



SOURCE™

SOURCE Hydropanel Demonstration Project (2018/ARP006)

Zero Mass Water (Australia) Pty Ltd Final Report to ARENA

February 2018 - November 2019



Funding Agreement Details

Recipient Name	Zero Mass Water (Australia) Pty Ltd
Project Commencement Date	27 February 2018
Project Completion Date	1 November 2019
Project Partners/ Participants/ Sub-contractors	<p>Project Participants: Argonaut Engineering & Construction Macarthur Centre for Sustainable Living Northern Beaches Shire Council Boderek Pty. Ltd. t/as Crookwell Electrical Wilco Electrical Pty Ltd Western Australia Police Force The Wirrpanda Foundation Limited Mary's Mount Catholic School Array Energy Lady Elliot Eco Resort Morlife Pty Ltd. The Farm Byron Bay Muswellbrook Shire Council Mistere Kangaroo Island Pty Ltd t/as Mistere Spa and Resort Kangaroo Island Pilbara Meta Maya Aboriginal Corporation Little Gems Child Care & Early Learning Centre Gundy Soldiers Memorial Hall - Gundy Crown Reserve Trust "Canonbar", Waverley Road Gundy "Elmswood Farm", Miranee Road Gundy Solarquip Pty Ltd Australian Conservation Foundation (Residential home, Abrolhos Islands, WA Residential home, Geraldton, WA</p> <p>Approved subcontractors: WILCO Electrical Pty Ltd Array Energy The Solar Project Pty Ltd Aquila Plumbing Services Pty Ltd</p>
Contact Email	contact@zeromasswater.com

Milestone Summary

Milestone Number	Final Report – 1 November
Milestone Payment	N/A

Report Dates	Due: 1 Nov 2019	Submitted: July 15th, 2019	Reporting period: 27 Feb 2018 - 1 Nov 2019
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Budget Summary

Total ARENA Funding	\$420,000 (ex. GST)
ARENA Funding Paid to Date	\$420,000 (ex. GST)
Total Project Budget	\$871,500 (ex. GST)
Total Project Cost to Date	\$ 917,907 (ex. GST)

Project Milestones: Overview

151 SOURCE hydropanels are being used in a wide ranging contexts including farming, commercial, residential, public and remote applications. Each application continues to build customer awareness in its own market segment and is enhancing knowledge of innovative renewable technology, in addition to generating necessary maintenance skills where industry capability is building.

Milestone Reports 1, 2 and 3 have been successfully submitted by ZMW and approved by ARENA. These milestone reports have evidenced the installation and commissioning of 151 SOURCE hydropanel units, along with the provision of all Knowledge Sharing Deliverables. The timing and budget of the Project are both in accordance with the requirements in the Funding Agreement.

Project Outcomes

All Project Outcomes have been achieved. A key highlight of the Project lies in the ability of SOURCE hydropanels to produce substantial volumes of high quality potable water in 27 unique project locations using renewable energy. Since commissioning the 151 units have offset over 160,000 (500mL) single-use plastic bottles, equivalent to over 60 tonnes of carbon dioxide emissions. One Project site, Morelife in Arundel Queensland (10 SOURCE Hydropanels), reported the offset of 2,789 (330mL) single use bottles in just one month of optimal production.

A vital breakthrough of the Project has been the training and on-boarding of distributors, subcontractors, retailers and installation partners. The successful upskilling and educating of these partners has facilitated the scale-up and decentralised deployment of SOURCE hydropanels across Australia. Zero Mass Water now has 4 distribution partners, 3 referral partners, 3 retail outlets, 4 installation partners and approximately 10 apprentices and subcontractors with expertise in the sale, site-inspection, installation and O&M of SOURCE hydropanel projects.

The most significant difficulty faced in the growing, yet nascent off-grid atmospheric water generation market is the upfront cost of SOURCE hydropanels for households (decentralised projects). While the cost of SOURCE relative to water output is set to drop considerably with increased global production and associated economies of scale with manufacturing, the existing price for CapEx solutions is a considerable barrier to entry. Zero Mass Water has partnered with the Commonwealth Bank of Australia and Ratesetter to offer customers product finance and provide more flexibility with incremental payment over the 15 year lifetime of SOURCE hydropanels. This feedback, obtained during the Project has spawned a new take-or-pay product offering, classified as a Water Purchase Agreement (WPA). WPA's enable end users to pay for water on an incremental basis - with all project construction and O&M costs borne by ZMW.

