snowy hydro

NEWS

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T3 TURNS 50

- Cabramurra - high altitude digs
- Regional university study soars
- Snowy 2.0 tunnelling milestone

INSIDE

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This page: Jounama Dam spillway
Cover image: Tour groups inside Tumut 3 Power Station to celebrate its 50th birthday

CEO UPDATE

A message from acting CEO Roger Whitby

It's my privilege to be leading, even on an interim basis, Snowy Hydro following the recent retirement of our longtime managing director and CEO Paul Broad and I wish Paul all the best in his future endeavours. Paul left some big shoes to fill, but rest assured that the Snowy team is working hard to continue to 'keep the lights on' while our search for a permanent CEO continues.

As acting CEO I'm delighted to share our recent activities and achievements across the business with you. A particular highlight for me was attending Tumut 3 Power Station's 50th birthday celebration in early November. Our hydro assets have always been the heart and soul of Snowy, and it was pleasing to see the local community share in this milestone event and partake in the many activities on offer including tours, a welcoming indigenous smoking ceremony and our Next Generation educational program for kids.

In some ways it's hard to believe T3 has reached this milestone, but not surprising. The power stations and our other assets - like the dams, tunnels and aqueducts - that make up the mighty Snowy are designed to have very long operational lives, with T3 projected to last at least another 50 years to the incredible age of 100.

These assets are, of course, only as good as the people who maintain and operate them. Lucky for Snowy, we have a great team of highly skilled people dedicated to ensuring the assets are kept in top working condition.

I think we would all agree that the Scheme is a remarkable engineering feat, with a history that Australians can be very proud of - with its immense scale, robustness and fast-start, on-demand capability. The mighty Snowy will continue to play a leading role in securing the energy system and underpinning Australia's renewable transition.

Earlier this year Snowy Hydro operated its generating assets at record levels - effectively as a baseloader - to cover bulk energy shortfalls from other energy providers. These events significantly depleted our hydro storages or 'fuel' capacity. Despite this, there is a heck of a lot of water in the system!

Thanks to La Nina and other climate drivers, the eastern states have seen above average rainfall for some time, causing full or close to full storages and, at times, spilling. Between August and October, Lake Eucumbene's storage increased by 1,100 gigalitres - that's about twice the capacity of Sydney Harbour.

These high water levels are persisting at both Jindabyne and Blowering dams. Our teams continue to work hard, in cooperation with WaterNSW and other government agencies, to carefully manage our water position as we approach the hotter summer conditions.

