

water

Looking forward Thinking ahead



Our Mission
Remove

2 million

tCO₂
emissions
EVERY YEAR
BY 2030

Who is **deta**

Our team of engineers and project managers are experts in decarbonisation, water, process improvement and sustainability.

Working with clients across Australasia we have helped businesses develop strategies, business cases, and implement capital projects to reduce emissions and operational costs, across all sectors.

It's not just the technical expertise that makes DETA different, it's our collaborative approach to projects that makes our team so successful in delivering real outcomes.

Through our work across New Zealand, Australia and the Pacific Islands we have found many organisations wanting to make changes but struggling to get a foothold amongst competing interests both internally and externally. In the interests of a collectively better future we have put together our guide to understanding Water Roadmaps, helping you start your journey of sustainable action for your business.

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Introduction

Why Develop a Water Roadmap?

Water's role in society varies from a basic component to an essential input and requires effective management to ensure its supply as a renewable resource. Developing a Water Roadmap is more than resource management - it's about de-risking your business for the future.

Increasing awareness of the impact human activities have on our waterways is sparking a reform of water management across the globe. Political and social pressures are causing governing authorities to change regulations, impacting business's legal and social license to operate.

New freshwater regulations are broadening consent processes to now consider a wider range of social and environmental factors, and requirements for water-take monitoring and reporting are increasing.

The need for a Water Roadmap can arise from any combination of driving forces, however changing regulations will be the primary driver in the near future. Early engagement with councils will ensure the most critical water risks are addressed by your organisation.

It is about:

- 1. Building** business resilience
- 2. Reducing** business costs
- 3. Developing** reputation and reinforcing credibility
- 4. Driving** innovation
- 5. Fiduciary** responsibility of the Board
- 6. Creating** value
- 7. Sustaining** competitive advantage

Overall, it is about understanding what strategies we can put in place now to ensure our businesses are still providing value to stakeholders in the future.

The purpose of this guide:

Help organisations create a strategic focus and clear methodology to gain momentum in this space.

We have broken down the key stages in developing a Water Roadmap, looking at:

- 1.** What is required for each step?
- 2.** What are potential roadblocks and common questions that arise?
- 3.** What support can DETA offer?

Risks to Business

Physical Risks

- ▶ water scarcity
- ▶ flooding
- ▶ pollution
- ▶ climate change



Reputational Risks

- ▶ risk to brand value
- ▶ risk to customer loyalty



Regulatory Risks

- ▶ more stringent withdrawal and discharge limits
- ▶ non-renewal of consents
- ▶ increased costs of operation
- ▶ prosecution
- ▶ additional requirements such as monitoring



How can we help?

Our expertise in water efficiency spreads broader than just water reduction, with experience in yield recovery from waste water, hazardous waste stream optimisation and water mitigation strategies.



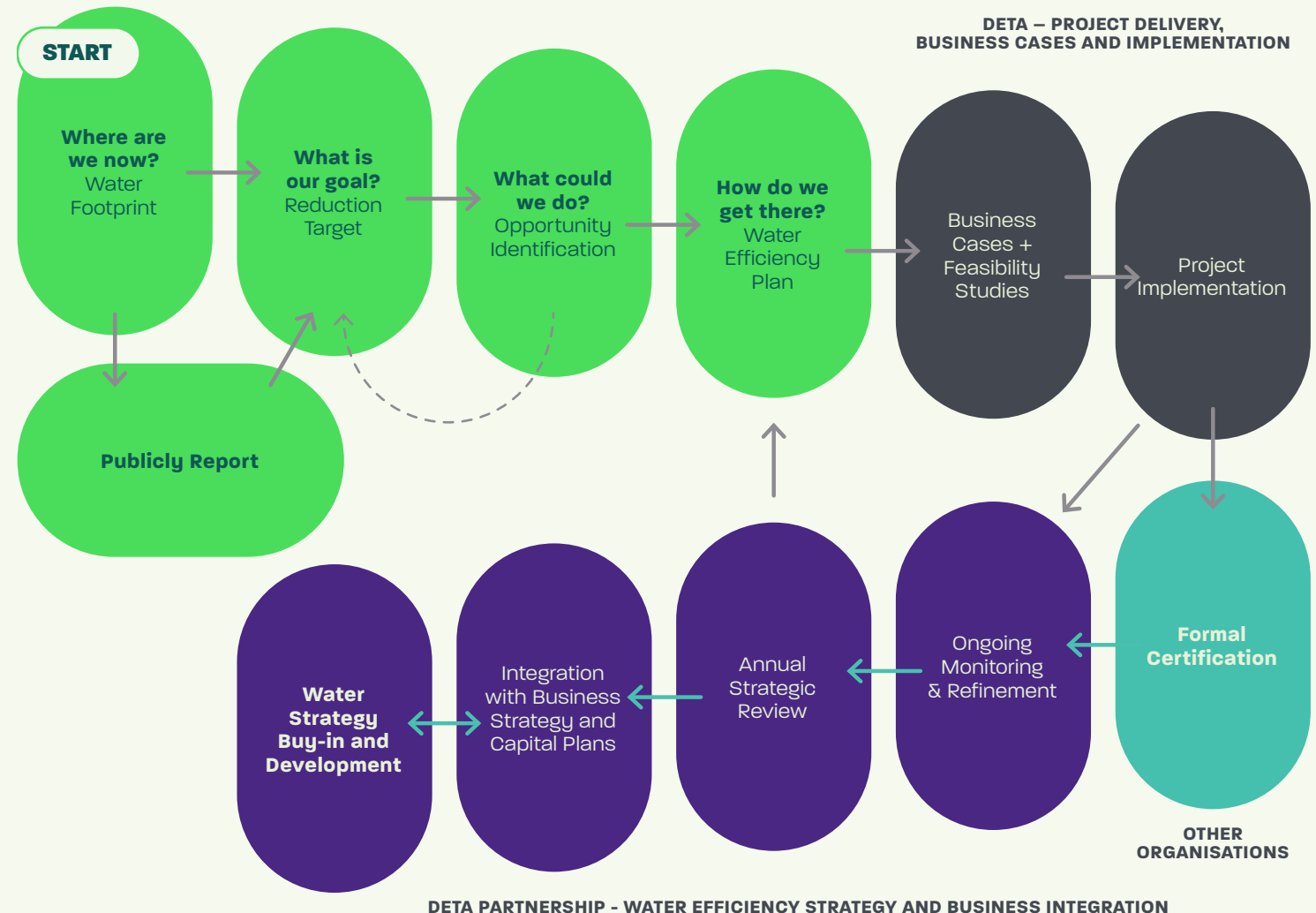
Overview

Water Roadmap

For the vast majority of companies the Water Roadmap will have very similar stages, each of which are examined in more detail in this document.

The two key things to note from this process are that it is **iterative** and **collaborative**. For the process to work it should be updated annually reflecting progress in water reduction, changes in the business, and developments in technology. There must also be full buy-in from all levels of the company. The strategy set by an organisation's leadership team has no traction without a strong implementation team, and a continuous improvement mindset from all members of the business. We recommend involving all key stakeholders, both internal and external, as early as possible in the process.

Our Roadmap to get you there



Guiding your Business Towards Water Efficiency

The Water Roadmap starts at the governance and strategy level of an organisation. Prioritising water issues and communicating their associated risks as strategically important throughout your organisation is the first step.

To drive progress, commitment must be made from a top-down level with a clear mandate to improve water management. Alignment with corporate strategy and regulatory requirements assures the allocation of resources to effect real change.

