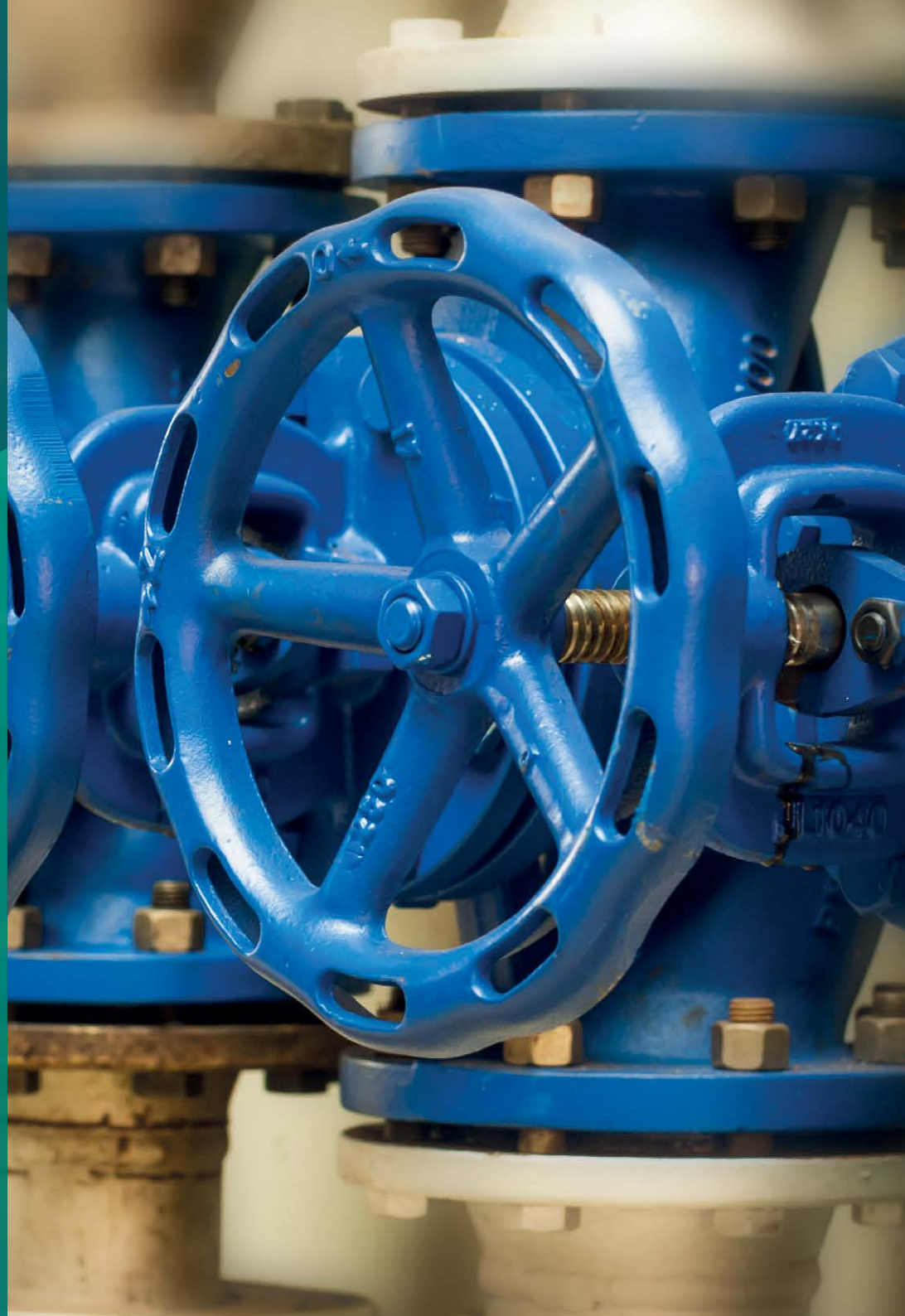
Water Target Guidance

Pathways to Water Conservation

BORD BIA
IRISH FOOD BOARD

Origin Green
IRELAND



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Origin Green IRELAND

1 Introduction

> "Water is one of the most essential resources on earth, critical for human health, the production of food and for industrial activity. The provision of clean drinking water and the disposal of wastewater in a manner that protects the environment is vital to our daily lives, and for economic and social development."
>
> **Irish Water Business Plan 2015-2021[1].**

The **Irish Water Water Stewardship Programme** states the following:

- **Only 1% of the water on our planet it is available to drink.**
- **Infrastructure is running at high risk and about half of treated water is lost through leakage.**
- **Summer drought of 2018 highlighted that we need to work together to protect our precious water.**
- **Ireland's population is prospering & growing, placing greater strain on infrastructure.**

Sourcing and investing in an energy efficient process, equipment and controls is an obvious part of every business's operation and cost control strategy, but the same is often not true for water and wastewater. Water is however a precious and costly resource that is just as important to conserve.

