

June 2017

snowyhydro

NEWS

SNOWY 2.0

All you need to know about the Snowy 2.0 Feasibility Study

also in this edition:

- *2017: Scheme Modernisation Update*
- *Safe Driving in the Snowy Mountains*
- *Calling all tradies: Join the Snowy Team!*

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ISSUE 37



An exciting time f



CEO, Paul Broad, outlines the Snowy 2.0 Feasibility Study and what it means for Snowy Hydro and the Snowy Mountains region....

What an exciting few months it has been for Snowy Hydro and for the Snowy Mountains Region. Having the Prime Minister Malcolm Turnbull visit Tumut 3 Power Station back in March, and stand alongside me to announce the Feasibility Study into additional pumped hydro capability of the Scheme, was certainly a point in Snowy Hydro's history that we will all positively recall in the future.

The Snowy Scheme was built by smart and visionary engineers who saw the potential for expansion. Over the years we have looked into various options, and so we already have a body of work to consider during the Feasibility Study. While these options have not stacked up previously, the changing nature of the National Electricity Market (NEM), the exit of thermal baseload power like Hazelwood in Victoria, and the rise of renewables mean that expanding pumped hydro may now make economic and business sense.

We have dusted off our plans from the 1980s and the one that we most favour, and are conducting the study on, is for pumping from our existing Talbingo Reservoir back up to Tantangara Reservoir. While you can read on in this edition of Snowy Hydro NEWS for

more detail, the basic plan is a tunnel between these two reservoirs, and a 2000 megawatt underground power station in between them with generation and pump capability.

This project has the potential to deliver one of the largest pumped hydro schemes in the world and underscores the importance of the Scheme's existing role as the battery of the NEM. While it has long been an Australian engineering icon, the importance of the Scheme's role as the battery storage of the NEM will only become more critical as we transition to a low carbon economy. The reliable, fast-start Scheme can help provide stability to the market by managing the exit of baseload thermal power and the rise of intermittent renewables.

Snowy Hydro and SMEC have a long association and we now have joined forces once again to carry out the Feasibility Study. SMEC was the obvious choice to partner with us on the study - given we share the same DNA - and our focus now is to bring together a skilled team of people to revisit this visionary proposal developed over many years by the talented men and women who built the Scheme.



or Snowy Hydro...

As we move through the Feasibility Study, we will gain greater clarity around the technical and engineering requirements for the expansion, as well as costs and timeframes for its construction. However, there are huge challenges around the technical aspects of this project, particularly around the geology. While we have surface geology, we will need to carry out some further exploratory works and are looking at drilling small boreholes for geotechnical sampling to test the underlying rock, particularly where the station will be built underground. Snowy Hydro is working cooperatively with the National Parks and Wildlife Service and other government agencies and locals to carry out the study with as little disturbance to the Park and regular activities as possible.

It is also important to reiterate that this project will have no effect on water, nor our commitment to deliver water to irrigators. The original reason for the construction of the Scheme was to deliver water from east to west - to the foodbowl of Australia - and that will not change. In fact, one of the benefits of this project is to drought-proof the Scheme as it will allow us to recycle existing water within our storages and continue to deliver on our water licence arrangements. It's a win-win for all.

This project is attracting a lot of attention towards Snowy Hydro and the region. You will see many reports in the media, such as those recently regarding the Federal Government buy back of Snowy Hydro. Ownership of the company is a matter for our

shareholders - while that is under consideration, Snowy Hydro continues to operate as a private company with an independent and commercial Board of Directors and without any government protection. We pride ourselves on our identity as a successful and innovative company operating on an equal footing with private sector competitors and as the fourth pillar in a dynamic and changing market; and will continue to operate in this way.

Another media debate has been around the transmission upgrades required for additional pumped hydro in the Scheme. We have said right from day one that Snowy 2.0 will not work without transmission upgrades to get the electricity to customers north and south. The work and cost required to carry out any necessary transmission upgrades are being assessed in conjunction with TransGrid, which manages the NSW high voltage transmission network.