This could present itself in a range of ways, for example:

1. A strategy defining the overarching mission, vision, and goals of your organisation towards good water stewardship.
2. Establishing a water management policy.
3. Identifying and assigning responsibility to a person to carry out this mandate.
4. Addressing water-related risks in your risk management plan.
5. Incorporating the costs and benefits of sustainable water management into organisation plans, including capital investment or contractor and supplier engagement.
6. Including water footprinting in annual reports.

Water Risk & Compliance

Unlike carbon emissions, water is spatial from region to region and temporal with conditions changing throughout the year based on both normal and abnormal climatic shifts. The water risks affecting your organisation are therefore highly contextual. Information on the water risks in your region can be found from:

- ➔ Local Councils
- ➔ niwa.co.nz
- ➔ lawa.org.nz
- ➔ waterquality.gov.au
- ➔ nationalwatergrid.gov.au



Gathering information on compliance is important to understand how to manage your organisation's water resources. This can include water-related regulations, voluntary standards or industry standards.

How can we help?



For many organisations getting the ball rolling requires specialist knowledge. DETA offers **Governance Assistance and Strategic Planning** in a partnership model that will help you gain clarity and align your Water Roadmap with your organisation's mission and goals.

Establishing a Baseline – Development of a **Water Footprint**

To move forward, the current situation must be mapped out to better understand how water is used within your organisation and to establish a baseline.

Therefore, information from an internal and external perspective regarding the context, performance and compliance of your organisation must be compiled so you can develop a water footprint.

Your organisation's water performance is broken down into three scopes:

Scope 1

▶ **Water withdrawal:** The sum of all water withdrawn from surfacewater, groundwater, seawater or third-party water and brought within your organisational boundary.

Scope 2

▶ **Water consumption:** The sum of all water that has been withdrawn and not returned in the same period, or released to a different recipient in the same period. Classifications of water consumption within your organisation's boundary.

Scope 3

▶ **Water discharge:** The sum of all water discharged outside of your organisational boundary. The quality of discharge varies significantly by industry. Parameters to measure include BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), nitrogen, phosphorous, TDS (Total Dissolved Solids), and heavy metals.

Industry Snapshot



Fonterra Takanini Water Audit

DETA carried out a water audit of Fonterra's Takanini manufacturing site to review site water consumption and identify opportunities to improve efficiency. Specific actions identified had potential to reduce site water consumption and wastewater discharge by more than 10%, with a payback of less than 6 months.



How can we help?

The development of a water footprint can be undertaken by a business internally, but often expertise or resourcing is not available. In these cases, DETA can **Develop your Water Footprint**. An additional benefit of partnering with DETA is the on-going access to our templates and calculation sheets which will allow you to update your footprint independently as your expertise increases. The development of a water footprint can be undertaken as a single piece of work or as part of the **DETA Water Kickstarter**.

[see page 15 for more details](#)

Water Footprint Reporting and Setting a Target

Reporting your water performance against a public target is an essential part of the Water Roadmap ensuring your organisation owns its impacts on water issues and enables you to be transparent about risks and opportunities you face.

After establishing a baseline, setting a target is an important step in the Water Roadmap. This allows your organisation to focus time and resources on achieving the goals of your water strategy.

Setting and publishing a target is not a straightforward process as a majority of targets are mandated by councils. Engaging with your relevant council when setting targets will help ensure that they are not only achievable but also satisfy council requirements, ensuring an ongoing license to operate.

Water Reporting

The large number of different tools and metrics used for reporting can be confusing at first. We recommend starting with the following guides:

➔ **GRI 303 Water and Effluents**



➔ **The CEO Water Mandate Corporate Water Disclosure Guidelines**



Water Stewardship

Alliance for Water Stewardship (AWS) is a global membership collaboration of organisations, NGOs and the public sector who aim to contribute to the sustainability of local water resources. To become a certified member, 5 actions are required. The member organisations must commit to:

1. Gathering and understanding water-related data.
2. Commit to water stewardship and create a water stewardship plan.
3. Implement their plan.
4. Evaluate their performance.
5. Communicate and disclose progress with stakeholders.

➔ **Alliance for Water Stewardship**



How can we help?

As with the development of a Water Footprint, establishing a target can be undertaken by a company internally but often the expertise is not available. In these cases DETA can work with your business and councils to **Develop a Target**.

The main benefit of using DETA is our experience with a range of organisations across multiple sectors with different timelines and opportunities for reduction, and a track record of producing tough but achievable targets.

The development of a target can be undertaken as a single piece of work or as part of the **DETA Water Kickstarter**.

Developing a **Water Efficiency Plan**

By completing the previous stages of the Water Roadmap, you have begun to better understand the water-related risks and opportunities relevant to your organisation and these have been communicated and incorporated into a water strategy. A water footprint has been developed and a target has been set to establish your commitment to improved water stewardship. Now a plan is needed to achieve it.

A water efficiency plan provides an overview of the potential pathway for your organisation's water stewardship journey.

It involves using industry experience to look at a range of water efficiency opportunities, providing a high-level indication of potential savings and costs.

Considerations into previously planned expansions or strategy changes are included, accounting for movements in the market and technological improvements.

Plans generally start by exploring point of use water reductions, followed by water reuse and recycle opportunities.

The result of this process is a report that outlines the steps in implementation. Start with the easy, low-cost improvements that make instant business savings now.

Alliance Group Steps Up

To take action on water use you need a baseline

Base-lining means understanding water flow, how much is used, where it gets stored, and where it is discharged.



This document should be updated annually as opportunities are implemented and plans evolve. DETA's Water Efficiency Plan can be easily integrated with other strategy documents and decision-making processes.

Site Water Mapping and Metering

Alliance was looking to understand their water use on sites – with a view for improving efficiency of water use.

DETA worked across multiple Alliance sites to **baseline** water usage, and evaluate the efficiency of cold and hot water systems. The objective of this work was to identify water management improvements by mapping line diagrams and process flows.

Optimising cold water usage can create cost savings, and improvements in hot water utilisation can often create carbon reduction savings from gains in process heat efficiencies.

This project resulted in mapping of site water usage and flow across all Alliance sites. Opportunities for strategic placement of metering were identified to support this activity, longer term.



How can we help?

Of all the stages previously examined this is perhaps **the stage in which it is most helpful to engage DETA**. Our expertise across a range of industries in developing these plans means we have the processes in place to easily identify potential opportunities for your company and have a solid understanding of the likely costs and benefits associated with these.

In addition, we have a collection of templates and graphs that will allow the plan to be presented in a way that is understandable through all levels of the organisation and does not require technical knowledge to refer to and discuss.

Opportunity Refinement and Business Case Development

The Water Efficiency Plan established in the previous step provides high level descriptions of opportunities and indicative savings and costs, but lacks the details required for the more complex opportunities to be immediately implemented.

To do so, concept designs need to be further developed and for opportunities where there are multiple options, these need to be evaluated. This is achieved through the development of feasibility studies and/or business cases.

The evaluation of these is likely to follow your established business practices, but with water efficiency projects, consideration should also be given to the sensitivity of escalated water service costs, as well as opportunity costs and cost per cubic metre of water saved.

Water efficiency projects can be perceived as having little economic benefit, but often there are a variety of co-benefits that can be far more compelling than the water savings.