It can be easy to take water for granted when living in Ireland, as there seems to be plenty of rain and clean, safe water is readily available. However, the water from the mains supply is processed and we don't have an unlimited supply – in fact, only 2.5% of the world's water is fresh water, and only 1% of freshwater is easily accessible[2].

Mains, or town, water is extracted from rivers, reservoirs and boreholes around the country. There are around 900 water treatment plants in Ireland producing 1.6 billion litres of potable water (water that is safe to drink) and distributing it through 60,000km of pipelines. This infrastructure is running at high risk, with around 30% of treatment plants considered at risk of failure and about half of treated water is lost through leakage[3].

Wastewater must be collected and treated before it is returned to the environment or business users like Origin Green companies. There are around a 1,000 treatment plants in Ireland. These treatment plants use energy, chemicals and other resources to treat and be able to return the water to businesses therefore our demand on these services have an indirect environmental impact. The additional requirement of inefficient plant and equipment used in food and drink manufacture is then a burden that the system is ill-equipped to carry.

1 Irish Water Business Plan; Transforming Water Services in Ireland to 2021, Irish Water. https://www.water.ie/docs/Irish-Water-Business-Plan.pdf

2 "Freshwater Availability." Liquid Assets: How Demographic Changes and Water Management Policies Affect Freshwater Resources, by Jill Boberg, 1st ed., RAND Corporation, Santa Monica, CA; Arlington, VA; Pittsburgh, PA, 2005, pp. 15–28. JSTOR, www.jstor.org/stable/10.7249/mg358cf.9

3 Water Services Strategic Plan, Irish Water. https://www.water.ie/docs/WSSPContentsExecSummary.pdf.

2 Water Use in your Organisation

A critical step is to begin to identify some basic aspects of water use in your organisation by considering the following questions.

When answering the final question consider the following typical water uses in a business as a starting point. A walkover of each site to observe water use and speaking with key staff will help inform this.

Thereafter your organisation can consider does it manage water use in these areas and plan to become more efficient on its sustainability journey.

Questions

How is water supplied to your organisation?
Do you have one or multiple mains water supplies? Do you have alternative water supplies such as water abstraction (boreholes, surface water) or rainwater harvesting supply etc.

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, land/groundwater, etc.)?

How is water use measured in your organisation?
Do you have water bills based on actual or estimated readings? Do you or Irish Water record water use by meter on a regular basis to better understand water use in your organisation?

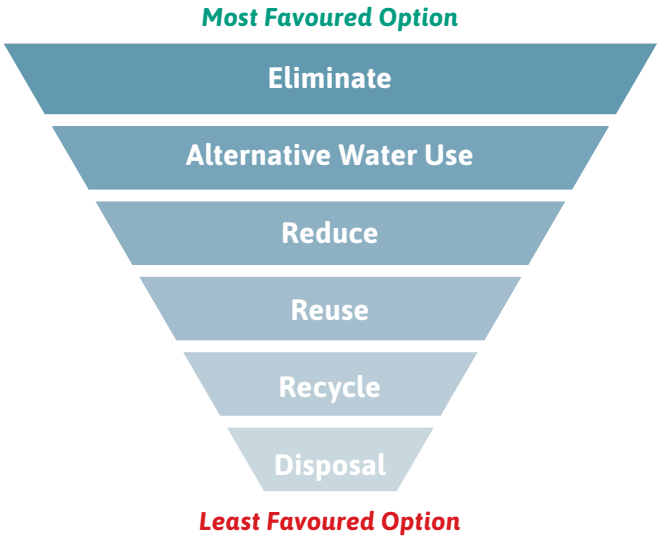
Where is water used in your organisation?
Consider both domestic and process, inside and outside your facilities.

Typical Water Uses and Wastewater Sources in Origin Green Members

Flushing toilets and urinals	Cooking vessels
Washing hands (toilets and handwash stations)	Boilers for raising steam and/or hot water
Showers	Use in products (Ingredient) or chemicals
Canteens and drinking water	Rinsing products
Washing vehicles	Transferring raw materials
Primary production (irrigation) or landscaping	Cooling, refrigeration
Humidification	Washing process areas
PPE/boot wash	Ice machines
Domestic wastewater	Production trade effluent
Hygiene wash-down trade effluent	

3 Introduction to a 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 sustainable water management. 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. Origin Green members that apply the water management hierarchy to their water using activities will improve their water efficiency.



