

North Queensland regional power independence and a superb new water supply for Cairns

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ABSTRACT

We present hydrological and economic modeling of a dam 40 km south of Cairns at an altitude of 620 m. The key is a relatively large dam wall and a small but deep 40 GL lake in a catchment area that receives 6–10 m of precipitation annually (120–160 GL run off). This would secure all current and future water needs for Cairns. The lake would be coupled by a vertical shaft to a 250 MW (peak) hydro-power station 500 m below and inside the mountain. From there, a 6 km tunnel running east connects with the coastal dam service-tunnel and a 3 km tunnel running west takes the water back to the river below the falls. On average this would result in the release of 300 ML/d opening up opportunities for tourism, new industries, and irrigated farming of high yield crops. The tunnel offers the possibility of a new transport corridor from the Coast to Atherton on the central tablelands. The increased flows in the dry season could be important for the health of the river which is also a nursery-ground for the Great Barrier Reef. The CO₂ savings from reduced coal fire power needs are significant. Comparative analysis with all three local dams shows that the proposed lake is smaller and many times more useful per m². Importantly, this reliable hydro-power would allow considerable regional load-balancing of unreliable wind and solar power, representing a big step away from dependence on remotely provided power which is a key recommendation in the widely supported Tropical North Queensland – Sustainable Region Initiative.

Keywords: Cairns water supply; CO₂ reductions; Hydro power generation