Including these in the business case for the project can shift a project from being seen as unattractive to essential. Examples include:

- ▶ Ensuring your organisation's legal and social license to operate.
- ▶ Preventing operational crises resulting from the inadequate supply or quality of water in water dependent processes.
- ▶ Gaining an advantage over competitors because of stakeholder perceptions that your organisation uses natural resources responsibly with minimal negative impact on communities and ecosystems.
- ▶ Assuring investors that business operations will continue to be profitable by securing a reliable water supply for operations and reducing water-related costs.

- ▶ Upholding corporate values based on sustainable and equitable development by contributing to the well-being of local ecosystems and communities.

These aspects should have been integrated into your business processes in the first stage (Guiding Your Business Towards Water Efficiency) but when this has not occurred the criteria should be adjusted in this step to ensure that the best projects/options are progressed with.



How can we help?

For a single option feasibility study or multiple option comparison DETA can provide concise and accurate **Feasibility Studies/Business Cases** in either a company specific or in our standard format. These will outline the benefits of the project – looking at traditional economic metrics as well as capital intensity, full life cycle costs with water price inflation considered and Capital Costs specified to the Capital Cost Estimate accuracy required (to meet your company Capex Stage Gate requirements).

An additional benefit of using DETA for **Opportunity Refinement** and **Business Case Development** is that our project delivery team works in very close collaboration with the Water Reduction side of our business. This allows for a continuation of the partnership previously established and we've found this has had great outcomes for our clients.

Implementation

Refining and evaluating the opportunities introduced in the Water Efficiency Plan allows for the execution of these reduction projects with the full understanding of the benefits they will provide. Companies have a range of internal strategies that dictate how to proceed with implementation.

However, we often find a dedicated resource can be incredibly beneficial for water efficiency work as it is often in addition to the business as usual work which consumes the vast majority of site-based engineering and project engineering time.



Capability Snapshot

Water & Wastewater Reduction

Water is a critical resource for many of our customers, & using water in the most efficient manner can de-risk business from an operational & consenting perspective. DETA's expertise in water efficiency spreads broader than just water reduction, with experience in yield recovery from waste water, hazardous waste stream optimisation, & water mitigation strategies.

- ▶ Water audit & site reviews
- ▶ CIP Optimisation
- ▶ Water treatment & feasibility development
- ▶ Biogas feasibility studies
- ▶ Project support & project management

on average

**11%
WATER**
REDUCTION POTENTIAL

Identified across our clients' portfolios due to **DETA** water saving projects



How can we help?

If your organisation requires support to implement the reduction projects, DETA can continue to partner with you on the **Water Roadmap** with a range of contracting models tailored to best suit your organisation.

Working with DETA through **Project Implementation** also ensures the seamless continuation of strategy and refinement and maintains the connection between the project delivery and technical teams, strengthening our partnership.

Continuous Improvement – Ongoing Monitoring of your **Water Footprint** and Refinement of the Roadmap

A key trait of the Water Roadmap is iteration, creating continuous improvement. It is a living and breathing document that will need to be regularly amended to reflect changes in your business, to technology, or to the operational environment.

Undertaking an annual strategic review may show that some opportunities produced more savings than expected and others less so, there may be a change in the way you decide to run your business or a change in your target markets. Additionally, with large investments in renewable technology across many industries, the expansion of available technology may change what best practice

looks like on a rapidly changing basis. All these factors should be considered and accounted for in the Water Roadmap in order to produce the best results from a water and economic perspective.

It is also important to be updating your water footprint annually and reporting this - making the most of the improved data collection methods that have been put in place.

Technology Snapshot

CIP Processes – A water focus saves resources

Having an eye on water management for your CIP processes can lead to substantial cost savings, improved productivity, and sustainable operations. By conserving water, optimising chemical usage, reducing energy consumption, and enhancing equipment performance, businesses can streamline their operations while contributing positively to the environment.

Goodman Fielder CIP Optimisation

DETA delivered a CIP improvement project at the Longburn site to target water, energy and chemical reductions. DETA worked with the site and their suppliers to understand current operations, make changes to CIP practices

and develop a business case to install new control equipment to allow more formal CIP process changes to occur. The project forecasted more than 60% reduction of total CIP costs upon implementation.



How can we help?

This aspect of the process ties back to the first step of the Roadmap - **Governance Assistance and Strategic Planning**. A long-term partnership with DETA will provide your organisation with our ongoing experience and support on how to adapt the established strategy and plan for changes in the water landscape. Both in terms of available technology and economics as well as in governmental policy and previous project outcomes.

In addition, the water footprint established earlier in the Roadmap is designed to be owned long-term by your organisation. DETA can assist in regularly updating your water footprint in line with your sustainability policy, if you don't wish to do this yourself.

Exploring Water Efficiency Initiatives for Sustainability Gains

By turning the spotlight on water efficiency, you not only contribute to a sustainable future but also unlock substantial financial benefits such as:

- ▶ saving significant amounts on costly chemicals treating water
- ▶ reducing energy consumption
- ▶ optimising discharge logistics
- ▶ consent compliance
- ▶ optimising sites to be net-zero for water usage

deta unlocked

10m³

hourly hot water savings

resulting in

2.5 GWH

per annum energy savings

Alliance Group - Pukeuri Hot Water Systems Upgrade

1400

m³/day of water savings

that's equivalent to

1600

Households worth

Fonterra - Water Reduction



Dairy for life

As part of a nationwide strategy, Fonterra were looking at ways to reduce their water usage over several of their key sites. DETA was engaged across these sites to investigate opportunities for water reduction, creating efficiencies, and prioritising water projects. Fonterra have set a 30% water reduction goal at manufacturing sites in water constrained regions by 2030*.

*www.fonterra.com

DETA Delivered

- ▶ **Water Maps** – site mapping highlighted areas for improving water efficiency
- ▶ **Water Audits** – site reviews of water usage drilled down to find opportunities for cost and energy savings
- ▶ **Wastewater Treatment Review** – investigation of wastewater treatment processes identified opportunities for reducing plant size, unlocking potential savings in CAPEX, chemicals, and energy

Summary

There are clear strategic and financial advantages in developing your company's Water Roadmap. It is about future proofing your organisation, innovating, building reputation and mitigating against the risk of a high water cost. Consumers

who demand improvements will vote with their wallets. Being proactive rather than reactive will allow your business to not only survive but thrive in the evolving economic landscape.



What's Next? read on to see how to put a water reduction journey together, step-by-step.

Four steps to water reduction

Businesses globally recognise the significance of reducing their water footprint. The path to this sustainable action starts with developing a comprehensive Water Roadmap. A Water Roadmap is a powerful tool that can drive positive change, enhance operational efficiency, and unlock opportunities for growth.

The DETA Water Kickstarter is a strategic framework designed to guide businesses in identifying the actions that will have impact and setting out the steps to create a Water Roadmap. There are four steps to the DETA Water Kickstarter. Step one is creating a Water Footprint, giving you an idea of what your water usage profile looks like. The next phase is what we call the

Water Audit - combining the steps setting the **reduction targets** and identifying **reduction opportunities** into one comprehensive report full of tangible options for the way forward.

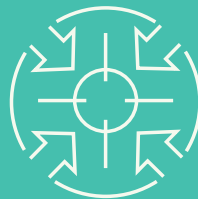
The Water Reduction Plan is the strategy and action piece - it's the pathway to get results.



Water Footprint

- ❓ Where does your water come from?
- ❓ What is the magnitude of your water usage profile?

