rewarding positive ideas and regularly update staff on water efficiency programme activity and performance.

1.5 Water Use in Your Organisation

Once you have received the necessary commitment from the senior management team the next stage is to begin to identify some basic aspects of water use in your business by considering the following questions.

Questions

How is water supplied to your business?

Do you have one or multiple mains water supplies?
Do you have alternative water supplies?

(see Section 2.0 for further information on alternative water supplies)

How is water disposed of to the wider environment?

Do you discharge wastewater (sewerage and trade effluent) to sewer and/or controlled water (e.g. river, lough, etc.)?

Where is water used in your business?

Consider both domestic and process, inside and outside your property.

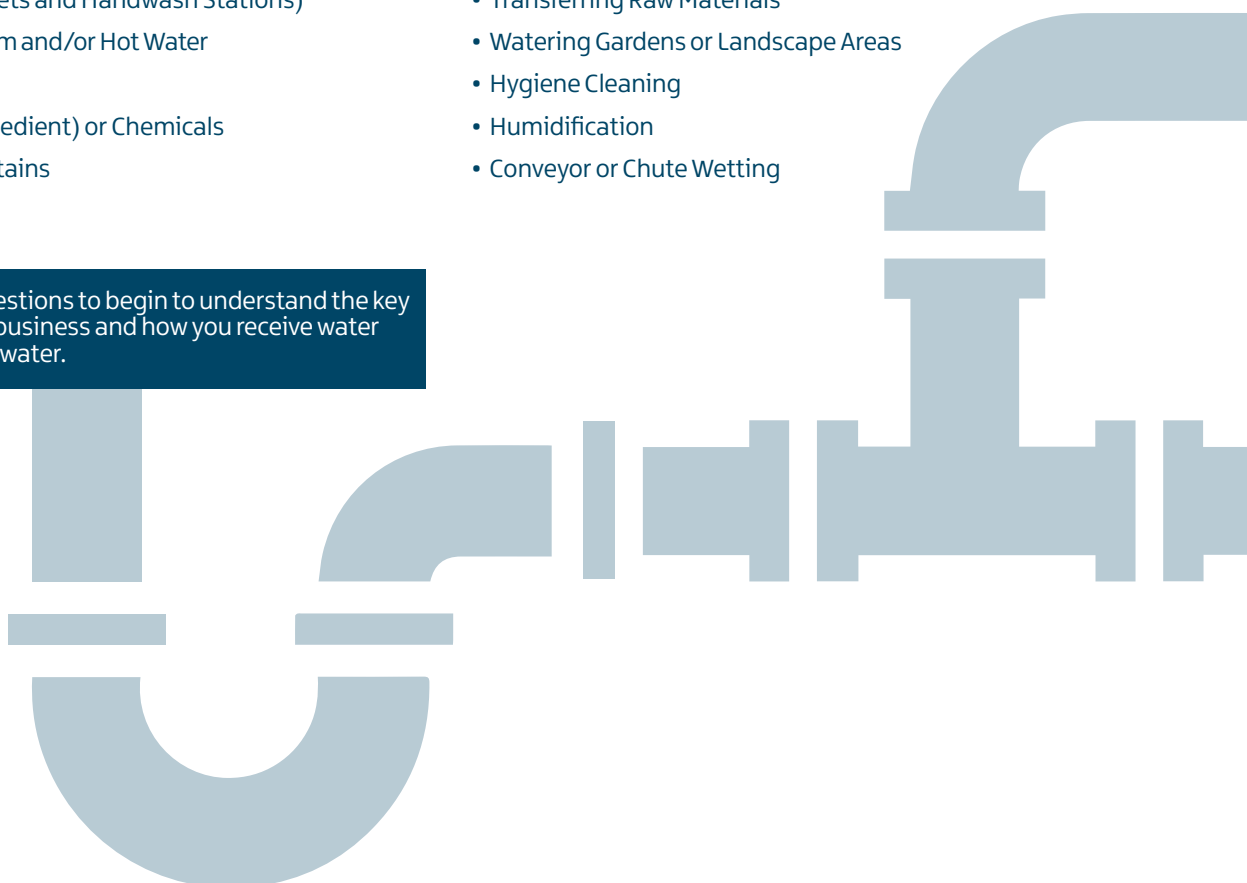
When answering the final question consider the following typical water uses in a business as a starting point. Remember there may be others in your business.

Typical Water Uses in NI Businesses

- Flushing Toilets and Urinals
- Cooling Water
- Washing Hands (Toilets and Handwash Stations)
- Boilers - Raising Steam and/or Hot Water
- Showers
- Use in Products (Ingredient) or Chemicals
- Drinking Water Fountains
- Rinsing Products
- Washing Vehicles
- Transferring Raw Materials
- Watering Gardens or Landscape Areas
- Hygiene Cleaning
- Humidification
- Conveyor or Chute Wetting

Action

Answer the above questions to begin to understand the key uses of water in your business and how you receive water and dispose of waste water.





2.0 Alternative Water Supplies

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2.1 Background

Alternative water covers a wide variety of sources to include groundwater, surface water, rainwater harvesting and reclaimed water. The purpose of alternative water is to provide a more cost-effective option to mains water.

It can potentially provide potable water that can be used in processes, or non-potable water that can be used in less stringent applications such as toilet flushing, irrigation systems, vehicle washing and other uses where the water is not for drinking, food preparation or personal hygiene. Depending upon the hydrogeology, groundwater in Northern Ireland is often suitable for potable use without any treatment.

The benefits of using alternative water can include:

- **Save Money:** By reducing the demand on your mains water supply your business can save money.
- **Security of Supply:** Knowing you will have a water source if your mains supply is interrupted.
- **Reduced Environmental Impact:** By reusing water, or sourcing it locally, your business can lessen its environmental impact.

With respect to groundwater, the following benefits also apply:

- **Stable Temperature:** Groundwater in Northern Ireland typically remains between 8-12 degrees celsius throughout the year. If managed properly this can limit the risk of pipes freezing and bursting, and allow use in processes which are sensitive to temperature change.
- **Stable Quality:** Groundwater quality rarely changes to any significant degree over short periods of time which can make it suitable for use in processes that are sensitive to quality changes.

While alternative water sources can bring these benefits to your business it is important they are managed appropriately. Alternative water supplies which are installed incorrectly or have not been adequately maintained can lead to public health risks through the possible contamination of the drinking water supply.

2.2 Types of Alternative Water

The main types of alternative water include:

Groundwater	A borehole is simply a deep well providing access to groundwater.
Harvested Rainwater	Rainfall collected from a roof or landscape surface.
Surface Water	Water abstracted from a local surface water (e.g. river, lough, etc).
Reclaimed Water	Water collected from buildings or processing activities.

When identifying sources of alternative water, a key consideration for a supply to be successful is to establish what those sources will be used for. Many alternative water sources are best suited to non-potable uses though some can be made potable with additional treatment.

Action

Consider the key uses of water in your business - do you have an alternative water source which could be used to displace the use of mains water and save your business money?

2.3 Guidance on Alternative Water

British Standards have published two documents BS EN 16941-1:2018 for rainwater harvesting systems and BS 8525-1:2010 for greywater systems. These standards cover the design, installation and maintenance requirements for these alternative water systems and include water quality requirements for the end uses. The Private Water Supply Regulations (Northern Ireland) 2017 set the water quality requirements and in essence mirror the requirements set out for public drinking water standards. Further information and a private water supply registration form is available at: <https://www.daera-ni.gov.uk/articles/private-water-supplies>.

You should ensure that, if required, you register your supply with the Drinking Water Inspectorate in advance of use. If you are unsure if your supply requires to be registered you should seek advice from the Inspectorate at: privatewatersupplies@daera-ni.gov.uk

The Water Supply (Water Fittings) Regulations (Northern Ireland) 2009 would also apply to properties that have both a mains and an alternative water supply and are intended to protect public health and to make sure there is no waste, misuse, undue consumption, contamination or erroneous measurement of public mains water. Further information can be downloaded from: <https://www.niwater.com/water-fittings-regulations.aspx>

Rainwater harvesting systems receive a discounted measured sewerage tariff of £1.12 per m³ from NI Water. The charge is determined either by installing a water meter, or if a meter cannot be fitted, the volume is based on the catchment area of the system and 80% of the NI long term annual rainfall.

The Water Abstraction and Impoundment (Licensing) Regulations (Northern Ireland) 2006 sets out a control regime for regulating the abstraction of water from underground strata and waterways and for constructing, altering or operating impounding works. You do not require a licence to abstract less than 10 m³ per day but you must comply with Permitted Controlled Activities (PCA) conditions which can be found at: <https://www.daera-ni.gov.uk/publications/water-abstraction-and-impoundment-licensing-regulations-northern-ireland-2006-permitted>

If the volume of water abstracted is above 10 m³ per day, you are required to apply for authorisation under the Regulations. The Department of Agriculture, Environment and Rural Affairs has published guidance for operators of abstractions and impoundments; a copy of this document can be found at: <https://www.daera-ni.gov.uk/articles/abstraction-and-impoundment-licensing-requirements>

The Environmental Protection Agency (Ireland) provide recommended guidelines for the safe installation of a groundwater supply via a borehole: <http://www.epa.ie/pubs/advice/drinkingwater/advicenote14.html>

The Environment Agency has published guidance 'Greywater for domestic users: an information guide'. This document provides information on greywater systems in the UK. It covers the use of greywater for non-potable domestic water uses such as toilet flushing and garden watering. It considers the greywater from showers, baths and hand basins and excludes the more contaminated water from washing machines and kitchen sinks.

This publication does not give recommendations on specific greywater reuse systems.

The document provides guidance on the:

- Benefits of these systems
- Savings that can be achieved
- Alternatives to be considered
- Cost of installation
- Suitability of greywater reuse systems
- Maintenance requirements
- Water quality issues
- Regulations and guidance that should be referred to

A copy of this document can be found at: https://www.sswm.info/sites/default/files/reference_attachments/ENVIRONMENT%20AGENCY%202011%20Greywater%20for%20Domestic%20Users.pdf

The Environment Agency has also published guidance 'Harvesting rainwater for domestic uses: an information guide'. This document provides information on rainwater harvesting systems in the UK. It covers the supply of non-potable water for domestic uses such as toilet flushing, watering the garden and washing clothes using a washing machine. It does not cover systems supplying water for drinking, food preparation or personal hygiene.

