



snowyhydro

# NEWS

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# Lighting up the night sky

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# CEO UPDATE

A message from Managing Director  
and CEO Paul Broad

Teamwork is a value we see every day in our business and it helps us achieve success in a highly competitive sector.

Effective teamwork isn't just about a group of people doing a job. It's having a collective goal and working collaboratively with energy, enthusiasm, innovation and often, flexibility, when things change unexpectedly.

So it makes me very proud seeing our Snowy Mountains region bouncing back from the lows of bushfires and COVID, and of course, the role Snowy Hydro is playing in this recovery. Together with the community, local businesses, local government, agencies and other key stakeholders, we are all making a contribution.

It's great to see local food and accommodation houses busy and businesses throughout the mountains benefiting from increased economic activity generated by both Snowy 2.0 and Snowy Hydro generally. We look to work with local suppliers as much as we can and value our relationships with our contractors, who are key to helping keep the Snowy Scheme assets in great shape and work with us on individual projects.

This certainly applies with Snowy 2.0 and our construction contractor Future Generation Joint Venture. The partnership relies on great cooperation, teamwork and shared principles, which we have recently celebrated during the commissioning of our first tunnel boring machine, the Lady Eileen Hudson.

Work continues at rapid pace on Snowy 2.0, the major pumped-hydro expansion of the Scheme. There are many new work fronts and more than 1,000 people working on this fantastic project that, when complete, will 'firm' intermittent renewables like wind and solar so we can generate power when it's needed.

I hope you've visited our website or followed Snowy Hydro on social media and seen some of the excellent Snowy 2.0 project videos that we publish each month.

Shortly there will be an opportunity to vote for names for our two remaining tunnel boring machines - they will be named after inspirational or ground-breaking Australian women in STEM, so keep a lookout for the online voting period later this month.

Meanwhile, we're gearing up for winter throughout the business and hoping for plenty of snow that will later become our 'fuel' supply, to generate clean hydroelectric power. Snowy's hydrographic, water, scientific services and other teams all come together so we can effectively manage water across the Scheme.

If you're driving through the mountains this winter season, please take care and drive to conditions.

**Paul Broad**  
Managing Director and CEO



## TBM NAMING COMPETITION

# CAST YOUR VOTE!

**T**he three tunnel boring machines (TBMs) that will be commissioned for Snowy 2.0 have a mammoth task ahead.

In total, the TBMs will excavate 27 kilometres of tunnels to link Tantangara and Talbingo dams, with a new underground power station also to be built.

The first TBM to start work was officially named the Lady Eileen Hudson at a commissioning ceremony at Lobs Hole. TBMs are traditionally given female names for good fortune on the project before they begin tunnelling.

A competition with schools in the Snowy Mountains region is helping decide names for the remaining two machines. Snowy Hydro has enlisted the help of local students to come up with a list of possible options, inspired by Australian women in STEM.

Students from years 5 to 12 (stages 3-6) have been researching the work of women working in science, technology, engineering and mathematics and have discovered many fascinating examples.

Representatives from Snowy Hydro and Snowy 2.0 principal

contractor, Future Generation Joint Venture, have chosen a shortlist from the nominations and members of the public are invited to vote for their favourite.

The two names that receive the most votes will be bestowed on each of the unnamed TBMs. The students who nominated the most popular names will win a VIP experience at the Snowy Hydro Discovery Centre in Cooma, and a special visit to see one of the TBMs at a Snowy 2.0 construction site.

Check Snowy Hydro's social media accounts for details on how to vote.

## WOMEN IN STEM

# Snowy snapshot

A new generation of engineers and scientists at Snowy Hydro are modern day role models for students considering a career in STEM. Like so many working in STEM disciplines, all three grew up with a curiosity about how things work, and a love for problem-solving.



Sara  
Roder

Sara Roder was an inquisitive child, who constantly asked her parents to explain things to her so she could figure out how they worked. After three years studying mechanical engineering at university, Sara joined a three-month vacation program at Snowy Hydro. She returned a year later after completing her degree to take up a role as a graduate mechanical engineer and has worked in various teams at Snowy as part of the graduate program over the past two years. Her current rotation is in Snowy's Investigations and Development Projects team, which looks at innovative ways to improve day-to-day work on the Scheme.



Winsome  
Whyte

Winsome Whyte studied civil engineering and architecture at university with her eye on a career as a specialist structural engineer, but her career path was not straightforward.

