W-Lab Technology Roadmap

WATER SERVICES ASSOCIATION OF AUSTRALIA

W-Lab

The W-Lab Vision

Water Services Association of Australia through W-Lab brings together a specialist network of water experts, innovators and utilities, leveraging technology to secure the future of the industry. It bridges the gap between innovation and the water utilities by leaning on our network's knowledge and expertise to inspire confidence.

We have collaborated with members from our diverse network across Australia and New Zealand, including large, small, regional and council water utilities to create our vision of a new water future:

- That is co-created by customers and utilities;
- where water, energy, waste, telecommunications and agriculture are integrated; driven by communities and enabled with technology;
- where closing the loop has created new economies;
- that gives back to nature, enabling thriving communities.

This Roadmap is our guide, to keep us on track to reach our vision and enable our partners and collaborators to see where we are heading. It will guide how water utilities in Australia and New Zealand approach technology and innovation and leverage their collective knowledge, expertise and resources to solve current and emerging challenges. The Roadmap is a dynamic document that will change as members address key challenges, learn, adapt and move into new areas.

What value will the Roadmap deliver?

Success means W-Lab Members will...

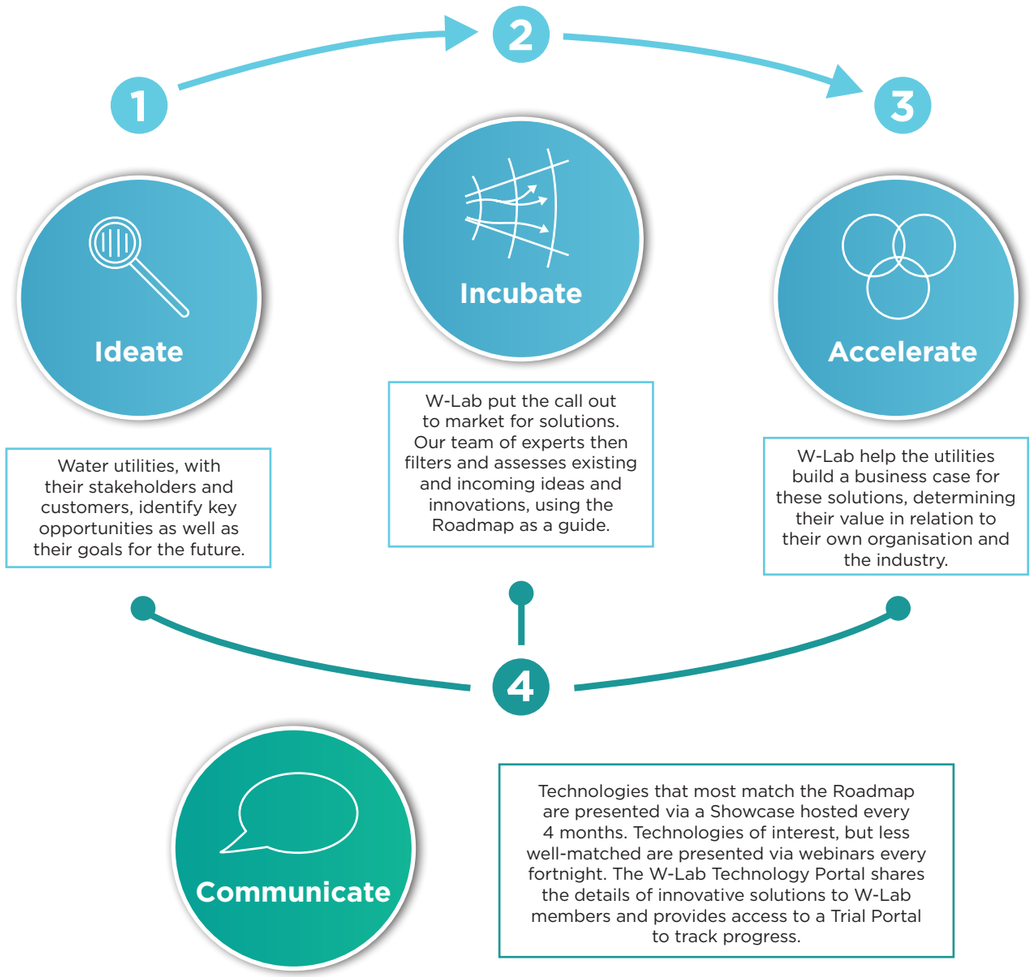
1. Lower costs through innovative approaches to maintain and modernise our infrastructure.
2. Remain relevant as an equitable provider of essential services in our regions.
3. Deliver to ever-evolving customer expectations in service delivery and care for the environment.
4. Improve the safety and wellbeing of our workforce.
5. Respond to increased climate variability and population growth.

How W-Lab Works

W-Lab will achieve this co-created vision through a new way of consolidating industry knowledge and insights, allowing utilities to steer the course of innovation. By empowering utility stakeholders, W-Lab creates champions and change-makers in industry.

W-Lab will scout for technologies and solutions that have the most potential to progressively propel the industry to fulfill our collective vision. Water utilities collaborate in evaluating and trialling solutions. W-Lab will help utilities build the business case for solutions with the most potential.

W-Lab has four stages



How are technologies sourced?

W-Lab provides a invaluable point of entry into the Australian and New Zealand water industry using an invaluable evaluation process that aligns with member requirements. Through our "Call to Market" documents - W-Lab helps technology vendors navigate their market entry with clear guidelines and actionable insights. W-Lab ensures that the time, effort and resources devoted by utilities and technology vendors generates clear outcomes.