While this is an exciting time for Snowy Hydro and the region, it's important to remember that we are at the feasibility stage and we need to carefully consider the costs, location and benefits of the project once the feasibility study is complete.

I expect there will be much debate and discussion of this project in the weeks and months to come, I will let you know when there are further details.

Snowy 2.0

Feasibility Study

On 16 March 2017, Snowy Hydro announced its proposal to carry out a Feasibility Study into the expansion of the pumped hydro-electric storage in the Snowy Mountains Scheme, also known as Snowy 2.0.

The Feasibility Study is currently under way and due for completion in December 2017.

What is Snowy 2.0?

Snowy 2.0 is a pumped hydro project with the potential to provide storage for large scale, reliable renewable energy to Australia at a time when energy security and climate change are at the forefront of public policy.

If built, Snowy 2.0 would increase the generation capacity of the iconic Snowy Scheme by up to 50 per cent, making up to 2000 megawatts available to the National Electricity Market.

This energy storage capacity could then be used to ease pressure at times of high demand and provide rapid-response back-up to fill unexpected gaps in electricity supply. This is important as the economy reduces reliance on fossil fuels and increases its use of renewable energy – the security provided by energy storage can protect the community from blackouts and price shocks.

How would it work?

Pumped hydro involves recycling water between adjacent reservoirs at different elevations. Pumped hydro schemes store energy by pumping water from a lower reservoir into an upper reservoir at times of low demand. During times of peak demand, the

water is released back into the lower reservoir through the turbines to generate electricity. These schemes enable large scale storage of clean, renewable energy in a flexible way.

The Project Site

The site under consideration for Snowy 2.0 would link the existing Tantangara and Talbingo reservoirs that form part of the Scheme, which has been delivering hydro-electric power and irrigation to Australia for decades. The proposal does not require the construction of any new dams, nor will it affect irrigators and downstream water users.