Winnie's early roles were in construction management and project management before a regional opportunity led her to a role as a strategic engineer with Snowy Hydro's dam safety assurance team. Winnie loves the science and maths behind why something works and enjoys applying that logic to solve real world problems.



Emilie  
Lapointe

As a geotechnical engineer on Snowy 2.0 since the start of the geotechnical investigations program, Emilie Lapointe knows a thing or two about rock types in the Snowy Mountains.

Her team uses the information gathered by drilling through rock, down-hole and lab testing to build the geological model for the design of Snowy 2.0's tunnels and underground power station. Emilie initially considered a career in political science, but the idea of hands-on problem-solving led her to pursue a role in STEM.

# Jindabyne Central and Monaro High

Physics and engineering students studying electromagnetism for their HSC at Jindabyne Central School and Monaro High School recently had the opportunity to experience power generation in real life. They consolidated their learning with a trip to the Snowy Scheme, organised by Snowy Hydro's education programs team.

Science teacher **Charles Dean** accompanied his students on the two-part excursion and wrote this report:

*I recently had the enjoyable task of arranging a Stage 6 (years 11 and 12) excursion for physics students from my school, Jindabyne Central. The first part of the excursion was a multimedia presentation at*

*the Discovery Centre in Cooma, presented by a Snowy Hydro engineer and their education programs manager.*

*The presentation described the underlying principles our students learn about in their study of physics at HSC level and how that applies to power generation at Snowy Hydro. In the immersive theatre, we also saw a bird's eye view of the Scheme's operation using an interactive projection of the region that students could move around.*

*My students were impressed by the expertise and knowledge shared by the team at the Discovery Centre. They commented on how well the chosen visuals portrayed physics principles at work, and the scale and complexity of the operation as a whole.*

*A few weeks later we visited the Guthega Power Station, where we were warmly welcomed by a Snowy Hydro engineer, who showed us the inner workings of the plant and took the time to answer our many questions. A particular highlight for the group was a demonstration of the start-up procedure and full operation of one of the generators.*

*The sights, sounds and feel of the moving water under our feet, of the turbine and the generator above our heads filled our senses. It was a highly impressive demonstration of how physics theory has been applied on a large scale.*

*I was impressed with how well-prepared and accommodating the team was towards engaging with our Stage 6 students, who all thoroughly enjoyed the experience.*



Students at Guthega Power Station. Teacher Charles Dean third from right.

## REGIONAL WORKS

# PROVIDENCE PORTAL

**A**n important part of regular operations at Snowy Hydro is ensuring the Snowy Scheme's assets and surrounding environment are safe and well-maintained. Changing seasonal conditions and extreme weather events are part of life in the mountains, but can cause damage to equipment and natural structures.

At Providence Portal, an earthworks project was recently completed to stabilise eroded embankments and reduce further erosion downstream where water from the Tantangara to Eucumbene tunnel outlet flows into Eucumbene Dam.

The 500m section of channel is designed to sit below the Lake Eucumbene full supply level, but had recently been exposed due to current lake levels. Water flow

caused erosion which destabilised the embankment, leaving a steep slope and increased sediment levels in the channel.

To stabilise the bank, steep batters were excavated or 'laid back' to reduce the slope and earth was then spread and compacted onsite. Rock armour was brought in to help the channel better withstand future erosion. The site was temporarily fenced off and closed to the public while our contractor, Leed Engineering, carried out the six-week remediation work.

The long-term benefit of the project is a much safer and improved foreshore experience for people visiting this area of Lake Eucumbene, a popular spot for fishing and camping. With work complete, Providence Portal was reopened to the public in May.





Snow depth sensor and weighing scale; snow corer.

# Advances in snow measurement

**S**nowfall and the subsequent spring melt contribute around two-thirds of the water stored in Snowy Hydro's dams. As this is the 'fuel' supply to generate clean hydroelectric power, it's essential to understand how much snow has accumulated across the mountains to effectively manage water within the Snowy Scheme.

Through the winter season, Snowy's Hydrographic team measures various characteristics of the accumulated snowpack, including snow depth and weight. This information allows Snowy Hydro to calculate the amount of water, or water density, of the snowpack. Skiers would be familiar with powdery snow, which typically contains around 10-20% water density. Slushy snow, more common at the end of the season,

has a higher water content - water density in a ripened snowpack can be up to 50% or more!

