



Wannon Water Circular Economy Roadmap

A pathway to unlocking a series of economic, environmental, and societal benefits

Supporting Document - February 2023 – Final



Acknowledgement

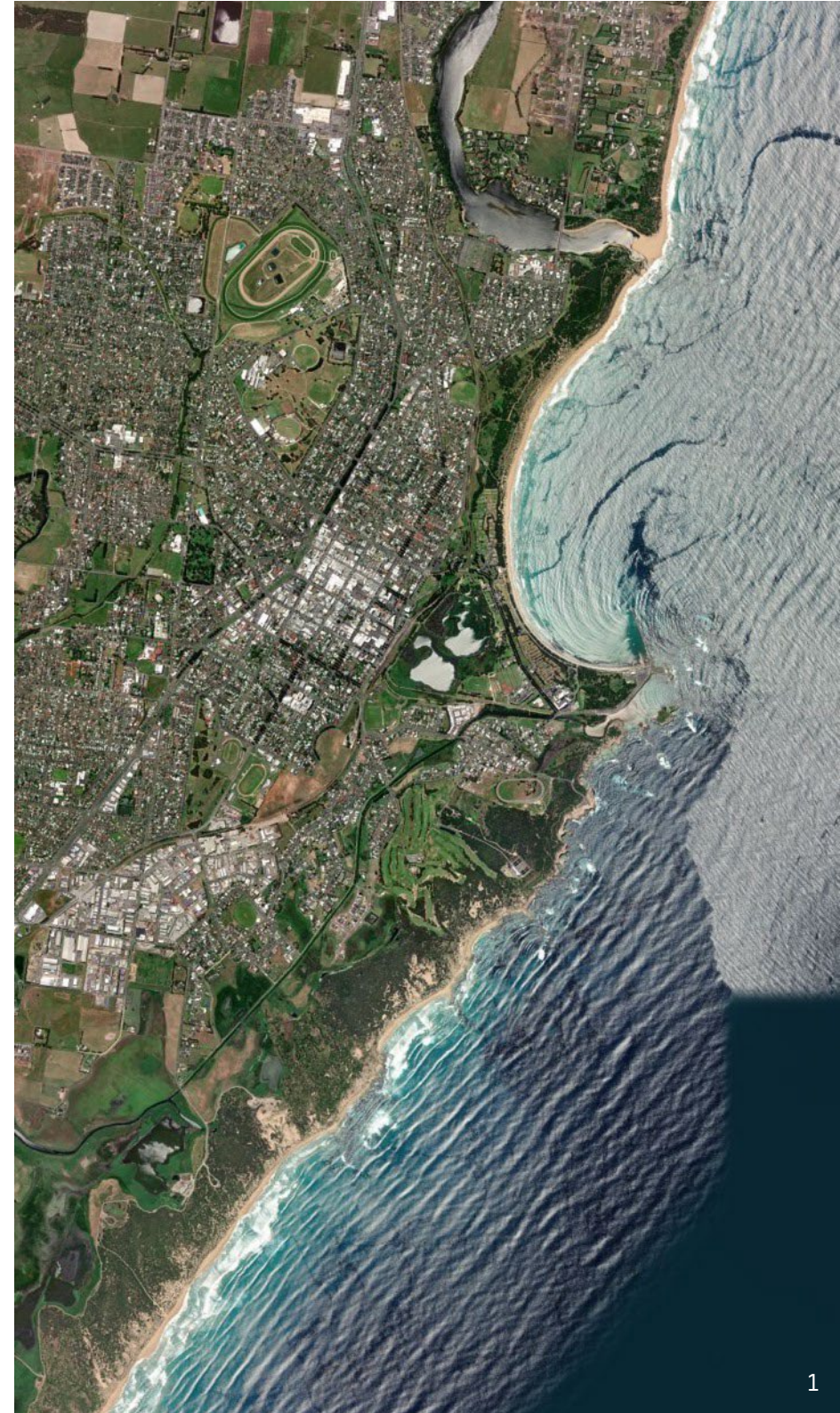
This document was created on the lands of the Eastern Maar and Wurundjeri people. This project focused on activities taking place across the wider Maar Nation. Neighbouring groups we wish to acknowledge include Kerr-up-Jmara, Chaap-Whuurong, Kuurn-Kopan, Kirra-Whuurong, and Yarro-Waech. We pay our respect to their elders past and present.

We recognise the intrinsic connection of Traditional Owners to Country and acknowledge their contribution over tens of thousands of years to the management of land, water and resources. We also acknowledge the deep listening and learning that needs to occur for us to be able to progress towards a circular economy.

At Wannon Water we embrace the spirit of reconciliation, and we are working towards equality of outcomes for and ensuring an equal voice.

The Wannon Water Circular Economy Roadmap has been supported by seed funding from Department of Energy, Environment and Climate Action (DEECA). Funding has enabled acceleration in industry innovation and helped build the evidence base for circular economy opportunities.

The development of this roadmap incorporated many voices and would not have been successful without the involvement of DEECA, local industry members, local council, authorities, and specific Wannon Water team members. Their time and contributions are appreciated and provided the research and evidence to build this roadmap.



About this document

Intended audience

This document provides information to support Wannon Water's Circular Economy Roadmap and accelerate innovation across the organisation. The Roadmap identifies key projects to help guide Wannon Water's shift to a circular economy, in partnership with key stakeholders.

The intended audience include:

- Wannon water
 - **Board:** to inform organisational strategy and policy, and undertake advocacy work at a broader level
 - **Executive team:** to inform and align strategy and plan resources
 - **Senior Management team:** to inform the operationalisation of circular economy work
 - **Employees:** to foster awareness and action
- Regional stakeholders: to inform collaboration and inspire action
- Water utilities: to inform action and collaboration opportunities and provide resources
- Government: to provide a case study of regional collective action/translating Govt policy to action and create awareness for potential funding opportunities

Supporting documents



Current State Report – Wannon Water Circular Economy Roadmap



Material Flow Assessment – Prepared by Tonkin + Taylor



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Executive summary

As an essential service provider, Wannon Water delivers water, sewerage, recycled water and trade waste services to over 100,000 residents and more than 4,000 businesses across the Great Southwest Coast. We operate and maintain 14 different water supply systems across 30,000km of water and sewer mains.

Along with other water utilities, government and major industry across Victoria, we recognise an increasing responsibility to deliver our services in line with circular economy principles. This means ensuring we **routinely design out waste and pollution from our operations and systems**, we are **keeping products, materials and resources in the economy** and we are **regenerating natural systems through our operations**.

We have already taken significant steps towards circularity across our organisation, including reclaiming biosolids from wastewater to spread on farmland, using a Rhizopod system for treating wastewater in Penhurst, recycling of our electronic goods, our renewable energy initiatives including plans for a floating solar farm, our recycled water schemes, and our growing practice in Integrated Water Management.*

However, we realise that now is the time to accelerate our commitment to regenerating our local environment and strengthening our local community through taking targeted action towards catalysing a circular economy in the way we operate and more broadly across the region. This is being driven by:

- Our responsibility to adhere to the circular economy hierarchy as outlined in the Circular Economy (Waste Reduction & Recycling) Act 2021 as well as requirements from Recycling Victoria to integrate and report on circular economy principles
- Needs and expectations of customers and partners that Wannon Water is a sustainable community organisation that protects and enhances the environment through action and education and is resilient in the face of climate change unpredictability
- Strategic direction from industry leaders WSAA to accelerate circular economy action across the water sector as well from regional forums such as the Barwon Southwest Regional circular economy plan

We have outlined a clear vision and set of actions in our circular economy roadmap that will guide us towards a circular and regenerative future.

Our vision: Building strong communities and supporting Victoria's transition to a circular economy by:



Routinely designing out waste and pollution from our operations and systems



Keeping products, materials and resources in the economy



Regenerating natural systems through our operations

Our goal: In 2025, we can say our CE conversations and actions have made a real and positive difference

Our sub-goals:

- 1 Understand our CAPEX and civil maintenance waste better
- 2 Incorporate CE principles into the design of solutions
- 3 Work more closely with industry partners and traditional owners
- 4 Educate and build the capacity of our team and our contractors
- 5 Accelerate uptake of renewable energy in the design of solutions
- 6 Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure
- 7 Shift our measurement of 'value' to place more worth on reducing waste and regenerating nature

*for a full list of our current circular economy initiatives, please see page 22 of the current state report.

About this roadmap

Wannon Water has an opportunity to play a role in shaping the future of circular economy across the Western District of Victoria. Our Circular Economy Roadmap provides a path forward, including tangible projects to be completed by December 2025.

This pathway has been informed by:

- Qualitative research undertaken with a variety of representatives from Wannon Water
- Findings from a material flow assessment conducted in August 2022
- Two co-design workshops including one with Wannon Water representatives and one with regional stakeholders from catchment management authorities, industry, local council, and state government
- Working sessions and ongoing consultation with Wannon Water representatives

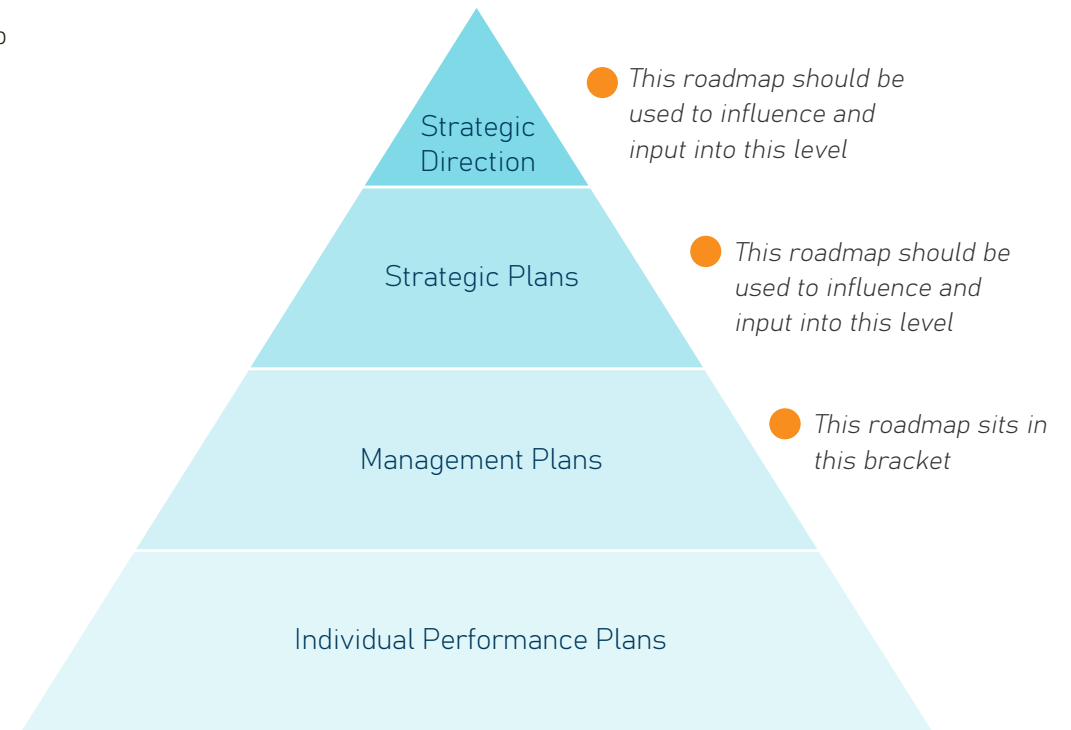


Figure 1: Circular Economy Roadmap in relation to Wannon Water strategy hierarchy



Strategic context



What is the circular economy?

In a circular economy, economic activity and revenue is decoupled from the extraction and consumption of finite resources.

Circular economy has emerged as a response to the current linear model of “take, make, consume, waste” and proposes a new model centered around waste reduction, re-use, recycling, recovery and environmental regeneration. The current economic model – based on extraction and depletion of earth’s finite resources – disturbs the vital equilibrium that exists between the economy, society and the environment. This threatens the biosphere as well as human health.

The circular economy principles (defined by the Ellen Macarthur Foundation):

Designing out waste and pollution – this acknowledges that ‘waste’ is the result of design choices, and that in nature ‘waste’ does not exist. In a circular economy, a specification for any design is that the materials re-enter the economy at the end of their use.

Circulating products and materials (at their highest value) – two fundamental cycles underpin this principle – the technical cycle and the biological cycle. In a technical cycle, materials are kept in use through being reused, repaired, remanufactured and recycled. In a biological cycle, biodegradable materials are returned to the earth through processes like composting and anaerobic digestion.