Conclusions

The Project has helped remove roadblocks for the establishment of the SOURCE hydropanel industry. It has enabled optimisation of site-inspection, installation processes and O&M. The Project has also improved customer relationship management, with more accurate production data allowing for better customisation of projects, as well as helping standardise service regimes and improve communications through the SOURCE App. The overall market awareness of renewable water generation has undoubtedly increased in Australia. Prevailing water scarcity and quality challenges, in addition to increased awareness of the environmental impact and economic cost of bottled water and transporting bulk water, has led to support and endorsement from Local, State and Federal Government, in addition to valuable partnerships within the corporate sector and ultimately the support of one of the world's most influential impact investors, Bill Gates.

Project Outcomes - Details

<p>1. Demonstrate a new technology in Australia – a product that produces clean, renewable, infrastructure-free drinking water using only air and the power of the sun;</p>	<p>Achieved</p> <p>Through the Project, ZMW, with the support of ARENA, has been successful in demonstrating SOURCE - a new technology in Australia. ZMW has successfully partnered with 27 Project Hosts, installed and maintained SOURCE hydropanels in widely varying site location across Australia.</p> <p>Valuable production data has been collected and presented. Significant market awareness and publicity has been generated through the Project leading to the doubling of total SOURCE projects to over 55 Australia-wide in a relatively short 12 month period.</p> <p>SOURCE hydropanel demonstration arrays are now installed and commissioned in New South Wales, Queensland, Victoria, the Australian Capital Territory, Western Australia and South Australia. The list of Project Hosts is diverse, including farms, local government councils, a school, remote island eco-resorts, commercial premises, residential homes, a community hall and aboriginal businesses.</p> <p>Over 25 online and print media pieces have been published in relation SOURCE hydropanel installations completed under the Project, including with ABC, Reneweconomy, Sydney Morning Herald, 7News, 10News.</p> <p>The accelerating market awareness generated during Milestones 1, 2 & 3 of the Project is now being reinforced by empirical water production data, environmental performance and the communication of this information across a wide cross-section of the Australian market.</p>
<p>2. Educate Australian distributors and installers in the installation, operation and servicing of SOURCE hydropanels, creating and industry capability that is currently nascent (and related experience-driven cost reduction that will directly lead to the system cost reduction);</p>	<p>Achieved</p> <p>Following the thorough training of all distribution and installation partners in Milestone periods 1 & 2, and the successful management 27 Project Hosts during the</p>

	<p>Milestone 3 period, distributors and installers have significantly expanded their understanding of operating and maintaining SOURCE hydropanels and SOURCE App on-boarding, whilst developing their customer-facing skills in dealing with customers and communicating performance data in a succinct, commercial manner.</p> <p>The operations and maintenance phase during this Milestone 3 period has created industry knowledge that was, just 12 months ago, non-existent. Although there are many more lessons to be learned, ARENA-approved distributors and installers are now capable of managing SOURCE customers with a high degree of independence.</p> <p>Substantial learnings were achieved over the course of the Project, with meaningful evolution in customer relationship management, SOURCE App on-boarding and provision of notifications, leading to faster response times and a diverse range of satisfied Project Hosts.</p>
<p>3. Remove multiple roadblocks for the growth of SOURCE hydropanels in Australia – product awareness, qualified distributors and installers, performance validation and operating data for product financing; and</p>	<p>Achieved</p> <p>Australia now has 4 autonomous distributors of SOURCE, 3 SOURCE referral partners, 3 retail outlets, 4 installation partners and approximately 10 apprentices and subcontractors with expertise in the sale, site-inspection, installation and O&M of SOURCE hydropanel projects.</p> <p>The consumption of water by all 27 project hosts, the communication of production performance data, the launch of WPAs and additional sales and marketing channels have allowed ZMW to attract 2 new distribution partners, 3 referral partners and double its suite of Australian projects.</p> <p>Distributors and installers, who have existing sales and marketing channels, are continuing to build market awareness of SOURCE hydropanels. These partnerships have enabled ZMW to install units in many different applications within a short project timeframe</p>