The latest monitoring technologies, deployed at a number of remote winter locations, use a snow depth sensor and weighing scale system to capture the depth and weight of a one-metre square patch of snow, with data regularly transmitted directly to the Water team for analysis. One of these high-tech systems is operational at the Deep Creek snow monitoring site, between Cabramurra and Khancoban.

Field measurements are also conducted at key snow monitoring sites using a hollow metal tube called a snow corer that is pushed into the snow down to ground level, capturing a sample of snow that is then measured by weight. This is

carried out along a line of reference points to measure the snow characteristics at each point and the results are 'meaned' for an overall representative measurement.

Both methods provide data for a particular section of the catchment, but conditions of the snowpack can vary significantly depending on elevation and aspect, and changes throughout the season.

Historical records provide lots of useful information, but are only representative of that location. Move 100 metres up or down the mountain and the reading will be different again. Coupled with satellite imagery analysis of snow cover through the year, snow depth measurements contribute to Snowy Hydro's understanding of potential available meltwater in the alpine catchments.

# REGIONAL BUSINESS BOOST

Last year delivered a double whammy to Snowy Mountains motels and resorts, with bushfires hampering summer travel and severely damaging Selwyn Ski Resort, and COVID restrictions impacting winter activities. This year has seen the return of weekend and school holiday tourism and Cooma Motor Inn, like many local motels, is busier than ever. The Sharp Street motel, with 43 rooms and the newly opened Gate restaurant, is frequently occupied with workers for Snowy 2.0. With the 'no vacancy' sign often needed midweek, even the traditionally quiet days of the low season have become a rare event.

Business is also buzzing for PHE industrial electrical contractors in Tumut. The long-established local outfit has provided electrical services to Snowy Hydro for the past 17 years and has now added Snowy 2.0 to their list of projects. The team has been busy installing electrical mains cables and external lighting at the segment factory at Polo Flat. PHE has taken on extra staff to meet the increased workload and is using local companies for supplies.

Further afield, Midland Industries at Parkes is gearing up for its fleet of custom-made trailers to hit the road between Polo Flat and the Snowy 2.0 construction sites. With the first tunnel boring machine now commissioned, large loads

of concrete segments will be making their way to site where they will be assembled into rings to line the tunnels.

Midland has hired more than a dozen extra workers, including welders and mechanics, to assemble and fit out 14 custom-made vehicles. Each of the vehicles has a prime mover and three short trailers specially designed to distribute the weight of the segments and safely manoeuvre the steep, winding conditions on mountain roads. With 130,500 concrete segments required to line the 27 kilometres of tunnels, the trucks will carry nine tunnel segments each (rather than three on a traditional semi-trailer) and help reduce traffic on the roads.



## PROJECT UPDATE

# SNOWY 2.0

Main image: TBM at main access tunnel portal; Joule Ridge works; the Lady Eileen Hudson TBM; works at Tantangara

### **Snowy 2.0 is now in full swing, with steady progress at a number of sites across the project.**

At Lobs Hole, the Lady Eileen Hudson tunnel boring machine (TBM) is completing the final stages of commissioning. This TBM will excavate two separate tunnels – the main access tunnel to the location where the underground power station will be built, followed by the tailrace tunnel.

After the recent official naming

ceremony, the TBM has moved through various stages of final preparation and construction of the support infrastructure needed for tunnelling, including the process water treatment plant and concrete grouting plant.

The first stage of commissioning the TBM involves installing six temporary segment rings, which are the same dimension and shape as the permanent segments that will line the tunnels as they're excavated. This stage takes around a week, with one ring installed each day against a thrust frame to gradually push the 11m cutterhead

closer to the rock face.

The final stage of commissioning will see a further seven blind rings installed to push the TBM's cutterhead and shields underground. At this point, permanent segment rings will be installed, and in parallel, progressive installation of the remaining gantries as more room is made available in the TBM cradle. With the 137-metre TBM completely underground, the tunnel conveyor will be installed, allowing the excavated material to be removed.



Next up is the assembly of the second TBM in preparation for excavation of the cable tunnel. Over recent weeks, more than 57 oversized loads containing components of the second TBM have moved up the mountains for delivery at Lobs Hole. A police escort was required for 27 of the loads – thank you to NSW Police, Transport for NSW and Lampson transporters for facilitating the move, and to local residents for their patience throughout deliveries. The TBM main bearing drive, weighing 165 tonnes, was the single heaviest component and needed four prime movers (two at the front and two at the back) to make the trip.