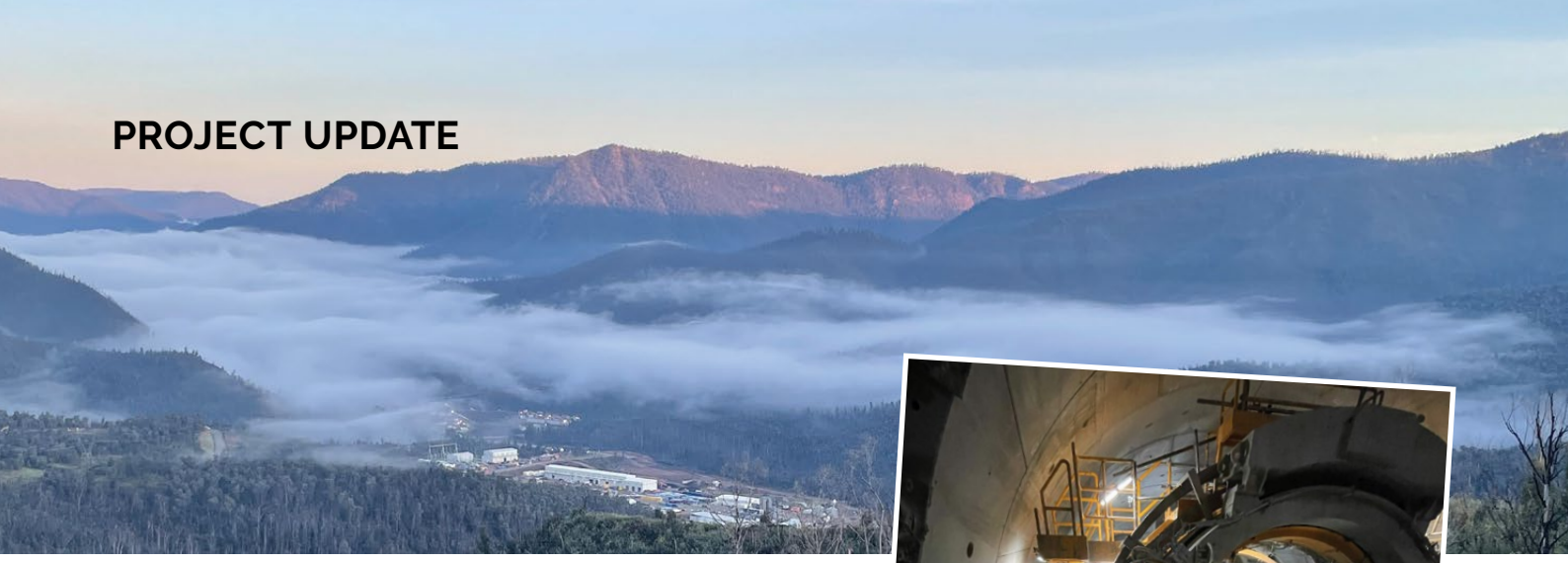
In other news, Snowy 2.0 recently reached another major milestone with the completion of the main access tunnel excavation works. While there is still a great deal of tunnelling to complete, this heralds a new phase as the focus turns to the heart of the project, the underground cavern. Snowy 2.0 remains a huge economic booster for the Snowy Mountains and wider region, with a workforce of 2,300 and four major worksites currently in operation.

The rebuild of Cabramurra, our operational township in the mountains, is well underway. In October we poured the first slab providing the foundation to construct an accommodation complex of 100 apartments to house our workers and contractors in that region. Progress updates on the build will be provided in coming editions and made available on our social media channels, which I encourage you to visit.

Lastly, on behalf of the entire Snowy team, I wish you a happy Christmas and holiday season. Please stay safe and take extra care when travelling on the roads.

See you in the new year.

Roger Whitby
Acting CEO



Lobs Hole

Snowy 2.0

Tunnelling milestone

In a major project milestone, excavation of the first tunnel for Snowy 2.0 is now complete, with TBM Lady Eileen Hudson reaching the location of the new underground power station cavern.

The 11-metre diameter tunnel boring machine has excavated 2.85km to create the main access tunnel (MAT) at Lobs Hole, and is the first new major tunnel excavation at Snowy Hydro in decades.

Snowy Hydro acting CEO Roger Whitby said the tunnelling achievement was a significant milestone, with Snowy 2.0 set to underpin the nation's transition to renewables.

"Snowy 2.0 will not only provide on-demand, quick-start generating capacity for the National Electricity Market, but a massive 350,000 gigawatt hours of energy storage."

The tunnel provides access to the location where two enormous caverns 800m underground will house the pumped hydro power station complex, including a 251m-long, 52m-high machine hall cavern and 223m-long, 46m-high transformer hall cavern. The power station complex also has several other smaller caverns required to facilitate construction.

With the completion of the MAT, the focus now moves to conventional drill and blast (D&B) tunnelling activities, creating an additional 350 underground jobs and an increase in plant and equipment. These D&B tunnels will provide access to various levels of the caverns, penstocks, tailrace collector and surge shaft areas.

Inside the main access tunnel

Tantangara headrace tunnel

TBM Florence is continuing to excavate the headrace tunnel at Tantangara following successful reinforcement works. Ground conditions encountered by the TBMs have been highly variable, ranging from soft sandy ground to extremely hard rock.

