

ARENA

HYDROELECTRICITY AND PUMPED HYDRO ENERGY STORAGE PROJECTS

APRIL 2020

Lead Organisation	Project	Summary	Project Type	Partners	Pumped Hydro or Hydro	On-River or Off-River	Fresh Water or Sea Water	Capacity	Started	State	ARENA Funding	Total Project Cost	Key Contact	Key Contact Email	ARENA Project Page	Knowledge Bank Reports
OMPS Pty Ltd	New England REZ - PHES benefits study	A study of Pumped Hydro Energy Storage (PHES) technologies to investigate the benefits of PHES in the New England Renewable Energy Zone (REZ) in NSW.	Other Study	Alinta, Lloyds Register, SMEC, Ernst and Young, AEMO, Transgrid, Powerlink	Pumped	Off-River	Fresh Water	600MW / 7200MWh	2019	NSW	\$951,000	\$2,232,000	Jeremy Moon	j.moon@ompshydro.com	Link	
Hydro Tasmania	Battery of the Nation - Future State NEM analysis (Phase 2)	The Future State NEM Analysis (Phase 2) Feasibility Study (Project) is a detailed study into a significantly expanded role for the Tasmanian energy system in the National Electricity Market (NEM) of the future.	Feasibility Study	TasNetworks, AEMO	Both	Both	Fresh water	Variable	2019	TAS	\$500,000	\$1,877,880	Cameron Potter	cameron.potter@hydro.com.au		Six reports on the project page
ANU	Short Term Off-River Energy Storage (STORES 2)	The project aims to identify, rank and order the most prospective PHES sites. And develop a Cost Estimation Tool to allow public users cost one of the identified PHES sites with sufficient reliability to proceed to pre-feasibility.	Other Study	None	Pumped	Off-river	Fresh water	Variable	2019	ACT	\$308,736	\$503,517	Andrew Blakers	andrew.blakers@anu.edu.au	Link	
Hydro Tasmania	Battery of the Nation - Tasmanian Pumped-Hydro Opportunities - Stage 2b	Prefeasibility study to identify the key project risks, benefits and costs, to enable investment decisions to be made on whether to conduct full feasibility studies. Based on the findings of the prefeasibility studies, business case(s) will be prepared for full feasibility studies for selected projects.	Pre-feasibility Study	None	Pumped	Both	Fresh water	Variable	2019	TAS	\$700,000	\$1,400,000	Nick West	nick.west@entura.com.au		
Origin Energy Eraring Pty Limited	Shoalhaven - Pumped Hydro Expansion Opportunity Feasibility Study	The feasibility study will explore the technical and commercial feasibility of expanding the existing Shoalhaven PHES Scheme.	Feasibility Study	None	Pumped	On-river	Fresh water	235 MW	2018	NSW	\$2,000,000	\$6,800,000	Mary Dullard	mary.dullard@originenergy.com.au	Link	
OneSteel Manufacturing Pty Ltd	Middleback Ranges - Pumped Hydro Energy Storage Project Pre-feasibility Study	The project is a pre-feasibility study for the development of a PHES plant at a mine site known as the "Iron Duchess North" in the Middleback Ranges, South Australia. The base case for the pre-feasibility study is 110 MW dispatchable power and six hours storage with consideration to increase capacity to 220 MW. The success of this project would demonstrate the potential for unlocking value from other legacy mining sites. The combination of solar and pumped hydro in this project also has significant potential to create the low-cost power required to support Australia's energy-intensive industries.	Pre-feasibility Study	None	Pumped	Off-river	Fresh water	110-220 MW / 660 - 1320 MWh	2018	NT	\$500,000	\$1,540,000	John King	john.king@simecenergy.com.au	Link	Pre-feasibility Study - Knowledge Sharing Report
Hydro Tasmania	Battery of the Nation - Augmenting the Tasmanian Hydropower System - Stage 1b	This project will conduct a full feasibility study on the final Tarraleah scheme redevelopment option identified in the pre-feasibility study (Stage 1a). It aims to deliver redevelopment cost and value certainty for optimising the scheme for a different future role in NEM.	Feasibility Study	None	Pumped	Both	Fresh water	220 MW / 634 MWh	2018	TAS	\$2,500,000	\$5,000,000	Paul Molnar	paul.molnar@hydro.com.au		
Energy Australia Development Pty Ltd	Cultana Pumped Hydro Energy Storage Project - Financial close activities	ARENA funding to support the Recipient advancing the Project by gaining sufficient detailed knowledge on all required aspects to enable an informed consideration of the Final Investment Decision (FID).	Other Study	ARUP, Melbourne Energy Institute (MEI)	Pumped	Off-river	Sea water	225 MW / 1,770 MWh	2018	SA	\$500,000	\$9,000,000	Julian Turecek	julian.turecek@energyaustralia.com.au	Link	
Genex Power Limited	Kidston Pumped Hydro Energy Storage Project - Financial close activities	The project involves completing the activities required to achieve Financial Close for the Kidston Pumped Hydro Energy Storage Project, which will comprise up to 270 MW of solar PV and 250 MW of pumped hydro. It will build on the existing 50 MW solar farm already in operation.	Other Study	None	Pumped	Off-river	Fresh water	250 MW / 2,000 MWh	2017	QLD	\$5,000,000	\$13,300,000	James Harding	jh@genexpower.com.au	Link	
Hydro Tasmania	Battery of the Nation - Establishing an expanded role for Tasmania in the future NEM - Stage 3a	The project will build physical system and economic models of hydropower and broader system augmentation, including Tasmanian pumped hydro storage opportunities, to prosecute a case for a significantly expanded role for the Tasmanian energy system in the National Electricity Market (NEM) of the future.	Feasibility Study	None	Both	Both	Fresh water	Variable	2017	TAS	\$500,000	\$1,000,000	Cameron Potter	cameron.potter@hydro.com.au	Link	Battery of the Nation Analysis of the future National Electricity Market
Hydro Tasmania	Battery of the Nation - Tasmanian Pumped-Hydro Opportunities - Stage 2a	Concept study into Tasmania pumped-hydro opportunities including conversion of existing hydro generation into pumped hydro units. It is expected that projects with capacity in excess of 2500 MW of potential could be identified.	Feasibility Study	None	Pumped	Both	Fresh water	Variable	2017	TAS	\$300,000	\$600,816	Christopher Gwynne	christopher.gwynne@hydro.com.au	Link	Battery of the Nation - Tasmanian pumped hydro in Australia's future electricity market.
Hydro Tasmania	Battery of the Nation - Augmenting the Tasmanian Hydropower System - Stage 1a	Feasibility studies into the redevelopment of the Tarraleah Power Station and augmentation of the Gordon Power Station.	Pre-feasibility Study	None	Hydro	On-river	Fresh water	Gordon: 5-30 MW, 67 GWh Tarraleah: 220 MW, 634 GWh	2017	TAS	\$500,000	\$1,000,000	Tony Ang Ang	tony.ang@hydro.com.au	Link	Hydropower asset improvement at Gordon Power Station Repurposing Tarraleah Hydropower scheme for the future electricity market