How are technologies presented?

Technologies that have the greatest potential are invited to present at one of three Showcase Events hosted annually. Technologies that are still of interest but not showcased may apply for a subsequent opportunity area where there is overlap and can be featured through W-Lab's fortnightly webinar series. All reviewed technologies have a profile created on our Technology Portal, for anytime ease of access.

W-Lab Yearly Cycle

W-Lab is a 4 year program with a repeating yearly cycle. We will run an Ideation Summit every 2 years. The yearly three stage process is depicted below:

Year 1 Showcase Areas

1 November 2020

Explore new markets and recover value from waste

2 March 2021

Limit our extraction of freshwater from the natural environment

3 June 2021

Create insights from data to inform our decisions and share with others

4 September 2021

Understand and support the diverse needs of our customers

What are the Opportunities?

Each water utility's individual challenges are, of course, unique – however, experience shows us that many of these challenges are also shared by others in the industry, from the smallest to the largest organisations. We aim to explore a mix of opportunities across core, adjacent and transformational innovation areas. This will enable all members to participate and see value in W-Lab regardless of where they are on their innovation journey.

Core technologies enable strengthening of core business, adjacent technologies move into adjacent areas whilst maintaining cost and practicality. Transformational technologies are those looking to transform current practices, based on understanding future challenges and maintaining flexible strategies.

The opportunities and technology areas listed below have been selected and prioritised with utilities to develop and showcase technologies through the W Lab journey.

INNOVATION FRAME – CUSTOMERS

A new water future where the sector is co-created by customers and utilities

Technology Innovation Levels

How might we	Core	Adjacent	Transformational
 Understand and support the diverse needs of our customers	• Making data and insight available to the customer	• Making it easier for customers to communicate with utilities	• Streamlined data sharing and communication with customers and industry
 Empower positive water behaviour and relationships in communities	• Engagement and communication with communities	• Gamification in the home using smart meters where possible • Customer platforms for 1.5-way communication	• Getting community ownership / buy in. Getting the community invested into the "water cycle"
 Work with customers to meet the challenge of affordability	• Predictive modelling tools and digital twins • Smart sensors (plug and play) • New methods of billing and payment	• Social Media derived insights • Gamification tool for education (value of water)	• Water efficiency devices linked to billing, operational needs, gamification • Commodity (water, waste) trading schemes and blockchain
 Empower customers to take control of the water cycle in their homes	• Grey-water recycling • Alternative water point sources • Water efficiency devices (fittings for the home and business)	• Alternative water source uses within community • Water trading managed by individuals	• Waste treatment in the home • Alternative water sources monitored and managed by utility
 Collaborate and share data across sectors to create meaningful insights about our customers	• Collecting and sharing information that is useful to cross industry partners	• Increased integrated cross industry data sharing platforms	• Cross industry integration of data collection, analysis and communication

INNOVATION FRAME – NATURE

A new water future where giving back to nature, enables thriving communities

Technology Innovation Levels

How might we	Core	Adjacent	Transformational
 Monitor and measure our progress	• Simplifying and reducing the cost of monitoring	• Increased monitoring and data processing power	• Increased real time, multiparameter monitoring of waterways
 Limit our extraction of freshwater from the natural environment	• Water efficiency devices • Leak management • Explore the potentials and benefits of water carting and recycled water • Optimise the use of traditional sources	• Novel water-sharing arrangements • Maximising the potential of stormwater	• Purified recycled water for drinking • Decentralized desalination
 Actively reduce carbon	• Revegetation • Energy optimisation	• Carbon sequestration on unproductive farmland • Energy storage	• Green Chemistry • Zero carbon • Scope 1, 2 and 3 emissions
 Understand the potential impacts of new products on our customers, our environment and our business	• Increasing efficiency of established circular economy concepts	• Increase the yield of current value streams	• Create new and high value products by reimagining our effluent streams.
 Incorporate natural systems into the design of our assets	• Water sensitive urban design • Explore the benefits of modelling solutions to include the natural environment	• Urban Cooling • Online remote sensing	• Biomimicry • Smart control systems e.g. passive systems or smart systems • Green Chemistry