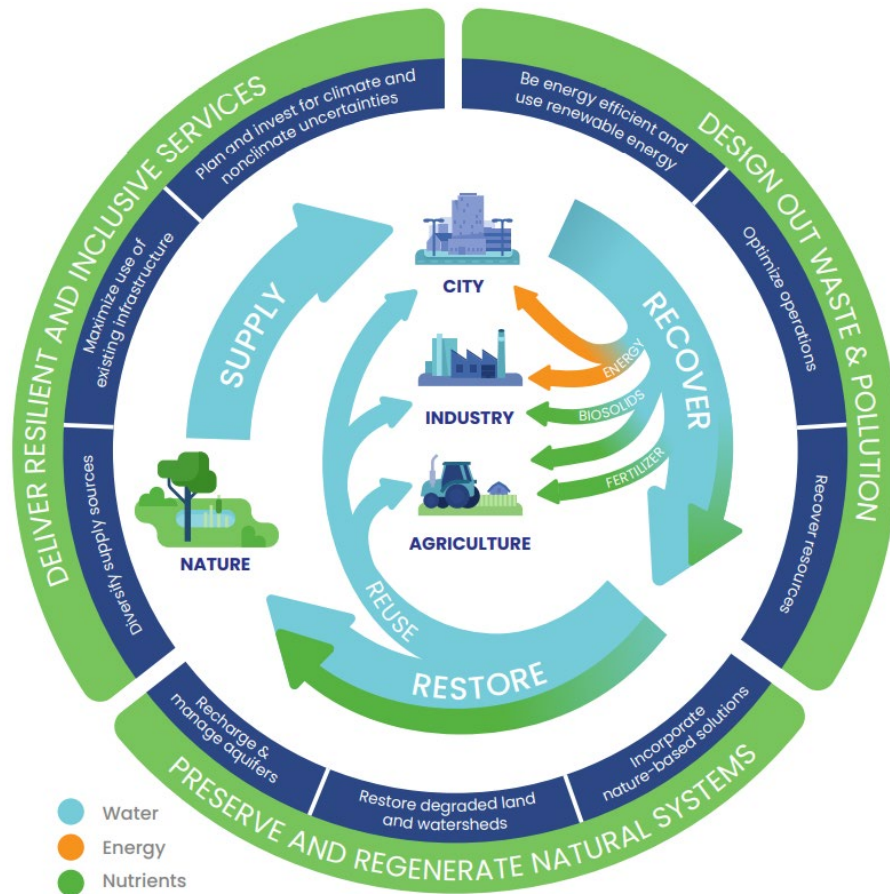
Regenerating nature – by shifting our economy from linear to circular, we shift the focus from extraction to regeneration. This allows us to support natural processes and leave more room for nature to thrive. A regenerative model allows us to return biological resources to the earth and replenish depleted nutrients.

These principles are underpinned by a transition to renewable energy and a reconfiguration of economic value.



Source: Ellen Macarthur Foundation

What does a circular economy mean for the water sector?



Source: The Water in Circular Economy and Resilience (WICER) Framework

See appendix for additional information on circular economy pathways in the water sector.

Transitioning to a circular economy presents enormous opportunity for water utilities as highlighted below:

- Increased resilience of water utilities to deal with the effects of climate change, a growing population, and resource shocks
- Maximizing the value of water and materials/nutrients through keeping them at their highest value and circulating them for as long as possible.
- Unlocks new revenue streams through finding productive uses for by-products and creating more economic efficiencies and enhancing operational savings.
- Reduces the financial risk of infrastructure projects through improving the rate of return.
- Contribution to preservation and regeneration of natural ecosystems, in turn helping to mitigate the impacts of climate change, create carbon sinks, and create a healthy and thriving natural environment.
- Invigorating local economies through repair, recycling, re-use and recovery services. Also enhanced regional resilience through creating local partnerships

“Victoria’s water sector can positively influence efficient and renewable energy production, imitate and restore the natural cycle of water across landscapes, and recover materials where nothing is considered a waste but an input to another process.”
- DELWP seed funding – embracing circular economy opportunities

The need for change

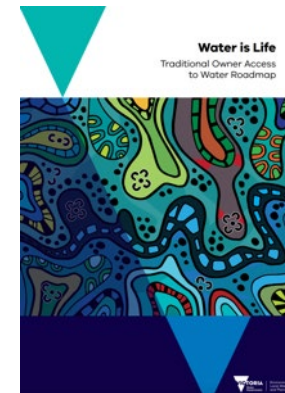
Wannon Water recognise an increasing responsibility to deliver services in line with circular economy principles. This is being driven by a number of factors:

- Obligations under Circular Economy (Waste Reduction & Recycling) Act 2021
- Requirements from Recycling Victoria to integrate and report on circular economy principles
- Shifting needs and expectations of customers and partners
- Strategic direction from Water Services Association Australia to accelerate circular economy action across the water sector
- Opportunity to start taking action on the Barwon Southwest Regional circular economy plan 2022
- Opportunity to understand how circular economy work can be integrated with our reconciliation action plan and carbon emissions reduction work

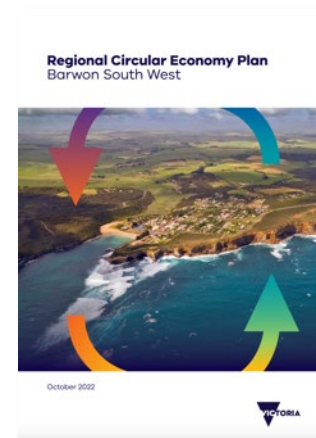
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However, we realise that now is the time to accelerate our commitment to regenerating our local environment and strengthening our local community through taking targeted action towards catalysing a circular economy in the way we operate and more broadly across the region.

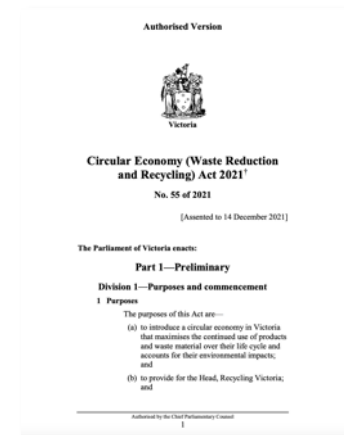
**for a full list of our current circular economy initiatives, please see page 22 of the current state report.*



“ Water authorities have a huge role to play. Everyone uses and touches water... ”
 – External stakeholder (Current state report)

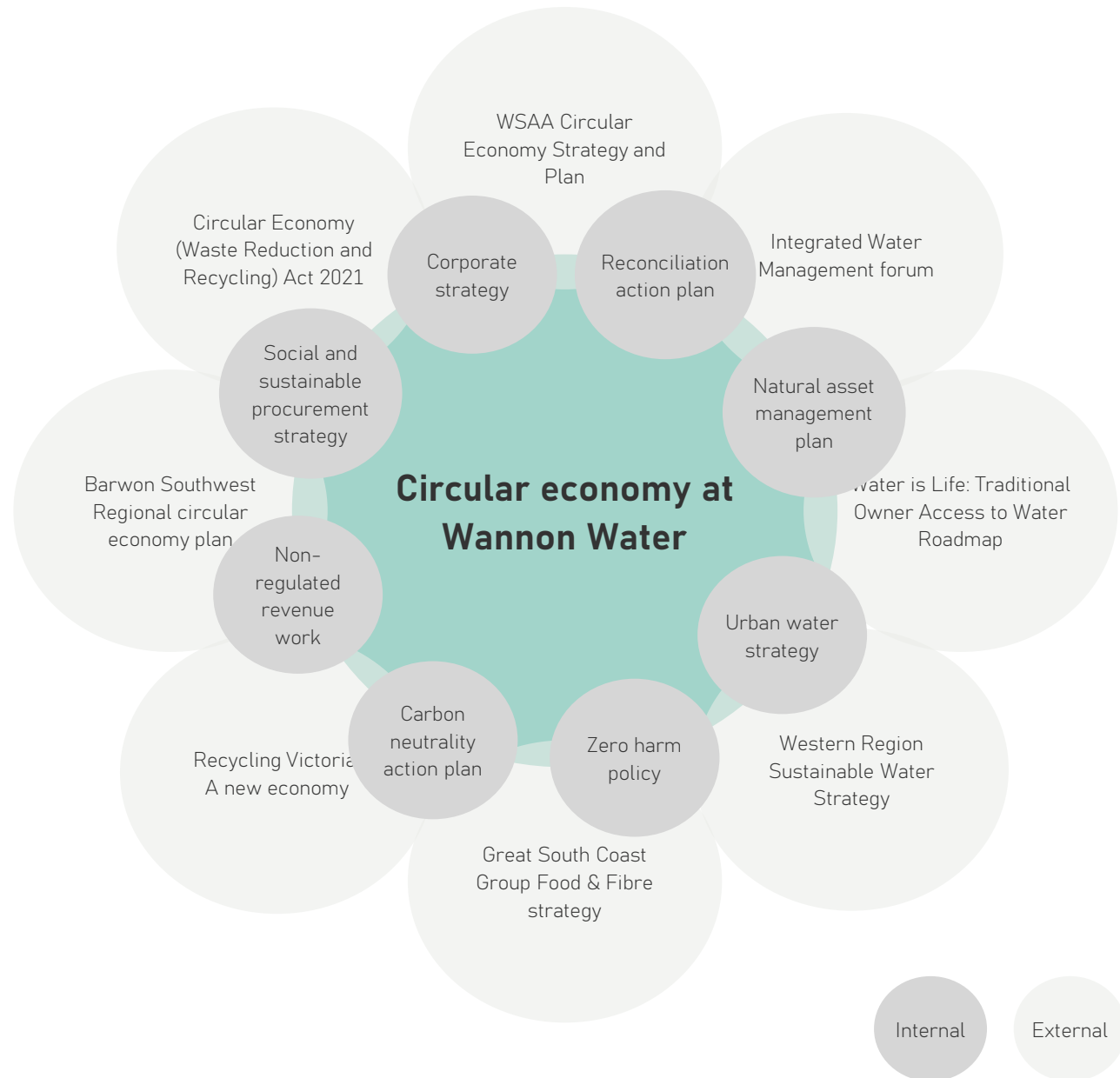


“ The role of Wannon Water as a leader. They are a large organisation with influence in the region. ”
 – Industry (Current state report)



Our strategic landscape

There are a number of external and internal strategies and plans that make up our circular economy context. The diagram below highlights the variety of strategies, plans, roadmaps and forums that influence (or have cross-over with) Wannon Water's circular economy action.



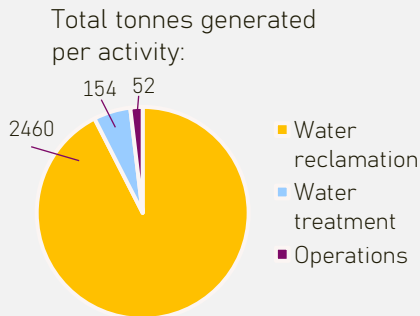
The current state of waste at Wannon Water – Overview

Waste at Wannon Water is made up of dry material and wet material. It is important to understand broader resource use and disposal, such as raw water extraction and disposal. The statistics below provide a high-level overview of key activities and outputs. Commentary at the bottom of the page highlights some key observations of Wannon Water’s waste profile.

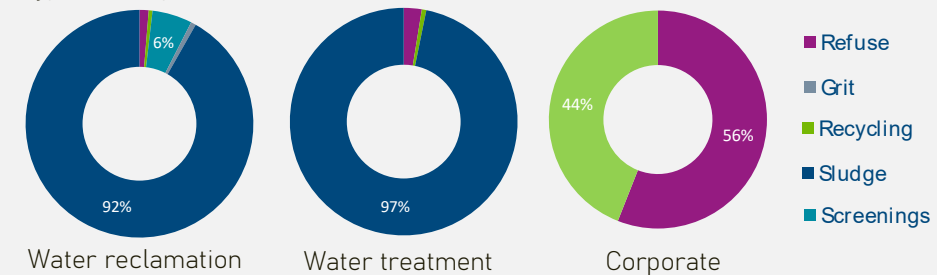
Waste overview

256 tonnes
of waste to
landfill
each year

Operations and corporate – top statistics (per annum):
37 T total dry material recycling
16,000 ML total raw water extracted
8822 ML total water discharge
1962 ML total water re-use and recycling



Types of outputs:



What do we know about waste at Wannon Water?