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

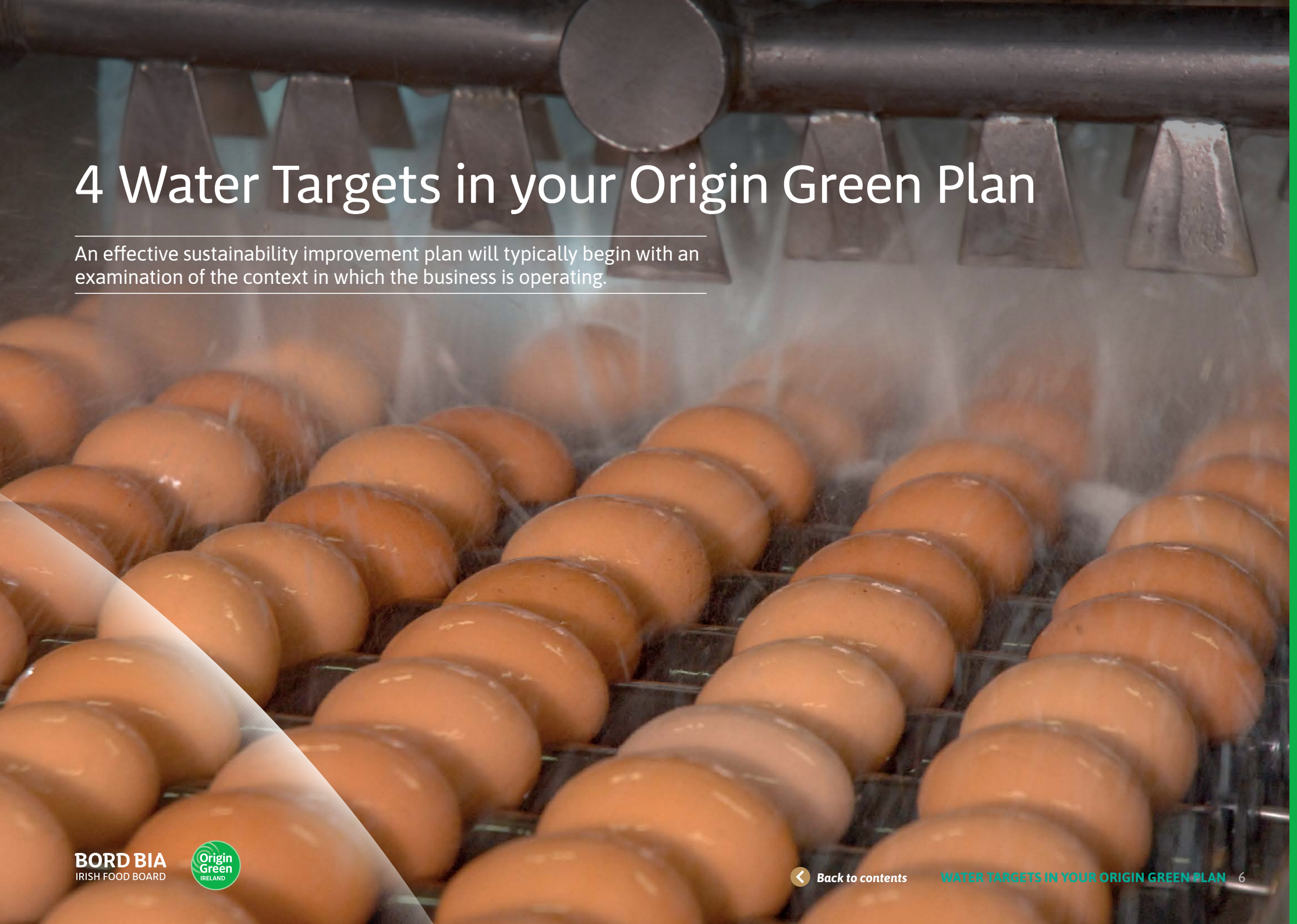
The main types of alternative water include:

Borehole Water	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 for reuse.

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.

4 Water Targets in your Origin Green Plan

An effective sustainability improvement plan will typically begin with an examination of the context in which the business is operating.



4 Water Targets in your Origin Green Plan

4.1 Setting Strategic Targets

An effective sustainability improvement plan will typically begin with an examination of the context in which the business is operating. By understanding the internal and external forces which shape their decisions a business can begin to understand what factors of success they influence and which they are influenced by. Important questions of context to ask when considering strategic goals are more open and focus on connecting the current operations to the vision of the business at a future date, such as:

- **What are the strengths and weaknesses of the business / business model?**
- **What resources do we have and are likely to have available?**
- **Where is the market moving toward?**
- **Are we exploiting existing technology fully and what new technologies might become available?**
- **Is it possible there will be changes to the regulations we operate under?**

An effective strategic plan will identify those external factors which the business is influenced by but has little influence over to reduce them. For example, a business may use a specific raw material which it has begun to be recognised as environmentally damaging. The strategic plan will recognise there is little the business can do to reduce the harm and prompt a search for an alternative raw material.