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INNOVATION FRAME – FLOWS

A new water future where closing the loop has created new economies

Technology Innovation Levels

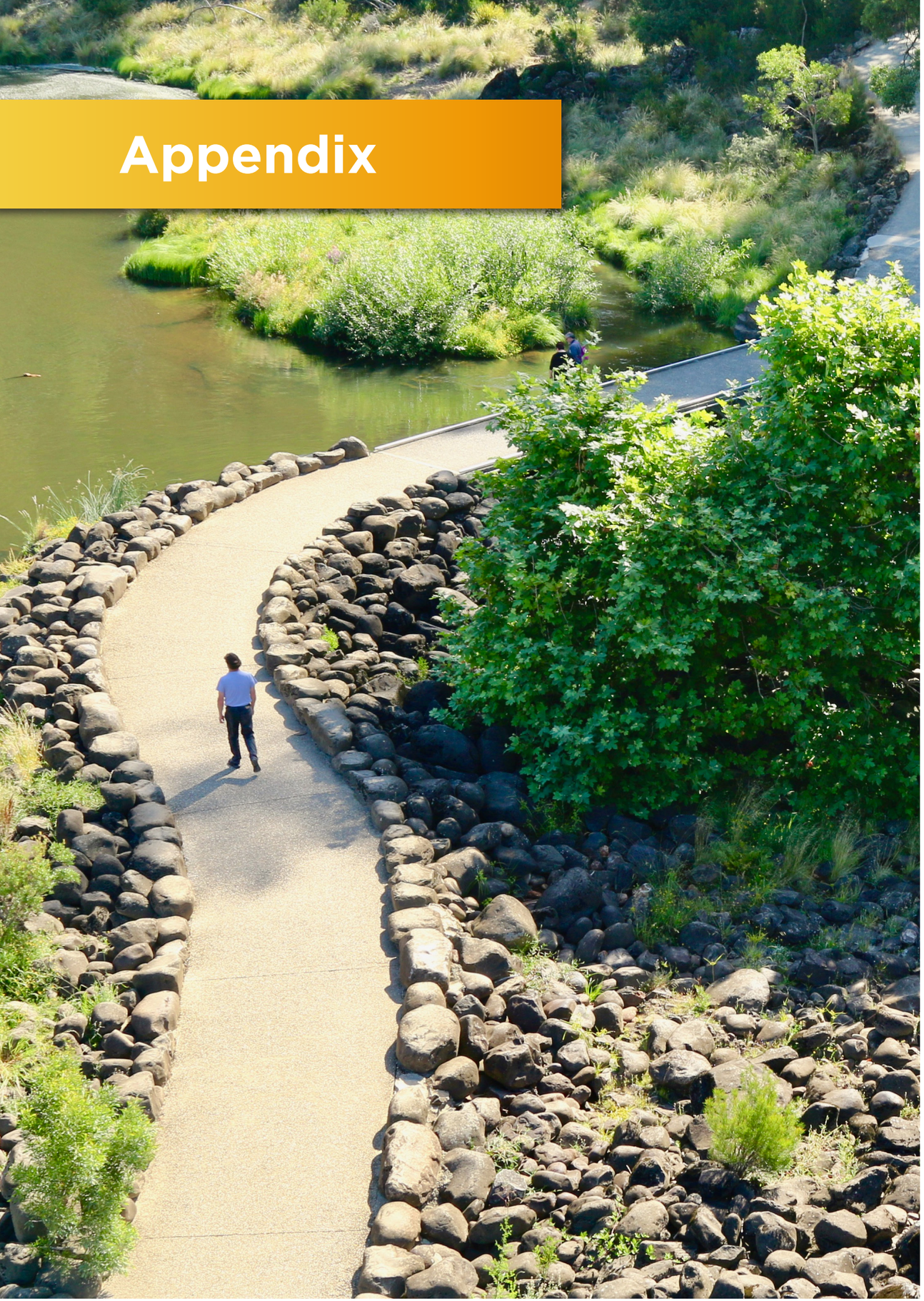
How might we	Core	Adjacent	Transformational
 Improve community understanding of water scarcity and reuse	• Community engagement and education	• Gamification (2D and 3D CGI) • Peer comparison	• Whole of household approach integrating all utility data • Tailoring customer experiences by using behavioural insights.
 Explore new markets and recover value from waste	• Energy efficiency • Decentralised grey water treatment	• Bio-gas generation efficiency • Nutrient recovery	• Hydrogen and other energy products • Biorefinery and zero waste
 Bring the circular economy into the home	• Decentralised grey water treatment • Optimising and advancing rainwater capture	• Point of use water treatment • In-home waste treatment and solids disposal	• Zero waste • Identify high value materials and see if we can match a water industry resource.

INNOVATION FRAME – ENTERPRISE

A new water future where various sectors are integrated, driven by communities and enabled with technology

Technology Innovation Levels

How might we	Core	Adjacent	Transformational
 Create insights from data to inform our decisions and share with others	• Using IoT to collect data • Smart Meters and sensors	• Pipe replacement programs /regimes. • Prediction in changes of water quality	• Sharing open data sets with the public for education and information as well as generating value.
 Use data to better understand our customers and communities	• Smart Meters and sensors, link to portal or customer interface to inform customer • Leak detection as a way to better serve communities	• Social Media sentiment analysis	• Preventative health • Community safety • Cross industry collaboration data and insight sharing platforms
 Explore decentralised water and waste water solutions	• Increased residential and commercial services	• Commercial services and recovery centre	• New and unique business models



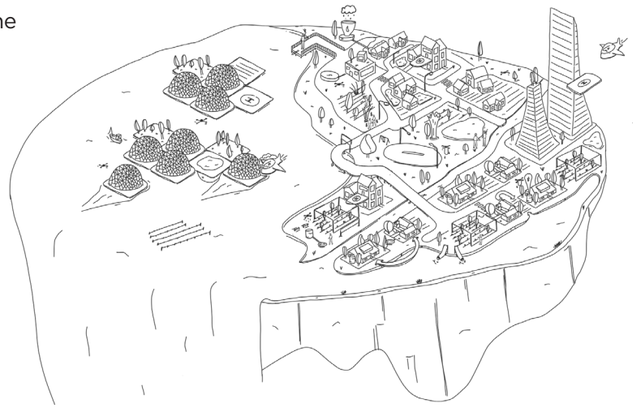
Appendix

Future State Narratives

W-Lab

The roadmap vision and future state narratives

These future state narratives created by W-Lab Members form the basis of the vision we are working towards. These narratives provide the different lenses to view our challenges and provide the framework for the segments of the Roadmap.