Sludge

The largest operational by-product is sludge, of which over 90% is currently being recovered for application to land, however its value is not fully realised.

Water recycling

Water recycling rates are low in comparison to ocean outfall quantities.

Screenings

A significant volume of waste is being sent to landfill and predominantly consists of screenings.

Transport

Large volumes of screenings and sludge are transported long distances for disposal or further treatment.

Contractor waste data

There is no data on the composition or amount of waste generated by the work Wannon Water engages contractors to complete (e.g., construction and demolition) however, dollar value of these works implies that there could be large quantities.

Asset maintenance and replacement data

No information is captured on composition or quantities of waste generated by asset maintenance or replacement except for items that can be approximated through the asset disposal register. The register indicates the amounts of pipe reaching end of life is the most significant of the items that could be quantified.

The current state of waste at Wannon Water – Activities and material flows

The following is a data snapshot of key activities, inputs and outputs. For a full breakdown of data, please see the Material Flow Assessment.



Operations

Key activities:

- Water treatment – 15 water treatment plants, 16 water disinfection plants
- Water reclamation – 17 sewage treatment plants, water recycling
- Biosolids treatment
- 196 pumping stations, water storage

	Inputs (2022)**	Outputs (2022)
Water treatment	<ul style="list-style-type: none"> • Raw water • Chemicals • Consumables 	<ul style="list-style-type: none"> • Potable water • Treatment sludge • Refuse
Water reclamation	<ul style="list-style-type: none"> • Sewage/trade waste • Chemicals • Consumables 	<ul style="list-style-type: none"> • Ocean outfall • Recycled water for reuse • Sludge • Screenings • Grit • Refuse
Biosolids treatment	<ul style="list-style-type: none"> • Sludge 	<ul style="list-style-type: none"> • Biosolids



Corporate

Key activities:

- Procurement
- Communications and engagement
- Retail

- | | Inputs (2022)** | Outputs (2022) |
|--|--|---|
| | <ul style="list-style-type: none"> • Packaging • Consumables | <ul style="list-style-type: none"> • General refuse (wastepaper/ cardboard, kitchen waste, soft plastics packaging, nonrecyclable containers) • Recycling |



Capex and civil maintenance*

Key activities:

- Service expansion
- Upgrades
- Renewal

- | | Inputs (2022)** | Outputs (2022) |
|--|---|---|
| | <ul style="list-style-type: none"> • Pipework • Electrical • Fleet • Civil structures, water storage structures, ancillary structures • Software systems, IT equipment • Earthworks • Valves, pumps, water meters • Chambers/pits • Road • Water service basin lining | <ul style="list-style-type: none"> • Construction and demolition waste (e.g., concrete, metal, spoil) • Aggregate • Soil • E-Waste • Pipe • Cables • Sold vehicles • End of life mechanical equipment • Water meters |

*Note: Wannon Water does not record the volumes of material procured for civil maintenance and capital projects but does record the value of assets built and capitalised or decommissioned and disposed of annually. Please see page 19-21 of the Material Flow Assessment for more detail

**Materials listed under capex and civil maintenance are ranked in order of biggest expenditure of routine capitalisations over the past five years

The current state of waste at Wannon Water – *Why do we create ‘waste’?*

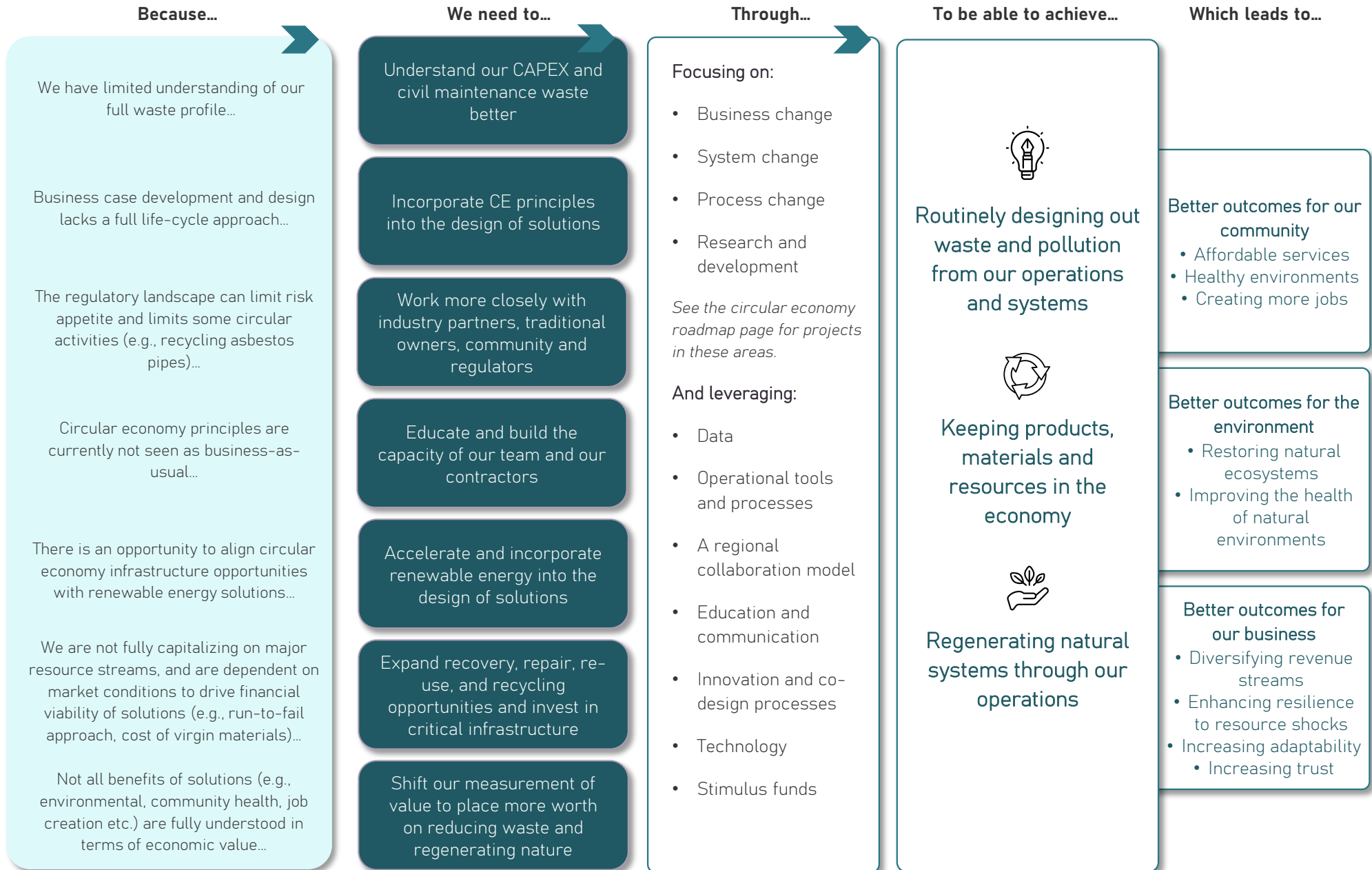
The current system

Waste is a symptom of the current approach (take-make-waste), therefore, in seeking to change the outcome (waste), we must identify and address the conditions that sustain it. At Wannon Water, there are several key factors underpinning why we create waste:

- What we can change
- **Organisational values, purpose, mindset:** While sustainability has always been a core part of what we do, circular economy principles have traditionally not been embedded in our business-as-usual operations and decision-making
 - **Design and lifecycle thinking:** When we design new solutions, we must consider multiple factors/criteria. However, traditionally, we have not applied a full life-cycle approach to designing assets or prioritised thorough analysis of the non-financial benefits of solutions.
 - **Material stewardship, data, and measurement:** There are many data gaps when it comes to understanding the full profile of our material usage and waste.
- What we can't change
- **Regulatory landscape:** The strict regulatory landscape in which Wannon Water operates limits our ability to re-use, recover, or recycle in some circumstances.
 - **Market factors and financial viability:** Standard market forces such as pricing and availability of products and materials dictate the financial viability of solutions, and ultimately dictate how materials/resources are used (e.g., run-to-fail).
 - **Environmental and social demand:** Historically, our large amount of rainfall and small population has meant we haven't been under pressure to recycle water. Additionally, demand for circular initiatives from customers has been low. However, these demands are changing with the advance of climate change.



Where are we heading and what needs to change?





Our circular economy roadmap



How to read the roadmap

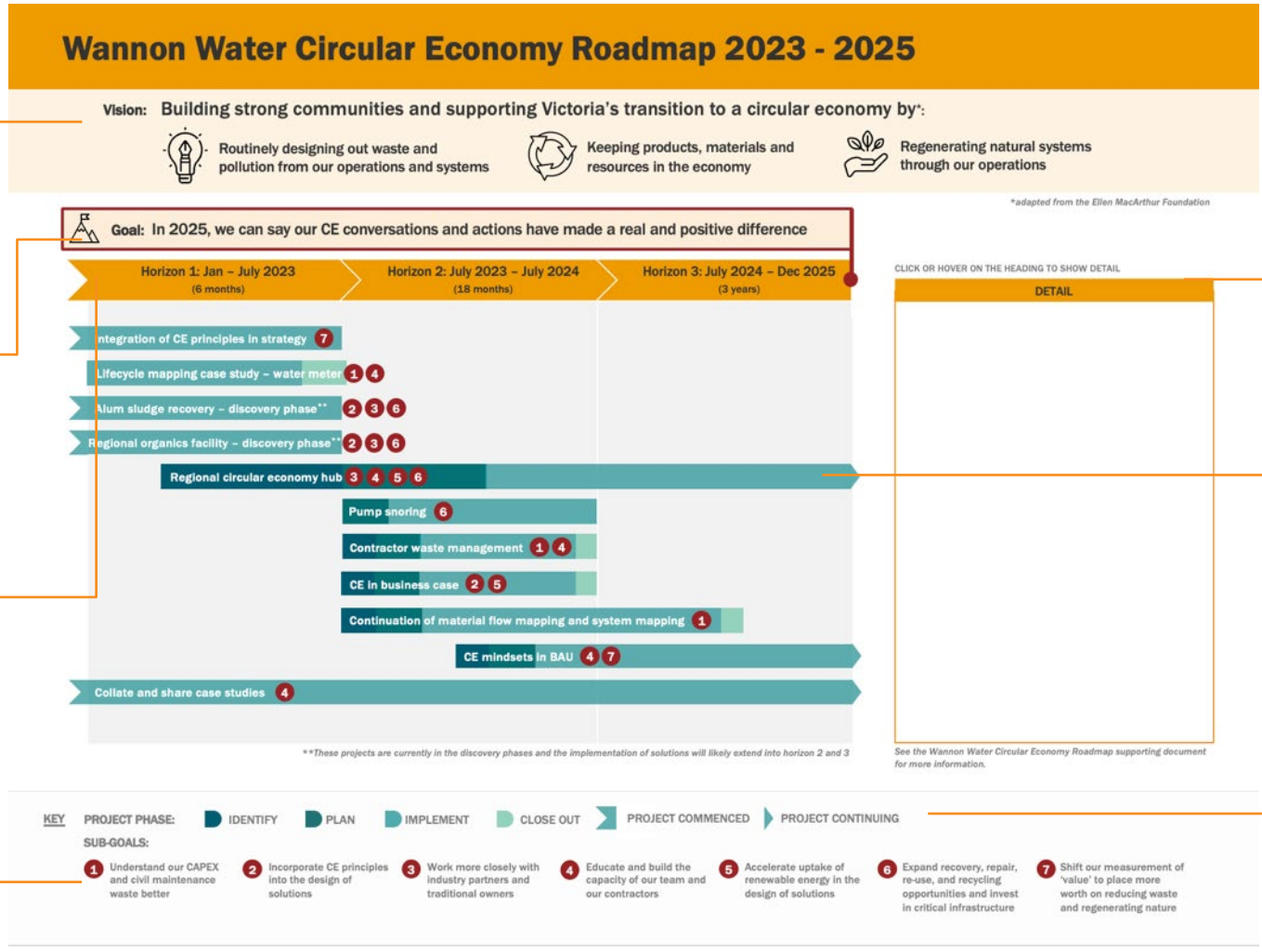
The roadmap can be interacted with by hovering a mouse over the different components to reveal additional information in the detail box (located on the right side). The roadmap is comprised of the following elements:

Our vision encapsulates the three circular economy principles we are working towards

Our goal is a statement explaining the outcome of this roadmap.