With an understanding of the current context and the desired future status, a business can describe in practical terms the work which needs to be done to connect them. The business will also be able to identify those aspects of their products, processes, location or community from which it can derive/provide most value.

4.2 Key Considerations From a Management Perspective

Does the targeted change align with the business strategy?
For instance, if the water improvement target set conflicts with planned growth in sales of a more water intensive product line the target and initiatives may be revised and strengthened. Environmental sustainability is important but the social and economic expectations of the business must also be considered.

Who will be responsible for the project?
Do they have the required authority, competence and resources (financial, human and/or technological) to manage the target and deliver on associated initiatives?

How will the change be managed, especially if the change is part of a wider programme?
What internal and external resources are required; have the effects been discussed (change management) across the business to look for potential risks or related opportunities; are there particular scheduling commitments or deadlines to be met?

How will you engage staff and management with the target?
How will you motivate staff and encourage ownership of the target and maximise the chance of success?

Who outside the business needs to be involved in the target or have the results communicated to them?
Do you need to consult certain departments, suppliers, regulators or other stakeholders to ensure the achievement of the target, or could you draw on their input and expertise as partners?

4 Water Targets in your Origin Green Plan

4.3 Ensure Targets are SMART

The SMART acronym encourages targets to be set appropriately and better enables companies to achieve sustainable outcomes.

S **Specific.** The target should be defined as clearly as possible, using simple terms and directed to significant water consumption areas and/or areas of potential significant improvement. Good targets are unambiguous.

M **Measurable.** The means of monitoring (manual or automatic meter reading, bills) should be identified and the unit of the metric confirmed e.g. are you measuring in litres or cubic metres (1 cubic metre = 1,000 litres) and normalising by kg, tonnes, litres of production output. This unit will be the basis of the established baseline. See **Section 4.4** on selecting water target metrics. Consider how water savings from implemented initiatives could be calculated (e.g. sub-metered, water balance) to understand its effectiveness and whether further roll out or review of the initiative is necessary.

A **Achievable.** An improvement target should be based on a sound understanding of your current solutions and the potential for change. The business should consider setting ambitious targets that motivate and inspire the company to demonstrate leadership in their sector however this should be balanced by what is achievable. Where practicable the following approach is recommended to set an achievable target;

- *Identify potential initiatives across the company discussing opportunities both behavioural and engineered solutions (controls, maintenance/servicing, equipment upgrades) where water is used and wastewater created. Include representatives involved with production/ operations, facilities/maintenance, purchasing/finance, trusted suppliers of equipment etc. and consider how you capture 'ideas' from the wider workforce e.g. a suggestion box in the canteen.*
- *Calculate potential water savings from these proposed initiatives making note of estimates whilst being conservative with savings where uncertainty lies.*
- *Discuss with management what priorities are e.g. no/low cost initiatives in year 1, capex initiatives in year 2 with a simple payback within a desired period or larger capex investment projects where life-cycle cost analysis has been applied to obtain the true benefit over the lifetime of the change/asset.*
- *Total the potential savings of all proposed initiatives for the plan to calculate your Plan water target. Then consider annual milestone water targets based on the likelihood of implementation of the initiatives across the Plan period.*
- *A quantified target such as **a 20% water use reduction normalised against production output (litres water/litres product) over a 5 year plan** period could either be split into 4% reduction each year or based on planned initiative implementation e.g. 8% year one, 6% year two, 2% years three, four and five.*

It is not recommended to set an improvement target without a reasonable understanding of the initiatives you will undertake and how they will contribute to achieving the target.

R **Responsibility.** Assigning responsibility is critical to drive progress, reporting and changes where the target and/or initiatives are not being delivered as planned. Staff without sufficient authority or resources to drive change cannot be expected to achieve targets assigned to them. Delegating a responsible person per initiative is a requirement of the Origin Green Programme. If the company is lacking in an available resource then a training initiative may help resolve this issue.

T **Time-bound.** Every action in business should have a deadline. Progress towards a goal will be more consistent and likely if those responsible for it have a clear sense of the deadlines against which their progress will be assessed. Milestone targets for each Plan year are expected to ensure appropriate reporting.