Customer:

A new water future where the sector is co-created by customers and utilities.

Changes to our customers' needs, increased awareness of and activism on climate change, an appreciation of the increasing value of water led us to innovate. All stakeholders want increased sustainability. We do more with less and we engage the customer and community in this, recognising that our impact and benefit reaches beyond bill-paying-customers to the wider community.

We realise we can learn as much from our customers as they can learn from us. Customers now have more knowledge and a more intimate relationship with the water and wastewater cycle. They have direct visibility on the effects of additional contributions they make and understand environmental and financial implications of their informed choices.

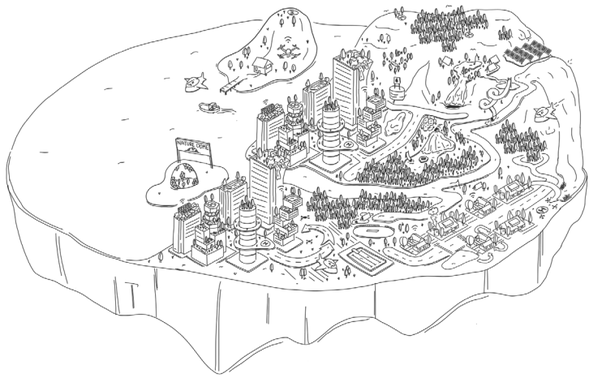
We continue to operate from an enviable level of trust, and we've tested this as we develop new innovative solutions (including digital and use of data) for individuals and communities. There is now a two-way value exchange between us and the customer as they contribute resources to the system, and we are better able to understand their needs.

As more technologies were introduced near/into the home, we balanced the feeling of choice and perception of being controlled. Customers see value in these solutions as they are empowered to self-manage their behaviour and make the most of the water resource.

We elevated our communication and engagement with customers and developed common and consistent digital platforms to do so. We give them information at the level they require, recognising that some want more (open dialogue on how water effects their personal health, choice, detail on water composition etc) and others prefer a set and forget if it is 'safe'. Our differentiated services and technology allow us to better meet the needs of vulnerable and hardship customers.

Our collaboration with industrial customers has reached new highs, finding synergies through data sharing, resource recovery and emerging markets has yielded better outcomes for the community.

We've been successful as we engaged early with regulators to collaboratively innovate and trial new technologies and services.

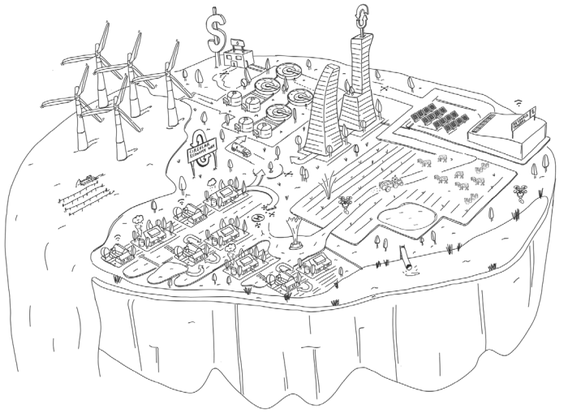


Nature:
A new water future that gives back to nature, enabling thriving communities.

It is not enough to do no harm to the environment. Our future water systems give back to nature and communities while also ensuring sustainable water sources for future generations. Our communities are benefiting through cooling, cleaner air, more activity and better overall wellness. We have shifted our mindset from building pipes and tanks to leveraging from the natural systems around us, becoming generators rather than consumers. We are sustaining and improving the natural environment through the application of technologies which are inspired by nature itself. Our natural systems are restored.

Our net environmental footprint (water, energy, carbon, waste, etc) and impact are positive through the entire water cycle. We draw nothing new from our environment. We create value by optimising limited resources.

We take a holistic/integrated view across systems, maximising resource use and recovery, and are inspired by First Nations knowledge. We give to culture without impacting culture.

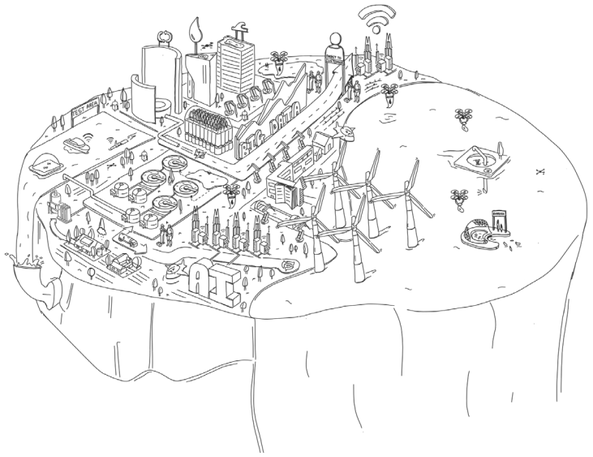


Flows:
A new water future where closing the loop has created new economies

In a drive to close the loop and stop the 'leaking' of resources from our industry ecosystem, waste is no longer an unrealised value. We are committed to a water-energy-waste nexus and work within the carrying capacity of nature.

We are not just 'growing potatoes on Mars', we have created new markets, products and industries. New industries have yielded new workforce opportunities and demanded training and growth of new skill sets. Producers are collaborating across industries, institutions and supply chains to ensure that whatever is left from production derives additional value.