	<p>and allowed ZMW to collect operating data for product optimisation and financing.</p> <p>ZMW and distribution partners, based on market feedback, have launched a Water Purchase Agreement (WPA), in which ZMW finances, installs and manages entire projects, then sells the water to an offtaker. ZMW and its distribution partners have found this to be an effective sales tool to reduce upfront CapEx and allow users to pay on a per L basis, an arrangement that aligns more closely with typical water utility and bottled water consumption patterns.</p>
<p>4. Progress the development of renewable energy technology through the demonstration of innovative applications in Australia.</p>	<p>Achieved</p> <p>The Project has challenged the way mainstream clean energy businesses, governments and homeowners in Australia perceive renewable energy production and use. The relevance of The Project in Australia is manifest and supported by the vast media coverage that followed the launch of SOURCE in Australia and through the committed efforts of distribution partners in building their SOURCE installation capacity.</p> <p>SOURCE hydropanels are being used in a wide variety of contexts by a diverse mix of end-users. The ability of ZMW, with ARENA's support, to install SOURCE hydropanels, train distributors and installers, generate marketing content and build awareness of this innovative technology; is helping progress the development of renewable energy technology in Australia.</p>

Knowledge Sharing

All knowledge sharing activities (listed below) have been completed and relevant reports and documentation including in milestone reports 1, 2 & 3:

- KSP 1 - Bimonthly 15 minute survey **completed**
- KSP 2 - Webpage detailing the project on the recipient and ARENA's website **completed**
- KSP 3 - Media event/s (launch or completion) **completed**
- KSP 4 - One report on customer survey results **completed**
- KSP 5 - Third party consultant prepared fact sheet or infographic **completed**
- KSP 6 - One recipient led workshop **completed**

The background of the slide is a photograph of a residential property. In the foreground, there are several solar panels mounted on a roof. Behind the panels, there are several tall palm trees and other green foliage. The sky is bright and clear. The overall scene suggests a sunny, outdoor environment, consistent with the company's name and tagline.

SOURCE™

SUNLIGHT + AIR = WATER



Questions? Email rob@zeromasswater.com

A woman with curly hair, wearing a light-colored button-down shirt, is seated at a wooden table. On the table are several items: a white pitcher, a glass, a clear glass bottle with water and a purple flower inside, a tall clear glass bottle with water, and another glass. The background is a bright, out-of-focus outdoor setting with a wooden chair and a white railing.

**Perfect water for every
person, every place.**

SOURCE[™] Hydropanels



Hydropanel creates drinking water from sunlight and air

Self-contained, elegant design

Makes, mineralizes, and delivers water to a tap for any purpose, indoor or out

Completely infrastructure-free, reliable water serving needs from urban to remote locations



How Does SOURCE Work?

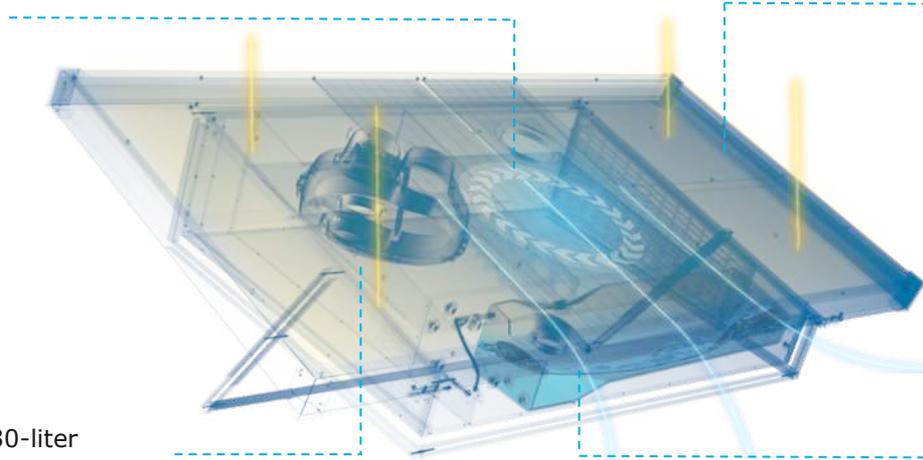


1

Using solar PV, SOURCE takes in ambient air via fans and adsorbs water vapor from that air onto a hygroscopic material