The document provides guidance on the:

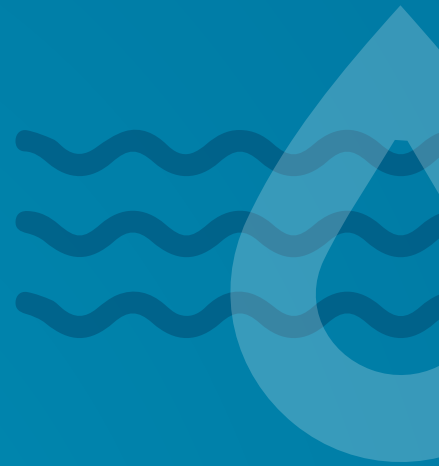
- Benefits of these systems
- Savings that can be achieved
- Alternatives to be considered
- Cost of installation
- Suitability of a rainwater harvesting system
- Maintenance requirements
- Water quality issues
- Regulations and guidance that should be referred to

A copy of this document can be found at: <http://webarchive.nationalarchives.gov.uk/20140328153649/http://cdn.environment-agency.gov.uk/geho1110bten-e-e.pdf>

It is recommended that the services of a suitably qualified hydro-geologist are procured during the planning and installation stage to ensure a sustainable supply of groundwater is obtained. These services may include a survey of the land available, identification of the best drilling point, commissioning and supervision of a driller, design of borehole (as per relevant guidance) and testing of borehole to ensure sufficient quality and quantity of water.

Further advice and information, including an initial borehole prognosis assessment, can be sought from The Geological Survey of Northern Ireland

gsni@economy-ni.gov.uk
(028) 90 388462



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3.1 Background

Step 2

Identify how much your business is paying in water and wastewater charges and also what hidden charges your business is facing.

All businesses in NI 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. NI Water supplies some 560 million litres of clean mains water a day for almost 1.8 million people as well as treating 320 million litres of wastewater a day.

Every year NI Water publishes a document, the NI Water Scheme of Charges, for the forthcoming year to provide details of the charges for water, wastewater and other miscellaneous services that apply from 1st April that year.

A copy of the current NI Water Scheme of Charges can be found on the NI Water website at: www.niwater.com.

Generally, all businesses using mains water (referred to as 'non-domestic' premises) will be charged based on whether they have a water meter fitted or not and also whether they are consented to discharge liquid waste, other than surface water and domestic waste (referred to as 'sewerage'), to sewer.

The three main charges to be considered are:

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

3.2 Measured Charges

For those businesses that have a water meter fitted, water and sewerage charges are based on the amount of water used.

Measured water and sewerage charges include a fixed standing charge and a volumetric charge. The water standing charges are based on water supply pipe size (internal diameter measured in mm) with larger bore supply pipes having a higher charge. Standing charges are currently categorised and charged as follows:

Water Supply Pipe Internal Diameter	2018/19 Charge
Up to 20mm	£68
Over 20mm up to 25mm	£114
Over 25mm up to 40mm	£211
Over 40mm up to 50mm	£331
Over 50mm up to 75mm	£657
Over 75mm up to 100mm	£1,189
Over 100mm	£1,690

If you don't know your water supply pipe size you can find this presented under the section 'Details of your Bill' on the bottom of page 2 of your NI Water bill for metered water and sewerage services.

Action

Check your actual business water meter supply pipe size and bill are the same. If different you could be under or over charged for your water supply standing charge.

The volumetric charges for water are based on the consumption recorded on the water meter, less a domestic allowance, where applicable. Where a metered customer pays business rates for their metered property, a domestic allowance of 100 m³ per 6 month billing period may be available for each individually rated property. The domestic allowance can be backdated up to a maximum of 6 years.

Action

Check your business is receiving the domestic allowance for water, where applicable, as this can be worth up to £214 per annum. A rebate may be applicable up to £1,284.

If your company is using over 100,000 m³ of water per annum, and you have implemented a range of water efficient practices, you can apply for a Large User (LU) Tariff. The LU Tariff provides an economy of scale saving for users of large volumes of water with the volumetric charge discounted for usage in bands of consumption above 100,000 m³ of water per annum.

Volumetric charges for water are categorised and charged as follows:

Volumetric Charge	2018/19 Charge
Standard Volumetric Charge	£1.070/m ³
LU Volumetric Charge Over 100,000 m ³ up to 250,000 m ³	£0.856/m ³
LU Volumetric Charge Over 250,000 m ³ up to 500,000 m ³	£0.803/m ³
LU Volumetric Charge Over 500,000 m ³	£0.749/m ³

Action

Check your business has a Large User Tariff if using more than 100,000 m³ per annum.

Consumption recorded from your water meter will be presented within your NI Water bill for metered water and sewerage services.

Action

Check your water meter readings are accurate. If different you may be being under or over charged for your water use.

The standing charges for sewerage are similarly based on water supply pipe size (internal diameter measured in mm) with larger bore supply pipes having a higher charge. Standing charges for sewerage are categorised and charged as follows:

Water Supply Pipe Internal Diameter	2018/19 Charge
Up to 20mm	£81
Over 20mm up to 25mm	£135
Over 25mm up to 40mm	£248
Over 40mm up to 50mm	£389
Over 50mm up to 75mm	£768
Over 75mm up to 100mm	£1,389
Over 100mm	£1,978

Action

Similar to water, check your actual business water meter supply pipe size and bill are the same. If different you could be under or over charged for your sewerage service.

The volumetric charges for sewerage are based on the consumption recorded on the water meter, less a non-return to sewer allowance and less a domestic allowance, where applicable.

The non-return to sewer allowance will generally be 5% of water use unless a different allowance has been agreed with NI Water.

A different allowance may be applied in respect to the following:

- Any further proportion of water used but not returned to sewer (e.g. water used as an ingredient).
- Any volume subject to trade effluent charges.
- Any discharge to the sewer from any source not recorded on the water meter (e.g. the discharge of alternative water to sewer).

Action

Check your non-return to sewer allowance is accurate by considering if any of the above applies to your business. If different you could be under or over charged for your sewerage service.

Where a metered customer pays business rates for their metered property, a domestic allowance of 95 m³ per 6 month billing period may be available for each individually rated property. The domestic allowance for sewerage can be backdated up to a maximum of 6 years.

Action

Similar to water, check your business is claiming the domestic allowance for sewerage, where applicable, as this can be worth up to £336 per annum. A rebate may be applicable up to £2,018.

The volumetric charge for sewerage service is a flat £1.770/m³ with no discount for large water users.

3.3 Unmeasured Charges

For those businesses that do not have a water meter fitted, water and sewerage charges are based on two elements - a standing charge applied to all unmeasured properties; and a variable charge based on the Net Annual Valuation (NAV) of your property.

Unmeasured Tariff	Water	Sewerage
Standing Charge	£29.24	£40.71
Variable Charge per each £1,000. NAV	£11.23	£15.33
Charge Cap	£450	£480

Action

Check your business property NAV is accurate. If not, you could be under or over charged for your water supply and sewerage service. If you don't know the NAV assigned to the premises then contact Land and Property Services (see www.lpsni.gov.uk or call 0300 200 7801 (charged at local rate) or +44 28 9049 5794 (if calling from outside the UK) for further information).

While reducing water use in a business that has unmeasured charges will not reduce water related costs it will reduce the environmental impact of the saved water.

Action

Consider the feasibility and merits of moving to a metered supply service for your business.

3.4 Trade Effluent

Trade effluent is defined as *'any liquid, either with or without particles of matter in suspension in the liquid, which is wholly or in part produced in the course of any trade or industry carried on at trade premises'*, but does not include sewerage.

If your company generates trade effluent you will need the consent of NI Water to discharge to a sewer connection. Failure to obtain permission before discharging trade effluent is a criminal offence and is punishable on summary conviction to a fine not exceeding the statutory maximum and on conviction on indictment to an unlimited fine.

Action

Check if your business discharges trade effluent to sewer and whether you have a trade effluent consent.

If your company is unsure what material is considered to be a trade effluent then contact NI Water on **0845 877 0030** to discuss with a NI Water Trade Effluent Officer.

Trade effluent charges are calculated based on the Mogden Formula. The Mogden Formula was agreed between the water industry and the Confederation of British Industry in the 1960's. Unless detailed in your consent, monitoring and sampling costs will be included in the annual trade effluent charges calculated in line with the formula:

$$C = R + V + (Ot/Os)B + (St/Ss)S$$

The individual parameters in the formula are explained below:

Symbol	Description [Standard Charges in £/m ³]
C	The unit charge in pence per cubic metre for the trade effluent discharge.
R	The unit cost in pence per cubic metre of reception and conveyance of sewage [0.2172].
V	The unit cost in pence per cubic metre of the volumetric and primary treatment of sewage treated and disposed of in sewage treatment works [0.2449].
Ot	The Chemical Oxygen Demand in mg/l of the trade effluent after 1 hour quiescent settlement at pH 7.0 S.U.
Os	The Chemical Oxygen Demand in mg/l of the settled sewage - standard strength at 260 mg/l.
B	The unit cost in pence per cubic metre of the biological oxidation treatment of settled sewage [0.1621].
St	The total suspended solids in mg/l of the trade effluent at pH 7.0 S.U.
Ss	The total suspended solids in mg/l of crude sewage - standard strength at 240 mg/l.
S	The unit cost in pence per cubic metre of treatment and disposal of primary sludge [0.1891].

Your business can minimise trade effluent charges through water efficiency and/or by reducing your effluent strength. A contaminant source reduction programme aims to minimise the strength of your effluent by investigating and implementing measures to prevent pollution.

The benefits of such a programme can include:

- Improved compliance with your trade effluent consent through lower pollutant concentrations.
- Reduced raw material losses leading to greater yield and business profits.
- Reduced load on any on-site effluent treatment and distribution equipment.
- Reduced Ot and St concentrations in your effluent leading to reduced charges for trade effluent.

$$\downarrow C = R + V + (\downarrow Dt/Os)B + (\downarrow St/Ss)S$$

Contaminant source reduction techniques are often simple and common sense and can include the following typical measures:

- Minimising the use of raw materials in process activities.
- Safe containment and storage of raw materials including secondary containment.
- Use of spill trays to avoid raw materials landing on the floor.
- Use of drain pots to catch material before it enters the drain.