4 Water Targets in your Origin Green Plan

4.4 Selecting Water Target Metrics

It is a requirement that your Origin Green water target has an appropriate metric (a key performance indicator) which will allow your company to determine objectively whether your water target is being met as planned and whether water efficiency is improving or not. Typically water use is normalised against the main influencing factor (for Origin Green members this is most commonly production output units), rather than simply measuring absolute water use data. This should ideally be production units rather than sales given produced units could be stored for a period before being sold impacting the usefulness of the sales based KPI. The table below details typical water target metrics.

You must decide what is a useful period to record and compare your KPI e.g. daily, weekly, monthly or quarterly dependent on your use and performance. Organisations most typically profile their monthly KPI to identify improving and worsening performance.

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.

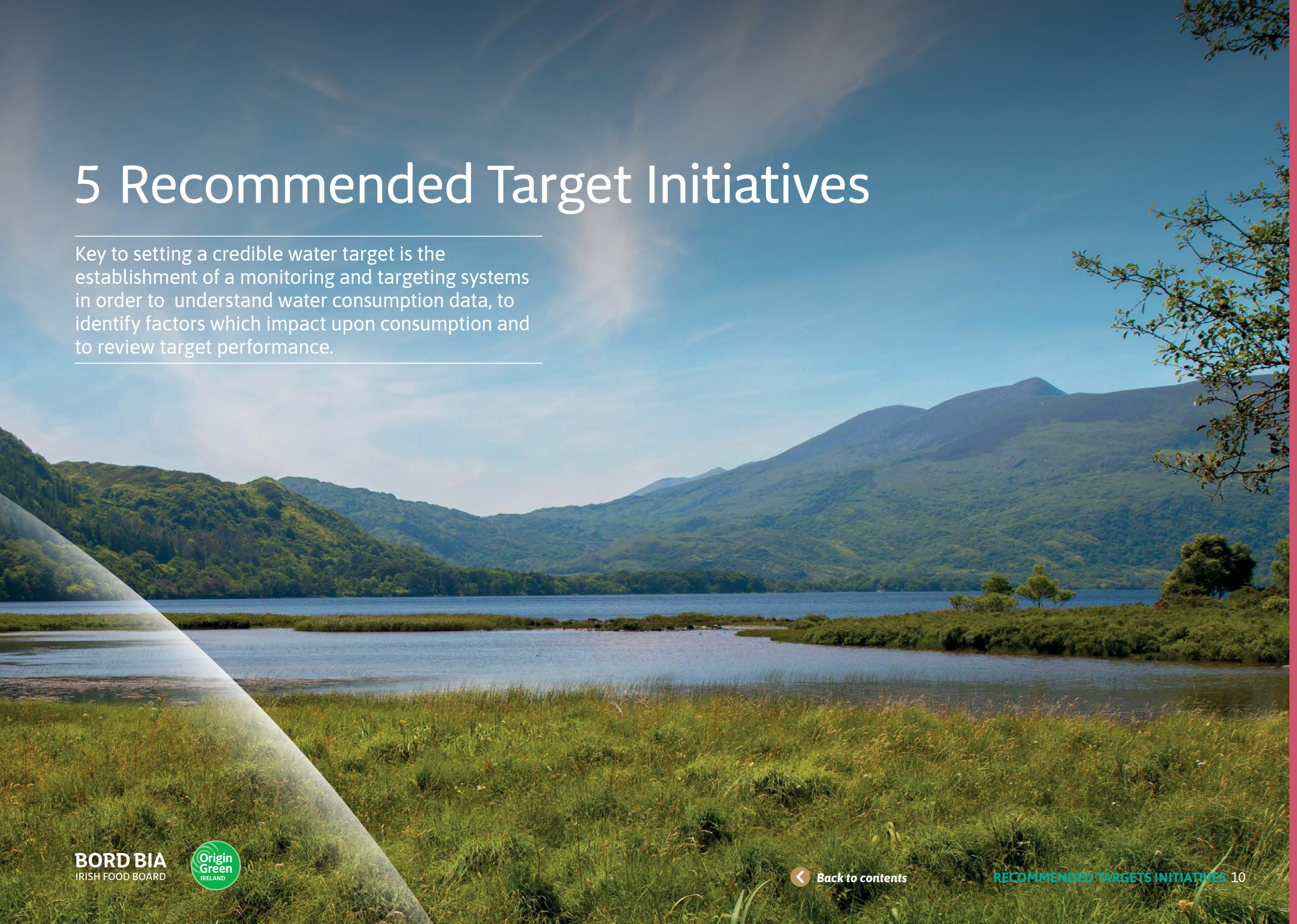
4.5 Changes to Water Targets

Targets and associated initiatives can be amended where clear justification is provided. For instance where an Origin Green member's production customer orders change from larger batches of production to smaller, varied production batches, this may increase water-based cleaning requirements between batches. In other words the baseline and targeted performance may require amendment to remain a SMART target. Changes to baselines and targets are permitted where there is clear justification for the decision provided.