The Snowy 2.0 teams have been working together to safely navigate the softer ground conditions experienced at Tantangara including some high groundwater inflows. Thanks to probing ahead of the TBM, the soft ground was identified in advance, and in consultation with tunnel design experts, a plan for stabilisation works was established.

Grouting around the perimeter of the headrace tunnel and steel ribs will reinforce the concrete segment lining in the soft zones, ensure stability and manage groundwater inflows.

Variable and soft ground conditions are expected to occur throughout the excavation of the long headrace tunnel. TBM Florence was specifically designed to encounter variable ground conditions and ground improvement works are a typical tunnelling process.

Living quarters

Accommodation facilities for Snowy 2.0 workers are like small villages in the mountains. More than 1,700 beds are now available at the purpose-built camps across worksites at Lobs Hole, Tantangara and Marica, and there is also accommodation at Joule Ridge in Cooma, with almost 100% occupancy. On the busiest days, up to 250 workers will check out of their rooms after completing a two-week roster and 250 workers will return from their break to check in. In between, housekeeping teams will service all rooms to clean and prepare them for the next cohort of workers.

Sheets and towels are laundered onsite at the camps. For those working underground, their PPE will be laundered at the end of shift, with clean kit provided the following day. The camps also have onsite gyms, small general stores, dining halls, wet messes and at Lobs Hole, a running and walking track. After hours, workers can opt to join yoga classes, walking groups, quiz nights and movie nights.

Buses transporting workers each day will do around 60 runs to collect workers from camp, deliver them to the various work sites and return them to camp at the end of their shift. The Future Generation Joint Venture general services team charged with ensuring workers are fed, rested and transported has grown from a handful in the early days of construction to more than 200 people operating the camp facilities today.

Spiral case in the oven

Top image: Main camp at Lobs Hole
Bottom image: In the gym

Colossal cookers

While the tunnels are being excavated, components for Snowy 2.0's underground power station including turbines and transformers are being manufactured. The six hydro power turbines will each contain a giant spiral case to help direct and regulate the flow of water from waterways through the turbine.

After welding in the Voith Hydro factory in Shanghai, each spiral case is baked in an oversized oven to alleviate residual stresses, increase its strength and reduce the risk of cracking. The heat treatment involves raising the temperature of the material to around 600˚C and then cooling it again, a process that takes four days.

To give some perspective, the spiral case is 14 metres wide, which is bigger than the giant 11-metre cutterheads used by the TBMs to excavate the tunnels. Two sections of the case are removed to enable transportation through the main access tunnel to the underground power station cavern. The pieces will then be welded together in-situ when the time comes to build the power station.

WATER MANAGEMENT

Keeping the lights on

Jounama spillway

With La Niña returning for a third season, it's no surprise that Australia is receiving high volumes of rain and catchment areas are experiencing inflows not seen for many years. The good news is that Snowy Hydro's storage levels are at their highest in two decades.

On the other hand, managing excessive water brought about by persistent rainfall is critical, particularly for communities living around storage areas, river systems and other waterways. The Snowy Scheme has had to operate around the clock at optimum levels to capture large inflows and help minimise flood risks and impacts, while still performing its critical role of supporting energy supply to the grid.

In a more regular rainfall year, the gates of Jindabyne Dam would be opened for a spring flushing flow – the major environmental release of water under the direction of the NSW Department of Planning and Environment (Water) as part of Snowy's obligations under the Snowy Water Licence. This year saw a number of regular pre-releases and some acute periods of flood operation to manage high inflows.

The Snowy Scheme also saw spills occur from a number of smaller operational dams, including Guthega, Island Bend and Tooma, which has only spilled on two other occasions in the last three decades. The Scheme has been doing a tremendous job of capturing, diverting and storing the water for future use, taking some pressure off downstream rivers and storages. Through late winter and early spring, storage levels rose over 20%.

