snowy hydro



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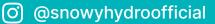
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CEOUPDATE A message from Snowy Hydro CEO

Dennis Barnes

Snowy Hydro is one of the most important contributors to an energy landscape undergoing a fundamental and critical shift on the road to net-zero.

This year, our electricity generating assets - with the Snowy Scheme as the most significant in terms of power generating capacity - continued to underpin this transition by providing the firming power necessary to enable more wind and solar power to come online.

Put simply, Snowy Hydro's portfolio of hydro, gas and diesel generating assets help to keep the lights on in homes and businesses across the National Electricity Market (NEM) when there isn't enough wind and sunlight for renewables to do the job alone.

Recently we signed a new 25-year agreement with Lochard Energy for gas storage at the lona facility in Victoria. This arrangement will help meet our future gas storage needs, to satisfy demand from our retail customers, and support our fast-start gas-fired electricity generators.

Construction of what is Australia's most complex and challenging infrastructure project, Snowy 2.0, continues in the Snowy Mountains, employing around 3,000 people and contributing significantly to local economies. Just like the original Snowy Scheme, its extension is pioneering, innovative work that has not been without its challenges. The end game is important. Designed to operate for 150 years, Snowy 2.0 is critical to Australia's transition to renewable energy.

In recent news, we will acquire a fourth project tunnel boring machine to help keep Snowy 2.0 on its delivery timeline. We've applied to the state government for a planning modification after carefully considering a range of options to get through a complex fault zone on the route of the tunnel to connect Snowy 2.0's upper reservoir to the underground power station.

To date, the performance of the Snowy 2.0 tunnel boring machines has varied, with two of the three machines generally progressing well, and the progress of Florence below expectations. We expect progress of all three machines to continue to vary as they encounter a range of ground conditions ahead of them.

Meanwhile, in local communities across the Snowy region, I know there's a lot of enthusiasm for the initiatives we have planned to mark the 75th anniversary of the Snowy Scheme's construction.

We're very pleased to be joining forces with the Australian Academy of Technological Sciences and Engineering (ATSE) to offer scholarships for university students studying science, technology, engineering or mathematics.

Commemorating 75 years of the iconic Snowy Scheme, Snowy Hydro will fund two scholarships valued at \$30,000 each over a three-year period through the ATSE Elevate program. We're holding a reunion event for former workers in Cooma in October and a community open day at Tumut 3 Power Station in Talbingo in November. We are further supporting Snowy Mountains locals with special 75th anniversary community grants funding for grassroots, community-led projects and events.

Spring is also a time when the winter snowfall becomes the annual snowmelt and our future hydro 'fuel' of the Snowy Scheme.

Over winter we made some changes and improvements to snow depths data collection and public reporting. Manual readings at Spencers Creek snow course, known as Australia's premier long-term snow record, occurred weekly to fortnightly, with a greater focus on the second half of the season when snow depths were peaking. New, automated instrumentation has been installed at an experimental site close to the Spencers Creek to collect and provide real-time snow depth information for online access.

This is an exciting time for Snowy Hydro, with the next 75 years set to be even more significant than the last. Thanks for joining us on the journey.

All the best,

Tennis

PROJECT UPDATE

Snowy 2.0

TBM Florence in head

Progress continues at Snowy 2.0, Australia's largest renewables project under construction, with several milestones achieved for key infrastructure, and a fourth tunnel boring machine to be launched.

TBM fleet expands

An additional tunnel boring machine will be activated on Snowy 2.0's 17-kilometre headrace tunnel.

With new ground testing techniques providing a better understanding of the full extent of a complex fault zone on the route of the tunnel to connect Snowy 2.0's upper reservoir to the underground power station, Snowy Hydro CEO Dennis Barnes said deploying a fourth tunnel boring machine is the right course of action.

"New ground testing techniques have revealed it is far more geologically challenging than earlier investigations indicated. We've carefully considered a range of options to get through the fault zone. Bringing in a fourth machine is the best way to keep Snowy 2.0 on track for its target completion date of December 2028."

A modification for Snowy 2.0's project approval has been submitted to the NSW Department of Planning, Housing and Infrastructure, and will be subject to the Department's independent community consultation and assessment processes. TBM Florence recommenced excavation of the headrace tunnel in mid-July following a seven-week operation using ultra high pressure hydro blasting to remove very hard rock preventing the machine from progressing.

With highly variable ground conditions expected to continue ahead of TBM Florence, progress will continue to vary, particularly as the machine navigates the curve in the main tunnel alignment.