3

The pure water flows into a 30-liter reservoir where it is mineralized with magnesium and calcium



2

With heat from the sun, SOURCE converts water vapor collected into liquid water, made pure

4

Sensors inside the reservoir monitor and optimize the water to maintain quality

SOURCE™ From Panel to Tap

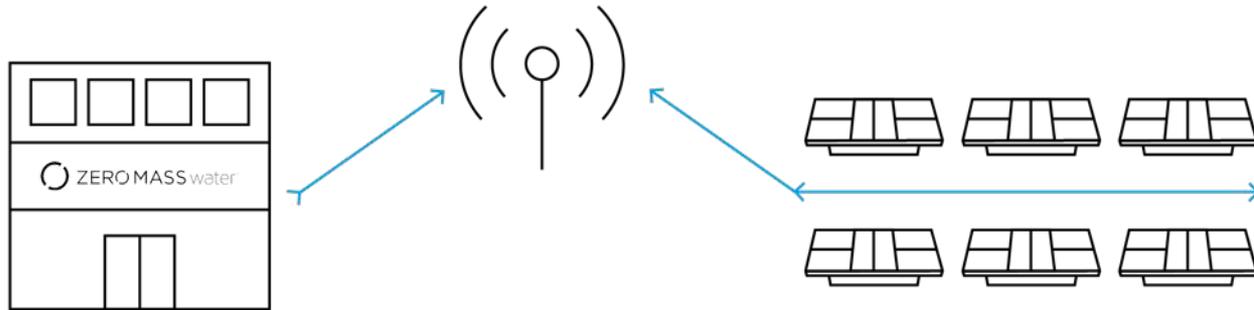
Once drinking water has been collected and mineralized, it is delivered right to your tap or in-home dispenser.



SOURCE™ is Reliable



Hydropanels connect to global network



Performance monitoring

Remote optimization & machine learning

Maximize uptime & efficiency

More than 25 Countries & Counting



**Together we can make
clean drinking water an
unlimited resource.**



SOURCE Hydropanels in Australia ARENA Demonstration Project



SOURCE™ Project Overview

ARENA Project Overview:

- The Project has supported the installation, operation and monitoring of 150 SOURCE Hydropanels across 27 project locations in Australia
- Installations were completed in a variety of geographies and environmental conditions
- Each demonstration installation varied by the mounting type (e.g. roof mount or ground mount), access and connectivity (e.g. remote, peri-urban or high density locations) and by the number of users (e.g. a 2 Hydropanel house or 10 Hydropanel community installation)
- Monitoring and evaluation of the performance of SOURCE and customer feedback sought

SOURCE™ Project Objectives

The ARENA Demonstration Project had a number of key objectives:

- Demonstration of a new application of solar energy that can deliver a valuable resource in the form of clean drinking water
- Introducing a non-plastic alternative for drinking water using renewable energy technology that is infrastructure-free and great tasting
- Educating Australian customer, distributors, installers and stakeholders in the installation, operation and servicing of SOURCE Hydropanels, creating an industry capability that was previously nascent
- Provide innovative drinking water solutions in remote and/or drought affected locations where traditional, centralised supply models are less viable

SOURCE™ Project Summary (part 1)

NSW & QLD installations:

Customer Name	Location	Number of Hydropanels	Type
Bing Lee Electrics	Sydney, NSW	8	Roof mount
Macarthur Centre for Sustainable Living	Mount Annan, NSW	10	Ground mount
Northern Beaches Shire Council	Currawong, NSW	6	Ground mount
Canonbar Investments	Gundy, NSW	2	Ground mount
Elmswood Farm	Gundy, NSW	2	Ground mount
Muswellbrook Shire Council	Muswellbrook, NSW	10	Roof mount
Bing Lee Electrics	Taree, NSW	4	Roof mount
The Farm & Three Blue Ducks	Ewingsdale, NSW	10	Roof mount
Crookwell Electrical	Laggan, NSW	5	Ground mount
Gundy Crown Reserves Trust	Gundy NSW	8	Ground mount
Array Energy	Cameron Park, QLD	2	Roof mount
Lady Elliot Eco Resort	Lady Elliot Island, QLD	6	Ground mount
Morlife Functional Foods	Arundel, QLD	10	Roof mount
Little Gems Child Care	Jimboomba, QLD	8	Roof mount