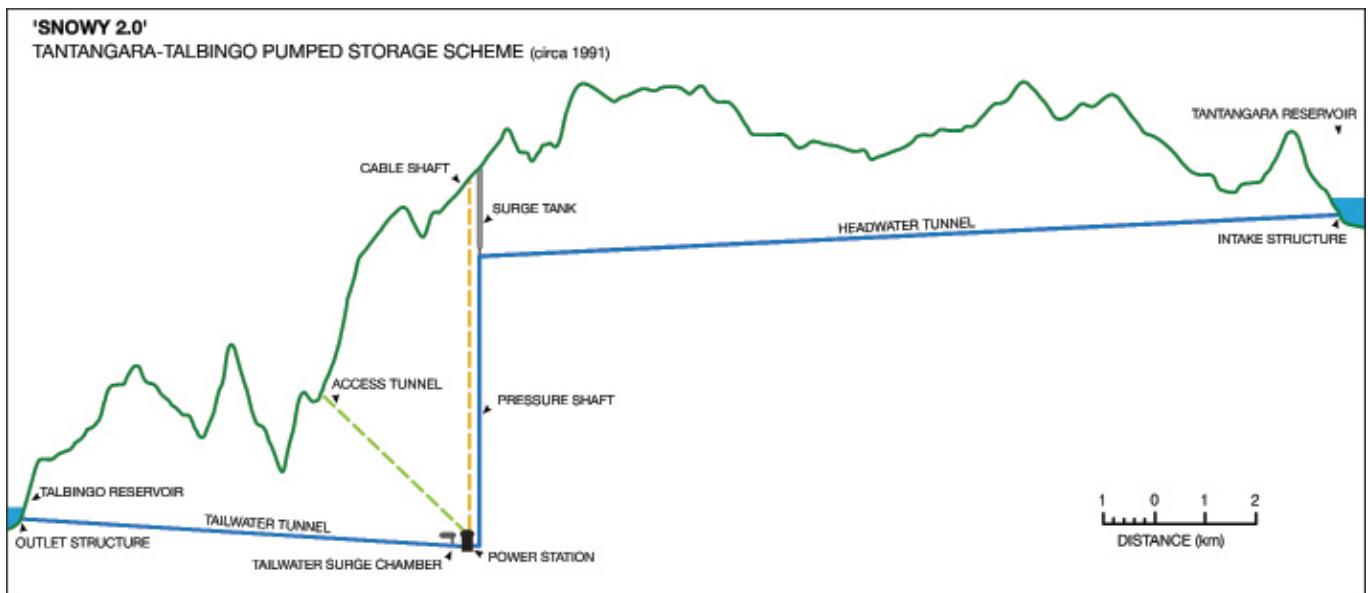
The Feasibility Study

Snowy Hydro Limited is carrying out the Snowy 2.0 feasibility study to investigate the potential expansion of pumped hydro-electric storage in the Snowy Mountains Scheme.

The Snowy Mountains Engineering Corporation (SMEC) Australia has been appointed as the lead consultant engineer for the study. We are proud to be once again partnering with SMEC after our initial work together on the development of the Snowy Scheme in 1949.



Snowy 2.0 Project Schematic



Once the Feasibility Study is completed in December, Snowy Hydro's independent Board of Directors will consider its findings. We will provide a further update on next steps at this time.

Frequently asked questions...

How long will the project take?

The Feasibility Study is currently underway and will be completed in December 2017. Once the study is complete, the timeframe for the project will be determined.

How does pumped hydro work?

Pumped hydro storage systems work like a conventional hydroelectric scheme: in periods of high demand, electricity is generated by releasing water from an upper reservoir into a lower reservoir. Unlike a conventional hydro scheme, where water is discharged, a pumped hydro scheme “recycles” or pumps water back to the upper reservoir during off-peak hours.

Why is pumped hydro a good option for Australia to consider?

Pumped hydro is a mature and proven technology which is used around the world, and has been part of the security back-up for the National Energy Market for decades. Pumped hydro can provide energy storage at a fraction of the price of batteries. In fact, it is around 100 times cheaper than the best practice energy storage batteries out there. Lithium ion batteries currently have a limited ten year life span, after which they need to be replaced. In comparison, pumped hydro has an enduring life. In terms of capacity, Snowy 2.0 could store up to 350 Gigawatt hours of energy. It would take 35 million domestic batteries to match this.

What does this mean for consumers?

By providing greater security and reliability of supply as the economy shifts to renewable energy, the project can help system security and prevent energy price shocks.

What are the environmental impacts of this Project?

The Feasibility Study will involve an environmental impact assessment and will comply with all regulatory requirements. Snowy Hydro has been operating in the Kosciuszko National Park since its creation and has a record of respect for the local environment. Snowy Hydro is governed by a licence to operate in the National Park and has an impeccable track record.

What does this mean for water in the Snowy Scheme?

Snowy Hydro will continue to operate under its stringent water licence arrangements. These requirements will not change. The proposed expansion will have no impact whatsoever on irrigators and downstream water users.

What about transmission?

Transmission requirements will be considered as part of the Feasibility Study. The work and cost required to carry out any necessary transmission upgrades are being assessed in conjunction with TransGrid (which manages the transmission network in New South Wales).

What role will SMEC be playing?

SMEC has been appointed as the lead consultant engineer for the Feasibility Study following a competitive tender process. SMEC will be working closely with Snowy Hydro on assessing the technical requirements and options for 2.0. SMEC has reopened its office in Cooma with more than 30 staff based in the town.

How long will the construction take?

The detailed investigations that we are undertaking in the Feasibility Study will help determine the time frame for delivery. Construction has been estimated at a minimum of four years from commencement, subject to the Feasibility Study.

What is the estimated Project budget?

The Feasibility Study will determine the cost of delivering the project; with a current estimate for construction of approximately \$2 billion. Any estimated construction cost is subject to the Feasibility Study.

What does the Treasurer’s budget announcement about changing ownership mean for the Project?