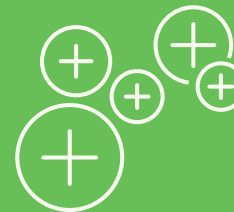
You Get – a report in a format that can be updated internally in the future to measure progress year on year.



Reduction Target

- ❓ Where can we reduce water usage or improve efficiency?
- ❓ What goals are realistic for your business?

You Get – a summary of clear & practical reduction goals for your organisation based on consideration of all relevant factors.



Opportunity Identification

- ❓ Where can we make changes in our processes to achieve our reduction and efficiency targets?

You Get - A Process or Business Flow Schematic will be prepared in a workshop with key stakeholders so as to brainstorm the identification of water reduction and efficiency opportunities.



Water Reduction Plan

- ❓ How do we pull all this together?
- ❓ How do we start? What do we do first?
- ❓ How much will it cost?

You Get – a report setting out the recommended implementation order of opportunities with a visual representation of the impact each will have, and the water levy threshold that will tip the economics in its favour.

Who is the DETA Water Kickstarter for?

The DETA Water Kickstarter is for any business in any sector who has a drive to make positive change. Whether you're just starting on your water reduction journey, or you're well on your way, the DETA Water Kickstarter can help you understand the next steps towards your water efficient operation.

What are the key deliverables?

The key deliverable is a report which will describe the journey from where your company is now to where you want to go.

It includes a:

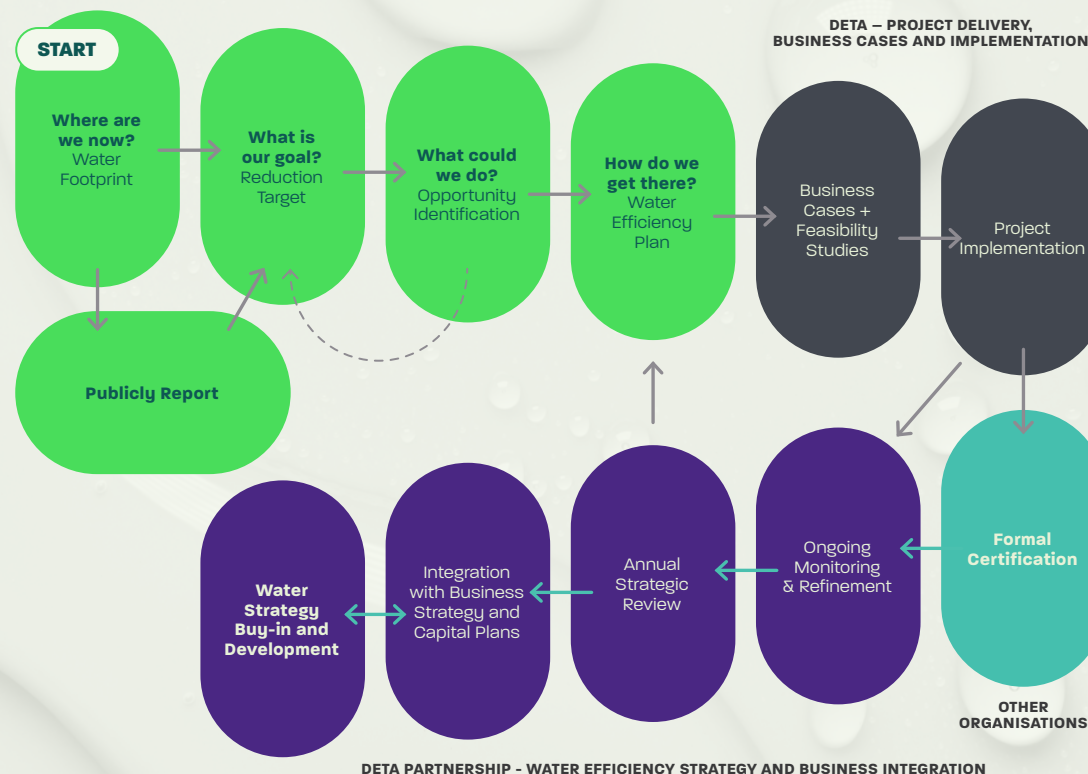
- ▶ Water Footprint.
- ▶ Reduction Target.

- ▶ Process/Business Flow Schematic.
- ▶ Water Efficiency Plan including:
 - Water Transition Pathway (Opportunity Summary).
 - Reinvestment Strategy Curves.
 - Capital Intensity Curves.

What are next steps?

This process forms a springboard from which you can jump into the refinement and detailed evaluation of the recommended opportunities and can either be a one-off interaction with DETA or part of an ongoing partnership through implementation and an ongoing strategic relationship.

Our Roadmap to get you there

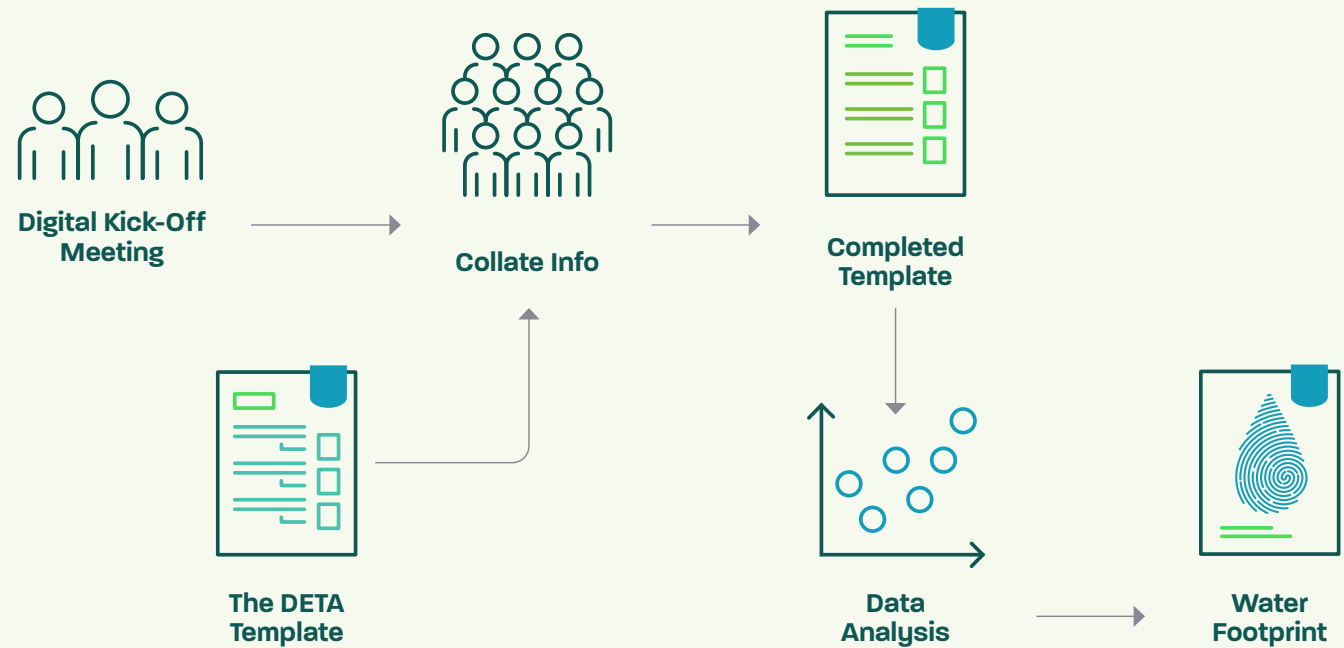


Follow us as we take you through the DETA Water Kickstarter step by step.