At Tantangara, the headrace adit portal is largely complete and a temporary cofferdam has been built to mitigate any risk of flooding during construction. The third TBM has started its journey, with hundreds of deliveries to the Tantangara site throughout late May and into June.



## JOULE RIDGE

- ▶ The bulk earthworks to prepare the Joule Ridge 126-bed accommodation facility in Cooma are almost complete. The next stage of the project is underway, with the installation of services such as stormwater, sewer, firewater, potable water and power.
- ▶ Improvement works by Transport for NSW have been completed at the intersection of Solomon Lane, Monaro Highway and Yareen Road to improve access to the site. The accommodation modules will begin arriving in late June.
- ▶ This development will house workers on the Snowy 2.0 project working at the Polo Flat segment factory and the Future Generation Joint Venture office. Accommodation will include 90 single rooms and 36 self-contained units.

## PROJECT UPDATE

# CONCRETE SEGMENT FACTORY

Stored segments at Polo Flat

## SNOWY 2.0 JOBS

**P**roduction is well underway at Polo Flat, with hundreds of huge concrete segments lined up in the storage yard ready to be transported. Viewed from above, the precast segment factory is a telling example of the scale and complexity of the Snowy 2.0 project.

The Cooma facility is a hive of activity, with up to 100 workers onsite producing segments, and carrying out final electrical and mechanical works for commissioning of carousels and the concrete batch plant. Every day more than 20 segments emerge from the manual production line, with output to increase significantly as automated components of the facility come online.

Currently, each segment is cast manually, with the mix poured into large steel moulds directly from the concrete agitator

until the automatic carousels are ready for operation. After the mix cures, the segments are removed from the mould and transferred to an outside storage yard, before being loaded onto trucks for the trip to Lobs Hole.

Once onsite, the segments will be loaded into the tunnel boring machine and used to line the tunnels, creating enormous 10 metre diameter rings. Nine concrete segments are required to create each ring, with 14,500 rings needed for the 27 kilometres of power waterway tunnels.

When fully automated, the Polo Flat facility will produce 4,500 segments – that's 500 complete rings – every month. With increased truck activity transporting the segments, a temporary traffic signal has been placed in Cooma to ensure traffic flows freely during peak periods.

More activity means more positions are opening up across all Snowy 2.0 work fronts. Over 1,000 workers are now involved in construction of the massive pumped-hydro project, bringing welcome opportunities to the region.

Future Generation Joint Venture is looking to fill more than 150 open roles at multiple sites including Lobs Hole, Tantangara and Marica for trades people, water treatment plant operators, stores people and labourers. Recruitment is ongoing across all sites for engineers and quality inspectors, as well as construction supervisors, tunnelling supervisors, conveyor supervisors and more. Interested applicants should head to <http://futuregenerationjv.com.au/job-opportunities-1> for further information.



Jindabyne students at Young Driver training

## SUPPORTING OUR COMMUNITY

# Young driver training

Establishing positive driving behaviour is essential for everyone's safety on our roads, particularly in the Snowy Mountains, where drivers face unique conditions including snow and ice, high speeds and wildlife on the road.

The Snowy Hydro Young Driver Program is a hands-on course to prepare learner and provisional drivers to better handle local conditions. The program also addresses common myths and any bad habits young drivers may have picked up from their parents.

According to instructors at Driving Solutions, who deliver the training, drivers of all ages tend to think, 'it won't happen to me'. The training emphasises that driving is the most dangerous activity most of us will do in our day, and to be mindful of the risks.

The course also helps build confidence in young drivers in their ability to handle an emergency situation, and to learn how long it takes to stop a vehicle.

A common misconception is that braking hard can cause a vehicle to crash or lose control, but instructors explain this is not the case when driving current-model cars equipped with ABS.

The students go through different braking exercises in a controlled and safe environment to better understand their options.

They also learn how to scan for trouble approaching intersections or safety zones, and how to make smart decisions to limit distractions and stay focused on the task of driving.

Around 250 students will go through the training program in 2021 as part of Snowy Hydro's commitment to the safety and wellbeing of young people living in the Snowy region.