Action

Develop a contaminant source reduction programme to minimise the strength of your trade effluent Settled Chemical Oxygen Demand and Total Suspended Solids and associated trade effluent costs.

NI Water may apply a fixed strength value for trade effluent. These industries include:

- Vehicle wash (jet)
- Vehicle wash (roller)
- Industrial laundry
- Swimming pool filter backwash
- Small brewery
- Cattle marts
- Mobile domestic wheelie bin cleaners
- Laundrettes

For example, a hotel with a swimming pool would be eligible to apply for a trade effluent consent. Trade effluent would cost £0.58/m³ for discharge as opposed to the current sewerage cost of £1.770/m³; therefore, sizeable cost savings could be made.

The volume of backwash water discharged per day would be: the number of backwashes per day (e.g. 2) multiplied by the backwash flowrate (e.g. 30 m³/hr) multiplied by the time for each backwash (e.g. 6 to 10 minutes).

3.5 Hidden Costs

In addition to the easily identified water, sewerage and trade effluent charges which arise on your water and sewerage, and trade effluent bills, there are many hidden costs associated with water use and disposal of wastewater. The true cost of water may be many times the amount on your water bill.

These hidden costs can include:

• **Water and Wastewater Treatment Costs:** Your business may treat your water prior to use to achieve a higher quality standard, or wastewater before discharge to sewer or controlled water. The cost of consumables such as water and wastewater treatment chemicals and energy to operate these systems can be a hidden cost for your business.

• **Lost Raw Materials/Product:** Your business may lose product or raw materials into your effluent, resulting in increased overhead costs and increased effluent strength resulting in higher trade effluent costs. This can be a hidden cost for your business.

• **Energy Costs:** Your business may heat or cool your water prior to use and then use energy to pump it around your site. **This can be a hidden cost for your business, for example:**

Action

Consider the hidden cost of heated water on your site by reviewing the worked example provided and then applying to heated water use on your site.

Worked Example:

Basis of Calculation

Based on gas oil at a cost of £0.66 per litre heating 1,000 kg (1 m³) of 10°C water to 65°C in a heating system with an 80% efficiency rating.

kWh conversion factor for gas oil is 10.7 kWh per litre of gas oil. Therefore, gas oil cost is equivalent to £0.06 per kWh

Calculation

Energy = Mass x Specific Heat Capacity of Water x Temperature Change.

- $Q = m \times Cp \times \Delta t$
- $Q = 1,000 \text{ kg} \times 4.2 \text{ kJ/kg} \cdot ^\circ\text{C} \times (65 - 10) ^\circ\text{C}$.
- $Q = 231,000 \text{ kJ}$.

Converting kJ to kWh = $231,000 \text{ kJ} \times 1 / (3600 \text{ s}) = 64.2 \text{ kWh}$.
Correcting for the heating system efficiency = $64.2 / 80\% = 80.3 \text{ kWh}$.

Converting this to a cost = $80.3 \text{ kWh} \times £0.06 \text{ per kWh} = \text{£4.82 per 1,000 kg or m}^3 \text{ of water}$.

Compare this against the standard volumetric cost of water = £1.070 m³ of water.

In this simple example, the hidden energy cost is almost **5 times** the standard volumetric cost of water for this company.

3.6 Summary of Actions Checklist

Action

For your convenience, a summary of the many actions recommended in this section is provided below:

3.2 Measured Charges

Check your actual business water meter supply pipe size and bill are the same. If different you could be under or over charged for your water supply standing charge.

Check your business is receiving the domestic allowance for water, where applicable, as this can be worth up to £214 per annum. A rebate may be applicable.

Check your business has a Large User Tariff if using more than 100,000 m³ per annum.

Check your water meter readings are accurate. If different you may be being under or over charged for your water use.

Similar to water, check your actual business water meter supply pipe size and bill are the same. If different you could be under or over charged for your sewerage service.

Check your non-return to sewer allowance is accurate by considering if any of the above applies to your business. If different you could be under or over charged for your sewerage service.

Similar to water, check your business is claiming the domestic allowance for sewerage, where applicable, as this can be worth up to £336 per annum. A rebate may be applicable.

3.3 Unmeasured Charges

Check your business property NAV is accurate. If not, you could be under or over charged for your water supply and sewerage service. If you don't know the NAV assigned to the premises contact Land and Property Services (see www.lpsni.gov.uk or call **0300 200 7801** (charged at local rate) or **+44 28 9049 5794** (if calling from outside the UK).

Consider the feasibility and merits of moving to a metered supply service for your business.

3.4 Trade Effluent

Check if your business discharges trade effluent to sewer and whether you have a trade effluent consent. If your company is unsure what material is considered to be a trade effluent contact NI Water on 0845 877 0030 to discuss with a NI Water Trade Effluent Officer.

Develop a contaminant source reduction programme to minimise the strength of your trade effluent Settled Chemical Oxygen Demand and Total Suspended Solids and associated trade effluent costs.

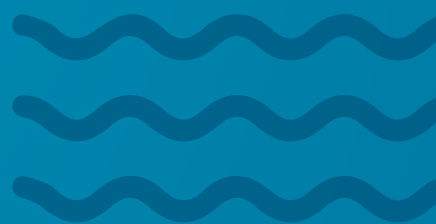
3.5 Hidden Costs

Consider the hidden cost of heated water on your site by reviewing the worked example provided and applying to heated water use on your site.



4.0 Monitoring and Targeting

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4.1 Background

A water balance is based on the simple concept that what goes in must come out. Ideally your water balance will numerically account for: the types and sources of water entering your business, where water is used within your business and how water is exiting your business.

The complexity of a water balance will generally be related to the complexity of water using activities on-site and the scale of the site. A good water balance will typically account for over 90% of water use in your business. Understanding where and how water is used in your business on a quantifiable basis will help you manage water use.

Once a robust water balance has been established your business can then design a monitoring and targeting (M&T) system to support water management over the long-term. M&T is an extensive topic so this guide only provides an introduction to the subject.

Contact the Invest NI Energy and Resource Efficiency Team if you require further advice. Please see Section 7.1 for further information on the services provided by the Invest NI Energy and Resource Efficiency Team.

'Until you can measure something and express it in numbers, you only have the beginning of understanding'

Lord Kelvin

4.2 Water Mass Balance

Step 3

Develop a water balance for your business attempting to quantify >90% of water use.

The first stage in developing a water balance is to undertake a site survey to: gather existing data on water use and costs (e.g. water, sewerage and trade effluent bills from NI Water); identify the main water using activities during a site tour and asking staff for their input; and identify where existing water meters and sub-meters exist. Once this data has been collected, bring it together in a simple spreadsheet or in a block diagram to develop the water balance.

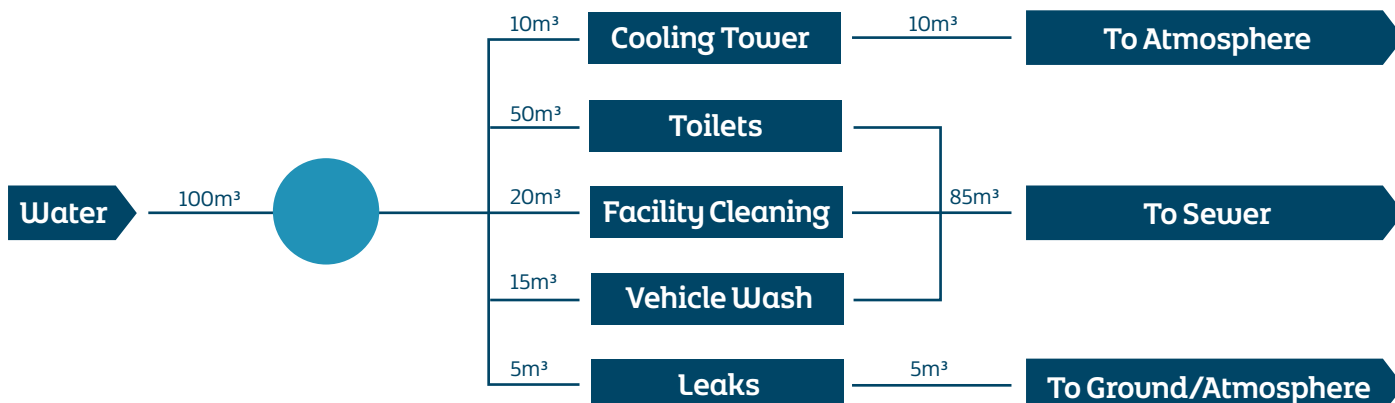
The next stage is to identify any missing data and subsequently collect this to complete the water balance. As mentioned earlier, a good water balance will typically account for over 90% of water use in your business.

If no or only limited sub-meters exist on-site consider the use of direct or indirect methods of estimating or measuring water use.

Direct methods can include the use of a portable non-intrusive ultrasonic flowmeter and datalogger to collect flows or as simple as a bucket and stop watch. Indirect methods can include using equipment manufacturer's data, estimates from process knowledge and calculations from other measurements (e.g. volume of a filled tank, etc.).

In preparing your water balance remember to consider the domestic use on site which can often be difficult to quantify due to the vast water supply network on-site.

Typical rules of thumb for domestic water use per person include: 25 litres per day per person (full-time equivalent person and no full food preparation canteen on-site) and 50 litres per day per person (full-time equivalent person and canteen on-site).



Example Water Balance

If after undertaking the above there are still discrepancies in your water balance consider the following:

Potential Issue	Opportunity for Improvement
Inaccurate Data	Check meters are suitable for use (e.g. meter specification is appropriate).
	Check meters are not faulty. Calibrate and service meters.
	Check staff are reading meters correctly. Train staff how to read meters.
Identification of Unnecessary Water Use	Walk around the site and identify continuously wet areas inside and outdoors.
	During periods where water is not used (e.g. overnight) take meter readings before and after to check for any unnecessary baseload.
	Use a leak contractor to identify underground or other difficult to identify leaks.

4.3 Monitoring and Targeting System

Step 4

Use the information in your water balance to design a monitoring and targeting (M&T) system.