The horizon bar outlines the timeline for the delivery of projects.

The **sub-goals** at the bottom of the page outline the focus areas we are looking to address through the projects. They are informed by research.



The **'detail' box** on the right of the roadmap reveals detailed information on the areas of the roadmap by hovering the mouse over the different elements of the roadmap

The **project bars** outline the different projects to be undertaken. The length represent expected time the project will take. More information about each project can be gained by hovering your mouse over the project bar.

The **key** at the bottom of the roadmap showcase the project phases.

Wannon Water Circular Economy Roadmap 2023 - 2025

Vision: Building strong communities and supporting Victoria's transition to a circular economy by*:



Routinely designing out waste and pollution from our operations and systems



Keeping products, materials and resources in the economy

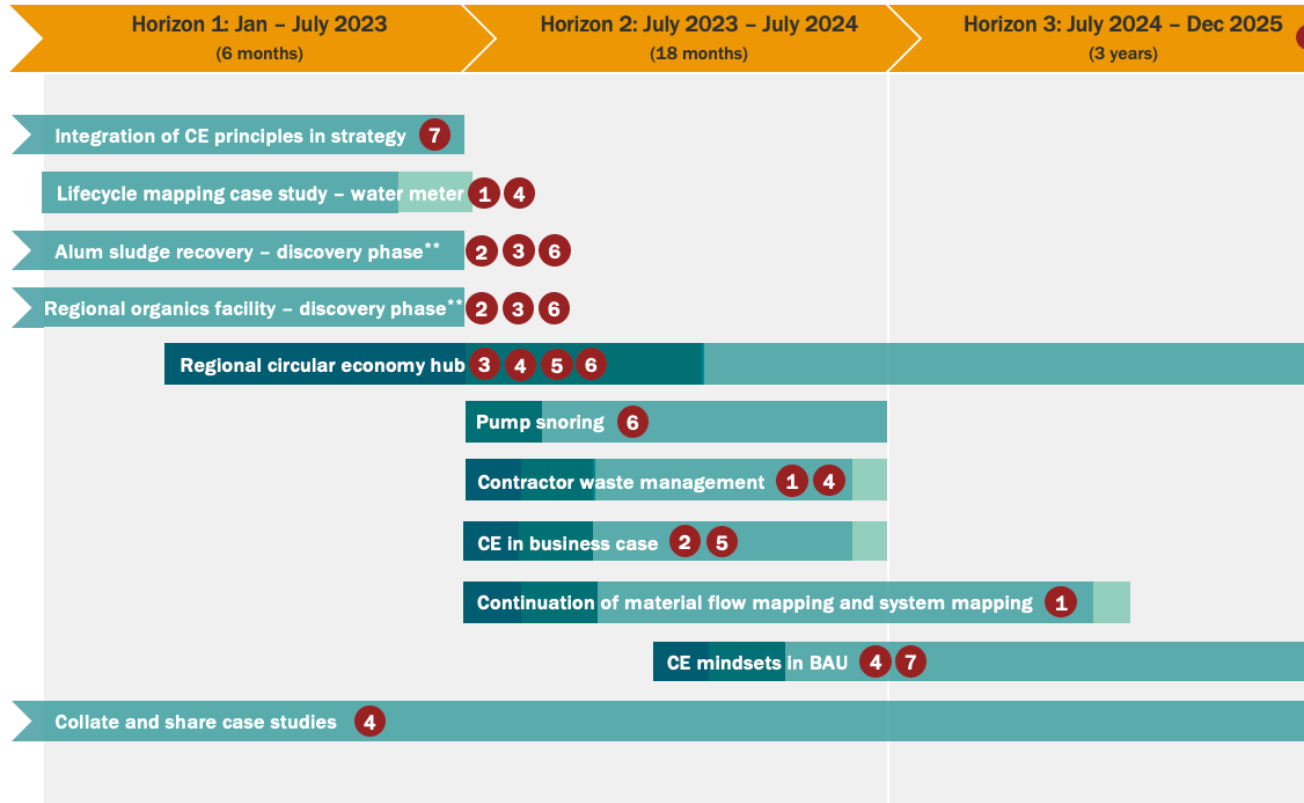


Regenerating natural systems through our operations

*adapted from the Ellen MacArthur Foundation



Goal: In 2025, we can say our CE conversations and actions have made a real and positive difference



**These projects are currently in the discovery phases and the implementation of solutions will likely extend into horizon 2 and 3

CLICK OR HOVER ON THE HEADING TO SHOW DETAIL

DETAIL

See the Wannon Water Circular Economy Roadmap supporting document for more information.

KEY PROJECT PHASE: IDENTIFY PLAN IMPLEMENT CLOSE OUT PROJECT COMMENCED PROJECT CONTINUING

SUB-GOALS:

- 1** Understand our CAPEX and civil maintenance waste better
- 2** Incorporate CE principles into the design of solutions
- 3** Work more closely with industry partners and traditional owners
- 4** Educate and build the capacity of our team and our contractors
- 5** Accelerate uptake of renewable energy in the design of solutions
- 6** Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure
- 7** Shift our measurement of 'value' to place more worth on reducing waste and regenerating nature

Our vision

Our vision is guided by the circular economy hierarchy as stated in the [Circular Economy \(Waste Reduction & Recycling\) Act 2021](#) and based on the three circular economy principles developed by the Ellen MacArthur Foundation. We are working towards the following:

Building strong communities and supporting Victoria's transition to a circular economy by:



Routinely designing out waste and pollution from our operations and systems

- Reducing reliance on virgin resources/materials and shifting focus to the waste hierarchy
- Creating assets that are durable, repairable, and shareable
- Integrating zero waste principles and lifecycle thinking into design
- Delivering services in a manner which avoids unnecessary or excessive purchasing or use of other materials/resources



Keeping products, materials and resources in the economy

- Maximising the productive use of all materials/resources/by-products through re-use, repair, recovery (e.g., waste to energy), recycling or composting.
- Procuring recycled material for infrastructure



Regenerating natural systems through our operations

- Creating nature-based solutions that actively rehabilitate and regenerate natural environments
- Ensuring the environment is a beneficiary in all designs
- Working with natural processes and environments to deliver water and wastewater services



Achieving the vision – our goal, sub-goals, and levers/tools

In order to fulfill our circular economy vision, we will use the next three years to work towards the goal and sub-goals outlined below. There are also several levers/tools we can employ across the projects identified in the roadmap.



Goal:

In 2025, we can say our circular economy (CE) conversations and actions have made a real and positive difference

Our goal highlights a commitment to promoting and taking action on circular economy within the organisation in order to achieve real change.

Sub-goals:

- Understand our CAPEX and civil maintenance waste better
- Incorporate CE principles into the design of solutions
- Work more closely with industry partners, traditional owners, community and regulators
- Educate and build the capacity of our team and our contractors
- Accelerate and incorporate renewable energy into the design of solutions
- Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure
- Shift our measurement of value to place more worth on reducing waste and regenerating nature

These sub-goals outline areas for us to focus in on. They are informed by research into the current state of waste at Wannon Water.

Levers/tools:

- **Data** – e.g., Collecting, tracking, and measuring data about materials, resources and ‘waste’
- **Operational tools and processes** – e.g., Integrating CE into business case, procurement processes and evaluation, contracts, induction processes
- **Regional collaboration model** – e.g., Forums, structures and ways of working for regional partnerships
- **Education and communication** – e.g., Sharing case studies, socialising circular economy goals and projects and making these relatable to people’s roles
- **Innovation and co-design process** – e.g., Encouraging multi-disciplinary teams, iterative design and testing
- **Technology** – e.g., Leveraging new technologies to enhance recycling, reuse, recovery and repair, as well as waste management and collaboration
- **Stimulus funds** – e.g., Tapping into federal govt, state govt, and industry funding to accelerate efforts

The levers/tools are elements we can employ in carrying out projects. They enable action and impact.

Projects in detail: Integration of circular economy principles in our strategy



Area of organisation:



Corporate

Type of project:

Business change

Materials:

All

Sub-goals:

- 7** Shift our measurement of 'value' to place more worth on reducing waste and regenerating nature

Wannon Water's circular economy goals are not currently reflected in the organisation's overarching strategy. To drive action and gain broad buy-in, our circular economy mission needs to be integrated into the strategy and reflected in relevant documentation.

What's the project?:

- Integrate the circular economy vision, goals, and projects into our organisational strategy and relevant documents

Outcome/value:

Transitioning to a circular economy is fundamentally about changing the way we attribute value and shifting our reliance on virgin materials/resources to reducing, re-using, recovering, repairing and recycling materials/resources. This requires circular economy principles and mindsets and to be embedded at the core of our operations and strategy. This project will ensure circular economy is a key focus area in our quest to reduce carbon emissions and achieve positive social and environmental outcomes.

Key activities to undertake:

This project is currently underway and in the 'implement' phase. It is due to be completed by July 2023.

- Review current organisational strategy and understand key gaps in relation to Wannon Water's circular economy vision and goals
- Update strategy as necessary and test with wider team
- Understand how we might measure impact

Success factors:

- Increased buy in and investment from our executives
- Consistency between documentation and organisational goals

Key levers/tools (see page 19):

- Operational tools and processes

Who is responsible:

Strategic Services

Example KPI's for measuring circularity:

Resource efficiency – e.g., quantity of waste generated, and percentage diverted from landfill; number of material flows tracked; rate of energy use in relation to production, use and disposal of materials/resources

Design – e.g., number of new projects with circular principles embedded; quantity of raw/virgin material/ resource being acquired

Stakeholder engagement – e.g., awareness of circular practices

Economic benefits – e.g., cost savings in relation to circularity, number of new revenue streams, number of jobs created

Environmental impact – e.g., greenhouse gas emissions reduction associated with circular practices; conservation of ecosystems, reduction of land use



Projects in detail: Lifecycle mapping case study – water meter

Area of organisation:



CAPEX/Civil
maintenance

Type of project:

Research and
development

Materials:

Water meters

Sub-goals:

1 Understand our CAPEX and civil maintenance waste better

4 Educate and build the capacity of our team and our contractors

The end-of-use fates of many assets/products procured and managed by Wannon Water as part of CAPEX and civil maintenance is not fully understood. There is a desire to understand the lifecycle of these materials/products in more depth in order to analyse the process and means through which they are managed and disposed of.

What's the project?:

- Deep dive into lifecycle of a water meter to understand contractor arrangements, waste flows, and possible re-use and recycling pathways
- This discovery and analysis process will take a circular economy lens and ask key questions of the current process. This project would act as a trial for understanding other key assets/products across CAPEX and civil maintenance works.

Outcome/value:

The outcome of this project is greater clarity on the full lifecycle of one of the most common assets used and maintained by Wannon Water. Highlighting key gaps, weaknesses, and strengths in the lifecycle can be used as a basis for understanding other key assets/products. This will ultimately result in better understanding of how operations promote or prevent recovery, repair, reuse and/or recycling, and therefore inform further action.

Key activities to undertake:

This project is in 'implement' phase. It is due to be completed by July 2023.

1. Mapping the water meter lifecycle
2. Research into alternative markets for components
3. Policies and processes review to design out redundancy/waste (cost: benefit of existing life cycle versus alternative life cycles)
4. Capture learnings of process and explore 'innovative' ways to share and present information that leads to other/more action

Success factors:

- Zero waste from the water meter replacement program
- Process and outcomes presented in a compelling way

Key levers/tools (see page 19):

- Data
- Operational tools and processes
- Education and communication
- Innovation and co-design process

Who is responsible:

Corporate Services

Useful links:

- [Icon Water paid to recycle water meters](#)
- [How to recycle utility meters: the process](#)



Projects in detail: Alum sludge recovery – discovery phase

Area of organisation:



Operations

Type of project:

Research and development

Materials:

Aluminium sulfate

Sub-goals:

- 2** Incorporate CE principles into the design of solutions
- 3** Work more closely with industry partners and traditional owners
- 6** Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure

Alum (aluminium sulfate) is a critical input for the safe and effective treatment of potable water. It is widely used for coagulation and clarification of water due mainly to its relative cheap cost of supply, ease of use and general effectiveness. However, the aluminium-rich sludge produced as a by-product is a growing concern, with an increased focus on environmental impacts of disposal potentially having a significant impact on the sector. All this is counter to circular economy principles, providing an opportunity for new thinking.