SOURCE™ Project Summary (part 2)

WA, SA, Vic & ACT installations:

Customer Name	Location	Number of Hydropanels	Type
Wilco Electrical Pty Ltd	Kardinya, WA	2	Roof mount
Western Australia Police Force	East Perth, WA	4	Roof mount
Western Australia Police Force	Joondalup, WA	8	Roof mount
The Wirrpanda Foundation	Cannington, WA	4	Roof mount
Pilbara Meta Maya Aboriginal Corporation	Wedgefield, WA	5	Ground mount
Pilbara Meta Maya Aboriginal Corporation	Karratha, WA	5	Ground mount
Jesse Liddon	Abrolhos Islands, WA	4	Ground mount
Jesse Liddon	Geraldton, WA	2	Ground mount
Mary's Mount Catholic School	Gooseberry Hill, WA	4	Roof mount
Mistere Spa and Resort Kangaroo Island	Kangaroo Island, SA	10	Ground mount
Smart Energy Lab	Mount Toolebewong, VIC	2	Ground mount
Australian Conservation Fondation	Carlton, VIC	4	Roof mount
Bing Lee Electrics	Belconnen, ACT	6	Roof mount



SOURCE[™] at Morlife Functional Foods

“It’s good to to know that the water we are drinking comes from the Hydropanels on our roof. It’s pretty cool that with this technology, water can be made anywhere.”

– Maya, Morlife Employee

- Needed a way to provide healthy hydration to staff without negatively impacting the environment
- Installed ten SOURCE Hydropanels on the rooftop at Morlife’s Gold Coast facility
- Today, Morlife staff enjoys premium, renewable water made from SOURCE and the beautiful Australian air





SOURCE™ at Canonbar Farm

We installed the SOURCE Hydropanels two months ago and the water tastes great. Now it's a great compliment to our drinking water!"

– Peter B., Hunter Valley, NSW

- Needed a drought-resilient drinking water solution for their family as a supplement to their rainwater tank
- Installed two ground-mounted SOURCE Hydropanels on the farm
- Now creates renewable, premium drinking water everyday, even in times of drought and fire, and has eliminated the waste of bottled and filtered water



SOURCE™ Third Party Water Quality Results

Analyte	ADWGs-Oct 2017	27 Jul 18 MacArthur - Mount Annan	9 Aug 18 Bing Lee - Old Guildford	30 Aug 18 Memorial Hall - Gundy	30-Aug-18 Canonbar - Gundy	30 Aug 18 Ellswood Farm - Gundy
Escherichia coli - MPN/100mL	0	<1	<1	<1	<1	<1
Coliform, Total - MPN/100mL	NE	<1	<1	<1	<1	<1
Coliform, Fecal	0	<1	<1	<1	<1	<1
Sodium	180	<0.5	<0.5	<0.5	<0.5	<0.5
Calcium	NE	2.1	2.2	4.8	3.5	1.7
Antimony	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Barium	2	<0.001	0.002	0.005	0.002	0.001
Cadmium	0.002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.05	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	2	<0.001	<0.001	<0.001	0.003	<0.001
Lead	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	0.001	**	<0.00005	<0.00005	<0.00005	<0.00005
Nickel	0.02	<0.001	**	**	**	**
Selenium	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Uranium	0.017	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Iron	0.3	<0.010	<0.010	<0.010	<0.010	<0.010
Silver	0.1	0.059	0.089	<0.001	<0.001	<0.001
Magnesium	NE	0.9	1.1	2	1.4	0.7
Boron	4	<0.02	<0.02	<0.02	<0.02	<0.02
Aluminum	0.2	<0.01	0.02	0.04	0.02	<0.01
Zinc	3	<0.001	0.005	0.004	0.003	0.001
Manganese	0.5	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	NE	<0.5	<0.5	1.6	1.9	1.1
Molybdenum	0.05	<0.001	<0.001	<0.001	<0.001	<0.001
Tin	NE	<0.001	<0.001	<0.001	<0.001	<0.001