M&T is a water management technique that can be applied in any type and size of company.

The purpose of an M&T system is to enable an understanding of your water consumption data; identify factors which impact upon consumption; and set appropriate targets that will allow your company to review performance.

Essentially, an M&T system will provide a baseline and ongoing performance analysis technique to support your water management activities.

The design of an M&T system should be based on the data collected during the preparation of the site water balance which will identify the major water using areas or activities as well as the areas of concern or opportunity for improvement.

Consumption data can be collected manually (through collecting meter reading data) or automatically (through the use of Automatic Meter Reading (AMR) technology). AMR technology automatically collects consumption, diagnostic and status data from water meter devices.

The benefits of a robust M&T system include:

- **Identify Inefficient Water Use:** Monitoring water use against an expected target will help to identify the unnecessary use of water because of poor control, unplanned equipment faults or human error. This data can be used to provide feedback to staff in order to raise awareness of water efficiency performance and identify areas of opportunity.
- **Quantify Improvement Projects:** Monitoring water use before and after the implementation of water efficiency improvement projects will provide quantification of the benefits of a particular water saving measure or action. Confidently communicating the success of a water saving initiative to staff and senior management will maintain their commitment to water efficiency.
- **Continuous Improvement:** Through the setting of performance targets the M&T system can help to assess what is technically feasible at site, compare against good practice benchmarks, help to set budgets and feed into strategic commitments to improving water efficiency.

The complexities and capabilities of an M&T system should be established in relation to the complexity and scale of the water using activities on-site. At its simplest level a weekly water meter reading may be sufficient through to the use of several AMR units throughout a site.

4.4 Key Performance Indicators

Step 5

Use your water balance and M&T system to identify improvement actions to eliminate or reduce water use and minimise effluent generation (strength and volume).

Measuring water efficiency performance, rather than simply water use data, will allow your company to determine objectively whether water is being used efficiently or not. By establishing water management key performance indicators (KPIs), your company can understand how changing resource inputs and production parameters impact water use, effluent generation, establish baseline water efficiency performance and track changes over time.

Typical KPI's for water management include the following:

Key Performance Indicator	Units
Water Use	m ³ per tonne of product m ³ per number of products
Effluent Strength	kg Chemical (or Biochemical) Oxygen Demand per tonne of product kg Chemical (or Biochemical) Oxygen Demand per m ³ of effluent
Effluent Generated	m ³ per tonne of product m ³ per number of products

The following simple example is provided to demonstrate how improving your water efficiency KPI can help save your business money.

Action

Consider the potential cost saving opportunity through identifying your water efficiency baseline KPI and then realising a target KPI for your industry.

Worked Example:

Based on a baseline KPI of 5 litres of water per litre of beer, Brewing Company XYZ has set a target KPI of 4 litres of water per litre of beer. Annual production set at 20,000,000 litres of beer per annum. Cost of water is based on £1.070/m³

Calculation

Current cost of water = £1.070/m³ x 5 litres of water per litre of beer x 20,000,000

Current water cost = £107,000. per annum.

Future cost of water = £1.070/m³ x 4 litres of water per litre of beer x 20,000,000

Future cost of water = £85,600. per annum.

Therefore, by improving their water efficiency from a baseline KPI of 5 litres of water per litre of beer to a target KPI of 4 litres of water per litre of beer, Brewing Company XYZ will save their business **£21,400 per annum on water costs alone!**

There are many other reference sources for KPI's for different industry sectors to include: water retailer websites, trade body publications and other publications sources (e.g. Waste and Resources Action Programme). Examples of **sector specific water efficiency benchmarks** can be found in the four sector specific supplements that accompany this guide.

Once KPI's have been integrated into your M&T system the next step is to seek improvement in water efficiency performance for your site using this data. The following actions will help to analyse the KPI data and identify opportunities to improve water efficiency performance.

Action

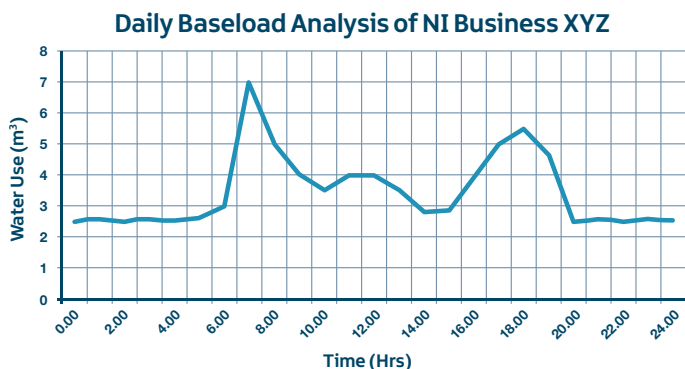
- Establish a baseline KPI for your site or a number of baseline KPI's for individual water using activities. More complex sites may require multiple baseline KPIs per water using activity.
- Establish a target KPI based on available good practice data or develop your own. Be realistic in targeting while setting a challenging target.
- Monitor the KPI over a set period of time and develop a graphical profile to trend performance over time. See Section 4.5.
- Identify if the KPI is moving towards target, and if not, establish the reason for this and implement a corrective action.
- Identify if there have been clear periods of water being used inefficiently and establish the reason. Implement a corrective action to avoid repetition of this poor performance.
- Similarly, identify if there have been clear periods of water being used efficiently. If so, what were the reasons of this good performance? Identify if adjustments can be made to maintain this good performance.
- Identify if the KPI performance varies significantly and if the variation is random or systematic. If so, identify the reason(s) for this (e.g. particular shift, seasonal issue, etc.) and identify a corrective action.
- Assess how similar time and/or production periods compare? Is there improvement being seen?

4.5 Graphical Techniques

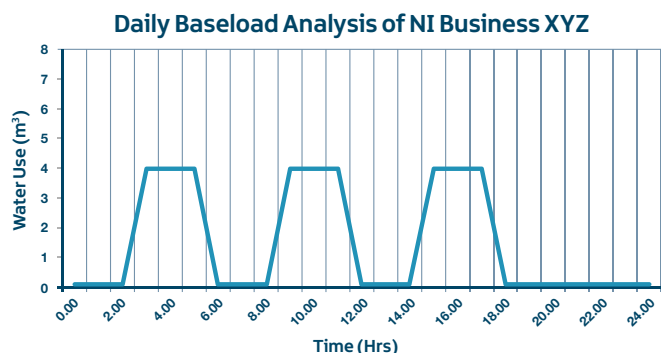
The following simple graphical techniques can be used to assist your company address the water use and KPI actions identified previously.

A simple water use line chart profile is a useful method of identifying the unnecessary use of water during unoccupied time periods. This type of data can be easily collected from AMR technology or through the use of a portable non-intrusive ultrasonic flowmeter and data-logger. Most data-loggers will allow the frequency of the data collection to be adjusted allowing detailed water profiles to be obtained.

The line chart example below shows the water profile for NI Business XYZ which operates from 07.00 to 20.00. While the chart below trends only water consumption data it can be quickly identified that there is a significant water use baseload during out-of-hours. Investigating why baseloads exist (e.g. leakage, equipment left on, etc.) can often lead to the identification of significant savings for businesses.



Attention should be paid to the location of the water meter or data collection point as many sites feed a storage tank before distributing water use to the site. If this is the case the water use profile will be of limited value as it will only show the storage tank filling operation as shown below.



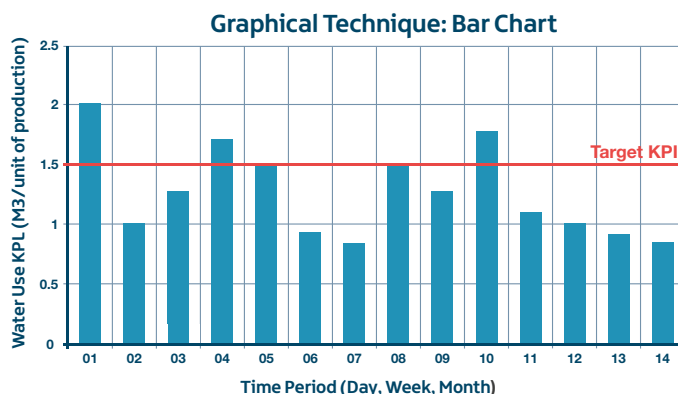
To obtain a true water use profile consider installing the AMR technology or portable data-logger after any storage tank.

Action

Develop a water profile for your daily water use and consider the following questions to identify potential water use reduction opportunities:

- Is water being used unnecessarily during out-of-hours?
- Does water use reduce during breaks?
Are staff leaving non-essential water using equipment on?
- Are there irregular spikes in water use?
If yes, identify the reasons for this.

An alternative graphical technique is to use a bar chart to monitor water efficiency performance against a target to compare performance during similar periods. The chart below quickly identifies how the target KPI was exceeded in time periods 1, 4 and 10 and the water efficiency performance was best in time period 7. By using this data to identify and then address the reasons for the water efficiency performance, your business can improve its water efficiency.





5.0 Water Efficiency Action Plan

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- 5.4 Water Saving Techniques - Other Techniques 25
- 5.5 Water Efficiency Action Plan 26



5.1 Background

Once your site has developed a robust M&T system and an understanding of water use in your business, the next step is to identify water efficiency improvement actions and to realise their benefits by implementing them.

By placing these water efficiency improvement actions in a prioritised and costed action plan, your business can compare the benefits of each against one another to assess their priority and ultimately whether your business will implement them.

Step 6

Identify water saving techniques that will allow these water saving opportunities to be realised.

There are many water saving techniques (technologies and good management practices) available in the market place which claim to reduce water use and save your business money. It is important when identifying and evaluating water saving techniques that your business understands: what budget is available for investment in the water saving techniques, the true capability and correct use of the water saving techniques, the capital and operating costs (including calibration and service) of the water saving technique and the true cost benefits of the water saving technique.

Once a decision has been made on implementing a water saving technique, it is also important to review the actual benefits of the action and to ensure any equipment is included on a preventative maintenance schedule. The following sections identify potential water saving technologies (domestic and industrial/process) and good management practices that can be used by your business to become water efficient.

5.2 Water Saving Techniques - Domestic Technologies

This section identifies potential water saving technologies to reduce water use in domestic activities and/or costs for businesses in NI.