TBM Lady Eileen Hudson is progressing well on her second mission excavating the tailrace tunnel. This tunnel will connect the underground power station to the lower Talbingo reservoir.

Following service modifications and an extension of the conveyor belt, excavations will commence to join the tailrace tunnel with the Talbingo intake excavation.

TBM Kirsten is excavating the 1.6km Inclined Pressure Shaft (IPS) which will connect the underground power station to the headrace tunnel leading to the upper Tantangara reservoir. The TBM has installed 14 trial tunnel lining rings in the IPS using locally manufactured concrete segments specifically designed to withstand extreme fluctuations in water pressure.

Talbingo intake

In a major milestone, excavation teams have reached the bottom of the Talbingo intake, removing 570,000 cubic metres of material. From the top of the excavation, the intake is 110 metres in depth. The intake is where water will exit and enter the tailrace tunnel, connecting the lower Talbingo reservoir to the underground power station.

Preparations are underway for the drill and blast tunnelling operations that will connect the tailrace tunnel with the intake structure.

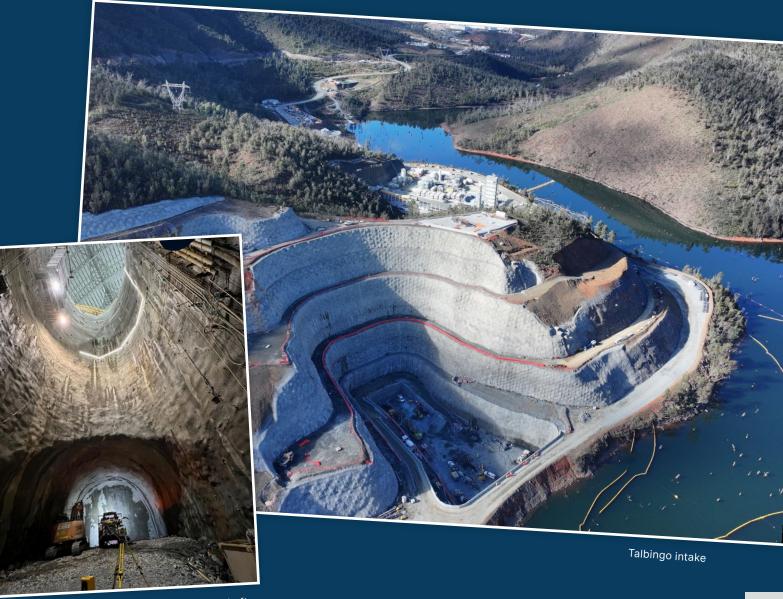
Planning for the construction of the intake structure has commenced, including testing the design with a 1 to 10 scale physical model to ensure hydraulic performance of the structure.

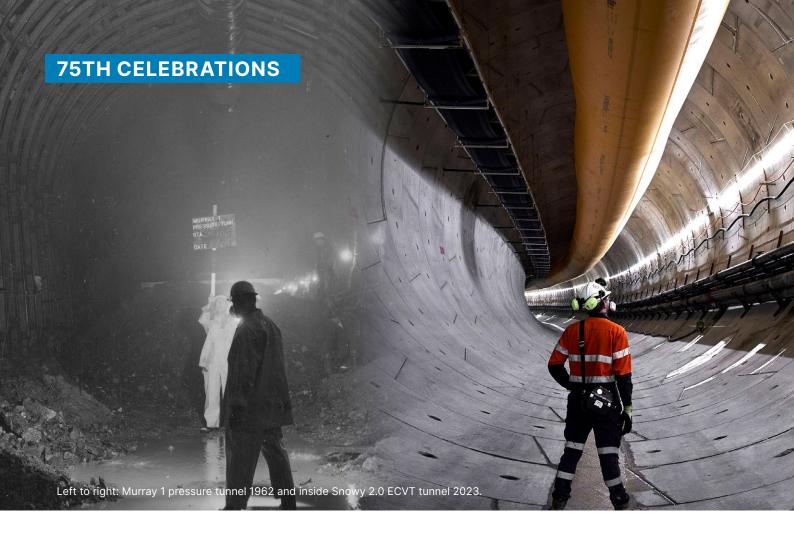
Tantangara gate shaft

In another key milestone, excavation of the gate shaft at Tantangara is complete with underground drill and blast work to connect it to the reservoir intake well advanced.

The main function of the gate shaft is to stop and start the flow of water into the headrace tunnel and power station for maintenance, or in the case of an emergency.