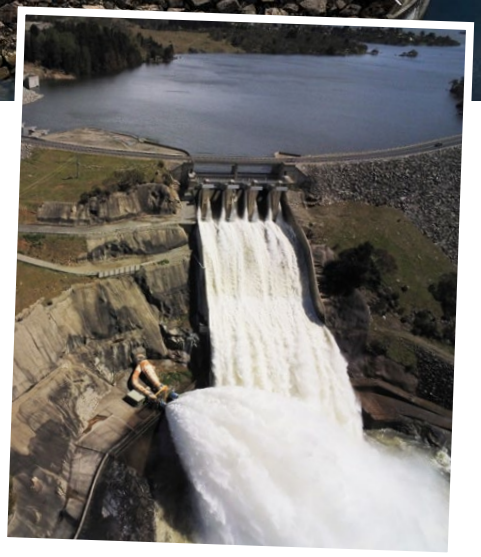
These events have been managed in close consultation with the Bureau of Meteorology, NSW & Victorian SES, WaterNSW and NSW DPE.

Despite the extreme and persistent rainfall this year, 2022 may not end up the wettest year overall. While some individual monthly records have been broken, including the wettest August, records show that only one or two years in 10 are wetter than the conditions currently being experienced.

Information relating to Snowy's management of water is published on the website and on social media channels, but it's essential those planning to use local waterways for recreation stay well-informed by heeding the latest advice on extreme weather events from the Bureau of Meteorology and state emergency services.

Snowy Hydro continues to work closely with WaterNSW and utilise Scheme storage where possible to mitigate flows while flood risks are highest.

For emergency help in storms and floods contact the SES on 132 500.



Jindabyne Dam spill

Weather events

This third consecutive La Niña system is expected to be relatively short-lived. Current climate forecasts suggest it will weaken over summer, with neutral conditions (neither La Niña or El Niño) likely by early 2023.

A climate pattern in the Indian Ocean (the negative phase of the Indian Ocean Dipole) has also contributed to above average rainfall this winter and spring.

Snowy Hydro's largest inflow volumes are typically seen when La Niña combines with a negative Indian Ocean Dipole event. Under these climate patterns, there is an abundance of tropical moisture available for rainfall events.

REGIONAL WORKS

High altitude digs

It's been a while since the rumble of construction activity was heard in the streets of Cabramurra. The Dunns Road bushfire in January 2020 devastated the historic Snowy town, destroying dozens of houses along with the former school building, Edinburgh Cottage and other community venues. Snowy staff and contractors who had been accessing Cabramurra as a drive-in drive-out base were relocated and the site was forced to close temporarily while it was made safe.

Over the past two years, demolition and remediation work has prepared the town for its next chapter. Early works, including the construction of an onsite concrete batching plant and a temporary 43-bed accommodation camp for workers, are now finished.

The existing main buildings housing the bistro and general store escaped major damage in the fire and provided a solid starting point to rebuild the town. By mid-2022 the foundations for Cabramurra's new, fit-for-purpose accommodation building were in place and the first ground-floor slab was poured in October.

With 100 apartments over two levels and undercroft parking, the building is designed with energy efficiency and alpine safety in mind. It will incorporate the latest bushfire resistant designs and construction materials.

The first stage will also include a new staff medical centre and a covered walkway to the existing bistro. With the initial rebuild scheduled to be complete towards the end of 2023, planning is well underway for stage two. This will include the construction of one-bedroom apartments for drive-in drive-out workers.

Cabramurra rebuild gets underway

GOLDEN JUBILEE

Tumut 3 turns 50

Snowy Hydro welcomed the community to an open day at Tumut 3 Power Station in November to celebrate the 50th birthday of the largest power station in the Snowy Scheme.

Visitors from around the region and beyond pre-registered to attend celebrations at Talbingo and to catch a rare glimpse of operations at T3, the first and biggest pumped-hydro facility in Australia. The facility is capable of both generating and pumping by recycling water between Jounama Pondage and Talbingo Reservoir.

