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Dear Chairman,

Re: MDB Plan - Impact on Regional Australia Submission - Zero Height Roof (ZHR)

Thank you for extending to us (nationbuilder.com.au) an invitation to make a submission to the House of Representatives Standing Committee on Regional Australia referencing The Impact of the Murray Darling Basin Plan in Regional Australia.

As it happens we have been in China dealing with a range of commercial matters and have only returned to Australia today (Monday the 20th December 2010). We have, however, prepared a submission which is intended to provide the Committee with sufficient factual material to form an educated view on the merits of the two novel technologies which are at the heart of nationbuilder.com.au. The Submission is sufficiently rich in visual and technical data that it has grown to more than 70MB in size and therefore cannot be sent via email in its complete form so it will follow this letter by mail.

Much of the public discourse surrounding the MDB is about how to more equitably and sustainably apportion access - whether for the environment or other uses - to a fixed and limited supply of water. Our submission is about how to increase the supply of water. The MDB's problem is not primarily a lack of rainfall but a lack of runoff. Zero Height Roof is a new form of building structure adapted to cover large areas of open ground with a roof at relatively low cost, creating the prospect of large scale rainfall catchment facilities suitable for the provision of water to regional communities and ecological systems.

The Belgium Flower Markets provide the largest contiguous roofed structure on earth at 990,000 square metres. Construction of large structures has previously been constrained by the cost of

foundations required to counter the natural movement and subsidence of the earth under the structure over time. ZHR solves this problem by utilising a novel baton, tension truss and anchor system that allows the earth to continue moving without compromising the integrity of the roof above it. This approach removes the prohibitive cost of concrete foundations in the construction of a skin or roof that is capable of acting as an affordable, durable, rainwater factory - a river in a can.

We propose the construction of a ZHR trial facility for the Tamworth and Gunnedah Region situated above the present Dungowan Dam as well as demonstrating to the Committee its utility and financial feasibility in various places across the Australian continent. We are confident the project is capable of attracting substantial (possibly entire) private sector funding if the Commonwealth will play a leadership role in the trial stage.

Our submission provides a rationale for the construction of a series of new dams across regional Australia in combination with hydro-electric recharge pumping facilities. (Recharge pumping is a renewable source of 8% of North American energy but comprises less than 1% of Australian energy supplies.) If implemented, this networked dam and recharge pumping infrastructure would radically improve the economic prospects of communities in regional Australia, the MDB and the environmental prospects of our continent both east and west of the Great Dividing Range. It is not possible to revegetate inland Australia without provision of substantial new water sources and reservoirs. It is not the case that Australia lacks the rainfall for the task. What we lack is the infrastructure to capture and store water during irregular flood events.

Our submission also makes the case for a new technology we have developed to extract energy from ZHR which we have called Solar Thermal Engine (STE). A large roof or skin covering the ground captures underneath significant amounts of heat. That heat flows naturally by convection to the highest point in the structure where it can be condensed by heat pump means and released in such a way as to drive a turbine in a powerful new form of renewable energy. Every element of the innovation has been technically proven - the novelty is in combining the elements. Solar Thermal Engine should be understood as an adjunctive technology to the Zero Height Roof. Both are patented by the Raffaele brothers and described in detail at: www.nationbuilder.com.au/ (The CSIRO has recently announced its interest in a variant of STE: see <http://www.csiro.au/science/Solar-Brayton-Cycle.html>)

Openness to these ideas has been constrained by two major factors:

- the felt need of State governments to avoid any development that might reduce community acceptance of desalination as the principal hope of water security; and
- the reluctance of environmental custodians to reduce community pressure for more intelligent and sustainable uses of existing water supplies including suspicion of “engineering solutions” in an environment of reduced rainfall post-climate change.

These are matters for the Committee, and the community more generally, to consider and resolve and are largely beyond the scope of our submission. We simply note that each of the seven major desalination plants that have been constructed, or are under construction, in Perth, Brisbane, Sydney, Melbourne and Adelaide, is at sea level. Water weighs one tonne per cubic metre. The only direction water can be pumped, from a desalination plant at sea level, to a population relying upon it, is uphill. The lubricity of water means it flows downhill at no energy cost (it can actually create energy), across level ground at minimal cost, and uphill at very great cost. Aside from the cash cost of pumping potable water uphill, the carbon cost of providing the energy for that task, largely from fossil fuels, will lock Australia into a carbon snooker for a generation unless other alternatives are explored and implemented quickly. Those alternatives are available - ZHR, recharge pumping and Solar Thermal Engine. We strongly support efforts to better use limited water supplies but we believe the community is intelligent enough to do both things at once - to walk and chew gum. We believe legitimate

concerns about maintaining the momentum for reform on sustainability grounds must not be allowed to sterilise the ground for exploring and implementing engineering innovations that can substantially increase available water supply. We also don't see any alternative - we reject the only other logical conclusion, that inland Australia will never again see trees while the continent is inhabited by humans.

Various financial models are presented in our submission. The model for ZHR contains three simple elements: cost of construction per metre; amount of rainfall in relevant catchment; price of water. The STE will not be cheap to construct but holds the potential to repay initial capital costs and comfortably provide a return to investors on current pricing of water and electricity. Conservative financial assumptions indicate that even if the initial pilot project was entirely funded by the Commonwealth, it would repay the initial investment at about year 10 in a (minimum) 30 year asset life (depending on materials choice, rainfall on current trend, price of electricity escalating at CPI etc) and would require no ongoing recurrent funding by the Commonwealth. The technologies and strategies developed by us and presented in our submission give the Commonwealth the opportunity to do more than simply adjudicate over what inadequate share of the currently available resource each legitimate interest will receive. We believe that ZHR and STE can revolutionise our understanding of the water, energy and environmental infrastructure challenges we face as a nation and especially those of communities within the MDB.

The majority of the ideas and proposals we will put to the Committee can be found on our website: www.nationbuilder.com.au/ We apologise that we have been unable to send our submission to you in its entirety today but trust that this letter and the provision of a link to our website shows we are acting in good faith.

Yours sincerely

Peter Raffaele

Michael Raffaele

www.nationbuilder.com.au/