Where are we now? Developing your Water Footprint



Water footprints are created from measuring all the water usage associated with a business. A Water Footprint will tell you where you are today from a usage and efficiency perspective, and sets a baseline to measure reduction progress and action going forward.



The Purpose?

- ▶ To understand where your organisation is currently sitting withdrawal, consumption and discharge-wise.
- ▶ What sources of withdrawal, consumption and discharge currently exist?
- ▶ Which sources are necessary to include in the DETA Water Kickstarter?

The outcome is a simple presentation of your current footprint which will immediately highlight where the most effort should be spent.

How it works?

- 1.** Discussion to identify boundaries for the footprint
- 2.** DETA provides a template for data collection
- 3.** DETA transfers your information into our templates and provides a one page **Water Footprint** report including boundaries (see page 19)



Here we introduce a fictitious manufacturing company called Starscan Foods. Let's take you through our DETA Water Kickstarter process step by step, starting with a one page Water Footprint.

- ▶ The primary driver for Starscan Foods to address their water use is the regulatory risk imposed by local councils on their water discharge.



- ▶ CIP is the largest consumer of water by end use for Starscan Foods highlighting the need to focus on these systems in the next stages.



Water Footprint - Starscan Foods

Context

After being issued multiple fines for discharge non-compliance, Starscan Foods is at risk of receiving an abatement notice from local councils. Starscan Foods must either upgrade their wastewater treatment plant or reduce their discharge by 15%.

Compliance

- ▶ Five incidents of failing internal discharge compliance criteria
- ▶ 2 incidents failing regulatory compliance criteria

Performance

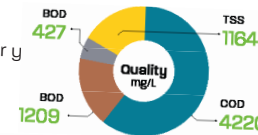
Withdrawal

902,700 m³ per year



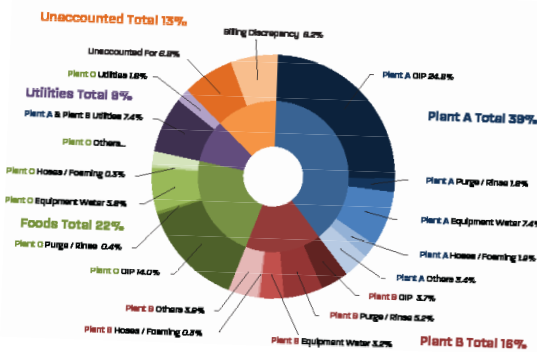
Discharge

58,000 m³ per year

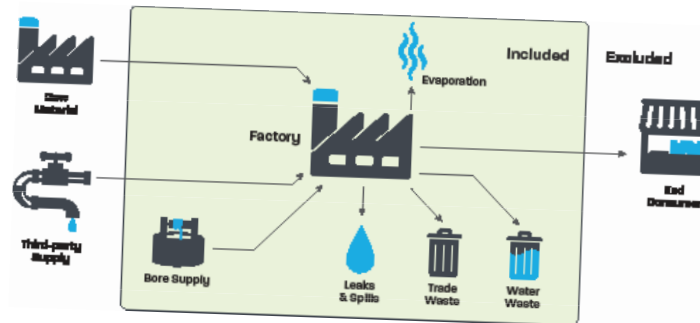


Consumption

902,700 m³ per year



Boundary and Exclusion Identification



- ▶ Indirect sources of water such as the water embedded in the raw materials Starscan Foods consumes are recognised but not included for consideration in the next steps.

- ▶ There is a visible difference between the volume of water billed and measured indicating a metering issue needs to be resolved.

- ▶ Plant A is the largest consumer of water by area for Starscan Foods highlighting the need to focus on these systems in the next stages.

What is our goal? Setting a Reduction Target

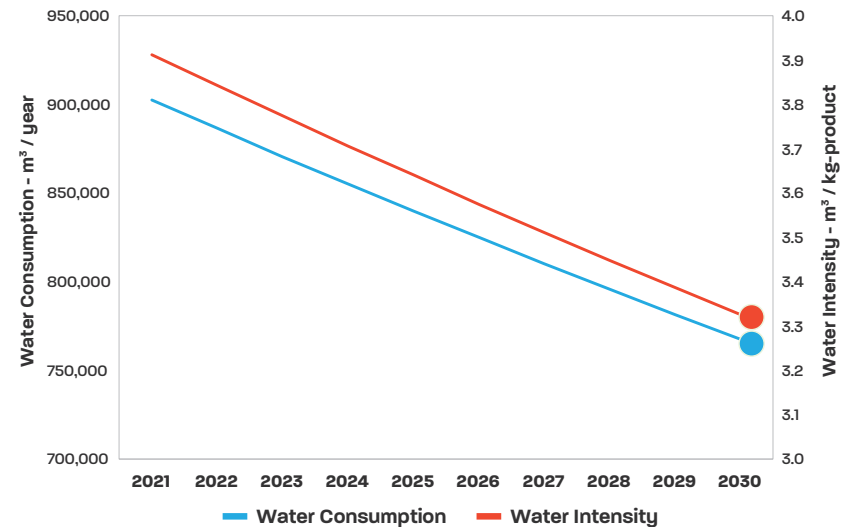


After a Water Footprint the next step is a Water Roadmap.

The roadmap helps Starscan Foods set goals and reduction targets, and identify opportunities for reducing water.

Starscan Foods have set a target to reduce water consumption and improve efficiency by 2030 from a 2021 base-year.

Starscan Foods 2030 Water Reduction Targets



Consider these questions to make a start setting reduction targets for your business

Target Considerations

- ▶ What is the extent of current opportunities?
- ▶ How far could the current known opportunities take you?
- ▶ What is the market dictating and what are competitors doing?
- ▶ What would be the competitive advantage of targeting different levels of reduction?
- ▶ What is your business plan for the next 10 years? Are you expanding, maintaining status quo, diversifying?

▶ Starscan Foods Water Targets

After working with DETA and consulting local council, Starscan Foods has set the following targets:

- ▶ ● Reduce water intensity from 3.9m /kg product to <3.3m /kg product by 2030.
- ▶ ● 15% water reduction at manufacturing sites by 2030.
- ▶ 100% of manufacturing sites treating wastewater to leading industry standards by 2030.

- ▶ How it will be measured and monitored? Actions to achieve and maintain (or exceed) it?
- ▶ Planned timeframes to achieve it?
- ▶ Financial budgets allocated for actions?
- ▶ Positions of persons responsible for actions and achieving targets?