Snowy Hydro has three shareholders. The Commonwealth owns 13 per cent, NSW Government 58 per cent, and Victorian Government 29 per cent. Any changes in ownership are a matter for our shareholders. Snowy Hydro has been an entity incorporated under the Corporations Act 2001 (Cth) since 2002, and will continue to operate as a Corporations Law company governed by an independent Board of Directors.

WHAT YOU CAN EXPECT TO SEE?

Snowy Hydro is working cooperatively with the National Parks and Wildlife Service and other government agencies and local residents, to carry out the study with as little disturbance to the Park and regular activities as possible.

During the study, residents and visitors to the Snowy Mountains may see some activity around Tantangara Dam, Bullocks Hill and Talbingo Dam, such as:

- Site inspections & surveys;
- Some increased traffic from trucks and equipment being transported and located on site;
- Works to achieve access to some sites; and
- Drilling of boreholes for geotechnical sampling.



FOR MORE INFORMATION & INQUIRIES:

Snowy Hydro will keep the community up to date on the study as it proceeds. Community inquiries can be addressed to corporate.affairs@snowyhydro.com.au

Companies interested in potentially providing services to this project should contact (02) 6453 2888 or shlprocurement@snowyhydro.com.au

Please note that the Feasibility Study will be completed by December 2017.

2017: Scheme Modernisation



Modernisation of the Snowy Scheme assets is an ongoing project around all of our Snowy Mountains assets. Manager Outages, Peter Hill, gives an update on the works underway at present...

Two major work streams of the Scheme Modernisation Project are underway at present at our Murray 1 Power Station, near Khancoban, and our Tumut 1 underground Power Station, near Cabramurra.

Both projects are critical to ensuring our assets are upgraded as some have been in operation since construction and the reliability of our plant to respond to market needs is critical to the success of our business.

Update on works at Murray 1 Power Station:

There are two major projects being undertaken at Murray 1 Power Station - unit controls upgrade, and unit refurbishment. Controls upgrade works commenced in 2012 and so far, eight out of ten units have been upgraded to new controls, protection and excitation systems.

Refurbishment works started last year, with Unit 4 being the first to be refurbished whilst also having its controls upgraded in a major outage that commenced in July 2016. This unit has been fully rebuilt after refurbishment, including the installation of a new turbine runner, and has been fully commissioned and returned to commercial service.

Ongoing outages at Murray 1 will include the refurbishment and controls upgrades of all other units in the power station, with a goal of completion of all works by December 2026.

Plans are also underway to commence similar works at Murray 2 Power Station. One unit was refurbished and upgraded back in 2007, and controls upgrade

and possibly some unit refurbishment works for the remaining three units are tentatively scheduled to start from 2018.

Update on works at Upper Tumut:

The Tumut 1 Power Station Major Outage project includes both unit refurbishment and controls upgrade works. Unit 4 was refurbished and upgraded then returned to service in May 2016, and the next unit is now scheduled to be refurbished and upgraded in an outage from March 2018 and expected to be returned to service in August 2018. The works also include the replacement of the old turbine runners with new runners that deliver more power with an increase in water efficiency.

With one unit to be refurbished every calendar year, Tumut 1 is expected to be completed by August 2020, with similar work then planned to commence at Tumut 2.

These major outages require a large number of resources (both internal and external) covering many different areas of work. Typically, we have had a workforce totaling on average between 20 to 80 people on site during the outage period. Refurbishment works also require significant machining and fabrication work off site.

Continuation of these major refurbishment and controls upgrade works provide very fulfilling and challenging work to our highly skilled Snowy workforce and also provide certainty to many major suppliers. This also helps boost local township businesses in terms of arranging logistics for the workforce.





L-R:
Martin McNamara
Natalie Boehm
Jade Roach
Michelle Veney
Alexandra Korsch
Mitch Hope
Johnathon Doidge

Celebrating our company values



A night of nights was held in early May where we celebrated our inaugural Snowy Hydro Values Awards Dinner in Cooma. **Manager Engagement and Leadership, Alice Purss**, has the details...