# RED ENERGY AMBASSADORS

## Matt Graham

**World champion freestyle skier Matt Graham fell in love with his sport during family ski holidays as a child. The self-described adrenaline junkie started mogul skiing at the age of seven.**

**2020 was a challenging year – how did you adapt your training?**

Once Australia went into lockdown last April, I purchased some home gym equipment to continue my strength and conditioning training. During the first half of the year, we were unable to do any skill-based training so I watched a lot of old mogul videos and training footage to keep my mind active and in 'ski-mode'.

**Tell us about winning the World Cup title.**

Winning the World Cup title has always been a goal of mine. It is considered one of the major achievements in our sport, so to win it felt amazing! It was such a long and tough season for the team travelling around the world during a pandemic so to finish on top made it all worth it.

**What's your focus for 2021?**

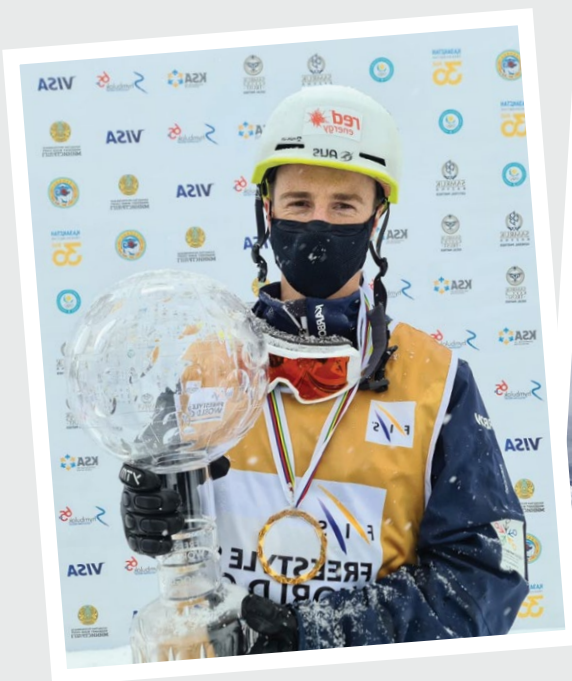
2021 is the Olympic lead-up year, which is always a big year for athletes. My focus is to maximise every training opportunity we can get. I am also studying part-time this year, which is keeping me busy in my off-time.

**You recently spent some time in the Snowy Mountains. What did you get up to?**

I haven't been down there in the off-season for many years, so it was great to go on some hikes and see the mountains. I also spent some time mountain biking around Jindy and enjoying some quality food and drinks around town. The Main Range walk up Mt Kosciuszko was probably the highlight!

**Will we see you on the ski slopes in Australia this winter?**

Yes, and I cannot wait! I will likely be down in the Snowy Mountains from mid-July until mid-September.



Matt Graham in action.



Lauren Parker is a medal-winning paratriathlete

## Lauren Parker

**Eleven months after a devastating accident ended her triathlon career, Lauren Parker won a Commonwealth Games bronze medal in paratriathlon. The world champion now has her sights set on the Tokyo Paralympics.**

### What does a typical training day look like for you?

I train three times a day, with 2-3 hour sessions and every day is different. My swim sessions are between 3-5km. Bike sessions are between 30km-100km and

a run session in my racing chair is about 10-30km. My week also includes three gym sessions, physio and massage.

### How was your sport impacted by the pandemic?

At the start of 2020 I was ready and focused on the 2020 Paralympics. I had prepared my body and was really on-track. When the pandemic hit and the games were postponed, I felt deflated because of all the hard work I had put in. But I also chose to look at the positives, and that I would be fitter, stronger and faster with another year of training for the 2021 Paralympics.

### How are you feeling about the Tokyo Paralympics?

This question is difficult because I've just had the worst and hardest three weeks I could have imagined. I've just spent 16 days in hospital due to a complication. I was the fittest and strongest I'd ever been before going to hospital in early April, so it was definitely a major setback in my preparation and threw my plan out. However, I have overcome far worse, so I'm choosing to be positive and just get the job done. I only have one mission for Tokyo and that is to come home with the gold medal!

Red Energy, owned by Snowy Hydro, has a deep connection with Australian skiing and snowboarding and helps to provide power to most of Australia's snow resort operations. In NSW, Thredbo powers all its major resort operations with an agreement with Red Energy for the supply of 100% renewable electricity to the resort.



Matt Graham, Australian Mogul Skiing Olympian and Red Energy Ambassador

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