Key Performance Indicator	*Units*
Water Use *(Note: 1 metre cubed (m^3) is equal to 1,000 litres)*	m^3 per tonne of product produced litre water per litre product produced m^3 water per total number of products litres water per staff member per working day *(outsource/no production e.g. administration activities)*
Effluent Strength	kg Chemical (or Biochemical) Oxygen Demand per tonne of product kg Chemical (or Biochemical) Oxygen Demand per m^3 of effluent mg of pollutant/litre wastewater *(more typical in effluent discharge consent limits)*
Effluent Generated	m^3 per tonne of product m^3 per number of products

5 Recommended Target Initiatives

Key to setting a credible water target is the establishment of a monitoring and targeting systems in order to understand water consumption data, to identify factors which impact upon consumption and to review target performance.



5 Recommended Target Initiatives

5.1 Monitoring and Targeting

Monitoring and Targeting (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 an 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 usage 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 complexities and capabilities of an M&T system should be established in relation to the complexity and scale of the water usage 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.

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

- **Is water being used unnecessary 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.**

5.2 Water Mass Balance

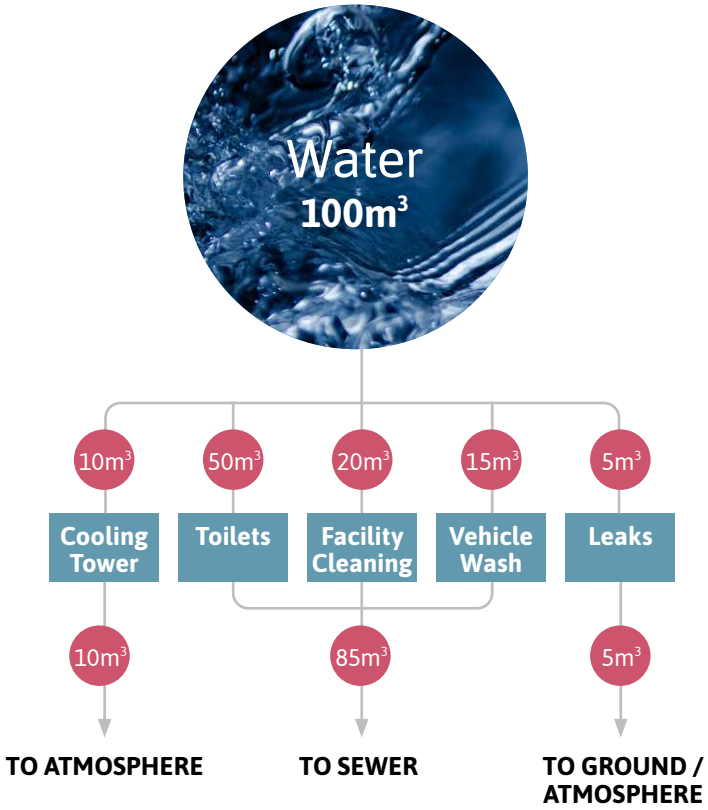
The first stage in developing a water balance is to undertake a site survey to: gather existing data on water use and costs (e.g. water, sewerage and trade effluent bills from Irish Water); identify the main water usage activities during a site tour and asking key staff for their input; and identify where existing water meters and sub-meters may 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. 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 then 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 a data logger 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).

5 Recommended Target Initiatives

5.2 Water Mass Balance continued



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.

5 Recommended Target Initiatives

5.3 Staff Training & Water Efficiency Awareness

To help support your company improve water efficiency, it is key your staff are aware of how to perform their role by using and maintaining water saving techniques, controls and equipment. As well as including water efficiency awareness 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 initiatives involved to meet the set milestone and overall plan targets. Examples of awareness raising could include;

Turning off water consuming equipment when not in use (if approved by production/operations management). Spot checks at break and end of shift periods to identify where awareness is required.