Guests were treated to tours of the power station and bus trips to Talbingo Reservoir and the top of the iconic T3 penstocks, as well as a whole lot of fun for younger visitors in the Snowy Hydro Next Generation activity marquees.

Kids joined Snowy workers, engineers and educators in activities ranging from creating their own TBMs to bore tunnels through the playdough mountains, to making snowflake cut-outs with glitter and paint decorating and all manner of engineering 'inventions'.

Based on the enthusiastic engagement and noise levels inside the tents, it was a fun day out for all who attended.

Functional beauty

When Tumut 3 Power Station was officially opened on 21 October 1972, *The Canberra Times* reported around 1,500 guests gathered at Talbingo to watch Governor-General Sir Paul Hasluck operate a switch which sent water from the Talbingo Reservoir flowing down the penstocks to the station to start No 1 generator.

Speaking at the event, the Minister for National Development, Sir Reginald Swartz, said few engineering concepts could compare with the Scheme due to its size and complexity, the difficulties of terrain and climate and the challenges faced by designers and workers. "The Snowy Scheme not only has captured the imagination of the engineering world, it is in itself a thing of functional beauty on the rooftop of our country."


EVENTS TEAM
1972-2022


3
2

QUEEN ELIZABETH II (1926 - 2022)

The Royals visit Snowy

In 1963, the late Queen Elizabeth II and her husband, Prince Phillip, Duke of Edinburgh, dedicated three days of their five-week visit to Australia to tour the Snowy Mountains Hydro-electric Scheme.

The Scheme was part-way through construction when the Queen and Prince Phillip visited a number of Snowy towns, took a boat trip on Lake Eucumbene and stayed overnight at Edinburgh Cottage in Cabramurra. The royal couple also attended mass at Island Bend's All Souls' Church before flying from Cooma to Canberra to continue their Australian tour.

Above: Wearing a protective coat, gumboots and a hard hat, the Queen travelled underground by rail car to meet the workers at the Geehi-Snowy tunnel face.

Below: The Queen and Prince Phillip at Lake Eucumbene

Royal Tour 1963

Queen's official party entering Geehi Tunnel

Remembering lives lost

Some time after a light plane crashed while attempting to land at Polo Flat 46 years ago, Snowy employee Alec Harvey erected a white concrete cross in memory of the four lives lost. Mr Harvey's two daughters Evelyn and Patricia, aged 23 and 19, died in the crash on 20 May 1976, along with their 24-year-old friend Rosemary Hellmers and the pilot, 57-year-old Jack Howard.

Mr Harvey had arranged a joy flight for his daughters and their friend on the Snowy plane, a common practice when there were spare seats. After dropping passengers at Khancoban and Talbingo, the plane was on the return trip home when it clipped a radio mast in heavy fog at the air strip before crashing to the ground.

Cooma Lions Club President John Neilson knew the pilot and remembers the crash which devastated the local community, but was unaware Mr Harvey's cross had remained at the site all these years. It was not until workers began clearing long grass in 2020 in preparation for construction of the Snowy 2.0 segment factory, that the discovery was made. "It was about four inches thick, in concrete, and was lying on the ground," said Mr Neilson.

Measuring around 1.5 metres in length, the cross was carefully lifted from the crash site and after discussions with family members, relocated to the Aviation Pioneers Memorial in Cooma. Lions Club volunteers created a new memorial by setting the original cross in a concrete plinth with lights and two plaques inscribed with the names of those who died and facts about the accident.

Susan Howard was 20 when she lost her father, pilot Jack Howard, in the crash. "I had left home but was back visiting that week and was supposed to go flying with my father that day. I woke up to a cold cup of tea – he just decided not to wake me again, I guess."

An official dedication ceremony was held in May this year on the 46th anniversary of the accident, with family members and representatives from Snowy and the community in attendance. Four white roses were planted around the cross in memory of Evelyn, Patricia, Rosemary and Jack.