SOURCE™ Third Party Water Quality Results Cont'd

Analyte	ADWGs-Oct 2017	27 Jul 18 MacArthur - Mount Annan	9 Aug 18 Bing Lee - Old Guildford	30 Aug 18 Memorial Hall - Gundy	30-Aug-18 Canonbar - Gundy	30 Aug 18 Ellswood Farm - Gundy
Nitrate as N	50^^	0.12	1.3	4.1	1.1	1.1
Nitrite as N	3^^	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoride	1.5	<0.1	<0.1	<0.1	<0.1	<0.1
Sulfate	250	<1	2	<1	<1	<1
Chloride	250	<1	<1	<1	<1	<1
Total Dissolved Solids	600	<5	8	37	17	17
Cyanide, Total	0.08	<0.004	<0.004	<0.004	<0.004	<0.004
Alkalinity as CaCO3	NE	10	8	8	15	6
Bicarbonate Alkalinity as CaCO3	NE	10	8	8	15	6
Carbonate Alkalinity as CaCO3	NE	<5	<5	<5	<5	<5
Alkalinity, Phenolphthalein	NE	<5	<5	<5	<5	<5
Calcium hardness as calcium carbonate	200	9	10	20	15	7.1
pH - SU	6.5 - 8.5	7	7.4	6.9	7.4	6.6
Conductivity	NE	20	29	54	37	20
Turbidity - NTU	5	0.4	0.7	0.6	0.5	0.5
Ammonia	0.5	0.031	0.27	0.028	0.015	0.015
Color	15 HU	<5	<5	<5	<5	<5
Total Suspended Solids	NE	<5	<5	<5	<5	<5

SOURCE™ Consumer Feedback

Customer Experience Survey

Zero Mass Water conducted a Consumer Experience Survey that was sent to the key contacts from all 25 ARENA project installation sites. From their responses we have learned the following:

- Over **85%** of the ARENA SOURCE installations occurred in locations which did not consume water direct from the tap
- Over **50%** of the consumers of SOURCE water have decreased their consumption of bottled water

What is your favourite reason to drink SOURCE water?

36%

Innovation

29%

Sustainability

21%

Taste

7%

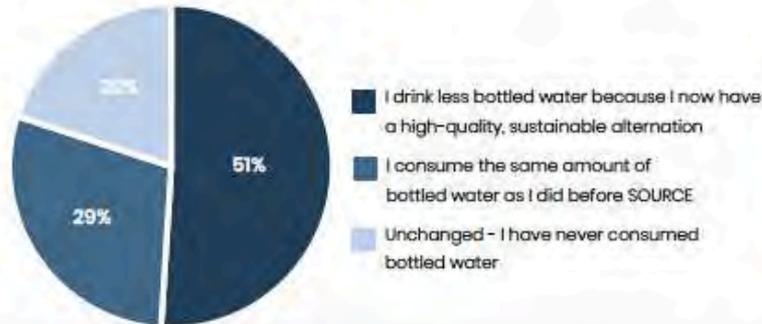
Convenience

7%

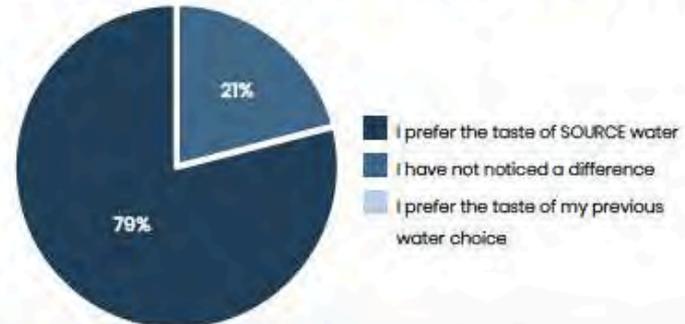
Health

SOURCE[™] Consumer Feedback

How has installing SOURCE impacted your consumption of bottled water?