We operate in synergy with natural cycles through an integrated system where our stakeholders - customers, communities, regulators, suppliers, operators, innovators - are all part of the journey. Communities are key players in resource trading and green processes.



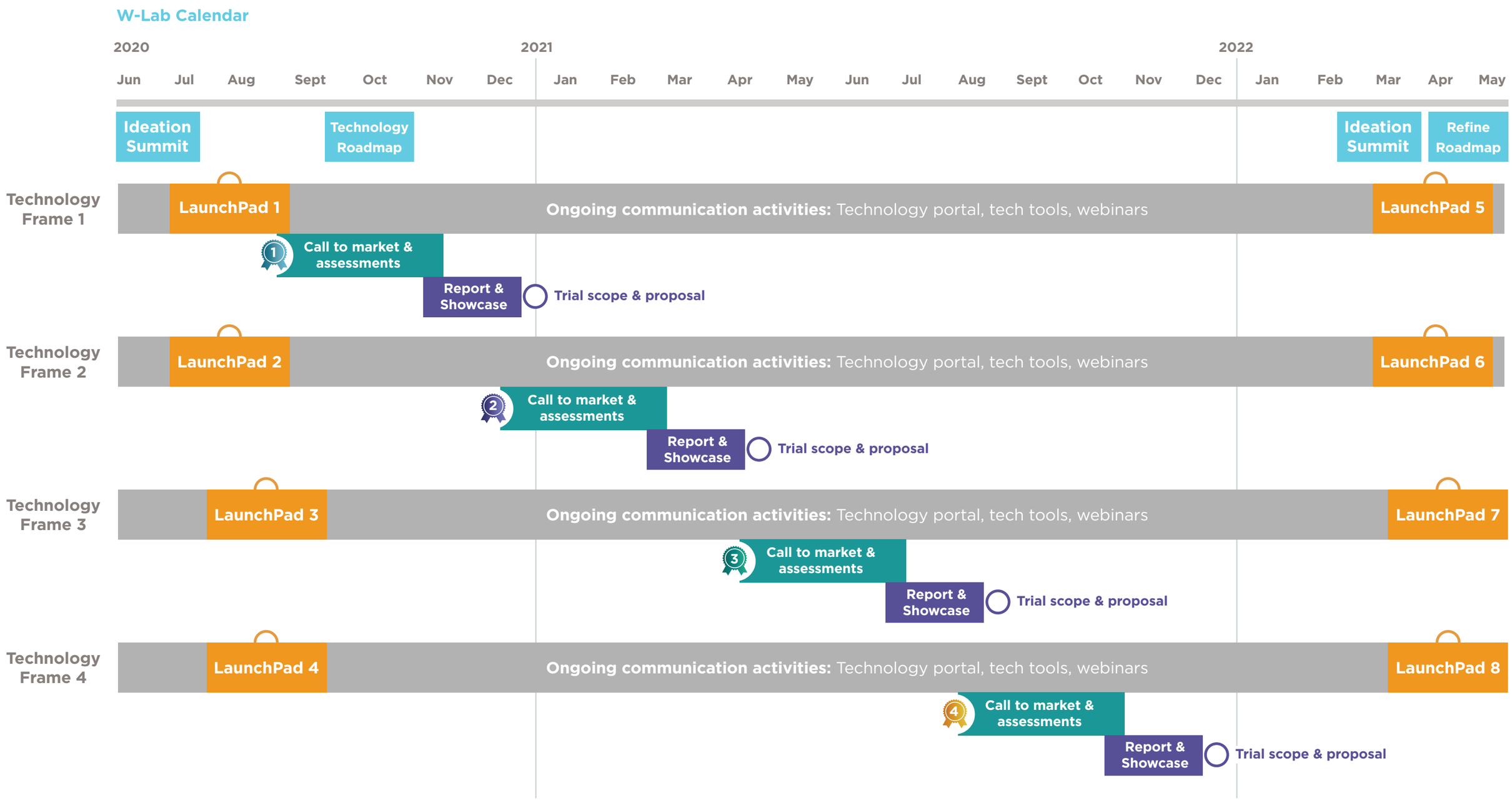
Enterprise:
A new water future where water, energy, waste, telecommunications and agriculture are integrated, driven by communities and enabled with technology.

Water and resources are precious. We are a large employer and contribute to the economy as an essential service. We keep building trust and an understanding with the community of the complexity of managing this resource. Our goals have changed from providing a service to creating prosperous and healthy communities.

In this future, all water, energy, waste, agriculture and telecommunication services are integrated. Technology advancement has enabled off-grid solutions to complement these integrated solutions. Infrastructure won't provide one function, it is used collectively to make our cities greener, more sustainable and livable. Different players are all working together, not restrained to any one part of the workflow. Revolutionary digital transformation removes the barriers and enables collaboration and co-planning. High quality and high-resolution data is collected and standardised . This data provides confidence and empowerment for decision making and enable the ability to integrate across sectors.

Community, regulator, councils, utilities and industry are all working together towards the same goal and managing similar complexities such as climate change and population growth. Adaptive planning is key and there is an overarching holistic approach in governance. There is long term commitment and stability across our goals. We are agile in our response (workforce agility and flexibility) in order to take advantage of these opportunities.