Urinal Flush Control

There are three main urinal controllers available which use occupancy or water pressure to control water usage in urinals: non-concussive; occupancy detection; and hydraulic valve.

Non-concussive actuator: Alternatively known as a push button actuator these require the user to press a button to release the urinal flush water allowing control of the volume of water used per flush.

Occupancy Detector: These sensors use passive infrared technology to sense when a urinal has been used to control the amount of flush water used.

Hydraulic Valve: The hydraulic valve is installed in the urinal water supply pipe and remains closed while the water supply pressure remains constant. If the washroom is used then the urinal will flush.

Water Efficient Taps

There are a number of water saving taps available 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 (or even a combination of both).

Non-concussive: Alternatively known as push button taps these require the user to press a button to deliver a pre-set volume of water before self-closing.

Occupancy Detector: These sensors use passive infrared technology to activate and self-close or stop a tap.

Flow limiter: An aerated or regulated flow device inserted in the tap (pre-fitted or retrofit insert) to minimise water use.

Waterless Urinals

There are two main types of waterless urinal available which use a siphonic trap or deodorising pad. While waterless urinals will reduce water use it is important the operating/cleaning cost is considered in any investment decision. Poor management and maintenance of these devices can lead to odour problems which should also be guarded against.

Siphonic Trap: The siphonic trap operates by using a low density barrier fluid (which floats on the surface of the trap) to allow wet waste to pass through it to drain. Eventually new barrier fluid will be required which will add an operating cost to your business.

Deodorising Pad: The deodorising pad is inserted into a modified S-bend to maintain hygiene. Eventually new pads will be required which will add an operating cost to your business.

Water Efficient Showers

There are a number of water saving shower systems available 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 (or even a combination of both).

Non-concussive: Alternatively known as a push button shower these require the user to press a button to deliver a pre-set volume of water during a shower before self-closing. These are useful in high use areas such as leisure and sports centres.

Occupancy Detector: These sensors use passive infrared technology to activate and self-close or stop a shower.

Flow limiter: Generally an aerated or regulated flow device inserted in the shower (pre-fitted or retrofit insert) to minimise water use.

Efficient Toilets

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.

Retrofits: 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.

5.3 Water Saving Techniques - Industrial/Process Technologies

This section identifies potential water saving technologies to reduce industrial or process activity water use and/or costs for businesses in NI.

Flow Controllers

Many types of industrial equipment require pre-set water flow rates to operate effectively. The reality is often that equipment may be commissioned at the pre-set flowrate but due to pressure fluctuations, operator interference or the use of a poorly designed control system water is often wasted through overuse. The use of in-line process control or flow limiting technology can minimise water wastage

Process control devices can be used to automatically shut-off flows at set times or in particular situations. Automatic shut-off methods include: limit switches, signals from process controls and interlocks.

Flow limiting devices are designed to produce a constant flow of water through a product such as a tap or tap outlet, over a range of pressures. A pressure reducing valve (PRV) 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. A simple rule of thumb is for every 10% reduction in pressure achieved the flow will be reduced by ~5%. PRV's are frequently used on: the mains supply to each floor in a building, the down legs of a gravity-fed distribution system; and risers in a pumped system.

Vehicle Wash Water Reclaim Equipment

Vehicle wash water reclaim equipment is purpose-designed consisting of collection, treatment, storage and control system. Treatment usually involves filtration of the wash water to remove grease and oils and settlement to remove suspended solids. Removal of suspended solids is particularly important to prevent damage to vehicles during washing activities.

Nozzle & Spray Technology

New advanced nozzle and spray device technology is available which can reduce water use. Generally, three types of nozzle configurations are available which include: flat spray, hollow cone and full cone.

The nozzle configuration should be matched to process requirement as well as considering nozzle parameters (e.g. flow rate, spray pattern, physical and chemical properties of material to be rinsed, spray impact and droplet size). Nozzle suppliers can provide advice on the most suitable technology for your application.

For existing nozzle systems, ensure they are maintained as blocked nozzles are often removed rather than repaired and water use increases as a result.

Clean-in-Place Systems

Clean-in-Place (CIP) systems can achieve significant savings in water use through the more efficient in-situ cleaning of pipes, tanks and other process equipment. This type of technology is generally used in businesses that regularly clean vessels, pipework and fittings. As well as saving water, a good CIP system will provide substantial benefits to include: reduced cleaning chemical use, energy and labour time; opportunity to recover and re-use fluids; and improved cleanliness and hygiene.

Water Management Equipment for Mechanical Seals

Mechanical seals are leakage control devices, which are found on rotating equipment such as pumps, compressors, rotating equipment and mixers to prevent the leakage of liquids and gases from escaping into the environment. To allow seals to operate correctly, clean water is injected to provide lubrication; this is referred to as seal water. While seal water flows are typically small, they are often continuous and can result in high water use over time.

To minimise seal water use, water can be conserved by optimising seal water flow rates (many are well in excess of the manufacturer recommended settings) using a flow regulator or by recycling seal water. A selection of water management equipment is available to achieve these water conservation opportunities.

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 business for mains water to save you money.

Leakage Detection Equipment

Due to the complex and inaccessible nature of a water distribution network, it is often difficult to identify leakage without the help of leakage detection equipment. Several technologies exist for logging data, monitoring systems and identifying inconsistencies that may indicate leakage in your water distribution network.

Industrial Cleaning Equipment

In businesses in NI that have large floor areas industrial cleaning equipment is often the most water efficient method of cleaning. Two main technologies exist in this area: scrubber/driers and steam cleaners.

Scrubber/driers operate by recovering dirty wash water from the floor surface, processing it and then reusing it with dirty effluents stored in a reservoir in the machine.

Steam cleaners use high temperature steam to sterilise an area which can kill bacteria and breakdown grease without the need for chemicals.

Tamper Proof Valves

The fitting of tamper proof valves on pipes which carry water to specific processes can help eliminate the unnecessary use of water.

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 business for mains water to save you money.

5.4 Water Saving Techniques - Other Techniques

In addition to the water saving technologies discussed in sections 5.2 and 5.3, this section identifies other potential water saving techniques which can be applied to reduce water use in businesses in NI.

Staff Awareness Training

For your business to become water efficient, it is key 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 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 (PMP) to inspect and repair faulty water using equipment (e.g. overflow outlets, tanks, pipework and valves, etc.), water saving equipment as well as managing leaks and overflows in the distribution network.

Staff Suggestions

Water is generally used on the shop floor and not in the boardroom so reach out to your staff to ask for suggestions on how the business can improve its water efficiency. Consider providing an incentive for the best suggestions received and implemented.

Insulation of Pipework

Where water has picked up heat from the built environment, water is often wasted by the continual running of water 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.

5.5 Water Efficiency Action Plan

Step 7

Prepare a Water Efficiency Action Plan (WEAP) to summarise and prioritise improvement actions including a business case for each action then implement them as appropriate for your business. Regularly update your WEAP as new improvement actions are identified.

A WEAP should be a dynamic prioritised summary of your water efficiency improvement actions and include a business case for each improvement action. A suggested layout for your WEAP summary is included in Appendix B.

The priority of each improvement action will be subject to the requirements or constraints of your business but generally no and low cost improvement actions will be prioritised over medium and high cost improvement actions.

This approach will allow your business to invest the cost savings from no or low cost improvement actions into funding medium and high cost improvement actions to maximise your overall return on investment in water efficiency.

Each business case should include the following information to enable senior management to make a reasoned commercial decision on whether to implement the improvement action (a sample template is provided in Appendix C):

- Improvement action title
- Implementation cost
- Estimated annual water savings (cost and environmental)
- Estimated annual effluent or sewerage savings (cost and environmental)
- Payback period or net present value
- Description of improvement action
- Rationale for making the change
- Identification of project risks
- Next steps including supplier details (as appropriate)
- Signposting guidance

Step 8

Review and evaluate the actual improvement action benefits achieved.

Use your water balance and M&T system to record the actual benefits of the improvement action and compare against the estimated saving in the business case. This data can be used to build confidence in the true benefits of water saving techniques for your business.

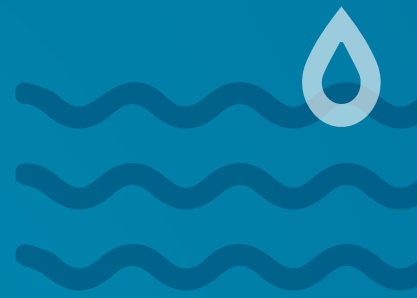
Step 9

Communicate success to staff, senior management and your supply chain to maintain their engagement.

Demonstrate the success of the water efficiency programme by showing progress on noticeboards, in staff newsletters, during meetings and your business website. **The Consumer Council for Northern Ireland, with the support of Invest NI and NI Water, has developed the 'Water Champions' award to promote those businesses demonstrating a commitment to being water efficient** (<http://www.consumercouncil.org.uk/businesses/save-money/water-bills/water-champions>). Consider promoting your success by submitting an application for the awards. Winners of the awards are announced to the media raising your credentials as a water efficient business and green supplier.

Step 10

Continually improve by returning to Step 2.



6.0 Good Practice Case Studies

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6 Good Practice Case Studies

The following good practice case study examples demonstrate the benefits implementing a water efficiency programme have already delivered to other businesses in NI.

6.1 Seagate



Seagate is a world leading electronics company specialising in data storage with a manufacturing plant in Derry. Due to the nature of electronics manufacture, the use of highly purified water is a key part of their business. Invest Northern Ireland provided them with expert water consumption support which included the following identified measures:

- Reducing treated water requirements by improving back wash efficiency for purification plants.
- Reusing water to minimise potable water consumption.
- Improving cooling tower efficiency through increased cycles of concentration.

All told, the identified measures had the potential to **save 114,051 m³ and £117,500 per year**

6.2 LacPatrick Dairies (NI) Ltd



LacPatrick, a major dairy site located in Coleraine was provided by Invest Northern Ireland with a water focused resource audit, which included the following recommendations to improve water efficiency:

- The development of a water mass balance.
- A programme of leakage repair.
- Re-use of Overflow Water in Butter Production Unit.

This was followed up with further one-to-one support for the development of the water mass balance. After receiving this support, LacPatrick Dairies successfully achieved the NI Consumer Council Water Champions Award.