Just over a year ago Snowy Hydro refreshed our company values, defining the way we want to work together as part of this unique, successful and ever-changing business. Our values of Safety, Teamwork, Decency, Ownership, Courage and Agility have become more than just words - they are the very heart of who we are at Snowy Hydro, a reflection of our proud history and a strong foundation upon which we continue towards an exciting future.

To recognise those who live our values each and every day, we established our Snowy Hydro Values Awards; and with over 130 nominations, 23 finalists and three judging panels later, almost 250 employees from across the business came together in Cooma for the inaugural Values Awards - and what an 'electric' night it was!

Our MC, Logie award winner, corporate trainer and PR consultant, Rachel Friend, welcomed everyone to the event and CEO Paul Broad gave the opening address. Our keynote speaker, Paralympic Gold Medalist, Curtis McGrath OAM, told his amazing story of time in Afghanistan, losing his legs as a result of

stepping on an IED and then going on to win gold at Rio in 2016 in paracanoeing. His story links strongly to our Values and we were honoured to have Curtis join us at this inaugural event. However, the purpose of the night was to announce and celebrate the winners of our six values awards, congratulations to the winners listed below!

In addition to our six values awards, we also established the Sir William Hudson Award to recognise an outstanding employee who consistently role-models our Values in all interactions with colleagues, customers and stakeholders. Duncan Taylor, a member of our independent judging panel and also Sir William Hudson's grandson, took to the stage to introduce the award and share stories of his grandfather. Duncan and our CEO, Paul Broad, then announced that Jade Roach, Business Partner - People Relations in Cooma, had won the award for her outstanding leadership, being a trusted advisor across the business, and her unwavering and authentic commitment to living the Values - congratulations Jade!

SAFETY: Martin McNamara, Mechanical Tradesperson, Operations, Murray Region

AGILITY: Mitch Hope, Team Leader, Service Desk, Information Control Systems, Cooma

DECENCY: Michelle Veney, Corporate Lawyer, Legal & Procurement, Sydney

COURAGE: Natalie Boehm, Manager Health & Wellness, Safety, People & Services, Cooma

TEAMWORK: Alexandra Korsch, Manager Maintenance, Operations, Murray Region

OWNERSHIP: Johnathon Doidge, Specialist Technician, Operations, Lower Tumut Region



Calling all tradies: Join the Snowy Team



Operating and maintaining the Snowy Scheme is not a mean feat and requires a number of skills and trades to get all the work done. **Area Manager, Drew Twigg**, is calling for tradespeople to consider a move to Snowy...

Snowy Hydro is regularly looking for skilled technicians and engineers to help us maintain the Snowy Scheme and fulfill our operational needs. With a broad diversity of plant and equipment and with many of our assets located in a unique environment, we have many opportunities for those with suitable trades and technical backgrounds.

The variety of work is enticing, from a Production environment where our team conduct maintenance and installation work in the remote locations of the Kosciuszko National Park that the general public don't get to experience, right through to Project based work involving large scale overhauls and upgrades of our major assets. Whether it be in disciplines of electrical - mechanical or civil, trades or engineering, Snowy will provide you with the training, support and resources that provide immense job satisfaction, engagement and reward.

When it comes to lifestyle, we all know that we are privileged to live in this amazing part of Australia - if you, your family, or a friend want to make a 'snow-change' - consider joining the Snowy team! In addition to working with a great team of people, we also have competitive remuneration packages, housing subsidies and even remote location allowances.

We currently have trades vacancies in Talbingo, Khancoban and Cabramurra areas, and also within our transient workforce for the Project Delivery Teams. So if you are a 'sparkie' or 'fitter' with some industrial experience, a control or protection technician, a dual-tradie in mechanical and electrical, or even a Controls Engineer - jump onto our website now to apply!

go to www.snowyhydrocareers.com.au

Click on ALL JOBS

to look at all the current opportunities we have on offer and apply!