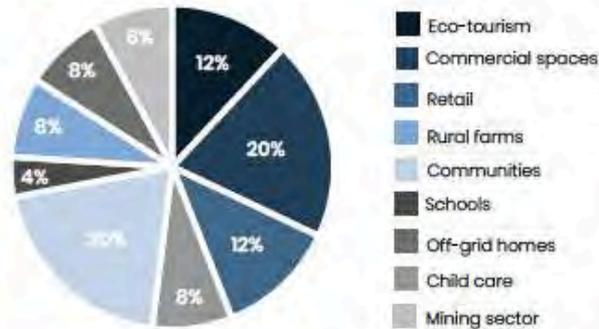


Since installing SOURCE, how does the taste compare to your previous drinking water choice?

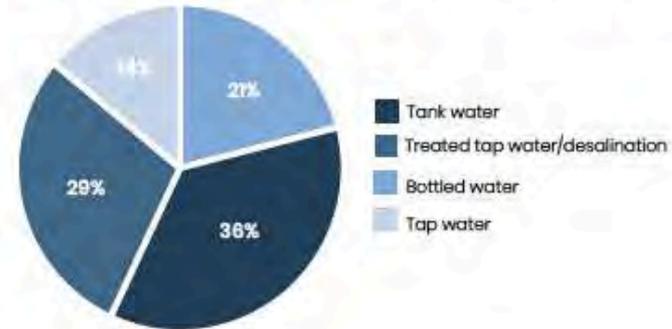


SOURCE™ Consumer Feedback

Where are SOURCE Hydropanels being used for drinking water?



Before the SOURCE installation, what was your primary choice of drinking water at this location?



SOURCE™ Highlights & Challenges

A key highlight:

- Since commissioning the 150 units have offset over 160,000 (500mL) single-use plastic bottles, equivalent to over 60 tonnes of carbon dioxide emissions.

A vital breakthrough:

- 4 distribution partners, 3 referral partners, 3 retail outlets, 4 certified installers and approximately 10 apprentices and subcontractors now have expertise in the origination, sale, system design, installation and maintenance of SOURCE Hydropanel projects.

A significant challenge:

- Challenge: The upfront CapEx cost of SOURCE is a barrier for some market segments
- Resolution: After the first wave of installations in 2018, SOURCE was included as a technology in the the Commonwealth Bank of Australia's Energy Efficient Loan's program, offering discounted asset finance rates for SOURCE installation around the country.

SOURCE[™] Lessons Learned

Larger installs

- ZMW and distribution partners have identified that focusing on large commercial installations is a viable strategy for increasing economies of scale (through reduced per-unit install costs) while maximising bottled-water offset.

Ground mounted installs

- ZMW and distribution partners have also found that ground-mounted installations are an effective strategy for making the installation process safer, faster and cheaper for installers, reducing costs and eliminating the need for permits/DAs

Water Purchase Agreements (WPAs)

- ZMW and distribution partners, based on market feedback, have also launched a Water Purchase Agreement (PPA), in which ZMW finances, installs and manages entire projects, then sells the water to an offtaker. ZMW and its distribution partners have found this to be an effective sales tool to reduce upfront CapEx and allow users to pay on a per L basis, an arrangement that aligns more closely with typical water utility and bottled water consumption patterns.

SOURCE™ Plastic & CO² Outcomes

Project Production to Date...

161,262

500 ml plastic water
bottles displaced

62.02

Tonnes of carbon dioxide
emissions avoided*

5

Cars removed
permanently off the road

*Pacific Institute “Energy Implications of Bottled Water” 2009; Zero Mass Water Analysis

Major Barriers

Technology

Potential to reduce installation costs and improve water yield

Delivery Model

Burden of upfront investment and technology risk falls on buyer

Awareness

Majority of applicable customers are unaware of SOURCE

Sustainability

Convenience and health of bottled water supports ongoing growth

*World Health Organization, Forbes, United Nations, National Geographic

SOURCE Gen E Rooftop



SOURCE™ Gen F Rooftop



SOURCETM Water Purchase Agreement

1

Tell us how many liters of water you need

2

ZMW takes care of shipping, installation, maintenance

3

Your only cost is SOURCE Water at a fixed price per liter





SOURCE

SUNLIGHT + AIR = DRINKING WATER

WORK?