6.3 Wilson's Country Ltd



Wilson's Country Ltd is a family-owned business based in Carn Industrial Estate in Craigavon. The business uses large volumes of mains water to process potatoes each week, which is then treated and discharged to sewer.

To reduce their water related costs, Wilson's identified two significant water efficiency improvement actions to include:

- Installed a new alternative groundwater (borehole) supply to minimise the amount of mains water required in the process saving £30,000 per annum and a project payback of 30 months.
- Design of a wash-water recovery project estimated to yield additional savings of £103,000 per annum and a project payback under 30 months.

6.4 Karro Food Ltd



Karro Food Ltd, formerly Vion Pork Ltd, is based in Cookstown. A large water user, the company implemented a water efficiency programme which identified £16,696 per annum of water related cost savings achieved through:

- Establishing an M&T system to identify leaks.
- Fitting urinal flush controls to toilet areas and volume reduction devices to toilets.
- Fitting trigger guns on hoses.
- Fitting movement activated hand-wash units.

6.5 Foyle Omagh Ltd



Foyle Omagh Ltd is part of the Foyle Food Group which is recognised for its production of beef and lamb. Established in 1925, the company is located in Omagh, County Tyrone.

The site is a large water user with key activities including: domestic water use, hand-wash stations, vehicle wash, cooling/chilling water, sterilisation, product and general cleaning.

Foyle Omagh Ltd was keen to improve its water efficiency to continually improve on their KPI of 1.33 m³ per animal

Annual water savings of £38,242 per annum were identified through the implementation of water saving techniques, including water efficiency training for staff, preventative maintenance and improved monitoring, charging and metering for vehicle washing.

6.6 Jurys Inn



Jurys Inn is a chain of hotels founded in Ireland. The Jurys Inn, Belfast hotel participated in the Invest NI Water Efficiency Programme in 2014. On completion of the audit at Jurys Inn, five recommendations were made on how to improve water efficiency. As a result of this, Jurys Inn reported that they have identified and implemented various water saving methods in order to help them become more water efficient.

These include:

- Installation of pressure reducing valves in each bedroom
- Requested monthly reports on water consumption as opposed to quarterly reporting
- Introduction of pre-rinse sprays in kitchens
- Further installation of valves in boiler room
- Staff training
- Flow reduction in wash hand basins

Through these water saving methods, Jurys Inn identified cost savings of £7,940 with environmental savings of 2,955 m³ of water per annum. They also successfully achieved the NI Consumer Council Water Champions Award.

As a result of the Water Efficiency Programme, Jurys Inn have taken further steps to ensure they are continually improving and striving to be more water efficient. They are soon to undergo a refurbishment and will install water saving devices in their bathrooms. Jurys Inn will continue to conduct staff awareness training and toolbox talks to reinforce the benefits of water efficiency.

6.7 Dale Farm



Following a water efficiency audit, it was recommended that in order to become more water efficient, Dale Farm should concentrate on:

- Development of a water mass balance
- Implement a monitoring and targeting (M&T) system
- Review CIP and other cleaning systems
- Improve maintenance
- Review homogeniser cooling water use

Dale Farm also received a further 5 days implementation support to develop a water mass balance and implement an M&T system. As a result Dale Farm has identified costs savings of £64,870 and environmental savings of 62,595 m³, and was awarded the NI Consumer Council Water Champions Award.

6.8 Sandvik



Following a water audit at their Ballygawley facility, the following measures were identified as being a priority for Sandvik to improve water efficiency:

- Update non-return to sewer allowance and rateable allowance
- Efficient nozzle management and leakage control during testing
- Implement an M&T system
- Rainwater harvesting investigation
- Implement water efficiency measures in toilets

Sandvik received a further 5 days implementation support to: develop a water mass balance; identify opportunities to recover or recycle process water; assess the potential for rainwater harvesting, and advice on water billing. They are undertaking a phased approach to the implementation of water saving technologies.

As a result of the above actions Sandvik has identified costs savings of £4,270 and environmental savings of 2,660 m³, and was awarded the NI Consumer Council Water Champions Award.



7.0 Signposting Data

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7 Signposting Data

The following signposting data is provided to identify key sources of information on water related matters relevant to businesses in NI.

7.1 Invest Northern Ireland Energy and Resource Efficiency Team

Invest NI is committed to supporting your business become water efficient through the use of water efficiency good practice techniques including state-of-the-art technologies. Please contact us for assistance to support your business to become water efficient.

Invest Northern Ireland - Energy and Resource Efficiency Team
Telephone: **0800 181 4422**

Invest NI offers the following support to businesses in NI:

- 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 NI business information portal www.nibusinessinfo.co.uk. Invest NI can provide tailored support to qualifying businesses to assess and reduce energy, water 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 water, 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 water, energy and raw materials.
- Invest NI can provide support for a free water efficiency audit to help identify and prioritise projects to reduce the cost of water, energy or materials in qualifying companies. These companies can also **access up to 5 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 water sources; minimising product losses; reviewing packaging requirements or use; environmental or energy management systems; equipment specification and identification of suppliers of more efficient equipment.
- Invest NI also provides “industrial symbiosis” services which generates 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 businesses already being supported by Invest NI** to purchase/install new equipment to reduce their water and materials 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 €200k of aid can be provided to any business in a rolling 3 year period.

For further information see Commission Regulation (EU) No 1407/2013 of 18 December 2013 or visit the EU Europa website www.europa.eu

7.2 Water Technology List

The Government's Water Technology List (WTL) promotes products that encourage sustainable water use and rewards businesses for investing in them. The Enhanced Capital Allowance (ECA) scheme enables you to deduct the whole cost of your investment in water-saving technologies and products from your profits in the tax year that you make the purchase. Even if your organisation is not eligible for tax relief, the WTL provides a source of information about devices that help to minimise water use.

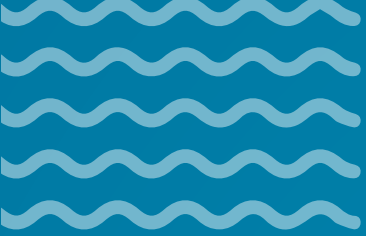
Manufacturers and suppliers that wish to include their products on the WTL must meet certain qualifying criteria. The WTL symbol can be used to promote products for sales and marketing purposes. See <http://www.watertechnologylist.co.uk> for further information and advice on the WTL.

The technologies that currently appear on the WTL include:

- Cleaning in place equipment
- Efficient showers
- Efficient taps, toilets and washing machines
- Flow controllers
- Greywater recovery and reuse equipment
- Leak monitoring and control equipment
- Meters and monitoring equipment
- Rainwater harvesting equipment
- Small scale slurry/sludge dewatering equipment
- Vehicle wash water reclaim units
- Water management equipment for mechanical seals
- Water seals
- Water efficient industrial cleaning equipment

7.3 Other Sources

Source	Description
www.investni.com	Provides information on the INI Energy and Resource Efficiency services.
www.niwater.com	Provides information on water efficiency and charging schemes.
www.netregs.org.uk	Provides information on water use and efficiency.
www.nibusinessinfo.co.uk	Provides information on water use and efficiency.
www.ciwem.org	Provides information on water use and efficiency.
www.wrapni.org.uk	Provides information on water efficiency and access to a practical guide 'Tracking Water Use to Cut Costs' to assist construction of a Water Mass Balance.
www.daera-ni.gov.uk/topics/water	Provides information on water related compliance matters.
www.consumercouncil.org.uk	Provides information on water use and 'Water Champions' award.
www.uregni.gov.uk/water	Provides information on the Utility Regulator.
www.infrastructure-ni.gov.uk/	Provides information on water and sewerage services policy.



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Appendix A

Ten-Step Process to Become Water Efficient

Step 1

Engage all staff and senior management in your water saving programme.

Step 2

Identify how much your business is paying in water and wastewater charges and also what hidden charges your business is facing.

Step 3

Develop a water balance for your business attempting to quantify >90% of water use.

Step 4

Use the information in your water balance to design a monitoring and targeting (M&T) system.

Step 5

Use your water balance and M&T system to identify improvement actions to eliminate or reduce water use and minimise effluent generation (strength and volume).

Step 6

Identify water saving techniques that will allow these water saving opportunities to be realised.

Step 7

Prepare a Water Efficiency Action Plan (WEAP) to summarise and prioritise improvement actions including a business case for each action then implement them as appropriate for your business. Regularly update your WEAP as new improvement actions are identified.

Step 8

Review and evaluate the actual improvement action benefits achieved.

Step 9

Communicate success to staff, senior management and your supply chain to maintain their engagement.

Step 10

Continually improve by returning to Step 2.

Appendix B

Water Efficiency Action Plan - Summary Template

Improvement Action Number and Title	Estimated Annual Saving			Implementation Cost (£)	Payback Period (Years)
	£	tCO ₂ e	Environmental		
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
TOTAL			m ³ (water) m ³ (effluent) m ³ (sewerage) kg COD kg TSS		

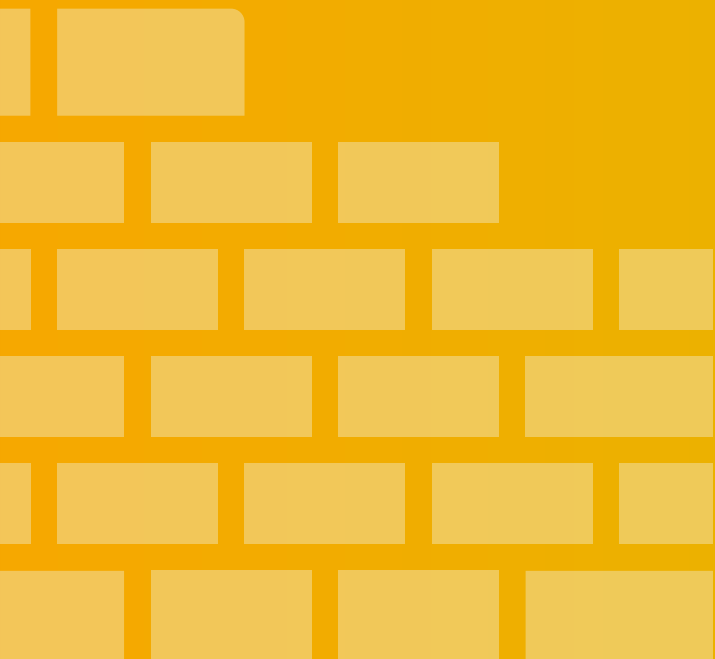
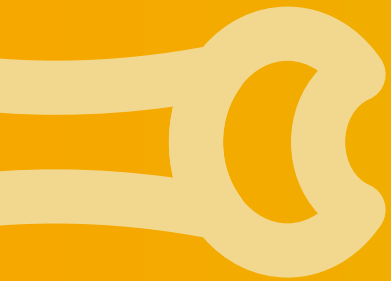
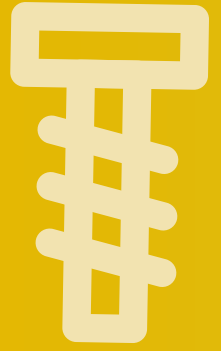
Appendix C