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Snowy Hydro	Snowy 2.0 Feasibility Study	The Snowy 2.0 feasibility study confirmed that the pumped hydro expansion of the Snowy Hydro project is both technically and financially feasible. Snowy 2.0 would deliver 2000 MW of additional dispatchable generation capacity and 350,000 MWh of storage. The construction would involve building an underground hydro-electric power station and 27 kilometres of tunnels connecting two existing reservoirs in the Snowy Mountains.	Feasibility Study	None	Pumped	Off- river	Fresh water	2000 MW	2017	NSW	\$8,000,000	\$29,000,000	Dean Thomson	dean.thomson@snowyhydro.com.au	Link	NEM outlook and Snowy 2.0
Energy Australia	Cultana Pumped Hydro Energy Storage Feasibility Study	Study to determine the technical and economic feasibility of a seawater PHES plant, located near Cultana, south-west of Port Augusta, in South Australia.	Feasibility Study	The University of Melbourne, ElectraNet, ARUP	Pumped	Off-river	Sea water	225 MW / 1,770 MWh	2017	SA	\$453,000	\$1,018,000	Julian Turecek	julian.turecek@energyaustralia.com.au	Link	Knowledge Sharing Report
Australian National University	An Atlas of Pumped Hydro Energy Storage (STORES)	The project generated a model termed as "an engine" to provide a comprehensive atlas of potential pumped hydro sites and an analysis of integration of PHES into local and state grids.	Other Study	None	Pumped	Off-river	Fresh water	Variable	2016	ACT	\$609,000	\$1,210,000	Andrew Blakers	andrew.blakers@anu.edu.au	Link	An analysis of potential STORES environmental and water consumption impacts Comparison of STORES with other energy storage technologies and gas and biomass generation Geographic information system (GIS) algorithms to locate prospective sites for short-term off-river PHES Capability of STORES to provide ancillary services Identification of potential STORES Renewable Energy Zones The Complete Atlas Public dissemination final report
Genex Power Limited	Feasibility study for Kidston Pumped Hydro Energy Storage Project (Stage 1)	Feasibility study to determine the technical viability of converting two large disused co-located mining pits into hydroelectric pumped storage generation at a former mine site in Kidston.	Feasibility Study	None	Pumped	Off-river	Fresh water	250 MW / 2,000 MWh	2015	QLD	\$3,996,211	\$14,000,123	Michael Addison	ma@genexpower.com.au	Link	Knowledge sharing report
Waratah Power	Impact of small scale hydropower technologies on Australian native fish species	The project produced detailed scientific information on the effects small hydro has on native fish species, which could be used to improve the design and operation of small hydro systems in addition to assisting regulatory changes.	Other Study	None	Both	On-river	Fresh water	Variable	2012	NSW	\$613,377	\$1,124,331	Andrew Jones	ajones@waratahpower.com	Link	Final Report

Further information is available at
arena.gov.au

Questions relating to the Renewable Hydrogen
Deployment Funding Round?
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