Following completion of the transition tunnels, the next stage of the intake earthworks will involve the removal of the temporary "rock plug" and excavation of a channel into Tantangara reservoir. This will allow water to flow through the intake and into the headrace tunnel.





75 years strong

Snowy Hydro is proudly celebrating 75 years of the iconic Snowy Scheme with a series of community-focused initiatives later this year.

Snowy Hydro will host two events in October and November, and offer support for grassroots, community-led projects through a special 75th Anniversary Community Grants Fund and two new STEM-focussed university scholarships, celebrating our decades of commitment to the Snowy Mountains community.

The first construction blast of the Snowy Scheme took place in Adaminaby on 17 October 1949 and with our tradition of honouring the legacy of the Snowy Scheme, Snowy Hydro recognises that these celebrations are shared with the communities across the Snowy Mountains, many of which were established during the construction era.

Snowy Hydro CEO Dennis Barnes said the company was looking forward to acknowledging the milestone with meaningful, community-led initiatives reflecting the legacy of the Snowy Scheme. "It's important that we mark the 75th anniversary alongside those who worked on the Snowy Scheme construction and with the broader community," Dennis said.

"Snowy Hydro has made a huge contribution to the local region and to Australia. We're delighted to welcome the community to celebrate this shared milestone with us.

"The next 75 years will be just as important. The Scheme and its Snowy 2.0 extension will help underpin the nation's transition to a renewable energy future."



What's on?

→ Saturday, 19 October 2024

Former worker reunion event

Snowy Hydro will host a reunion event at the Cooma Multifunction Centre to honour the former Snowy Scheme construction workforce and their families.

→ Saturday, 2 November 2024

Community open day at Tumut 3 Power Station.

This event at Talbingo is an opportunity for local residents and visitors to gain insights into Snowy Hydro's proud history, current operations and plans for the future.

The day will include tours of Tumut 3 Power Station, bus tours to Talbingo Reservoir and the top of Tumut 3's famous penstocks, fun and educational activities hosted by the Snowy STEM Academy, along with delicious food and coffee from local vendors.

Left to right: Island Bend dam 1964 and now

Register now!

Registration for both events is essential to secure your place. For more information, visit the Snowy Hydro website at **snowyhydro.com/75years**

Information about the community celebrations will be updated regularly on the Snowy Hydro website and via our social media channels.

Supporting grassroots projects and emerging leaders

Snowy Hydro is committed to supporting emerging leaders who will continue the legacy of the Snowy Scheme into the future. As part of this commitment, we have partnered with the Australian Academy of Technological Sciences and Engineering to offer two scholarships valued at \$30,000 each. Full story on page 8.

We also created the 75th Anniversary Community Grants Fund offering grants of up to \$5,000 for local community groups. Grants were awarded to applicants with creative ideas that clearly demonstrated a connection to the history and legacy of the Snowy Scheme.

COMMUNITY AND EDUCATION

New STEM scholarships

Snowy Hydro and the Australian Academy of Technological Sciences and Engineering (ATSE) are joining forces to offer scholarships for university students studying science, technology, engineering or mathematics.

Commemorating 75 years of the iconic Snowy Scheme, Snowy Hydro will fund two scholarships valued at \$30,000 each over a three-year period through the ATSE Elevate program. Along with financial assistance, students will have access to mentoring, professional development workshops, and wellbeing support through the broader ATSE network.

The scholarships are designed to offer gamechanging support to young women and non-binary people pursuing a career in STEM-related fields.

Snowy Hydro CEO Dennis Barnes said the scholarships provide a meaningful way to mark 75 years of the Snowy Scheme and will help make an important contribution to the skills that will help make the next 75 years possible.

"There's also an important diversity consideration here," Mr Barnes said. "The energy sector is typically male dominated and there's so much that can be gained by women and gender-diverse people choosing STEM disciplines.

"I'd love to see the people who are awarded the Snowy Hydro 75th Anniversary scholarships contributing to Australia's transition to renewable energy."

ATSE CEO, Kylie Walker said boosting gender diversity in STEM is not just a matter of equity but a critical driver for innovation and sustainability.

Far right: Wataru Hamasaka (Japan), 'The Sound of Sky', Snowy Valleys Sculpture Trail, Tumut; Tetsuro Yamasaki (Japan), 'Metamorphosis – Inside Out (Cube)', Snowy Valleys Sculpture Trail, Tumut. Photos Grant Hardwick. "Partnerships with industry leaders like Snowy Hydro are vital to this mission, as they provide the career opportunities and real-world expertise needed to empower women and gender-diverse people in STEM and drive meaningful progress in these fields."