— **or** —

Click on REGISTER

Create a profile and we will email you when you match any positions we have on offer!



Safe driving in the Snowy Mountains



As the temperature decreases across the Snowy Mountains region, the dangers associated with driving increase; and so too should our awareness. **Snowy Hydro Fleet Manager, Doug Rendoth**, gives a timely update...

Snow and ice on the road significantly affect how our vehicles accelerate, decelerate, turn and consequently stop so it is important to be aware of how we can mitigate the risks that arise from these changes.

At Snowy Hydro, any employee that intends on traveling regionally must participate in Snow and Ice Driver Training, a program critical to reducing road incidence within the company. The training places emphasis on the ways that we can lessen driving hazards in the winter and enables staff to make informed decisions when commuting.

One of the biggest hazards when driving in conditions where snow and ice are present is inappropriate speed and the effect momentum has on our ability to safely stop. The stopping distance when driving on wet ice can be up to 10 times greater when compared to driving on dry roads which equally increases the threat of an incident. Hence, by managing our speed and modifying it to suit the conditions, the greater the chance is of us arriving safely at our destinations.

- D** Determine the conditions of your route prior to departing by looking at weather and traffic sites
- R** Reduce the need to travel in the harsh winter climate
- I** Inspect the car prior to leaving – check oil, fuel and antifreeze levels as well as tyre pressure
- V** Vary normal travel times to account for slower driving speeds
- E** Expect the unexpected – don't be complacent as conditions can and will change quickly
- S** Slow down – visibility, reaction times and car capabilities vastly differ in freezing temperatures
- A** Avoid sharp steering, low gears and quick acceleration as these increase potential for sliding
- F** Focus and continually observe the conditions present
- E** Educate a friend or family member and share this information!

Snowy Hydro kicks off Young Driver Training for 2017



Since 2002 Snowy Hydro has run Young Driver Training courses in the Snowy Mountains helping our young drivers better understand the roads of our region. **Team Leader, Luke Judd, explains...**

Over 180 students from Snowy Mountains Grammar, Jindabyne Central, Tumut High, Monaro High and Corryong High school's have already jumped behind the wheel with expert driver trainer, Craig Williams from Snowy Mountains Driving School. Craig has over 20 years experience in driver training working within the NSW Police Force, Roads & Traffic Authority and through the Snowy Mountains Driving School. Craig delivers both the theory and practical elements of the program using the skid car provided by Snowy Hydro.

The program, which is aimed at Year 12 students who are mainly on their red 'P' plates, focuses on the unique road conditions of the Snowy Mountains and includes both theory and practical sessions designed to improve the attitude and driving behaviours of young people in our local community.

The practical sessions are held with a specially designed 'skid car'. The skid car is a Subaru Forrester with a custom designed skid frame which allows students, under direction and control of an expert driver trainer to experience what causes a car to lose control in a simulated skid situation - demonstrating that you cannot correct a skid in real life circumstances and driving environments.

"It is so rewarding to see students change their opinion from 'I don't need a driving lesson' to 'I learnt so much' during Snowy Hydro's Young Driver Training Program.

Even though the practical sessions don't exceed 40km/hr students still get surprised at how dangerous even slow speeds can be when the vehicle is out of control," said Craig.

"It is great to see our local high schools continue to partner with Snowy Hydro and share our safety belief. Snowy Hydro is all about safety - not just for our people, but for everyone in our beautiful Snowy Mountains region. We are all too familiar with disturbing news headlines about young people killed or injured in car accidents. If our program saves a life or prevents one crash, then it is money well spent," said Snowy Hydro CEO, Paul Broad.

The success of the Young Driver Training Program is a direct result of Snowy Hydro's partnership with local schools and this high quality, professionally run program provides a tremendous outcome not only for participants and their families but also for our entire community.

Next year we are looking to reintroduce the program back to Tumbarumba and Batlow. We'll be investigating potential venues in the coming months and will be advising schools if we are successful.