Water Efficiency Action Plan - Improvement Action Business Case Template

Improvement Action No: _____ Title: _____

Estimated Annual Saving			Implementation Cost (£)	Payback Period (Years)
£	tCO ₂ e	Environmental		
		m ³ (water) m ³ (effluent) m ³ (sewerage) kg COD kg TSS		
Description				
Rationale				
Project Risks				
Next Steps				
Guidance				

Construction Sector Supplement



Introduction

Reducing water use makes perfect business sense; it saves money, can enhance the reputation of a business and preserves natural resources. This Construction Sector Supplement accompanies 'A Practical Water Efficiency Guide for Businesses in Northern Ireland' (main guide) and provides information on practical water efficiency advice for the construction sector.

Background

Relatively little work has historically been carried out on water sustainability on construction sites. Water use is generally considered a relatively low priority in comparison to the focus on reducing waste and improving the carbon footprint. However, as water moves up the political and environmental agenda due to increasing pressure on water resources across the UK, this has started to change.

As well as the benefits of water efficiency identified in the main guide, the construction sector can also benefit from maximising accreditation with Environmental Assessment Schemes. Even the simple step of effectively monitoring water use on site will deliver direct benefits by helping secure credits under the Building Research Establishment Environmental Assessment Method (BREEAM), the Civil Engineering Environmental Quality Assessment and Award Scheme (CEEQUAL) or the Code for Sustainable Homes assessments.

The Strategic Forum for Construction Water Subgroup developed 'An Action Plan for Reducing Water Usage on Construction Sites' as part of a series of outputs aimed at supporting the delivery of targets set out in the Strategy for Sustainable Construction, a joint industry and government strategy. A copy of the action plan can be found at:

<https://www.greenconstructionboard.org/otherdocs/SCTG09-WaterActionPlanFinalCopy.pdf>

The Strategic Forum for Construction Water Subgroup has calculated the baseline water consumption on construction sites for 2008 against which progress against the water conservation targets can be measured. The agreed value is:

148 m³ per £million contractors output at constant (2005) price in 2008

Water Saving Techniques

- Construction Sector Focused Techniques

This section builds on those in the main guide by identifying water saving techniques to reduce water use for businesses in NI in the construction sector.

Dust Suppression (Damping Down)

Dust suppression methods range from simple pouring or spraying of water through to the use of bowzers for larger areas (e.g. roads). The use of efficient nozzle technology to create a more efficient spray pattern for dust suppression and/or the use of wetting additives will improve water efficiency of the bowzers. There are a variety of dust wetting additives available on the UK market which may help to reduce the water consumption of dust suppression activities. For example, some additives act to reduce the surface tension of dust suppression water, which increases the time taken for the water to dry out reducing the total volume of dust suppression water required.

Wheel Washing

Some drive through wheel washing systems do not recycle water. The use of a closed loop wheel wash with settlement tank and recycling system to recycle the water can improve the water efficiency of wheel washing systems. Waterless wheel cleaning systems are another innovative option that use angled steel grids to clean debris.

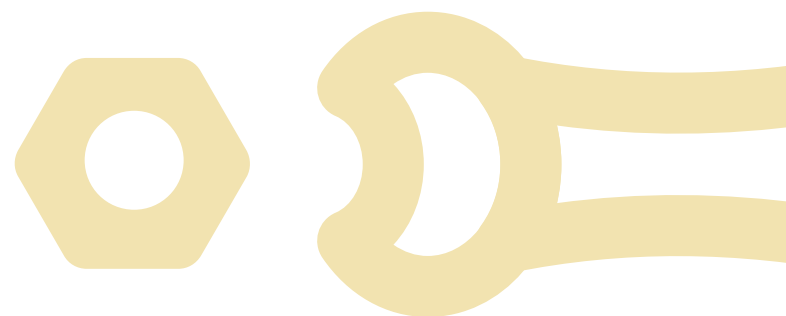
Washing Out Concrete Wagons

Main pressure hoses with basic spray patterns are water inefficient. Consider using:

- A high pressure, low volume efficient spray pattern to reduce water use;
- A specially designed sock to cover the chute, which can be an option to minimise water use, reduce spills and eliminate pollution; or
- The reuse of wash out water at concrete batching plants.

Water Use During Commissioning

High volumes of water are used during building envelope and services commissioning and testing. Advanced planning of water use during commissioning activities can maximise the opportunity for water recirculation and minimisation versus once through use. The water used for flushing building services should be isolated as soon as possible after the flush water turns clear to avoid the unnecessary use of water.



Additional Signposting Data

The following additional signposting data is provided (in addition to the sources in the main guide) to identify key sources of information on water related matters in the construction sector in NI:

www.nibusinessinfo.co.uk

Provides information on water use and efficiency.

www.consumercouncil.org.uk

Provides information on water use and 'Water Champions' award.

www.strategicforum.org.uk

Provides information on water use and efficiency including a How to Guide and Toolbox Talk Kit.

www.wrap.org.uk/construction

Provides information on water use audits on construction sites.

www.ciria.org

Provides information on water use and efficiency in the built environment.

www.waterwise.org.uk

Provides information on plumbing products that might assist with saving water on a construction site.

www.cefni.co.uk

Provides information from the NI Construction Employers Federation on a wide range of issues including the environment.



Engineering Sector Supplement



Introduction

Reducing water use makes perfect business sense; it saves money, can enhance the reputation of a business and preserves natural resources. This Engineering Sector Supplement accompanies 'A Practical Water Efficiency Guide for Businesses in Northern Ireland' (main guide) and provides information on practical water efficiency advice for the engineering sector.

Background

The Waste and Resources Action Programme (WRAP) has published a guide 'GG523 Cost-effective water saving devices and practices for industrial sites'. This guide is aimed at operators of industrial, manufacturing and engineering operations. A copy of this guide can be found at:

www.wrapni.org.uk/sites/files/wrap/GG523final.pdf

WRAP has also produced the following engineering sub-sector guide on 'GG303 Reducing water and effluent costs in PCB manufacture'. A copy of this guide can be found at:

www.wrap.org.uk/sites/files/wrap/GG303.pdf

The Environment Agency initiated a research and development project 'Optimum Use of Water for Industry and Agriculture' in 2003 to develop optimum water use values for different types of industry. This project included developing water efficiency benchmarks for the following engineering sub-sector industry types:

- electronic assemblies;
- metal finishing;
- metal processing;
- semiconductor wafer manufacture;
- steel manufacture; and
- precision engineering.

These documents can be found at

www.gov.uk/government/publications/optimum-use-of-water-for-industry-and-agricultural-dependent-on-direct-abstraction

Water Saving Techniques - Engineering Sector Focused Techniques

This section builds on those in the main guide by identifying water saving techniques to reduce water use for businesses in NI in the engineering sector.

Condensate Recovery

Condensate recovery is a useful technique to reduce water consumption in boilerhouse operations that can also lead to significant energy savings. Where possible, condensate should be collected and returned to the boiler hotwell to reduce the demand on water and energy use required to produce further steam and hot water.

Cooling Systems

Equipment that requires cooling water is often simply connected to the nearest available water supply resulting in mains water being used for cooling purposes and often on a 'once-through' basis. Fitting a closed (full or partial) loop system may allow this water to be re-used after cooling. A filter or small purge flow to drain may be required to control the build up of contaminants which may negatively affect the system (e.g. scale build-up, etc).

Automatic Shut-off

Equipment that does not require a constant supply of water can be isolated using a simple control system to minimise water wastage. Switching methods can include: limit switches, signals from existing process controls and signals from existing interlocks.

Efficient Rinsing

The water used in the rinsing of products or parts can often be minimised by using techniques such as trigger-operated spray guns or 'countercurrent rinsing'. Trigger-operated spray guns stop the flow of water when the trigger mechanism is released minimising water wastage. In countercurrent rinsing, the product or part is rinsed in tanks first in reused water and then in progressively cleaner water. At the same time, the rinse water moves progressively from the last rinse towards the first rinse.

Recycling Technology

Water used in industrial processes can often be reused after suitable treatment to remove unacceptable impurities. These treatment technologies include:

- filtration;
- clarification or sedimentation;
- centrifugation;
- flotation;
- ion exchange;
- distillation/stripping; and
- absorption/adsorption.

Additional Signposting Data

The following additional signposting data is provided (in addition to the sources in the main guide) to identify key sources of information on water related matters in the engineering sector in NI:

www.nibusinessinfo.co.uk

Provides information on water use and efficiency.

www.consumercouncil.org.uk

Provides information on water use and 'Water Champions' award.



Food & Drink Sector Supplement



Introduction

Reducing water use makes perfect business sense; it saves money, can enhance the reputation of a business and preserves natural resources. This Food & Drink Sector Supplement accompanies 'A Practical Water Efficiency Guide for Businesses in Northern Ireland' (main guide) and provides information on practical water efficiency advice for the food and drink sector.

Background

In 2013, the Waste and Resources Action Programme (WRAP) identified the total water use in the food and drink sector within Northern Ireland (NI) was 10.6 million m³ of water per annum versus 356.8 million m³ of water per annum in the UK as a whole. The breakdown of the key water using sub-sectors of the food and drink sector in NI were identified to include:

- 6.9 million m³ of water per annum manufacturing;
- 0.3 million m³ of water per annum retail; and
- 3.3 million m³ of water per annum hospitality and food service.