W-Lab Calendar 2020-2022



Flows Opportunities

The Opportunities

The following pages include a more detailed deep dive into the 'how might we' areas identified in the main document and roadmap. Additionally, there are categorized innovation interests outlined by W-Lab members during the first years LaunchPad events.

INNOVATION FRAME – FLOWS OPPORTUNITIES

A new water future where closing the loop has created new economies

How might we	Innovation		
Opportunities	**Core**	**Adjacent**	**Transformational**
 How might we work with communities to improve understanding on water scarcity and re-use to empower a positive behaviour and relationship with the water cycle?	• Effective and simple community engagement	• Increased engagement using games and friendly competition	• Tailoring customer experiences through behavioural insights
 How might we explore new markets, recover value from waste and understand potential impacts of new products on our customers, our environment and our business?	• Increasing efficiency of established circular economy concepts	• Increase the yield of current value streams	• Create new and high value products by reimagining our effluent streams.
 How might we bring the circular economy into the home?	• Easy to implement technologies for water capture and reuse	• Water and wastewater treatment at point of use	• Decentralised network of high value resource recovery

Year 1

Showcase Area

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to recover value

How might we explore new markets, recover value from waste and understand potential impacts of new products on our customers, our environment and our business?

		Number of interested utilities		
	Outcomes	**Almost All**	**Many**	**Some**
Core Innovation	Increasing efficiency of established circular economy concepts	• Energy efficiency • Decentralised grey water treatment	• Electricity generation from solar / hydropower / biogas • Biosolids to Fertiliser	• (To be explored)
Adjacent Innovation	Increase the yield of current value streams	• Biogas generation efficiency • Nutrient recovery	• Energy Storage	• Oxygen Generation
Transformational Innovation	Create new and high value products by reimagining our effluent streams.	• Hydrogen and other energy products • Bio refinery and zero waste	• Integrating with food and agriculture • Preventative health	• Rare high value materials • Bioplastics

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to decentralise the circular economy

How might we bring the circular economy into the home?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Easy to implement technologies for water capture and reuse	• Decentralised grey water treatment • Optimising and advancing rainwater capture	• (To be explored)	• (To be explored)
Adjacent Innovation	Water and wastewater treatment at point of use	• Point of use water treatment • In-home waste treatment and solids disposal	• Energy Storage • Oxygen generation	• (To be explored)
Transformational Innovation	Decentralised network of high value resource recovery	• Zero waste • Identify high value materials and see if we can match a water industry resource.	• Nutrient harvesting by reducing nitrogen load on treatment plants (urine diversion	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to empower the customer

How might we work with communities to improve understanding on water scarcity and re-use to empower a positive behaviour and relationship with the water cycle?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Effective and simple community engagement	• Community engagement and education	• (To be explored)	• (To be explored)
Adjacent Innovation	Increased engagement using games and friendly competition	• Gamification (2D and 3D CGI) • Peer comparison	• (To be explored)	• (To be explored)
Transformational Innovation	Tailoring customer experiences through behavioural insights	• Whole of household approach integrating all utility data • Transition through the use of technology solutions	• Social influencing • Art of the possible (visionary) • Foster partnerships • Rewards program	• (To be explored)

Enterprise Opportunities

INNOVATION FRAME – ENTERPRISE

A new water future where various sectors are integrated, driven by communities and enabled with technology

How might we — Innovation

Opportunities	Core	Adjacent	Transformational
How might we make better decisions for our core business and future growth by creating insights from internal and external data, that can be easily shared internally and with other industries?	• Increased data generation and collection	• Increased predictive analytics and modelling	• Cross industry collaboration data and insight sharing platforms
How might we use data to understand the diverse customer and community needs and provide value to them?	• Increased data generation and collection	• Leverage external data sources to derive insights	• Using data to provide value outside of water
How might we explore decentralised water and waste water solutions? (understand costs and benefits)	• Increased residential and commercial services	• Commercial services and recovery centre	• New and unique business models

Year 1

Showcase Area

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to generate insights

How might we make better decisions for our core business and future growth by creating insights from internal and external data, that can be easily shared internally and with other industries?

Number of interested utilities

	Outcomes	Almost All	Many	Some
Core Innovation	Increased data generation and collection	• Using IoT to collect data • Smart Meters and sensors	• AR for safety and training • Displaying data visually through dashboards and spatial platforms	• (To be explored)
Adjacent Innovation	Increased predictive analytics and modelling	• Pipe replacement programs / regimes. • Prediction in changes of water quality	• Predictive analysis for minimising risk of spot anomalies (pipe bursts, sewer spills, blockages etc) • Operational cost and performance	• Automated condition monitoring on assets
Transformational Innovation	Cross industry collaboration data and insight sharing platforms	• Sharing open data sets to the public for education and information as well as generate value.	• (To be explored)	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to understand the customer

How might we use data to understand the diverse customer and community needs and provide value to them?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Increased data generation and collection	• Smart Meters and sensors, Link to portal or customer interface to inform customer • Leak detection as a way to better serve communities	• Using IoT to collect data • Use data analytics and ML and AI	• Calibration of sensors - automated checking and recalibration • Want ongoing monitoring, automated analytics to provide insights to understand community and optimise operations
Adjacent Innovation	Leverage external data sources to derive insights	• Social Media sentiment analysis	• Use power in streetlights to power sensor and existing network to transmit data • AR and VE for customer information and engagement	• (To be explored)
Transformational Innovation	Using data to provide value outside of water	• Preventative health • Community safety • Cross industry collaboration data and insight sharing platforms	• (To be explored)	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to explore decentralisation