What could we do? Opportunity Identification

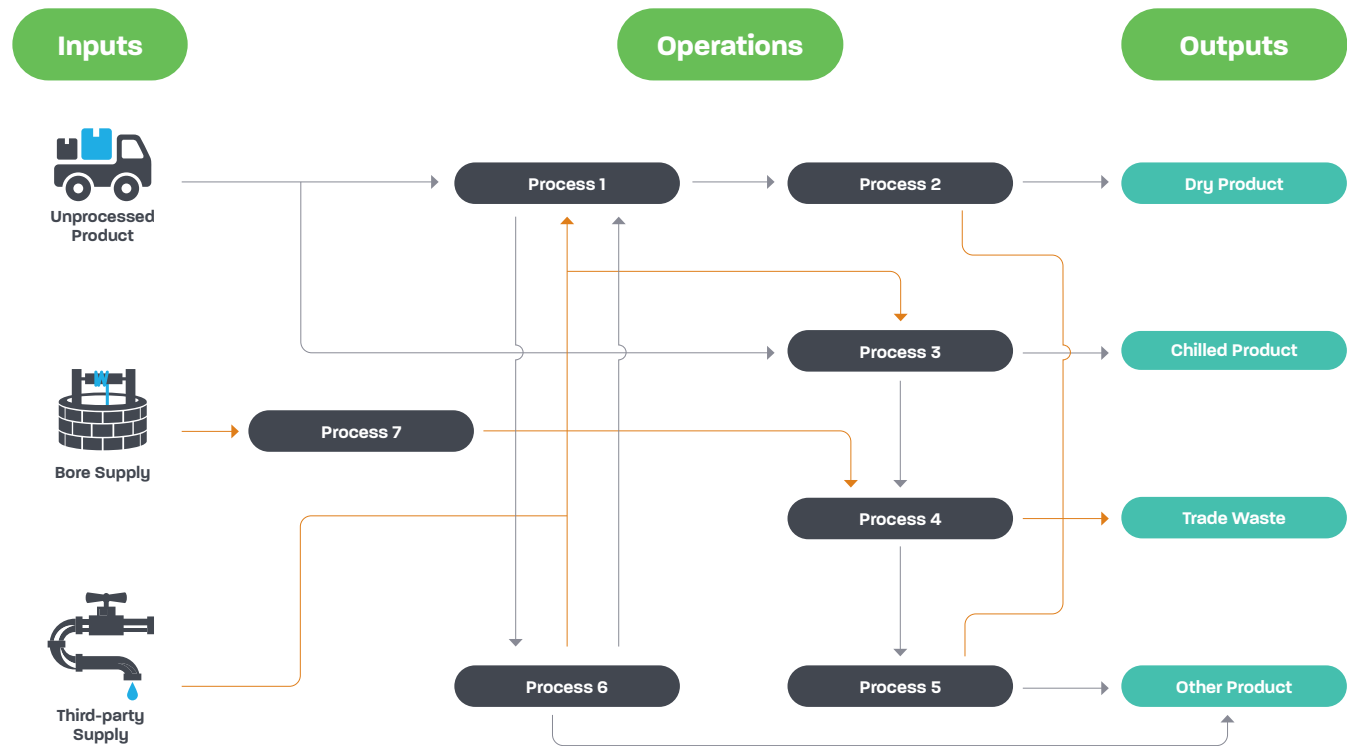


Now we have reduction targets, let's identify the opportunities to achieve them.

The steps of opportunity Identification

1. Workshop with Key Stakeholders to develop Process or Business Flow.
2. Development of Process or Business Flow Schematic.
3. Development of efficiency, technology and operation improvement opportunities. These are usually lower capital, low return, proactive approaches, aimed at reducing or eliminating freshwater requirements at source.
4. Development of large-scale process changes and/or reuse and recycle opportunities. These are usually higher capital, high return, reactive approaches, aimed at optimally managing discharged water after use.

Example 1 - Starscan Foods Process Flow Schematic



The Process Flow Schematic above guides Starscan Foods to ask the right questions and reveal opportunities.

- ▶ How could we optimise water usage?
- ▶ Are there more opportunities for reuse?
- ▶ Could we improve recovery?
- ▶ Do we need to use water at all?

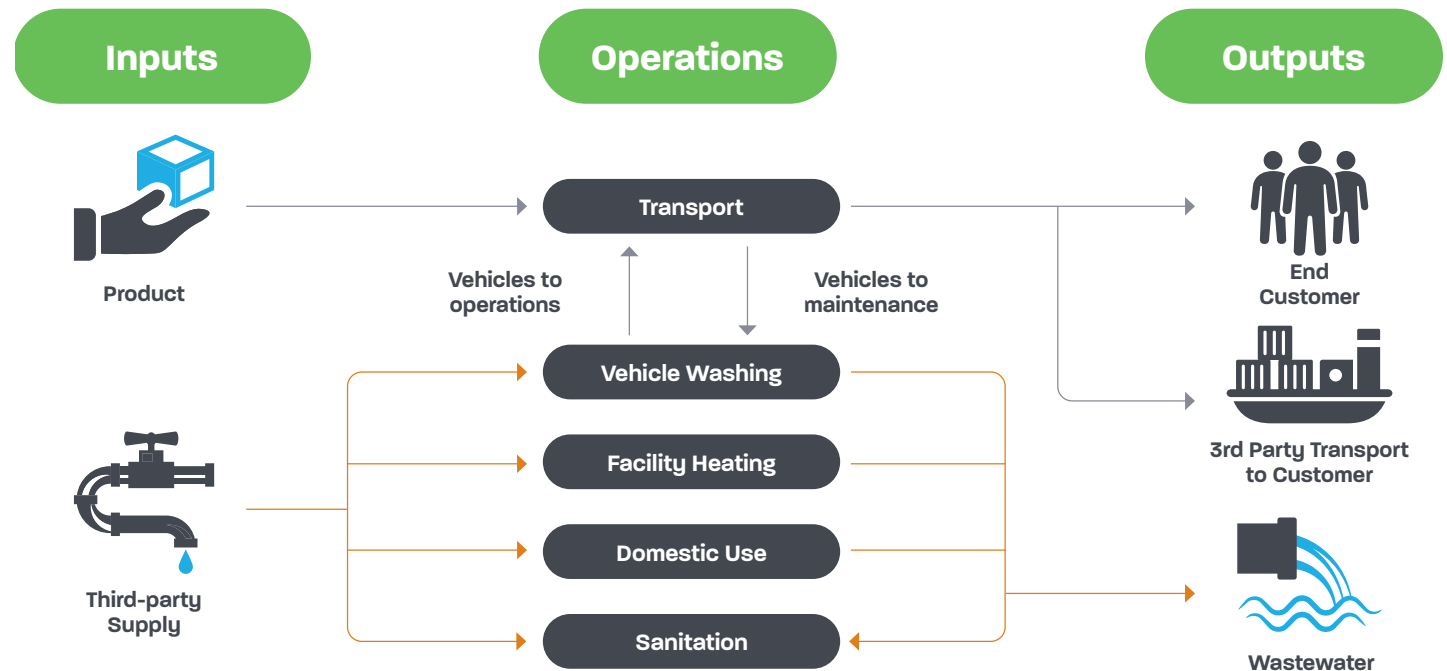
Opportunity Identification *cont.*



This process also works for non manufacturing businesses.

Here we introduce a fictitious logistics company called Movetracke Logistics and create a Business Flow Schematic.

Example 2 - Movetracke Logistics Business Flow Schematic



The business flow schematic above guides Movetracke Logistics to ask the right questions and reveal opportunities.

- ▶ Has a baseline been established?
- ▶ Does the volume of water billed equal the volume of water measured or is there an issue that needs to be investigated?
- ▶ Could rainwater capture be implemented?
- ▶ Is the vehicle wash equipment using water efficient fittings?
- ▶ Have the boiler controls been optimised?

How do we get there? Water Reduction Pathway



The next step is to prepare a water reduction pathway.

This involves a strategic plan with actions necessary to achieve water reduction and efficiency goals.

A water reduction pathway will consider technical feasibility, economic viability and the environmental impacts of the opportunities identified.