Research in industry identified the top five water efficiency opportunities for food and drink manufacturing businesses as:

- elimination of once-through cooling systems;
- checking water balance and fixing supply leaks;
- automatic shut-off;
- control of overflows; and
- optimising water supply pressure.

All of these water saving techniques are discussed further in the main guide. Further information on the food and drink sector through WRAP can be found at: www.wrap.org.uk/node/15637

As of 2015, water use data for the sector is collected by the Food and Drink Federation (FDF), Dairy UK and other trade associations.

There are a number of other food and drink industry initiatives and roadmaps being developed that identify key areas of focus, including water. These include:

Dairy Roadmap:

The dairy industry roadmap was launched in 2008 and developed by the Dairy Supply Chain Forum's Sustainable Consumption and Production Taskforce. Including milk processors, cheese and mixed dairies, the roadmap has set goals to improve the water efficiency of these food and drink sub-sectors. Further information can be found at: www.dairyroadmap.com

Meat Roadmap:

The meat industry roadmap was launched in 2008 and developed by industry representatives from farmers through to retailers who formed an Environmental Taskforce. The Meat Roadmap aims to give the industry the tools it needs to address a broad range of environmental issues (including water use) across the product supply chain. Further information can be found at: www.eblex.org.uk

Brewing Green:

The British Beer and Pub Association (BBPA) is the main body representing Britain's brewers and pub companies. BBPA's 'Brewing Green' commitment has a water reduction target that aims to achieve a brewing industry average of less than 4 litres of water for each litre of beer produced, a reduction of 42% by 2020 compared to 1990. This figure is based on total water use, rather than water use excluding that in product. Further information can be found at: www.beerandpub.com

Soft Drinks Sustainability Strategy:

The British Soft Drink Association (BSDA) is a national trade association representing UK manufacturers, factors and franchisors of soft drinks, including fruit juices and bottled waters. Member companies make up over 90% of the UK soft drinks industry. In 2008, BSDA launched its Sustainability Strategy which identified four key areas of focus – packaging, water, carbon and transport. Further information can be found at: www.britishsoftdrinks.com

Scotch Whisky Industry Environmental Strategy:

The Scotch Whisky Association (SWA) is the trade association for the industry. The Scotch Whisky Industry's Environmental Strategy was launched by SWA in 2009 and includes water. Further information can be found at: www.scotch-whisky.org.uk

A Better Retailing Climate:

A Better Retailing Climate is the British Retail Consortium's (BRC) voluntary initiative that sets out the environmental ambitions of a group of leading British retailers. The initiative was launched in April 2008, and food and drink retailers that have signed up to the initiative include: Asda, Fortnum & Mason, John Lewis and Waitrose, Marks and Spencer, Morrisons, Sainsburys, Tesco and The Co-operative. There are five targets including a commitment 'to measure water use in sites collectively anticipated as accounting for at least 75% of usage'. Further information can be found at: www.brc.org.uk

Retailer Initiatives:

A number of individual retailers have incorporated water reduction targets into their sustainability plans. These initiatives place a supply chain pressure on food and drink businesses in NI to improve water efficiency and include UK retailers: Asda, Waitrose, Marks and Spencer, Morrisons, Sainsburys, Tesco and The Co-operative. Further information can be found on individual retailer websites.

There are a significant number of sources available which identify **water use benchmarks in the food and drink sector**. A summary of the key performance indicators used by the main industry sub-sectors can be found in Appendix E of the WRAP publication 'Water Use in the Food and Drink Sector'.

The sub-sectors include: milk; powdered milk; ice-cream production; red meat (cattle, pig and sheep); poultry (chicken and turkey); finfish; white fish; shellfish; pelagic; beer; wine; distilleries; cider; fruit juice; carbonated soft drinks; bottled water; fruit and vegetables (strawberries, raspberries, tomatoes, lettuce, apples, onions, potatoes, brassicas, citrus, avocados and bananas).

A copy of this document can be found at (please note registration is required on the website): www.wrapni.org.uk/content/technical-report-water-use-food-and-drink-industry

Water Saving Techniques - Food and Drink Sector Focused Techniques

This section builds on those in the main guide by identifying water saving techniques to reduce water use for businesses in NI in the food and drink sector.

Membrane Separation Technology

A membrane is a thin physical barrier through which materials can either pass (the permeate) or be rejected and retained (the retentate). The structure and character of the membrane will determine the nature of separation. Membrane technology has many uses in the food and drink sector including: recovering water, concentration or purification of product and recovery of raw materials and products from waste streams. The main technologies used in the food and drink sector include:

Microfiltration

Removes particular matter from liquid streams. Common applications include the concentration of solids and water recovery.

Ultrafiltration

Separates solutes from solids, colloids, emulsions and macromolecules. Common applications include the filtration of fats and oils.

Nanofiltration/Reverse Osmosis

Separates water from water solute mixtures. Common applications include the concentration of fruit juices and water recovery.

Product Recovery Systems

A product recovery system uses an engineered plug or ball (often referred to as a 'pig') that fits inside a pipe and is pushed through by either the product itself or some other propellant (e.g. water, nitrogen or compressed air). The pig empties the pipe and removes deposits adhering to the walls. In most cases this recovered material can be reused, and as there is less contamination in the pipe, less cleaning water is used.

Pressure Washers

Cleaning can typically account for up to 70% of a food and drink sites water use. Cleaning is vital to ensure food safety but overuse by open hoses (low pressure/high volume) is common in the sector. Consider using pressure washers (high pressure/low volume) for cleaning surfaces or equipment as a more efficient method of cleaning.

Dry Conveyors or Chutes

The use of flumes or the wetting of conveyor belts can use significant amounts of water which is often directly discharged to drain. Consider the use of lubricants on conveyors or chutes to assist transfer materials in your process without the need for water. If lubricants are not appropriate or practical for your application then consider the reuse of flume water if hygiene standards allow.

Additional Signposting Data

The following additional signposting data is provided (in addition to the sources in the main guide) to identify key sources of information on water related matters in the food and drink sector in NI:

www.nibusinessinfo.co.uk

Provides information on water use and efficiency.

www.consumerCouncil.org.uk

Provides information on water use and 'Water Champions' award.

www.fdf.org.uk

Provides information on water efficiency and good practice case studies for the food and drink sector.

www.wrap.org.uk/node/15637

Provides information on water usage in the food and drink sector.

www.nifda.co.uk

Provides information to NI food and drink businesses on legislation, technology and innovation.



Tourism & Leisure

Sector Supplement



Introduction

Reducing water use makes perfect business sense; it saves money, can enhance the reputation of a business and preserves natural resources. This Tourism and Leisure Sector Supplement accompanies 'A Practical Water Efficiency Guide for Businesses in Northern Ireland' (main guide) and provides information on practical water efficiency advice for the tourism and leisure sector.

Background

The Construction Industry Research and Information Association (CIRIA) in 2006 published the document 'CIRIA C657: Water Key Performance Indicators and Benchmarks for Offices and Hotels'. This document establishes a range of water usage, sets benchmarks for better practice in hotels and offices and provides actions to reduce usage. A copy of this document can be found at:

<http://www.ciria.org/ProductExcerpts/C657.aspx>

The Watermark Project, run by OGCbuying.solutions was established in 2000 to provide benchmarks for various building categories within the public sector and enhance people's knowledge of water conservation. This project included developing water efficiency benchmarks for the following leisure related building types: libraries, museums, community centres, sports centres (dry) and golf courses. A summary of these benchmarks can be found at:

<http://webarchive.nationalarchives.gov.uk/20140328222606/http://www.environment-agency.gov.uk/business/topics/water/34866.aspx>

The Environment Agency initiated a research and development project 'Optimum Use of Water for Industry and Agriculture' in 2003 to develop optimum water use values for different types of industry. This project included developing water efficiency benchmarks for the following leisure related building types: holiday villages/parks and theme parks. A summary of these benchmarks can be found at:

<https://www.gov.uk/government/publications/optimum-use-of-water-for-industry-and-agricultural-dependent-on-direct-abstraction>

Sydney Water has developed water efficiency benchmarks for the following leisure related building types: aquatic leisure centres, clubs and hotels. A summary of these benchmarks can be found at:

<http://www.sydneywater.com.au/SW/your-business/managing-your-water-use/benchmarks-for-water-use/index.htm>

The Waste and Resources Action Programme has published a guide 'GG522 Cost-effective water saving devices and practices for commercial sites'. This guide is aimed at a number of commercial organisations including: hotels, leisure and community centres. A copy of this guide can be found at:

<http://www.wrapni.org.uk/sites/files/wrap/GG522final.pdf>

Water Saving Techniques

- Tourism and Leisure Sector Focused Techniques

This section builds on those in the main guide by identifying water saving techniques to reduce water use for businesses in NI in the tourism and leisure sector.

Grounds Maintenance

Minimise the amount of water used for grounds maintenance by considering:

- planting drought tolerate plants (e.g. holly, geraniums, etc);
- 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.

Kitchens/ Catering Areas

Minimise the amount of water used in the kitchen and catering areas by considering:

- 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
- when buying new machines consider water efficiency by looking for water use information on the European Water Label.

Laundry

Minimise the amount of water used in the laundry by considering:

- operating washing machines on full loads and at minimum temperatures; and
- when buying new machines consider water efficiency by looking for water use information on the European Water Label.

Swimming Pools

Minimise the amount of water used in the swimming pool by considering:

- checking if the automatic water top up system is functioning correctly and not overfilling the pool; and
- optimising the swimming pool halls' 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.

Additional Signposting Data

The following additional signposting data is provided (in addition to the sources in the main guide) to identify key sources of information on water related matters in the tourism and leisure sector in NI:

www.nibusinessinfo.co.uk

Provides information on water use and efficiency.

www.consumercouncil.org.uk

Provides information on water use and 'Water Champions' award.

www.green-tourism.com

Provides information on water efficiency case studies.

www.europeanwaterlabel.eu

Provides information on a water-efficiency labelling scheme which provides an easy means to identify water efficient products.



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

Invest NI Equality Team

T: 028 9069 8273

Text Relay Number: 18001 028 9069 8273

E-mail: equality@investni.com



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