How might we explore decentralised water and waste water solutions? (understand costs and benefits)

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Increased residential and commercial services	• Commercial solutions and services • Residential solutions and services	• Community farms • Decentralised Composting facilities	• (To be explored)
Adjacent Innovation	Commercial services and recovery centre	• Resource-recovery centre • Commercial solutions and services	• (To be explored)	• (To be explored)
Transformational Innovation	New and unique business models	• Unique/new business models	• (To be explored)	• (To be explored)

Nature Opportunities

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INNOVATION FRAME – NATURE

A new water future where giving back to nature, enables thriving communities

How might we	Innovation		
Opportunities	**Core**	**Adjacent**	**Transformational**
 How might we monitor and measure our catchment, network, assets, customers, service in order to track our progress?	• Simplifying and reducing the cost of monitoring	• Increased monitoring and data processing power	• Increased real time, multiparameter monitoring of waterways
 How might we find cost-effective, alternative water supplies, manage stormwater and limit our extraction of freshwater from the natural environment?	• (to be refined)	• (to be refined)	• (to be refined)
 How might we investigate solutions that actively reduce carbon and could be used in an environment where carbon mitigation strategies were financially incentivised?	• Immediate changes to lower carbon footprint	• Utilising sequestration and storage to buy time	• Moving towards a carbon negative future
 How might we explore new markets and understand potential impacts of new products on our customers, our environment and our business?	• Increasing efficiency of established circular economy concepts	• Increase the yield of current value streams	• Create new and high value products by reimagining our effluent streams.
 How might we incorporate natural systems into the design of our assets, including solutions which not only minimise environmental impacts but also help these water assets better integrate into their natural environment and system?	• Optimising current urban design processes	• Creating positive impact on the urban environment	• Designing built assets to mimic the natural environment

Year 1

Showcase Area

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to explore alternative water supplies

How might we find cost-effective, alternative water supplies, manage stormwater and limit our extraction of freshwater from the natural environment?

		Number of interested utilities		
	Outcomes	**Almost All**	**Many**	**Some**
Core Innovation	Increasing water efficiency, recycling water and developing new sources	• Water efficiency devices • Leak management • Explore the potentials and benefits of water carting and recycled water • Optimise the use of traditional sources	• (To be explored)	• (To be explored)
Adjacent Innovation	Stormwater and water flow optimisation	• Water sharing • Maximise the potential of stormwater	• (To be explored)	• (To be explored)
Transformational Innovation	Potable purified recycled water and desalination	• Purified recycled water for drinking • Decentralized desalination	• (To be explored)	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to track progress

How might we monitor and measure our catchment, network, assets, customers, service in order to track our progress?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Simplifying and reducing the cost of monitoring	• Water quality monitoring and online remote sensing	• Network of weather monitoring • Satellite, drones, Environmental DNA (new methods)	• Modelling solutions • Riverine canopy monitoring in GIS
Adjacent Innovation	Increased monitoring and data processing power	• Gamification	• (To be explored)	• (To be explored)
Transformational Innovation	Increased real time, multiparameter monitoring of waterways	• Low-cost, online sensors, presence of nutrients (TN, N species, total Phosphorous) + micro-organisms, cheaply and quickly	• (To be explored)	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to reduce our carbon footprint

How might we investigate solutions that actively reduce carbon and could be used in an environment where carbon mitigation strategies were financially incentivised?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Immediate changes to lower carbon footprint	• Revegetation • Energy optimisation	• Renewable energy	• (To be explored)
Adjacent Innovation	Utilising sequestration and storage to buy time	• Carbon sequestration on unproductive farmland • Energy storage	• (To be explored)	• (To be explored)
Transformational Innovation	Moving towards a carbon negative future	• Green Chemistry • Zero carbon • Scope 1,2 and 3 emissions	• (To be explored)	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to explore new markets

How might we explore new markets and understand potential impacts of new products on our customers, our environment and our business?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Increasing efficiency of established circular economy concepts	• All options on the table - water reuse	• (To be explored)	• (To be explored)
Adjacent Innovation	Increase the yield of current value streams	• Biochar and advanced carbon materials • Advanced treatment technologies e.g. microcontaminants	• (To be explored)	• (To be explored)
Transformational Innovation	Create new and high value products by reimagining our effluent streams.	• (To be explored)	• (To be explored)	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to include natural design

How might we incorporate natural systems into the design of our assets, including solutions which not only minimise environmental impacts but also help these water assets better integrate into their natural environment and system?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Optimising current urban design processes	• Water sensitive urban design • Modelling solutions	• Remote and Virtual tools	• (To be explored)
Adjacent Innovation	Creating positive impact on the urban environment	• Urban Cooling • Online remote sensing	• (To be explored)	• (To be explored)
Transformational Innovation	Designing built assets to mimic the natural environment	• Biomimicry • Smart control systems e.g. passive systems o smart systems • Green Chemistry	• (To be explored)	• (To be explored)