What's the project?:

- A desktop-review of the circular economy aspects of Alum use for the Victorian Water sector. The review will document a template approach applicable to other chemicals across the sector.
- There will be a focus on Victorian water corporations, but it is expected to have wide applicability to the Australian water sector. Wannon Water has been awarded a grant by DECCA to undertake this project. As part of the funding agreement, GHD was nominated as a collaborator to assist in the delivery of the project.

Outcome/value:

This discovery process will provide an overview of the possible pathways for alum recovery as well as alternatives to alum use in the water sector. This information will inform action and investment going forward as Wannon Water and the wider water sector looks to decreasing their environmental impact and diversifying supply of treatment chemicals.

Key activities to undertake:

This project is in 'implement' phase. It is due to be completed by July 2023. The implementation of solutions will likely extend into horizon 2 and 3.

1. Undertake desktop review with GHD
2. Document template approach
3. Share learnings

Success factors:

- Understanding of possible pathways for alum recovery as well as alternatives to alum use in the water sector
- Understanding of what action and investment is required going forward
- Diversifying supply of treatment chemicals and decreasing environmental impact

Key levers/tools (see page 19):

- Technology
- Stimulus funds

Who is responsible:

Strategic Services



Projects in detail: Regional organics facility – discovery phase

Area of organisation:



Operations

Type of project:

Research and development

Materials:

Sludge and other organics

Sub-goals:

2 Incorporate CE principles into the design of solutions

3 Work more closely with industry partners and traditional owners

6 Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure

While Wannon Water is currently recovering some sludge and providing it to farmers to apply to land as organic fertilizer, there is opportunity to enhance this recovery process. Other regions in Australia and around the world are showcasing the value in investing in organic processing facilities in order to capture organic materials in the region and turn them into useful products such as organic fertilizer, bio-char, and energy. Wannon Water, Industry, and municipalities in the Western District of Victoria are now looking at the potential for an organics facility in its own region.

What's the project?:

- Exploring opportunities for a regional organics facility with industry and municipalities. This will allow the region to combine all organic material at one, or a number of facilities for re-covering and processing organic material into useful products.
- The project will incorporate circular economy principles and explore robust sustainable opportunities and solutions. Other objectives include the reduction in greenhouse gas emissions, reduced operational costs for the region and the creation of new jobs.

Outcome/value:

This exploration of opportunities for a regional organics facility will be able to determine options for organics processing in the region – a critical project for reducing waste and enabling organic material to be processed into a valuable agricultural input.

Key activities to undertake:

This project has been represented in the roadmap as being in the 'implement' phase. However, a staged approach to the project has been adopted. This phase is due to be completed by July 2023. The implementation of solutions will likely extend into horizon 2 and 3.

Success factors:

- Understanding of possible pathways for a regional organic's facility
- Understanding of what action and investment is required going forward
- Diverting organics from landfill, fully realizing the value of sludge, and restoring the health of soils in the region

Key levers/tools (see page 19):

- Regional collaboration model
- Innovation and co-design process
- Technology
- Stimulus funds

Who is responsible:

Strategic Services



Current biosolids drying process at Camberdown site



Key learnings from the Regional Renewable Organics Network project

Barwon Water in partnership with local councils

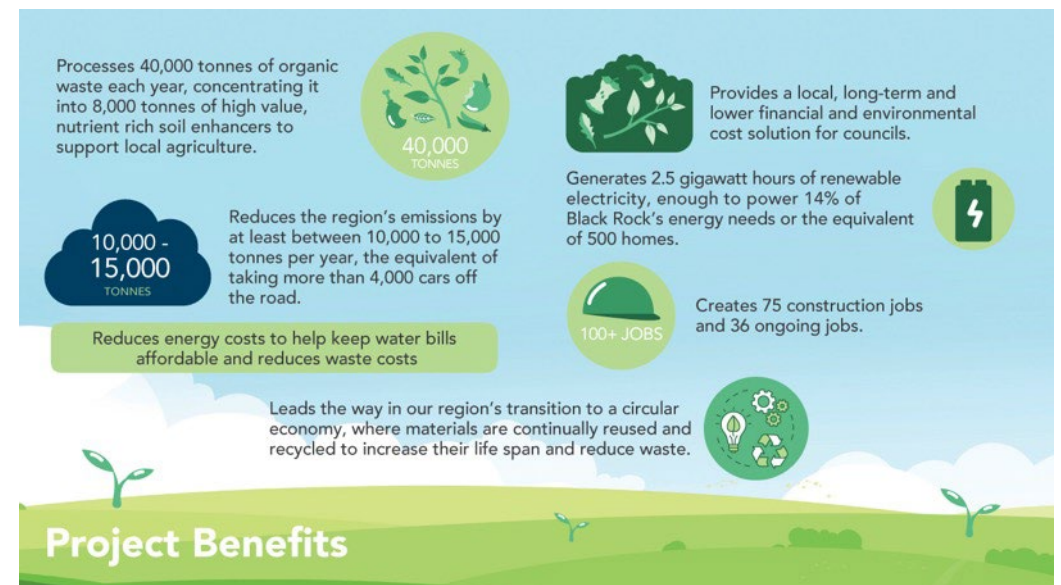
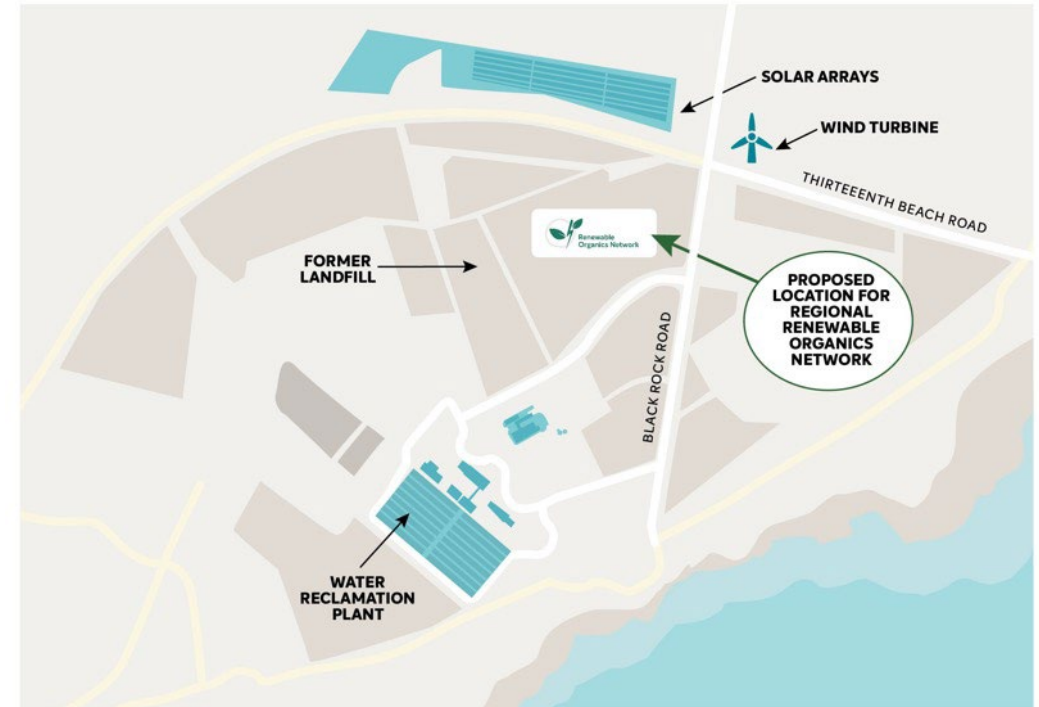
Q+A with Michael Thomas (Research & Development at Barwon Water)

What has been instrumental to success?

- Partnerships – Engagement with councils early on and being open and transparent about different needs, wants, desires etc. Additionally, partnerships with universities such as RMIT and industry have accelerated ability to innovate. This has spawned ideas such as having a commercialization hub.
- Good communication and engagement – Engaging with other areas of the community such as transport and energy and keeping them informed. Also explaining the 'why' and communicating the benefits through websites, factsheets, and public campaigns
- Understanding the end markets – e.g., biochar. This has enabled comprehensive market analysis to be conducted and deeper understanding of the financial benefits and value.
- Waste supplier agreements – Having a clear contractual agreement in place has been beneficial and also challenging. It's been important to understand limitations with council infrastructure such as bins.

What did Barwon Water have to change/enable internally?

- Created a dedicated circular economy initiatives team – This team employs a mindset around 'breaking the normal mold'. They are a mixture of disciplines including chemical and structural engineering, accounting, and health science. They are highly collaborative across the business.
- Embedding circular economy within strategy and leadership support – Leadership have focused attention on creating regional prosperity. This has encouraged an entrepreneurial mindset shift across the business which has spawned different modes of thinking.
- Asking different questions in design – From collaborating with a range of partners in the design phase, many new design challenges have emerged such as creating a modular facility and "let's build a battery that can power a pump station".



Source (both pictures): Your say - The Regional Renewable Organics Network at Black Rock

Projects in detail: Regional circular economy hub

Area of organisation:



Corporate

Type of project:

System change

Materials:

All

Sub-goals:

3 Work more closely with industry partners and traditional owners

4 Educate and build the capacity of our team and our contractors

5 Accelerate uptake of renewable energy in the design of solutions

6 Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure

The creation of a circular economy relies on the creation of a regional marketplace and infrastructure to support greater re-use, repair, recovery and recycling. In order to achieve this, collaboration across the region is vital. Wannon Water is seen by others in the region as a leader and convener in this space, and there is a desire from Wannon Water's end to work more closely with different stakeholders to create more opportunities for 'waste' reduction, re-use, recovery, repair and recycling. There is also an opportunity to create a platform for action in achieving the projects outlined in the Regional circular economy innovation workshop in November 2022, and to begin actioning projects outlined in the Barwon Southwest Regional Circular Economy Plan.

What's the project?:

- This project involves Wannon Water, DECCA, and other interested stakeholders coming together to create and sustain a regional 'hub' for stakeholders to learn, collaborate and activate initiatives to grow circularity across the region.
- The project looks to create recognition and buy-in from regional business, organisations and community, establish a compelling case for co-investment in the hub, expand the work that has been done to date and establish working partnerships, create the collaboration infrastructure (e.g., governance, facilitator, risk mitigation, digital and/or physical assets etc.) and create a forum for sharing, learning, and collaboration.

Outcome/value:

This project has the potential to create enormous value – from bringing together different stakeholders to collaborate on circular economy initiatives in the region, to undertaking circular economy research and development activities, to providing a platform for education, sharing, and learning. For Wannon Water, this project will allow them to identify and be part of regional material/resource synergies as well as work more closely with others in the region to create greater impact. As a leader in the region, it also reinstates Wannon Water's commitment to regional prosperity and innovation.

Key activities to undertake:

The first phase of this project – Identify – is to be completed by July 2023. The planning phase will take place from July 2023 to January 2024. Implementation will commence early 2024.

1. Create recognition and buy-in from regional business, organisations and community on the value of a hub
2. Establish a compelling case for potential partners to co-invest in the hub e.g., content, scope, resources, governance model
3. Gain clarity on who to invite to participate (e.g., networks) and procure expertise to establish the partnerships (e.g., broker)
4. Establish "infrastructure" e.g., governance, digital and physical assets
5. Deliver great projects to partners e.g., case studies, practical business outcomes they can use

Success factors:

- Becomes self-sustaining by 2025
- Attracts adequate investment to enable it to establish by end of 2023
- People say they are well informed and have the information and tools to undertake circular economy initiatives

Key levers/tools (see page 19):

- Regional collaboration model
- Innovation and co-design process
- Technology
- Stimulus funds

Who is responsible:

Strategic Services

Projects in detail: Pump snoring

Area of organisation:



CAPEX/Civil
maintenance

Type of project:

Process change

Materials:

Screenings

Sub-goals:

- 6** Expand recovery, repair, re-use, and recycling opportunities and invest in critical infrastructure

Currently pump stations have to be cleared of residue build-up. This residue, when pushed through the network is captured at the screenings stage and labelled as 'screenings'. The pump station system is currently not programmed to clear the residue through the system, resulting in multiple call-outs. This also means that the total quantity of screenings within the system is not able to be captured.

This project proposes coding the pump station pumping mechanism to cover a greater range so that all residue/screening can be pushed through the system and captured at the screenings stage.

What's the project?:

- Coding greater range of pump at pump stations to be able to push residue/screening build-up through system to be able to be captured at the screenings capture stage.