Starscan Foods Water Reduction Pathway

Opportunity Type	Actions	Year	Water Savings			Wastewater Savings			Energy Savings (thermal energy)		CAPEX	OPEX Savings	NPV	Payback
			m ³ /y	\$/y	Water Reduction	m ³ /y	\$/y	Wastewater Reduction	kWh/y	\$/y	CAPEX (k\$)	OPEX Savings (k\$/y)	NPV (k\$)	Payback (y)
Water Demand Reduction	▶ Implement leak management plan	2021	4600	6,900	0.5%	4400	13,500	0.5%	-	0	Maintenance	20	110	Immediate
	▶ Increase recovery setpoint in CIP system	2022	3600	5,500	0.4%	3400	10,600	0.4%	221000	6,800	0	23	123	Immediate
	▶ Install Temperature Controls	2023	41000	62,200	4.5%	39000	120,600	4.5%	2213000	67,700	59	251	1,299	0.2
	▶ Optimise equipment operating water flows	2024	39300	59,700	4.4%	37400	115,700	4.4%	-	0	80	175	876	0.5
	▶ Install adjustable nozzles on hoses	2025	2300	3,400	0.3%	2200	6,700	0.3%	-	0	6	10	50	0.5
Water Reuse Increase	▶ Recover steam cooling water	2028	5200	7,900	0.6%	4900	15,200	0.6%	-	0	5	23	119	0.2
	▶ Recycle water to the cooling tower	2028	6200	9,400	0.7%	5900	18,200	0.7%	-	0	18	28	131	0.7
	▶ Recycle CIP water	2028	27800	42,100	3.1%	26400	81,600	3.1%	569000	17,400	246	141	538	1.7
	▶ Reuse recovered equipment water as cooling water	2028	14400	21,800	1.6%	13700	42,300	1.6%	-	0	120	64	237	1.9
Improved Wastewater Treatment	▶ Wastewater treatment upgrade	2030	-	-	-	-	-	-	-167995	(5,137)	(1,600)	(5)	(8,723)	nil



The Water Reduction Pathway gives Starscan Foods the potential steps to meet water reduction targets

- ▶ CAPEX are +/- 50% accurate capital cost estimates appropriate for project screening - factored off similar projects in terms of scope and scale.
- ▶ We focus on reducing demand and increasing reuse before looking at improving wastewater treatment. While installing sub-meters does not explicitly result in water reduction, it is often the first port of call in the suite of water management tools, as they provide a short term capital cost that can defer capital expenditure, improve network management, and control water loss.

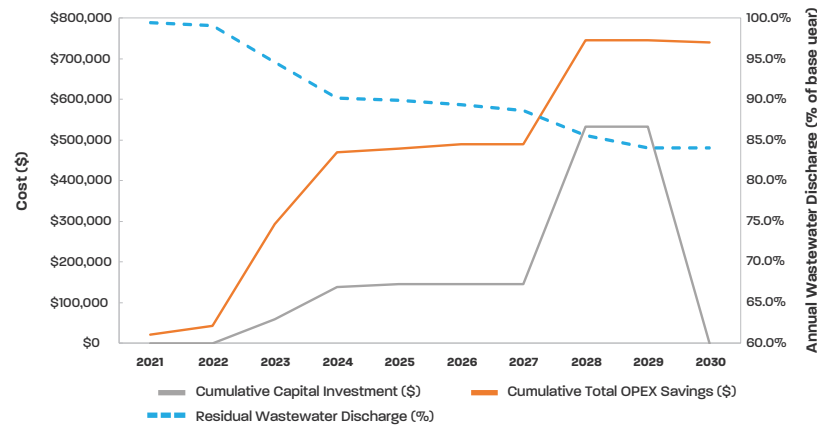
How do we get there? Preparing to build a business case



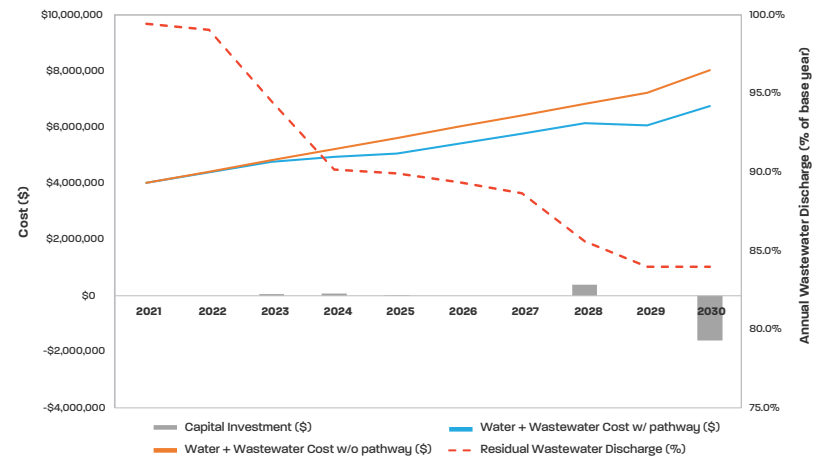
We are a big believer that **water reduction** not only reduces operating costs, but also **increases business resilience**. The cumulative OPEX savings not only exceeds the capital investment but also

reduces and defers the capital investment required to stay operational. The cost of doing nothing significantly outweighs the cost of acting now!

Starscan Foods - Cumulative OPEX savings vs Capital Invested



Starscan Foods - Capital Investment Pathway



▶ Choosing to undertake a Water Roadmap reduces the capital required to upgrade Starscan Foods' wastewater treatment plant. The savings generated by 2030 matches and often exceeds the cumulative capital investment required, showing water efficiency projects pay for themselves!

▶ Aligns with Water Reduction Plan!

▶ Represents where capital needs to be spent - can be integrated into capital plans.

▶ Accounts for the increase in water services cost, which affects operational costs.

The reinvestment strategy curves visualise the benefits of investing in water reduction for Starscan Foods.

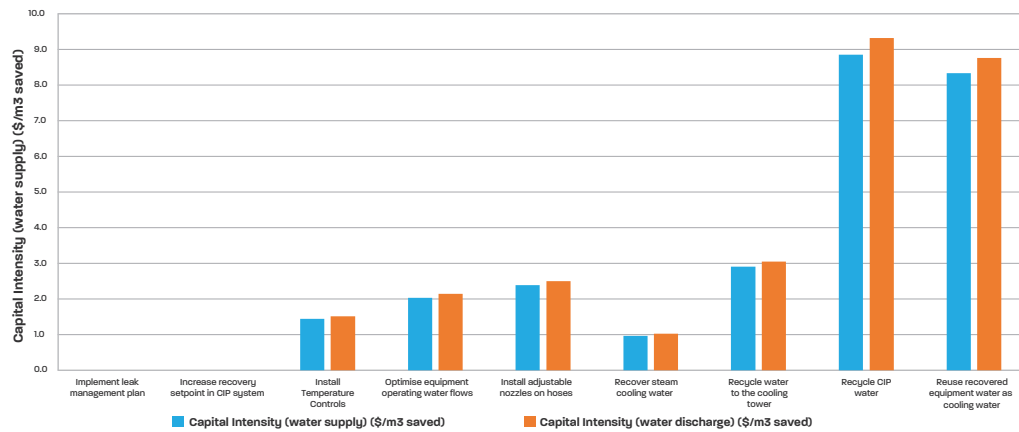
What could we do? – Capital Intensity Curves



Marginal abatement curves provide a visual representation of the various options available for reducing water usage, ordered by their cost-effectiveness.