Customer Opportunities

INNOVATION FRAME – CUSTOMER

A new water future where giving back to nature, enables thriving communities

How might we	Innovation		
Opportunities	**Core**	**Adjacent**	**Transformational**
 How might we understand and support the diverse needs of our customers? We need reliable information so that we can inform and empower our customers in different ways that suit each individual so that they may make good choices.	• Making data and insight available to the customer	• Making it easier for customers to communicate with utilities	• Streamlined data sharing and communication with customers and industry
 How might we work with communities to improve understanding on water scarcity and re-use to empower a positive behaviour and relationship with the water cycle?	• Engagement and communication with communities	• Increased predictive analytics and modelling	• Community-based collaboration data and insight sharing platforms
 How might we explore the price of water with our customers, to gauge their water service level needs and meet the challenge of affordability for this essential service?	• Increased water usage data collection and modelling	• Utilitising social media and games to extract insights and connect with customers	• Holistic solutions to connect customers with their water and waste
 How might we unlock the power of the customer by providing technology choices and consumption information that they can use to take control of the water cycle in their homes?	• Use of stand alone devices in residential applications	• Network of decentralised water sources and treatment managed by the community	• Network of decentralised water sources and treatment managed by the utilities
 How might we collaborate across sectors and share data where we share the same customers, we need to do this securely and create meaningful insights, which can be used by us, our partners and communities?	• Collecting and sharing information that is useful to cross industry partners	• Increased integrated cross industry data sharing platforms	• Cross industry integration of data collection, analysis and communication

Year 1

Showcase Area

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to understand our customers

How might we understand and support the diverse needs of our customers? We need reliable information so that we can inform and empower our customers in different ways that suit each individual so that they may make good choices.

		Number of interested utilities		
	Outcomes	**Almost All**	**Many**	**Some**
Core Innovation	Making data and insight available to the customer	• Customer platforms for one-way communication (sharing open data) • New ways of engaging with customers	• (To be explored)	• (To be explored)
Adjacent Innovation	Making it easier for customers to communicate with utilities	• Customer platforms with flexibility for customers to provide feedback and information.	• Predictive modelling tools and digital twins	• (To be explored)
Transformational Innovation	Streamlined data sharing and communication with customers and industry	• Customer platforms for two-way communication (sharing data eg Blockchain) • Water efficiency devices linked to billing, operational needs, gamification	• Customer platforms for two-way communication (sharing data) plus a third party e.g. electricity/rates/ Amazon	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to empower our customers

How might we work with communities to improve understanding on water scarcity and re-use to empower a positive behaviour and relationship with the water cycle?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Engagement and communication with communities	• Engagement and communication with communities	• (To be explored)	• (To be explored)
Adjacent Innovation	Increased predictive analytics and modelling	• Gamification in the home using smart meters where possible • Customer platforms for 1.5-way communication	• (To be explored)	• (To be explored)
Transformational Innovation	Community-based collaboration data and insight sharing platforms	• Getting community ownership / buy in. Getting the community invested into the "water cycle"	• Smart Sensors • Customer platforms for two-way communication (sharing data eg Blockchain, plus a third party eg electricity/rates/ Amazon	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to explore affordability

How might we explore the price of water with our customers, to gauge their water service level needs and meet the challenge of affordability for this essential service?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Increased water usage data collection and modelling	• Predictive modelling tools and digital twins • Smart sensors (plug and play) • New methods of billing and payment	• (To be explored)	• (To be explored)
Adjacent Innovation	Utilitising social media and games to extract insights and connect with customers	• Social Media derived insights • Gamification tool for education (value of water)	• Predictive billing	• (To be explored)
Transformational Innovation	Holistic solutions to connect customers with their water and waste	• Water efficiency devices linked to billing, operational needs, gamification • Commodity (water, waste) trading schemes and blockchain	• Gamification - imagine the possibilities	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to provide choices to the customer

How might we unlock the power of the customer by providing technology choices and consumption information that they can use to take control of the water cycle in their homes?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Use of stand alone devices in residential applications	• Grey-water recycling • Alternative water point sources • Water efficiency devices (fittings for the home and business)	• (To be explored)	• (To be explored)
Adjacent Innovation	Network of decentralised water sources and treatment managed by the community	• Alternative water sources uses within community • Water trading managed by individuals	• (To be explored)	• (To be explored)
Transformational Innovation	Network of decentralised water sources and treatment managed by the utilities	• Waste treatment in the home • Alternative water sources monitored and managed by utility	• Water-trading at a precinct and neighborhood scale • Water efficiency devices linked to all parts of the business • Water efficiency devices linked to other organisations	• (To be explored)

TECHNOLOGY OPPORTUNITY AREAS

Opportunities to share insights

How might we collaborate across sectors and share data where we share the same customers, we need to do this securely and create meaningful insights, which can be used by us, our partners and communities?

	Outcomes	Number of interested utilities: Almost All	Many	Some
Core Innovation	Collecting and sharing information that is useful to cross industry partners	• Cross-organisation/ industry platforms (sharing small/ siloed info) • Smart sensors (plug and play)	• (To be explored)	• (To be explored)
Adjacent Innovation	Increased integrated cross industry data sharing platforms	• Cross-organisation/ industry platforms (flexibility to share siloed info) • Smart sensors (integrates into other data sets)	• (To be explored)	• (To be explored)
Transformational Innovation	Cross industry integration of data collection, analysis and communication	• Open collaboration and communication with trusted partners • Smart sensors • Integrated data acquisition	• Integrated data acquisition and analysis for community and customer benefit (smart sensors)	• Gamification across industries

A confident and secure water industry empowered by technology and innovation.

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