Outcome/value:

The key outcome of this project would be decreased transport costs and emissions (due to less call-outs to pump stations) and increased capture and tracking of screenings going through the system. In terms of circular economy outcomes, greater capture of screenings enables better understanding of waste quantities and profiles captured through Wannon Water's system and enhances the potential of dealing with screenings in different ways (e.g., waste-to-energy).

Key activities to undertake:

This project will commence with the planning phase in July 2023 and will be implemented by the end of July 2024.

1. Lifecycle mapping/problem definition
2. Technical solutions review identifies preferred option
3. Business case demonstrating business improvement and environmental benefits

Success factors:

- Pump station cleaning program has been superseded by much more efficient process
- Process and outcomes presented in a compelling way

Key levers/tools (see page 19):

- Regional collaboration model
- Innovation and co-design process
- Technology
- Stimulus funds

Who is responsible:

Maintenance
Strategic Services



Projects in detail: Contractor waste management

Area of organisation:



CAPEX/Civil
maintenance

Type of project:

Research and
development

Materials:

CAPEX and civil
materials

Sub-goals:

1 Understand our CAPEX and civil maintenance waste better

4 Educate and build the capacity of our team and our contractors

As a large procurer in the region, our waste is often dealt with by others, inhibiting our ability to understand our full waste profile. We also have an opportunity to align contractors around our circular economy goals and encourage circular economy principles to be adopted more broadly through procurement and the practices of contractors.

What's the project?:

This project has two major parts:

- **Contractor waste management and minimization:** this involves reviewing the current practices and understanding how we might better manage contractor waste data in order to create a more detailed waste profile and inform action around recovery, re-use, repair and recycling. These activities may result in the addition of waste management and minimization standards in contract clauses, contractor waste reporting, and education/induction programs for contractors.
- **Procurement:** this involves reviewing current procurement documents and evaluation criteria to understand how circular economy principles might be embedded. This may involve putting greater weighting on the use of recycled material, tenderer's waste minimization and management protocol etc.

Outcome/value:

The outcome of this project is ultimately to better understand our waste profile, unlock different recovery, re-use, and recycling opportunities, and influence others across the region.

Key activities to undertake:

This project will run from July 2023 to July 2024 and will commence with the identify phase and go through to the close out phase.

1. Pilot study with one contractor
2. Investigate the inventory tools and work out the IT requirement e.g., inventory tool for waste, IT support to track the system
3. Providing notice to contractors about waste management policy
4. Contractor education and buy-in – provide information about requirements, support to meet requirements, and bring in lessons from WHS and OHS program of work.

Success factors:

- Recording and tracking of waste
- Finding and creating relationships with waste recovery organisations
- Reduced costs

Key levers/tools (see page 19):

- Data
- Operational tools and processes

Who is responsible:

Asset Creation

Useful links:

- [Sustainable procurement analytics platform – Planet Price](#)



Projects in detail: Circular Economy (CE) in business case

Area of organisation:

All areas

Type of project:

System change

Materials:

All

Sub-goals:

2 Incorporate CE principles into the design of solutions

5 Accelerate uptake of renewable energy in the design of solutions

7 Shift our measurement of 'value' to place more worth on reducing waste and regenerating nature

Reduction of material use, consideration of end-of-use fates, and regeneration of natural environments have traditionally not been a part of how Wannon Water assess, design and plan new projects. However, it's possible that in the near future it may form part of our obligations and regulatory requirements. A key leverage point for increased circularity across the organisation is factoring in circular economy principles in the business case development for all new projects.

What's the project?:

- This project involves integrating circular economy principles into the business case template so that economic, social, and environmental criteria are more heavily considered/weighted in the design phase (e.g., an agreed and set multi-criteria analysis). It is also an opportunity to explore innovative ways of designing out waste, re-using materials, creating new revenue pathways, or creating solutions that are climate-positive.

Outcome/value:

The outcome of this project is to encourage greater uptake of circular economy principles in the design phase of solutions and to have solutions that realise "whole-of-community" benefits against cost.

Key activities to undertake:

This project will run from July 2023 to July 2024 and will commence with the identify phase and go through to the close out phase.

- Upskilling and training for project managers, board, executive team etc. and education about circular economy (including circular design models, and case studies (see resources in appendix))
- Integration of circular economy principles in project scoping and business case development

Success factors:

- All new business cases are considering circular economy principles and whole-of-community benefit in the design of solutions
- The community, partners, stakeholders etc. are inspired to act on environmental value

Key levers/tools (see page 19):

- Data
- Operational tools and processes

Who is responsible:

Strategic Services
Asset Planning
Finance

Useful links:

- [Carbon impacts of renovating vs replacing – CARE tool](#)
- [Circular economy innovation frameworks](#)

Key learnings from the Penshurst Sewer Project

Wannon Water and Southern Grampians Shire Council

The Penshurst sewer project is an example of work Wannon Water has already engaged in that inadvertently incorporates circular economy principles.

The challenge: The township of Penshurst in the Southern Grampians Shire Council region of south-west Victoria is the most densely populated unsewered town within the municipality. A Council audit of Penshurst's septic systems found 93% (approximately 190 systems) were not performing satisfactorily and did not adhere to current public health and environmental standards. In addition, around 95% of owners did not maintain their systems, leading to a high risk of contamination of the groundwater and local water bodies.

The solution: The Penshurst Recycled Water Scheme is a neighbourhood-scale solution that will look to decommission existing onsite systems and install separate gravity all-waste sewers. These sewers would direct raw sewage from properties to a local precinct water recycling system, which would conduct primary treatment of wastewater, then disposal through evapotranspiration "pods". These natural pod systems provide further treatment in the soil and allow water to be taken up by plants and evaporated. They also allow water to be stored within the pods during cooler, wetter periods.

This green infrastructure solution enables multiple non-market benefits to be had such as carbon sequestration, air pollution removal, health benefits for local community, and maintaining quality of greenspaces through recycled water irrigation.

What makes this project a circular economy project?

- The natural pod system allows wastewater to be used and treated by vegetation. 'Waste' is designed out, through returning biological waste (the wastewater) to a biological system (plants).
- This system keeps resources in use through using recycled water for irrigation
- The natural pod system contributes to regenerating nature through greening the townscape, providing carbon sequestration, removing air pollution, and cooling the local surrounds.

Q+A with Brad Clingin (Manager Assets Planning, Wannon Water)

What has been instrumental to success?

- Gaining the social license to undertake it – we worked closely with the EPA to enable a pilot to be approved
- Engaged a domestic wastewater specialist and involved the community in coming up with options – drop-in sessions in community allowed residents to talk through what would and wouldn't work. This process helped to guide towards a certain solution.
- Undertaking a detailed benefit analysis to lay out the complete range of benefits for the different options – used the Frontier economics and DECCA benefit/cost analysis tool and a cost allocation framework tool to understand the full range of benefits, including non-market economic benefits.



Source: Brad Clingin

Source: Southern Grampians Shire Council

Projects in detail: Continuation of material flow and systems mapping

Area of organisation:

All areas

Type of project:

Research and development

Materials:

All

Sub-goals:

- 1 Understand our CAPEX and civil maintenance waste better

While a material flow mapping exercise has already been undertaken, there is a desire to understand in more granularity the full material profile of Wannon Water and accumulate more data on materials and resources being used across the organisation.

What's the project?:

- This project is a continuation of the work that has already been undertaken and is about uncovering more data and insight into assets/materials across CAPEX and civil maintenance (e.g., assets and 'waste' sitting at depots etc.). It is also about asking different questions of our resource/material usage and disposal.

Outcome/value:

This project will look to further uncover key gaps in data and operational processes and provide a better understanding of Wannon Water's full material use and waste profile. It will potentially enable the creation of a more detailed database of materials. More visibility of materials will enable Wannon Water to find circular solutions for specific waste streams.

Key activities to undertake:

This project will run from July 2023 to January 2025 and will commence with the identify phase and go through to the close out phase.

1. Understand limitations of the current analysis and look at how it may be expanded
2. Talk to Phil Perret to understand how it's aligned with his current works program
3. Employing the use of a specialised tool or software for data management
4. Establishing buy-in from contractors to provide data
5. Allocated budget and resources to achieving the project

Success factors:

- Clear understanding of Wannon Water's full waste and material use profile

Key levers/tools (see page 19):

- Data

Who is responsible:

Strategic Services

Useful links:

- [Measuring circularity within organisation - circulytics](#)

Projects in detail: Circular economy (CE) mindsets in business-as-usual (BAU)



Area of organisation:

All areas

Type of project:

System change

Materials:

All

Sub-goals:

4 Educate and build the capacity of our team and our contractors

7 Shift our measurement of 'value' to place more worth on reducing waste and regenerating nature

A crucial part of aiding our transition to a circular economy is shifting mindsets around the value of 'waste'. Every Wannon Water employee has a part to play in helping us achieve our goals in becoming a more sustainable, responsible, and resilient organisation.

What's the project?:

- This project involves upskilling and educating employees across the organisation about how circular economy principles can be embedded in their roles and ways of working. This will involve understanding how circular economy principles may apply to different roles and providing guidance (e.g., elevate training, checklists, toolkits or educational material) to encourage the uptake of circular economy principles.

Outcome/value:

The outcome of this project is about educating all employees and ensuring circular economy is well understood across the organisation – particularly what it means for Wannon Water and how it applies to different roles. This will result in greater understanding across the business and ultimately impact how materials/resources are acquired, consumed, used, and their end-of-use fates.

Key activities to undertake:

This project will run from January 2024 through to end of 2025, with the potential to be an ongoing project. The identify and plan phases will be completed by the end of horizon 1 and implementation will have commenced heading into horizon 3.

- Engaging across organisation to understand what is required
- Embedding circular economy principles in project management framework, creation of checklists, posters, educational material etc.

Success factors:

- Circular economy principles and thinking applied across the organisation

Key levers/tools (see page 19):

- Education and communication

Who is responsible:

People and Wellbeing
Strategic Services



Projects in detail: Collate and share case studies

Area of organisation:
All areas

Type of project:
System change

Materials:
All

Sub-goals:

- 4** Educate and build the capacity of our team and our contractors

A core part of this program of work is about building knowledge and sharing learnings across the organisation. Capturing case studies for each project will be an important mechanism for communicating circular economy activities and learnings across the organisation and more broadly. Case studies can also be used to inform and educate on what circular economy looks like and what it means at Wannon Water.

What's the project?:

- This task involves ensuring case studies for projects are written up and shared on a common platform. They may be promoted through various channels.

Outcome/value:

Circular economy is still a new concept for many employees and people across our region and the wider water sector. Examples of circular economy can also take many forms depending on the type of material/resource or the maturity of the organisation. Collating and sharing learnings and case studies as we finish up projects will enable others to understand what circular economy looks like in practice and to learn from Wannon Water's successes and challenges.

Key activities to undertake:

This is an ongoing activity and covers all horizons.

1. Make case study capture an integral part of the project close-out phase for circular economy projects
2. Decide on a common platform to house case studies and a common format to streamline write-up

Success factors:

- Greater understanding of circular economy activities
- Lessons from previous circular economy projects

Key levers/tools (see page 19):

- Education and communication

Who is responsible:

CE Project Leads

Supported by Communication and Engagement Team

Other projects identified

Through our co-design workshop, there were additional initiatives that were identified. These were assessed on priority and impact during the prioritisation workshop. These projects may be incorporated into the next program of circular economy work.

Project Title	Description	Actions
Site-based sludge drying	Dry sludge at the treatment plants via renewable energy prior to cartage	<ol style="list-style-type: none"> 1. EPA endorsement 2. CAPEX 3. Lots of space
Infiltration project/ management	Reduce the infiltration in our sewer networks – look at bypassing areas to better ID areas of infiltration. Challenges – interfering with private property.	<ol style="list-style-type: none"> 1. Better ID areas of infiltration/reason 2. Collaboration with council (stormwater info) 3. Define measure of success – water? Energy? Chemical use at WRP? Maintenance cycles?
Standardisation for equipment design, construction and operations	Developing standards in equipment design, construction and operation.	<ol style="list-style-type: none"> 1. Standard design for processes: pump station design, chlorine dosing, cooling tower, water treatment, programming 2. Developing inventory/stores 3. Training teams to follow standards
Agree on a CE indicator	Look at existing indicators, consider design/custom indicator, report annually, check data	<ol style="list-style-type: none"> 1. Resourcing/time 2. Data



A regional circular economy



Circular economy in the Western District of Victoria

In delivering on our mission, we acknowledge the opportunity to go further by working with closely with others across the region. From working with our industry customers to re-use and recover waste, to strengthening our relationships with traditional owners and their involvement in waterway management, to tapping into the local business and innovators to create new products and solutions out of local waste – the opportunities for our region to work together are extensive.