- **Encourage a culture of leak or fault reporting to fix the issue quickly**
- **Promoting dry cleaning equipment/techniques before water-based cleaning**
- **Training in correct use of power-washer equipment to optimise wet cleaning time**
- **Awareness of correct dilution rates for cleaning chemicals**
- **Covering cooking vessels to limit water loss through evaporation**

5.4 Preventative Maintenance Programme

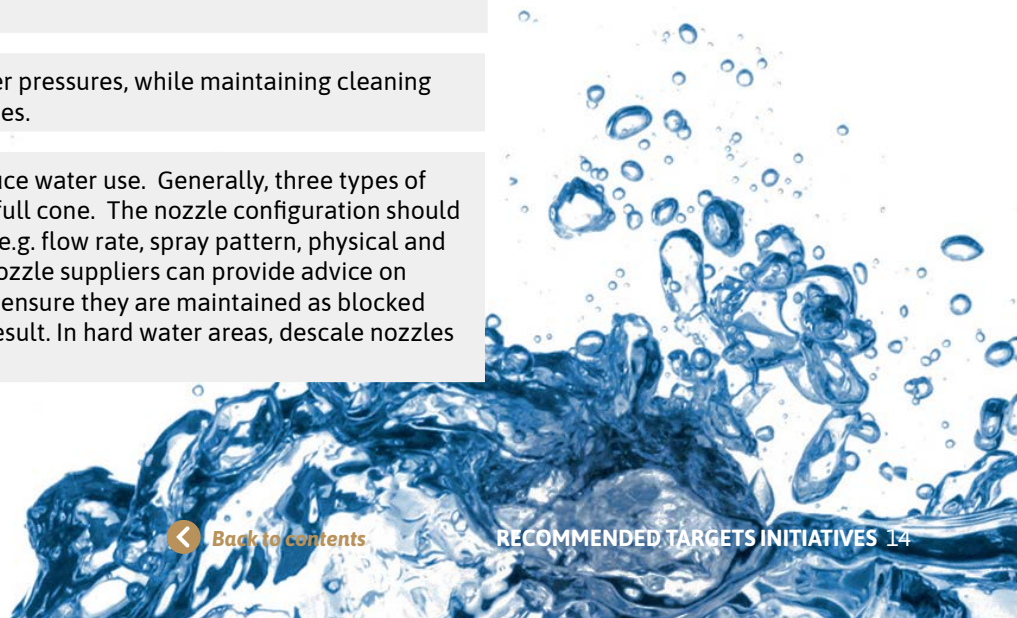
Implement a preventative maintenance programme (PMP) to inspect and repair significant water using equipment faults (e.g. overflow outlets, tanks, pipework and valves, etc.), water saving equipment as well as managing leaks and overflows in the distribution network.

5 Recommended Target Initiatives

5.5 Water Saving Initiatives for Food/Drink Production

This section identifies potential water saving technologies to reduce industrial or process activity water use and/or costs for Origin Green members. Note that equipment and controls can improve over time with innovations developed by equipment manufacturers. It is recommended that the organisation regularly engages with their equipment manufacturers and servicing providers to understand improvements available for their process and sub-sector.

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.
High Pressure Washing	Consider using high-pressure jets and sprays. New designs also operate at lower pressures, while maintaining cleaning and hygiene requirements. Pressure washers use up to 60% less water than hoses.
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. In hard water areas, descale nozzles each month.



5 Recommended Target Initiatives

5.5 Water Saving Initiatives for Food/Drink Production continued

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 food and drink 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. Use of final rinse water as pre-rinse. Recovery of final rinse water for re-use as pre-rinse, reducing water use per CIP cycle. Membrane treatment of process effluent can produce suitable quality of water for CIP use.
Pigging Systems	Product recovery can be achieved by using a pig, which is typically an engineered plug or ball that fits inside the pipe and is pushed through by the product itself or by some other propellant (such as water, nitrogen or compressed air). More recently, pigs made from ice or ice slurry have been used to clean pipework. Using a pigging system instead of water means you can recover product left in the pipework as well as saving water. Cleaning after product recovery produces low-strength wash-water, which will reduce effluent loads and disposal costs. It may also avoid the use of an on-site effluent treatment plant prior to disposal to sewer. Furthermore, the cleared pipework should require considerably less effort to clean. In some cases, it may not require any additional cleaning.
Industrial Cleaning Equipment	Businesses that have large floor areas industrial cleaning equipment is often the most water efficient method of cleaning. Two main technologies exist in this area to include: 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.
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.

5 Recommended Target Initiatives

5.5 Water Saving Initiatives for Food/Drink Production continued

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.
Steam Condensate Return	If the facility has a steam supply, collecting condensate for re-use (usually return to the boiler hot well) saving water but also energy costs through heat recovery.
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. It is common to use a third-party for this competent in the use of this leak detection equipment and calculations.
Production Scheduling / Lean Manufacturing	Water use for wash downs between line changes can be significantly reduced with smart production planning. This should be discussed with production management. Lean manufacturing can result in efficiencies such as reduced off-spec/wasted product which in turn means improved water efficiency. The knock-on benefits to water efficiency should be discussed during lean manufacturing changes/projects, quantified and included in the Plan where appropriate.
Cooling Water Reuse/Recirculation	Where mains water is used for cooling once only, consider recirculating cooling water and cooling it with an air blast cooler, refrigeration unit or cooling tower. Consider other sources of cooling water – process quality water and borehole, river or canal water. You could also re-use cooling water as feed water or make-up water in other equipment.
Greywater Recovery and Reuse Equipment	Greywater is the wastewater from showers, wash-basins or laundry activities. 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 Recommended Target Initiatives