Changes to Eucumbene River access from Denison



Over the last 12 months Snowy Hydro has been working with relevant stakeholder groups around changes to vehicle access at the Denison Camping Area. **Senior Environmental Officer, Chris Buscall, explains...**

Denison provides angler access to the Eucumbene River which is home to a superb annual trout spawning run. Anglers come from far and wide to take advantage of the fantastic fishing conditions.

In recent years the popularity of Denison has increased dramatically leading to environmental degradation, safety concerns, anti-social behaviour, impacts to the trout spawning and overall fishing experience. Over the past few years numerous complaints have been received from concerned fishers regarding the sustainability of the fishery given the environmental impacts and anti-social behavior.

In response to this community concern Snowy Hydro, NSW Department of Primary Industries/ NSW Fisheries and National Parks and Wildlife have determined that by managing vehicle access to the Denison day use and campground areas the condition of the fishery will be preserved and recreational river access can be maintained into the future.

Beyond the parking and camping area the Eucumbene River access is open to pedestrians. Disabled access may be arranged through obtaining

a Limited Ability Angler Access Key, this is the same key as the Master Locksmith Access Key (MLAK), a nationwide system that allows people with disabilities to gain access to public facilities. Eligible people will be able to obtain a key with two weeks notice from NSW DPI Fisheries after confirming eligibility.

For more information please contact the Angler Access Manager on 02 6042 4214 or via email angler.access@dpi.nsw.gov.au



Steve Samuels - Monaro Acclimatisation Society, Maarten van der Stap - GM Snowy Hydro Production, The Hon. Niall Blair - Minister for Primary Industries & The Hon John Barilaro - Deputy Premier, Member for Monaro and Minister for Regional New South Wales - at the announcement in March.

Our new Manager Community Relations



Please help us in welcoming our new **Manager, Community Relations, Neil Thew**, to the Snowy Hydro team..

By the time this newsletter is distributed around the region, it will be close to two months that I've been in the role of Manager, Community Relations with Snowy Hydro. It is a privilege to work with such an innovative and dynamic organisation. To be involved with and working alongside such professional people in an industry that is so important to the nation's economy is truly a pleasure.

I have big shoes to fill replacing Heath Woolley. He has left a legacy that I look forward to maintaining and building on in the future. Coming from the local area has been very helpful for me as I transition from my former role with Tourism Snowy Mountains into this new position. Many of the people that I liaised with previously at TSM are those that I'm catching up with now with my Snowy Hydro hat on.

Much of what Heath had previously committed to around the region as far as events, festivals, sponsorships, education, training and other community activities will not change with me taking over, so rest assured, Snowy Hydro's participation with all parts of the Snowy Mountains will remain as strong as ever.

Being involved in the community has forever been embedded in Snowy Hydro's DNA and is a facet of the organisation that I have always admired.

It is important to Snowy Hydro that the communities in which we live thrive and are places that people choose to visit and perhaps one day move to. So, being the organisation's representative, working alongside community groups, businesses, local governments and other regional stakeholders is something that I am very eager to maintain and develop further.

Part of my new role is to lead upgrade work on the Cooma Discovery Centre and Murray 1 Visitor Centre. Be prepared for the introduction of cutting edge technology and enhanced visitor experiences throughout the Centres in the near future as the upgrades are completed. The Talbingo town centre display shopfront is likely to be given a bit of a spruce up too.

I'm also particularly excited to be working with the amazing Snowy Hydro team during the 2.0 feasibility study process and helping to roll out key communications during this initial review process.

How to contact Neil:

✉ neil.thew@snowyhydro.com.au

name, red energy member

I spend my day on the
phone so you don't have to.
That's 110% Australian.

Red Energy is a 100% Australian company owned by the mighty Energy Networks giving 100% to our shareholders. It's not only we that the people of the Energy Regions deserve to feel our outstanding customer service. Our Customer Satisfaction team is the real right hand to the customer as you'll be dealing on one team with a friendly local team for fully tailored and great needs. With genuine attention and fair prices, we're ensuring our customers feel safe, not just a number.



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