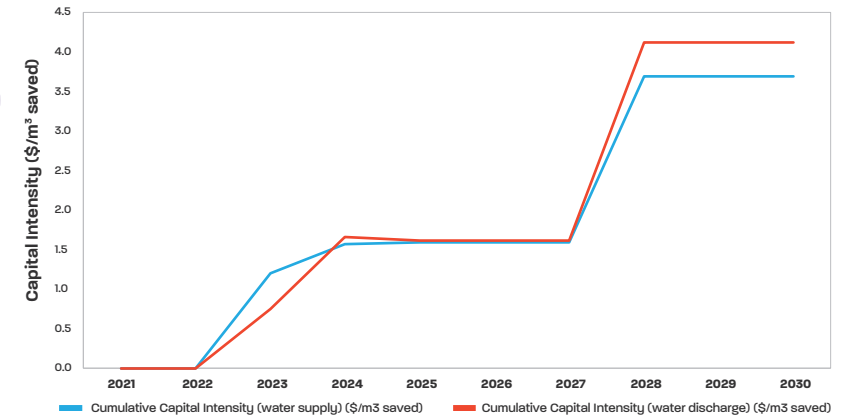
This helps guide investment decisions, identify cost effective opportunities and facilitate progress towards your water reduction target.

Starscan Foods - Project Capital Intensity

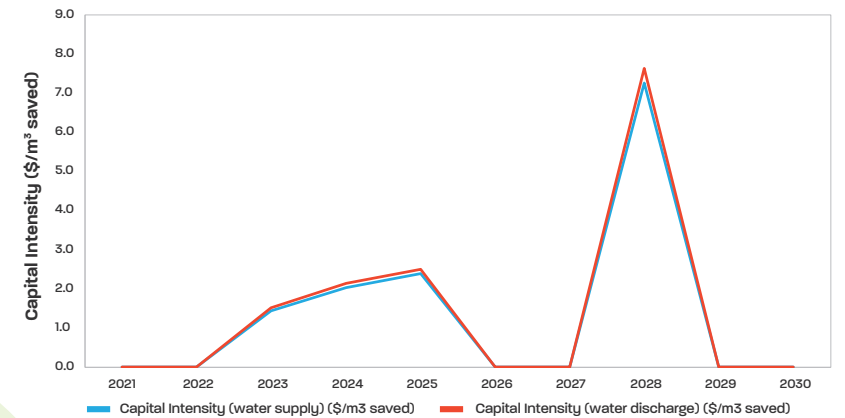


- ▶ Represents the cost per m³ of water saved.
- ▶ Different options can be added in depending on initial preference.
- ▶ Shows the low-cost approach DETA uses in their Water Efficiency Plans.

Starscan Foods - Cumulative Capital Intensity Timeline



Starscan Foods - Capital Intensity Timeline



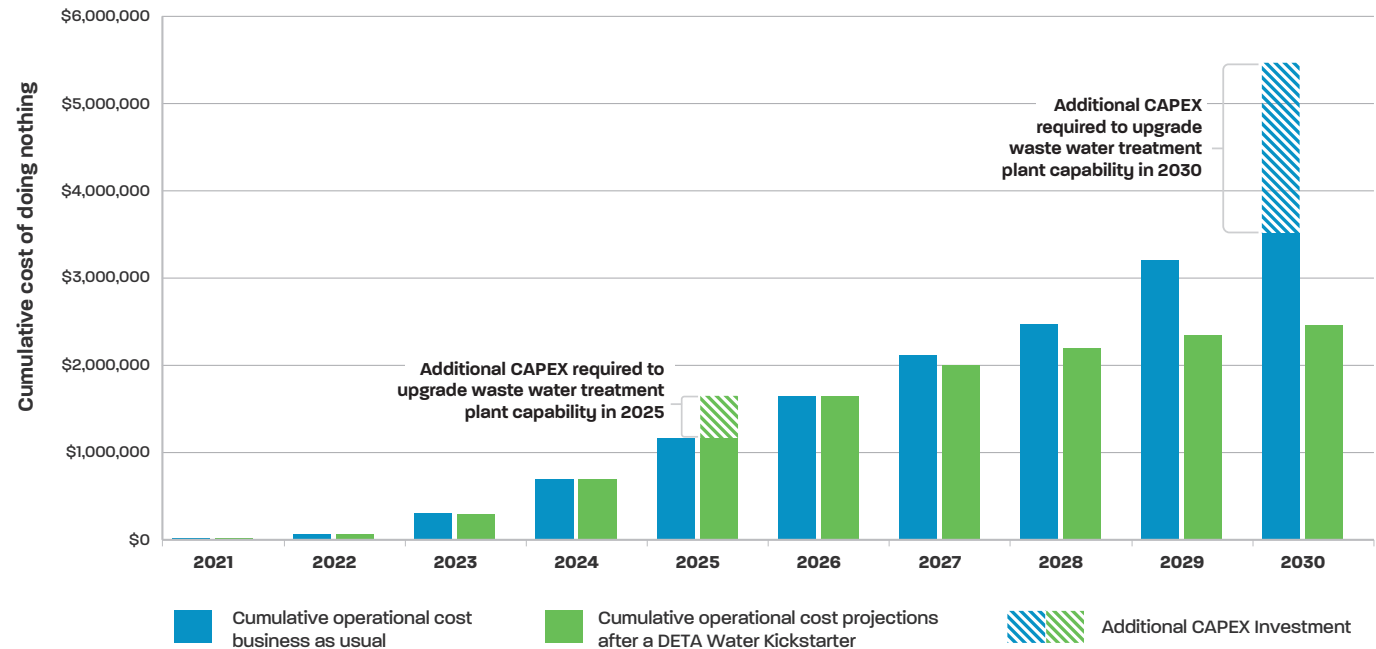
What could we do?

The cost of doing nothing



A final check-in with Starscan Foods, after commissioning a Water Footprint, setting reduction targets, and following the recommendations of their Water Reduction Plan, they are on track to achieve 15% water reduction at all manufacturing sites by 2030.

The final piece of the puzzle is meeting industry and regulation standards for wastewater compliance. Starscan Foods need to upgrade their wastewater treatment plant (WWTP).



As previously stated the cost of doing nothing is more expensive in the long term. Starscan Foods have achieved a 15% reduction in water discharge with DETA's help. To stay compliant, the company needs to build a new WWTP. With the help of the Water Roadmap – Starscan Foods can see that investing now in the new WWTP plant makes sustainable and financial sense.

- ▶ **Operational Cost Savings:** upgrading now yields a WWTP that is more energy efficient, requires less maintenance, and reduces operational costs. A smaller plant is required because of the water efficiency work done in the DETA Water Kickstarter.
- ▶ **Regulatory Compliance:** upgrading now ensures the plant is positioned to meet current requirements, can be future proofed to avoid expensive retrofits, and will de-risk Starscan Foods against non-compliance fines and actions.
- ▶ **Market Demands & Competitive Advantage:** being able to produce higher quality products more efficiently helps to ensure products remain competitive and relevant.

Where to from here?

The DETA Water Kickstarter can help get you started on your water reduction plan & achieve your sustainability results faster.

Some of our clients choose to start with a Water Footprint first, and some clients get us

on board for the whole DETA Water Kickstarter package.

Wherever you are along the sustainability pathway, our door is always open for advice or discussion on all things water efficiency and more.



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Need help with more than water?

Contact us for:

DETA Kickstarters

- ▶ Carbon
- ▶ Energy Management
- ▶ Waste
- ▶ Sustainability
- ▶ Transport

Our team of engineers and project managers are experts in decarbonisation, water, energy management, and sustainability. We have helped businesses across Australasia for more than 10 years with long-term planning & strategies that create positive sustainability & net-zero solutions.

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