INQUIRY INTO RATIONALE FOR, AND IMPACTS OF, NEW DAMS AND OTHER WATER INFRASTRUCTURE IN NSW

Organisation:Zero Mass WaterDate Received:11 September 2020



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Cate Faerhmann MLC Chair Planning and Environment Committee New South Wales Legislative Council Via email: Cate.Faehrmann@parliament.nsw.gov.au

Dear Ms Faerhmann,

Thank you for the opportunity to make a submission to the Committee's inquiry into the rationale for, and impacts of, new dams and other water infrastructure in NSW. Zero Mass Water is pleased to be able to contribute to the Committee's deliberations on these issues and can appear before the Committee or provide supplementary materials to the Committee as required.

This submission profiles Zero Mass Water as an innovative approach to mitigating shortages in high quality drinking water in regional Australia and addresses the following terms of reference directly:

(d) the impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storage projects in ensuring security of water supply for social, economic and environmental outcomes; and

(e) water infrastructure technologies that may promote enhanced environmental outcomes.

We believe reliable access to clean drinking water is a fundamental human right. While the water strategies, technologies, and policies of the 20th century have yielded remarkable success in providing reliable service to high density urban areas, they are failing rural homes and small communities across Australia who continue to face multi-generational challenges in accessing clean drinking water.

We encourage the Committee to consider pathways for non-traditional technologies, including alternate sources of water (i.e. atmospheric harvesting), alternate delivery models (i.e. direct to tap, behind the meter), and a fitness-for-purpose approach to water supply. Innovative technologies and decentralised, tailored supply can empower communities and households to access high-quality drinking water in a resilient and sustainable way.

Should the Committee have any questions or require further information, I can be contacted on

Yours faithfully,

Kristen Roy Country Director, Australia



What is SOURCE?

SOURCE[™] Hydropanels are manufactured by Zero Mass Water and provide communities with a drought-proof, sustainable and off-grid drinking water solution to supplement other water supplies. Unlike traditional water infrastructure, which can take months or years to construct, SOURCE Hydropanels are uniquely free of infrastructure and can be installed in a matter of hours. Zero Mass Water is present in over forty-five countries, supplying clean fresh drinking water in a wide range of environments and applications through partnerships with governments, corporations and development organisations.

The Hydropanels use a combination of solar energy and materials science to extract pure water vapour from the air and convert it into the highest-quality liquid water. The water then flows into a reservoir where it is mineralised before being delivered to a tap or dispenser. A standard household array - two Hydropanels - has a storage capacity of 60 litres or 120 standard water bottles. Arrays can be scaled to community size, with larger installations providing millions of litres each year to a centralised storage tank and dispenser. Attachment A explains how the Hydropanels work.

Our Experience in Australia

In 2018, a demonstration grant from the Australian Renewable Energy Agency (ARENA) allowed the technology to be proven in a variety of climates across the country, from Lady Elliot Island in Queensland to the Pilbara in Western Australia. SOURCE Hydropanels have now been installed at schools, community facilities, farms, and council venues in more than fifty locations around Australia.

In Murrurundi, a town in the Upper Hunter region of NSW, residents have traditionally relied on rainwater, bottled water, bore water, and the Murrurundi Dam for their water supplies, however the worsening drought has largely depleted these sources. Millions of litres of water are carted weekly to the pre-treatment lagoon to meet shortfalls and locals rely heavily on donated plastic bottled water to meet aesthetic and quality expectations. In 2018, Zero Mass Water installed Hydropanels at the local school to give students access to reliable and great-tasting drinking water and ease the burden on families providing bottled water to children each day. The community regularly accesses the school out-of-hours to replenish their water supplies.

In mid 2019, SOURCE Hydropanels were installed at remote Aboriginal communities in Queensland, NSW, South Australia, Western Australia and the Northern Territory to address residents' concerns about low and poor-quality water supplies. Residents now have an alternative to river and bore water, which is often poor tasting, discoloured, and contaminated by lead, sodium and nitrates. Having access to high quality drinking water reduces community reliance on expensive bottled water and the consumption of sugary beverages.

The installations described were made possible through a donation from the U.S. National Basketball Association (NBA) and Australian basketballer Patty Mills. The Murrurundi site was donated by the Three Blue Ducks restaurant at The Farm in Byron Bay, where Hydropanels are used to provide a closed loop water service for diners. These and other installations are outlined in Attachment B.





Response to Terms of Reference

(d) the impacts of climate change on inland waterways, including future projections, and the role of dams and other mass water storage projects in ensuring security of water supply for social, economic and environmental outcomes

The challenges presented by climate change are best illustrated by recent examples in Australia of drought, bushfires and the vulnerability of remote communities in the context of COVID-19.