"It's really nice for the community, and for Snowy and the Lions Club to get behind it. The memorial day itself was very moving, even after all this time," Ms Howard said. "My sister and my mother and I scattered my father's ashes so it's nice to have something literally concrete that commemorates his life."

A small cross on an original timber batten has also been installed. Members of the public are welcome to visit the memorial, located in Sharp Street, Cooma.

Regional study soars

CUC centre manger Nadine Holland with student Jay Marshall

Primary teacher Laura Murdoch

Like generations of locals who grew up in the Snowy Mountains, primary school teacher Laura Murdoch left home and the region as a teenager to attend boarding school and later, university. It's a story repeated in towns across the country, where young people leave to study and often take their newly-learned skills elsewhere. The reason Laura is now back and embarking on her new career is largely due to the Country Universities Centres (CUC) network.

"When I moved back to Cooma with my daughter, I wanted to upskill. I'd done my undergraduate degree at University of Canberra on-campus, but the CUC had recently opened up and I'd heard good things about it. When I decided to start my postgraduate degree in primary school teaching it was an easy decision because I knew I had the opportunity to come here and get things done."

The CUC initiative enables regional and rural university students to study close to home in a campus-like environment with learning facilities, support staff and access to technology. Over the past five years, university student numbers in NSW towns with CUCs grew by 24.7% compared with an average 5.4% for all non-metropolitan areas.

Laura is part of a growing trend of reverse 'brain drain', where regional students are accessing CUC services to complete their tertiary education locally.

According to the Regional Australia Institute's 2022 report into key service workers in regional NSW, CUCs are making a significant contribution to a pipeline of workers where there is high and growing demand. Of the 1,000 regional students currently enrolled in NSW tertiary study and being supported by CUCs, 65% are studying courses related to health, education and community services.

Now working as a casual teacher at both Cooma North and Cooma Public schools, Laura says she had been looking for years to find her professional passion.

"I can safely say the CUC is the reason why I even considered going back to study and why I am now a primary school teacher and really happy."

Did you know?

Approximately 10% of Snowy Hydro's workforce is made up of development programs at any one time. This includes apprentices, graduates and trainees.

After completing their tertiary studies, many trainees and vacation students return to work at Snowy Hydro. The Snowy vacation program is a key pipeline to the graduate program, with many current graduates starting as vacation students.

Snowy and CUC

In 2013, Snowy Hydro, Cooma Monaro Shire Council and key community members jointly funded the set-up of the Cooma Universities Centre. Snowy Hydro later gifted the Centre to the Cooma community and in 2017, it became CUC Snowy Monaro – the first affiliate of the Country Universities Centre.

There are now 17 centres in the CUC network across eastern Australia, supporting 4,100 students since opening, including more than 1,500 students in Snowy Monaro.

Snowy Hydro Acting CEO Roger Whitby said the long-running Cooma CUC partnership continues to be highly successful. "CUCs are helping to stop the brain drain - they allow regional students to stay in their communities, have access to tertiary education in a supportive environment and ultimately provide local employers, including Snowy Hydro, with qualified workers."

Doing business a better way

Red Energy's electric car

Red Energy's ongoing commitment to positive climate action has seen the business make a number of important changes to reduce its carbon footprint and achieve carbon neutral certification for its business operations.

At the company's headquarters, in the iconic Bryant and May building in Melbourne, Red Energy teams have adopted a paper-lite policy and whenever possible, they give the printer a rest and avoid using hard copy documents. They also opt for video conferencing to reduce the frequency of travel for meetings. The offices are powered by 100% GreenPower electricity and appliances and lighting have been upgraded for energy efficiency.

Red's fleet of vehicles now includes electric and hydrogen-powered cars and staff have access to electric bikes for shorter trips. For carbon emissions that can't yet be avoided, Red has purchased Australian Carbon Credit Units (ACCUs). In calculating its carbon emissions, Red included all staff travel to and from work, as well as staff working from home.