As a region we face several shared challenges, and these can be overcome through our combined, targeted efforts and resources.

Some key challenges we've heard include:

- **Geography:** The large size of the region and spread of population create unique difficulties in providing services
- **Cost:** The cost of accessing local processing facilities means that it can be cheaper to transport waste and recycling to larger facilities in Melbourne
- **Workforce:** Limited industrial workforce and availability of staff
- **Regulation:** Regulation can limit the ability to be innovative and do things differently. Additionally, the lack of clarity surrounding some regulation can inhibit ability to pursue circular economy initiatives
- **Silos:** Limited collaboration across industry and understanding of synergies, effective allocation of resources and scalable options with shared benefit
- **Education:** An understanding of the circular economy and the value it could provide is not well understood across the region.

We have also heard of several key enablers for progressing circular economy*:

1. Behaviour change (industry and consumers)
2. Improved collaboration and communication
3. Legislation, regulations or standards reform
4. Improved infrastructure
5. Other key changes including research and development, reskilling and job training
6. Developing end use markets



*Identified in Regional Circular Economy Plan – Barwon South West

Circular economy in the Western District of Victoria

During the co-design workshop with regional stakeholders, a compelling narrative around what we want to shift away from as a region and what outcomes we're seeking was identified. The following is a synthesised list of the key points from across the groups.

What do we want to shift away from?

- Extraction of resources and the perception of infinite natural resources
- Traditional models of efficiency, growth, and resource flows
- Traditional business cases and current understandings of 'value' that focus on financial benefits
- Traditional design that focuses on single use
- Wastage and disposal e.g., wastage of nutrients, disposal to landfill, using rivers as drains, careless dosing of inputs, disposal to waterways
- Competitiveness e.g., IP as a barrier to collaboration, fear of collaboration over competition
- High levels of transportation
- Siloing and separation e.g., regulatory silos, geographic separation from SA (think green triangle)
- Risk averse behaviour e.g., penalty-based regulation, "can't do" thinking, "too busy" attitude
- Decision's/capability out of region or out of sight e.g., reliance on 3rd party, decisions made elsewhere that inhibit our actions

What outcomes are we seeking as a region?

- Healthy habitats and waterways, and increased biodiversity that provide us with a high quality of life, support future generations, and are resilient in the face of climate change
- New definitions of value and greater awareness of the social and financial benefits of a healthy environment
- No 'wasted' material and resources in the region
- Materials/resources are kept at their highest value for longer
- More smart design e.g., modularity, designed to repair, compostable packaging
- Transition to renewables
- Greater local capability to sort, repair, and recycle materials and nutrients
- Local markets and economies of scale e.g., local building materials
- Greater sharing and collaboration e.g., bulk purchasing, shared technology
- Data-based decision-making and sharing e.g., regulations based on data not routine
- Greater regional control of decision-making and cross-border solutions
- Confident collaboration e.g., risk and value are well considered, allocated and managed across organisations (public and private)
- Transparent accounting and reporting for environmental cost and benefits
- No landfill

Our regional-focused initiatives

While many of our initiatives focus on improvements to our internal systems, there are several initiatives we will work with regional stakeholders on.

Contractor waste management

Key partners:

- Contractors

Link to Regional Circular Economy Plan (Barwon South West):

Behaviour change (industry and consumers)

- Promote sustainable, locally manufactured products within the region to support local circular economy jobs.
- Invest in community groups and social enterprises, training and volunteer attraction to continue to empower the community to transition to a circular economy.
- Communicate local circular economy outcomes to the community, promoting and celebrating the combined community effort e.g., recycling volumes, landfill volumes avoided, new products created.

Legislation, regulations, or standards reform

- Increase the uptake and use of recycled and recyclable materials within all levels of government through procurement practices and mandating appropriate levels of recyclable material in all projects.

Regional organics facility

Key partners:

- Corangamite Shire

Links to workshop ideas:

- Reclassification of sludge
- Regional organics and sludge solutions

Link to Regional Circular Economy Plan (Barwon South West):

Improved infrastructure:

- Invest in new materials recovery facilities in proximity to both Geelong environs and the South West to facilitate local processing and manufacturing.

Developing end use markets:

- Support reuse entities already working in the region to expand their capabilities or explore new projects which fit with the region's circular ambitions.

Improved collaboration and communication:

- Use strategic and region wide mechanisms to raise the profile of circular economy, including investment in infrastructure to increase reprocessing capacity for organics, carbon fibre and textiles.

Regional circular economy hub

Key partners:

- Industry leaders
- DELWP
- Corangamite Shire

Links to workshop ideas:

- Forum to deliver on circular economy – moving from waste to resource
- Enabling communities to enroll in circular economy thinking across the region
- Partnership broking to share risk

Link to Regional Circular Economy Plan (Barwon South West):

Improved collaboration and communication:

- Use strategic and region wide mechanisms to raise the profile of circular economy, including investment in infrastructure to increase reprocessing capacity for organics, carbon fibre and textiles.
- Promote innovative and collaborative approaches through science, technology, and initiatives to demonstrate reuse of materials, or recycling across different industry types.
- Make better use of existing tools and information to map and understand local circular economy opportunities including materials flow, use and volume to enable better take up (e.g., Sustainability Victoria, ASPIRE).

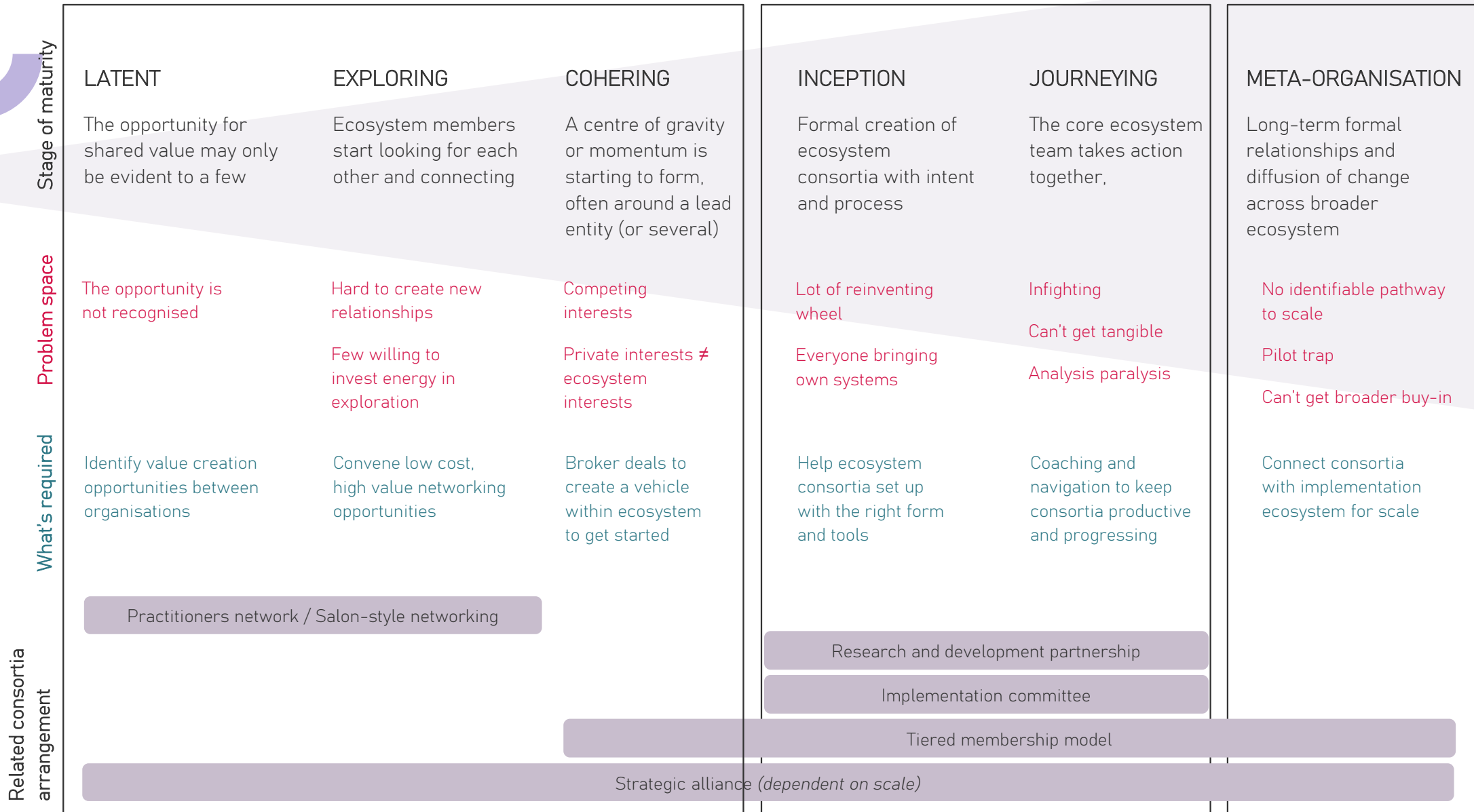
Other regional initiatives identified

Through our co-design workshop, there were additional initiatives that were identified that do not fit into the scope of the regional initiatives Wannon Water is leading. These projects can be further discussed and iterated through the formation of a regional circular economy coalition,

Project Title	Description	Actions	Who?	Link to Regional Circular Economy Plan – Barwon Southwest
Regional environmental analysis – business case requirement	Linking human habits with natural world by establishing benefits and costs database and template for inclusion in BAU/business cases.	1. Stakeholder mapping workshop	<ul style="list-style-type: none"> Wannon Water (leading) CMA Traditional Owners DEWLP 	<ul style="list-style-type: none"> Behaviour change (industry and consumers)
Recycled water for dairy	Working with dairy industry to increase onsite recycled water usage	1. Stakeholder engagement	<ul style="list-style-type: none"> Saputo Wannon Water (supporting) EPA engagement 	<ul style="list-style-type: none"> Improved infrastructure Improved collaboration and communication
Healthy farm, higher profit	Supporting farmers to maximise profit whilst improving environment. Creation of demonstration sites and soil testing trials, sharing data and evidence, and educating.	1. Identify best demonstration sites	<ul style="list-style-type: none"> CMA Agriculture Victoria Industry Body 	<ul style="list-style-type: none"> Behaviour change (industry and consumers)
Sustainable design in engineering	Including sustainable design and circular philosophy in engineering as a standard	<i>Not assigned</i>	<i>Not assigned</i>	<ul style="list-style-type: none"> Behaviour change (industry and consumers)
Region-wide business case/life cycle assessment reference material	Develop reference material (e.g., guidelines, templates, frameworks) that supports organisational transitions to circularity by assisting in the redefining of 'value'.	<i>Not assigned</i>	<i>Not assigned</i>	<ul style="list-style-type: none"> Behaviour change (industry and consumers) Improved collaboration and communication
Internal resource strategy for behaviour change	Centralise/standardise bins across office in Moyne. Review internal use of products and end waste/recovery	1. Develop and implement	<ul style="list-style-type: none"> Moyne Shire (internal) 	<ul style="list-style-type: none"> Behaviour change (industry and consumers)
Reduce pharmaceutical waste in water	<i>Not detailed</i>	1. Education and research program	<i>Not assigned</i>	<ul style="list-style-type: none"> Behaviour change (industry and consumers)

Stages of consortia

There are various stages of consortia that dictate the arrangement required. The diagram below provides an overview of the different phases of maturity.



Regional governance frameworks

There are several frameworks for a consortia arrangement, with each one offering a variety of benefits and potential disadvantages. A combination of structures may be employed dependent on the maturity of the ecosystem.