5.5 Water Saving Initiatives for Food/Drink Production continued

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.
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.
Sub-sector specific opportunities	There are many sub-sectors in the food and drink industry which will offer opportunities around plant and controls associated with that particular process. This guide cannot list all such opportunities therefore it encourages readers to reach out with organisations in their sub-sector to share successes and lessons learnt in their water saving journey. This promotes collaboration and confidence in technologies and behavioural change initiatives.

5 Recommended Target Initiatives

5.6 Water Saving Initiatives for Domestic Water Use

This section identifies potential water saving technologies to reduce water use in domestic activities and/or costs for Origin Green Members. Domestic water use is common in non-production areas such as offices, canteens, toilets and changing rooms. Often overlooked, there are typically no/low cost initiatives that are easily implemented for consideration.

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: Generally an aerated or regulated flow device inserted in the tap (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.
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.

5 Recommended Targets Initiatives

5.6 Water Saving Initiatives for Domestic Water Use continued

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 and 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.

5 Recommended Targets Initiatives

5.7 Wastewater Management Techniques

In addition to the water saving technologies discussed, this section identifies wastewater management techniques which can be applied to reduce wastewater strength and costs for Origin Green members.

FOG Traps	FOG stands for fats, oils and grease and originate from food products such as butter, lard, vegetable oils, animal fats, meats, sauces and dairy products. They are generated during the preparation of food and from any cleaning/washing up processes. If you are operating to best practice, you should already have a grease trap or grease removal unit(s) fitted at your business premises. It's important to ensure this trap/removal unit is the correct size and is kept fully serviced in accordance with manufacturer's recommendations.
Dissolved Air Flotation – Wastewater Reuse	Removal of suspended solids material, fats and oils that may be recycled (e.g. using anaerobic digestion), energy recovered (e.g. in an energy-from-waste plant), and treated water used in low-grade water-use applications (e.g. vehicle or yard washing).
Membrane Separation Equipment	A membrane is a thin physical barrier through which materials can either pass (the permeate) or be rejected and retained (the retentate). Apart from recovering water, they can be used to concentrate or purify product and recover raw materials and product from waste streams.

Further Support and Information

6.1 Irish Water

Irish Water runs a **water stewardship training programme** to support their business customers with training on how to lower water consumption and reduce operating costs while protecting the environment.

Course outline:

Module 1: Introduction to water stewardship - the business case

Module 2: Water mapping of your business

Module 3: Water conservation and quick wins at your site

Module 4: Developing a strategy and action plan

Save water and money - The programme will provide you with the knowledge and skills to reduce water consumption and operating costs at your site.

Protect the environment - You will learn the key principles of water stewardship and the actions required to improve your environmental performance.

Optional workshops/webinars - Mentoring and support for the development of your Water Charter as well as providing peer to peer learning opportunities.

Develop a water charter for your site assessment – The charter will capture the business case for action, your site's water map, water saving opportunities and an agreed action plan. To achieve certification, participants will be expected to present this charter to senior management and get approval for implementation.

Water Stewardship Training Benefits

- **Achieve international best practice certification. The programme is accredited by the European Water Stewardship Standards (EWS).**
- **Funded Programme by Irish Water and the Lean & Green Skillnet with the support of Skillnet Ireland and the Department of Education and Skills.**
- **The programme is the first of its kind globally and is fully supported by the EPA, Origin Green, BIM and Enterprise Ireland.**
- **Origin Green accepts their certification as part of the annual verification process.**

How to register?

http://www.smartwater.ie/certified-water-steward

6.2 The Large Water Users Community of Practice (CoP)

The Large Water Users CoP provides a platform for global organisations and leaders to exchange new ideas and foster new thinking around the most pressing water-related challenges of today. The Community of Practice initiative was established in December 2013 with support from the Environmental Protection Agency (EPA) under the STRIVE Programme: 2013 Green Enterprise Call.

Quarterly Meetings attended by members focus on the sharing of best practice, highlighting the value of the network as a forum for water management challenges to be shared and discussed in an open and collaborative manner across organisational boundaries.

The EPA, Irish Water, Enterprise Ireland and IDA Ireland are currently all active participants in the quarterly group meetings, ensuring the initiative remains complementary to other national initiatives while providing a mechanism for greater awareness and dialogue around the shared challenges facing all stakeholders.

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