In making these choices and changes to the way it operates, Red Energy is now a Climate Active carbon neutral-certified organisation - a certification awarded to businesses in recognition of their operations achieving carbon neutrality. Climate Active is a partnership between the Australian Government and Australian businesses and organisations to drive voluntary climate action. The certification also makes it easier for customers to identify and choose brands that are making a difference towards a more sustainable future.

In addition to achieving Climate Active carbon neutral certification for its operations, Red Energy CEO Iain Graham said the company also wants to help its customers play their own role in decarbonising the electricity grid.

"Since the day we launched Red Energy nearly two decades ago we've made renewable energy a priority for our customers. We are owned by Snowy Hydro, one of Australia's largest renewable generators, and we have proudly offered our customers the option of a renewable matching promise.

"What that means is that for every unit of electricity they buy from Red Energy, Snowy Hydro will match it by generating one unit of electricity from a renewable source.

"We also offer our customers GreenPower at competitive prices and we are about to launch a natural gas carbon offset product once again certified by Climate Active and relying on Australian Carbon Credit Units."

Red Energy's e-bike

T3 party time!

It may have been Tumut 3 Power Station's birthday, but the party was for everyone. Snowy's Next Generation Education Hub hosted three marquees at the 50th birthday celebrations at Talbingo in November with a choice of fun and fabulous activities on offer.

Discover STEM the fun way

Snowy Hydro's Discovery Centre at Cooma is the ideal location for school students to immerse themselves in science, technology, engineering and maths (STEM) learning, and explore the past, present and future of Snowy Hydro. The Next Generation Education Program brings science and engineering subjects to life through hands-on experiences and interactive activities.

The Next Generation Education Program offers three learning experiences.

- The Snowy Hydro Power of Water experience provides students with a comprehensive understanding of the Scheme to discover more about our renewable energy future. The experience includes the Discovery Centre's immersive theatre, a guided tour of the interpretive area to view real-time operating screens and inspect a scale model of a Snowy 2.0 tunnel boring machine, and the knowledge quest, designed to engage and challenge students with installations throughout the space. This introductory program is free and runs for between 30 and 45 minutes, depending on group sizes.
- The Snowy Hydro STEM silver program builds on the Power of Water experience and runs for two hours, tailored to students' learning needs. Choose from our suite of demonstrations and activities, including a Snowy 2.0 information session, one of our knowledge quests, a tailored virtual fly-over of the Snowy Scheme - or interact with a model power station, build a dam, create and test a turbine or make snow. The silver program cost is $50 per school group.
- Add another hour for the STEM gold program and class groups will cover everything in the previous two program levels, along with tailored presentations about the Scheme covering the environment, cloud seeding, renewable energy, history, National Electricity Market and water. The three-hour gold program pricing is $100 per school group.

Visit our website to make a booking: **https://www.snowyhydro.com.au/visit/booking-request/**

Summer holiday adventures

What better way to cool down on a hot summer's day than action-packed water-themed activities.

H20 Kids is Snowy Hydro's much-loved school holiday program run through out-of-school hours (OOSH) providers across the Snowy Mountains region. The popular STEM-focused program introduces young participants to real life engineering activities by exploring renewable energy, generation of hydro power and the different roles of Snowy Hydro workers.

Along with a special immersive theatre experience, there's plenty of messy fun to enjoy outdoors. Contact your local OOSH centre to book your spot this summer!

Students enjoying activities at Snowy's H20 Kids school holiday program

Doing business a better way

At Red, we're serious about making our environment better. That's why we've made changes to the way we work, reducing our carbon emissions across our operations. Red Energy is a Climate Active carbon neutral certified organisation. Now that's real Aussie energy.

AUSTRALIAN MADE AND OWNED

Owned by snowyhydro

Climate Active Carbon Neutral ORGANISATION

red energy™