Governance structure type	Description	Pros/cons	Examples
1 Tiered membership model	<ul style="list-style-type: none"> Organisations “pay to play” through becoming a member (this might involve different tiers) Membership funds contribute to shared resourcing to propel regional circular economy work (e.g., an executive officer to pursue work) Sub-committees and working groups to address key focus areas and source additional funding Structured approach involves creating a strategy, holding AGMs, frequent meetings etc. Becoming a strong voice, and presence in the region to advocate for circular outcomes Different tiers receive different benefits e.g., extra vote on board 	<p>Pros:</p> <ul style="list-style-type: none"> Organisations signed up are strongly committed due to financial investment Appointment of a non-partisan, permanent resource to drive action Structured approach leads to purposeful, long-term action Providing different incentives to attract greater investment Springboard for other regional strategic priorities <p>Cons:</p> <ul style="list-style-type: none"> Financial requirement may exclude some groups and the types of roles that contribute Tiered structure favours those with more funding 	<ul style="list-style-type: none"> Committee for Portland Hunter Joint Organisation VicWater Better Cotton
2 Strategic alliance (collective impact methodology)	<ul style="list-style-type: none"> Bringing together different interested stakeholders around a central issue supported by a backbone facilitator and organized by a producer Working groups (alliances for action) are formed and guided through the process Government funding to run the process A series of monthly workshops to check-in on progress of projects. These may be attended by ministers. Also provides an opportunity to network and increase profile Coaching sessions for participants, a toolkit to guide the process, and a showcase at the end of ideas to gather funding for prototypes and trials Might be integrated with the development of the Circular Economy Hub 	<p>Pros:</p> <ul style="list-style-type: none"> Process is guided by expert facilitator and producer Open to anyone to join Model incentivizes ongoing collaboration, networking and progression of ideas Upskilling and empowering participants in the process Flexible structure – can be scaled to be short or long-term, structured to be one-off program or a cyclical program with different phases all the way up to implementation of projects. Can also be a light-touch approach from facilitation with more focus on providing the tools for collaboration. <p>Cons:</p> <ul style="list-style-type: none"> Volunteer approach therefore not as much “skin in the game” Dependent on government funding to run the process 	<ul style="list-style-type: none"> Alliance for Action for Lower-Wage Workers CSIRO ON Prime Innovation program Regen Melbourne

Regional governance frameworks

	Governance structure type	Description	Pros/cons	Examples
3	Implementation committee	<ul style="list-style-type: none"> Interested parties come together to implement a key circular economy project/s identified in this report or the Barwon Southwest regional circular economy plan. Funding sources dependent on the type of project and decided by committee (e.g., local investment, government grants) Implementation approach is decided by committee Unstructured, flexible approach 	<p>Pros:</p> <ul style="list-style-type: none"> Interested parties are highly involved and invested in the outcome Any role or organisation willing to provide resourcing can be involved <p>Cons:</p> <ul style="list-style-type: none"> Potentially only a short-term arrangement (duration of project) Reliant on individuals from organisations balancing commitments Organisations unable to commit a resource will be unable to have input Risk in approach being unguided/unstructured 	<ul style="list-style-type: none"> Regional organics group
4	Practitioners' network or Salon-style networking	<ul style="list-style-type: none"> Informal networking/connecting arrangement centered around a place to meet one another and discuss the related topic Administration time is minimized Focus is on creating relationships rather than knowledge management May be centred around an activity, a framing question, or a provocation. 	<p>Pros:</p> <ul style="list-style-type: none"> Informal style with minimal administration time Strong focus on network/relationship building Exploratory focus with the potential to expand thinking and rally support for action <p>Cons:</p> <ul style="list-style-type: none"> Not action-focused 	<ul style="list-style-type: none"> Green drinks Circulating – a group exploring the circular economy Local government circular economy network
5	Research and Development partnership	<ul style="list-style-type: none"> Partnership between local industry, council, DELWP and Deakin to pursue key circular economy R+D areas Deakin as a delivery partner to undertake key research and deliver local trials Investment from industry and council and funding rounds from DELWP and Federal Government 	<p>Pros:</p> <ul style="list-style-type: none"> Localised research and development carried out by academia with access to latest technologies/innovation Dedicated resource to implement and run trials and share learnings across the region <p>Cons:</p> <ul style="list-style-type: none"> Only focused on research and development, therefore more funding would need to be sourced to implement projects at full-scale Potential inequity around who undertakes trials and who benefits from research and development focus areas 	<ul style="list-style-type: none"> Rural R&D Corporations Deakin Research Partnership to address mental health for SME business owners

Next steps



Next steps

Activate projects:

- Identify resources and funding required to achieve the projects identified in the roadmap
- Create a 'bank' of different funding streams to tap into to enable some projects to go ahead
- Understand how projects identified in this roadmap may utilise a design and innovation process (as identified in previous innovation work)
- Understand key regulatory risks involved with identified projects

Credibility and connections:

- Build presence in in the circular economy community through attending conferences, connecting with thought leaders and sharing stories more widely

Kickstart the coalition:

1. Convene with regional circular economy champions and organise the next check-in for regional stakeholders
2. Decide on a preferred governance framework for the network
3. Connect in with parties who were not involved in first round of engagement for this project



Appendix



Overview of process

Over the course of several months there have been a variety of research methods employed to establish an understanding of the current state of circularity at Wannon Water, uncover the opportunities in the current material flows, innovate potential solutions, and prioritise and refine concepts.



Understand the current state



Form circular economy initiatives and partnerships



Disseminate learnings

2. Explore

- Desktop research
- T+T undertook a material flows analysis
- Engagements with 16 internal Wannon Water staff and 13 external stakeholders
- Current state report

1. Set intent

- 2-hour intent setting workshop with ThinkPlace with T+T and Wannon Water.
- Formation of core design team
- Intent statement

4. Evaluate

- Prioritisation workshop with core design team to prioritise concepts

6. Reflect and build toolkit

- Reflecting on process
- Building case study and toolkit with methodologies and templates

3. Innovate

- 2x co-design workshops; one with internal Wannon Water members, and one with both internal and external stakeholders.
- Workshop summary reports

5. Build, Test, and Deliver

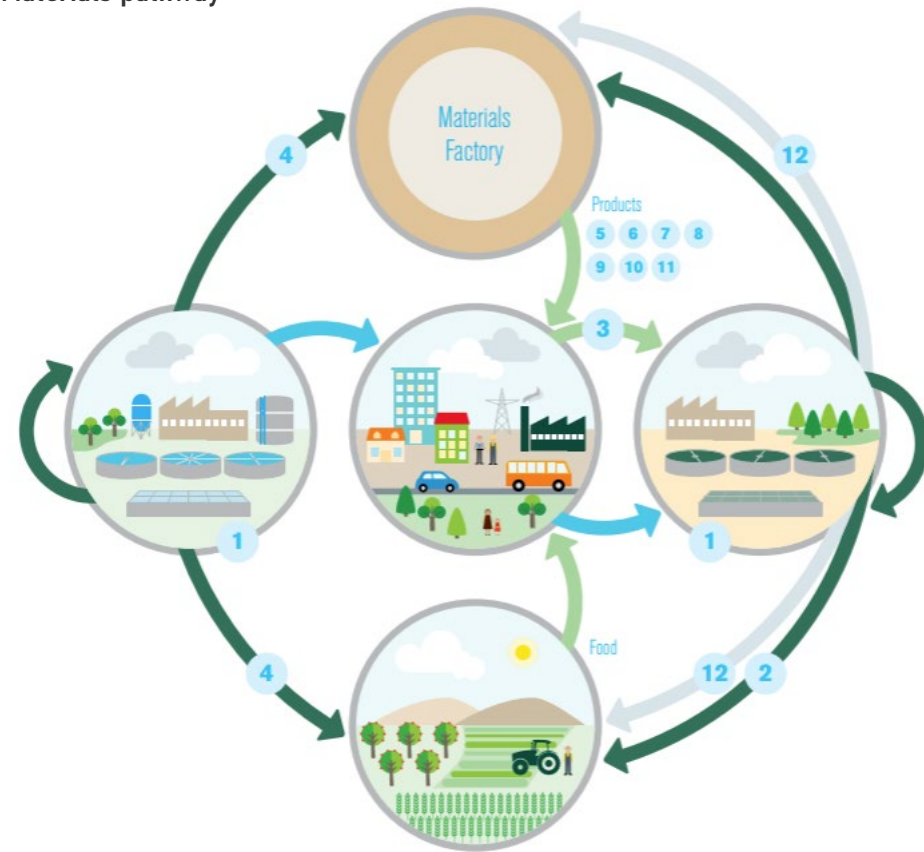
- Building roadmap and supporting document
- Testing with core design team

Water utility pathways in a circular economy – The International Water Association

Water pathway



Materials pathway



- Potable water
- Non-potable water
- Wastewater
- Reclaimed water
- Greywater
- Rainwater

- | | |
|---|--|
| 1 Upstream investments | 6 Reused water for industry |
| 2 Rainwater harvesting | 7 Direct potable reuse |
| 3 Greywater recycling for non-potable reuse | ⚡ 8 Leakage / Water loss |
| 4 Greywater for agriculture and aquaculture | 9 Reduction in water consumption |
| 5 Reused water for agriculture and aquaculture | X Onsite treatment |

- Recovered materials
- Organic matter
- Water
- Gas

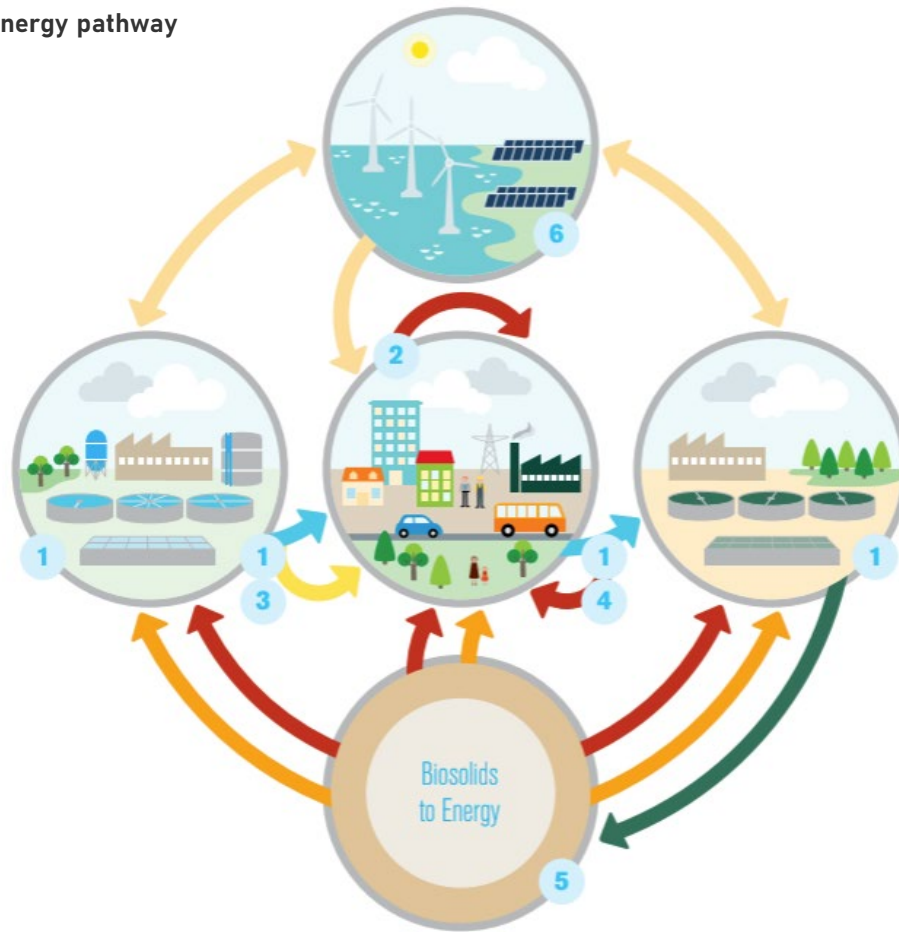
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|---|
| 1 Resource efficiency |
| 2 Wastewater sludge and products thereof for agriculture |
| 3 Organic waste added to wastewater sludge |
| 4 Drinking water sludge to agriculture or industry |
| 12 Effluent gas reuse |

Products

- | | |
|--|---|
| 5 Bioplastics | 9 Proteins & Feed |
| 6 Fertiliser (non-agricultural) | 10 Metals & Minerals |
| 7 Paper & Cellulose | 11 Human health products |
| 8 Building materials | |

Water utility pathways in a circular economy – The International Water Association

Energy pathway



- | | |
|--|---|
| <ul style="list-style-type: none"> Organic energy Heat Topographic energy Other renewable energy Water Recovered materials | <ul style="list-style-type: none"> 1 Energy saving at treatment plants & distribution systems 2 Energy reduction and recovery at home 3 Electricity produced from distribution systems 4 Heat produced from distribution systems 5 Wastewater biosolids to energy production (gas, electricity & heat) 6 Renewable energy |
|--|---|