The lack of drinking water resilience in each of these events was experienced through convoys of bottled water donations being driven to Walgett during the 2019 drought, distributions of bottled water to Cobargo residents following contaminated supply from fire-fighting efforts in January 2020, and empty supermarket shelves of bottled water as consumers stocked up on essential items ahead of the COVID-19 lockdown in March of 2020. These highlight several key issues:

- The supply and distribution of drinking water is heavily dependent on climatic conditions and compromised by drought. This is felt most acutely in rural households who often rely solely on rainwater collection. Technology that can supply these households with high quality water independent of rainfall will have a significant improvement in household resilience, health and cost of living;
- Climate-related weather patterns and disaster events like fires, floods and cyclones disproportionately impact our rural and remote communities, who are left seeking alternate drinking water sources in times of crisis. Independent, distributed drinking water systems located at the household level provide additional resilience to households; and
- Vulnerable populations are repeatedly dependent on bottled water in times of crisis, often for prolonged periods, which comes at a significant cost from an economic, environmental and emissions standpoint while providing no resilience to future threats.

Recommendation 1: Alternative water sources should be incorporated into climate change planning. There is currently a need for innovative, climate-proof solutions that can access reliable quantities of drinking water close to the point of demand (i.e. without reliance on rainfall or infrastructure to deliver water)

(e) water infrastructure technologies that may promote enhanced environmental outcomes,

Communities in Australia are overly reliant on a single water source, groundwater, which can be costly to treat and challenging to supply to remote and regional households. This entrenches a sub-optimal level of water quality and a dependence on environmentally detrimental alternatives.

Water supply is mostly categorised as either "treated" or "untreated", a classification which fails to consider that expectations and preferences of the Australian public go far beyond minimum standards of safety and potability where drinking water is concerned. As evidence, less than one percent (1%) of household water use in Australia is consumed directly for drinking¹, and yet Australians elect to

¹ Australian Government Website: www.yourhome.com.au



spend over \$1 billion dollars annually² on bottled water that meets consumer expectations for taste, quality and health. Conversely, the vast majority of agricultural, industrial and non-drinking household water is considered far less valuable and impactful by consumers.

There are opportunities here for suppliers to assess water needs on a segregated basis and balance project costs with the economic and environmental implications of drinking water alternatives. Suppliers should look for opportunities to apply a fitness-for-purpose approach to select appropriate water sources, delivery methods, reuse/recycling methods and efficiency measures that optimise the project from a cost, value and outcomes standpoint.

Recommendation 2: Water service providers should be encouraged to assess water needs on a segregated basis, incorporating a fitness-for-purpose approach that optimises usespecific solutions. Drinking water consumed directly by Australians is the most valuable, impactful and essential for health and should be regarded as a separate class of water within the broader category of treated water.

²Statista Non Alcoholic Drinks Report – Bottled Water (2020)





Attachment A



How it works







Attachment B: Example Installations

Gundy Soldiers' Memorial Hall, Hunter (NSW)



The town of Gundy once relied on rainwater harvesting, boreholes, bottled water, and the local river for their water supply. Facing severe drought, their local water supplies became severely strained, forcing residents to rely on bottled water alone.

To provide a sustainable, non-extractive solution, the Gundy installed eight SOURCE Hydropanels for the community to use to replenish their drinking water supply.

The installation of SOURCE provides safe, reliable, and delicious drinking water for the community to enjoy, boosting community

resilience to the drought.

Remote Aboriginal communities



Patty Mills, NBA player and one of Australia's leading sportspeople, was determined to bring a renewable supply of clean drinking water to drought-stressed areas of remote Indigenous Australia.

Throughout his basketball career, Mills has been dedicated to honoring his Aboriginal culture, and founded The Community Water Project to enable remote communities to overcome water stress.

With the support of the National Basketball Players Association and Australian Indigenous Basketball, The Community

Water Project installed SOURCE Hydropanel arrays in six remote Australian communities, including Wilcannia, Walgett, Cunnamulla (QLD), Oodnadatta (SA), Black Tank (NT), and Dampier Peninsula (WA).

Commenting on the Wilcannia installation, a community elder said, "Over the past 5 years there has been virtually no water in the Darling River, and the water that is left is poisonous. The Hydropanels donated to us provide 900 litres of water each month. It really makes a big difference to the lives of our elders and our young families."





Murrurundi Public School, Upper Hunter (NSW)



Murrurundi has been hard hit by the drought. Struggling with a low water supply, the town needed a solution that would provide community members with drinking water security.

Three Blue Ducks, a sustainably-minded farm-to-table restaurant, committed to supporting the town of Murrurundi by donating 10 SOURCE Hydropanels to Murrurundi Primary School.

Now the students, parents, and community members have continuous access to reliable, high-quality drinking water.

Waddi Beverages (QLD)



In order to uphold their sustainable values and meet the needs of their customers, Waddi water distributors needed a nonextractive drinking water product that was sustainable and high quality.

Waddi partnered with ZMW to offtake SOURCE water from an array in Scenic Rim, Queensland, creating a premium, responsibly packaged water product for supply to tourism and hospitality venues.