Applications for the Elevate program are now open and will involve an assessment process with selected scholars announced in November. The scholarships will commence in January 2025.

For more information visit the ATSE website. https://www.atse.org.au/what-we-do/pathwaysinto-through-stem/elevate/

Sculptures in the wild

Visitors to the Snowy Valleys Sculpture Trail can now follow the trail into Tumut with the addition of four new sculptures.

Created by the team behind Sculpture by the Sea at Bondi (NSW) and Cottesloe (WA), the 150km Snowy Valleys Sculpture Trail winds along a section of the picturesque Snowy Valleys Way from Adelong to Tooma.

Snowy Hydro is a proud partner of the internationally renowned art and cultural project, contributing funding for seven new sculptures and a school education program aimed at delivering sculpture workshops to school children at 17 local schools.





Top trainee Brooke Fletcher

Brooke Fletcher's career journey began with a visit from Snowy Hydro's 2021 trainee cohort to her class at Monaro High School.

"At the beginning of year 11 everyone started to think about what life would look like for them after school," said Brooke. "When the Snowy Hydro trainees spoke to us about the traineeship and the opportunities within, I knew Snowy Hydro was where I wanted to be."

Brooke joined Snowy in 2023 and has since completed the Certificate III and IV in Business. She says she has learnt many transferable skills she will take with her throughout her career, including time management, communicating effectively in the workplace and managing work priorities.

"Being a trainee with Snowy Hydro has taught me to push myself out of my comfort zone and also believe in myself – we are capable of more than we think."

Earlier this year, Brooke's achievements were recognised at the NSW Training Awards, run by the NSW Department of Education, for trainees who have demonstrated exceptional dedication and skill in their respective fields. Representing Snowy Hydro, Brooke was awarded Trainee of the Year for the Illawarra and South Coast Region.

Brooke's learning is ongoing and this year she will complete her Certificate IV in Human Resource Management while working as a trainee in Snowy Hydro's Organisation Development Team.

"Completing a traineeship opens so many doors and kick-starts your career. It's an amazing opportunity to grow your skills and it's an experience you won't forget! "

Brooke has progressed to the next round of interviews and is a finalist for the NSW Trainee of the Year award, announced in September.



Starting your Snowy career

Traineeships at Snowy Hydro provide an opportunity for school leavers to learn, grow and develop in the workplace. Alongside their TAFE studies and their day job at Snowy, trainees attend life skill sessions to learn about resilience, stress management, and how to budget money.

Snowy has offered entry level programs for more than 30 years, and currently takes on 10-15 traineeships each year across business, information technology and most recently, warehousing. Based at Cooma and Talbingo, warehousing trainees complete a Certificate III in Supply Chain Operations as part of the role.

Applications will open in April 2025 for the 2026 cohort of trainees, with the Snowy team travelling around the region to promote traineeships and apprenticeships during the recruitment process.

STORAGE CONTRACT

Lòchard gas deal

Snowy Hydro recently entered into a 25-year gas storage agreement with Lochard Energy at the lona underground gas storage facility in Victoria to support Snowy Hydro's gas fired generation fleet. The long-term storage deal will allow Snowy Hydro to utilise stored gas when required to operate its gas fired power stations.

Snowy Hydro owns and operates three gas fired power stations, strategically located in the LaTrobe Valley and Laverton in Victoria, and at Colongra, NSW with a current total generating capacity of 1,290 MW. Snowy Hydro's Hunter Power Project, under construction at Kurri Kurri in the NSW Hunter Valley, will add a further 660 MW of gas fired power to its generation portfolio when commissioned.

Australia's energy market continues to experience significant change with the uptake of renewables and the progressive closure of coal fired assets. Snowy Hydro helps manage intermittency in the National Electricity Market (NEM) through its portfolio of power stations including the Snowy Scheme.

Snowy Hydro CEO Dennis Barnes said reliability and security of supply is central to the way Snowy Hydro operates, maintains and develops its nationally critical infrastructure.

"Snowy Hydro's generating portfolio of hydro, pumping and gas fired power stations continues to support further deployment of renewables into the grid by 'firming' intermittent generation sources into reliable power. The gas storage agreement with Lochard Energy will support the operation of our gas fired power stations in Victoria."



Lochard Energy CEO Tim Jessen said Lochard welcomes the opportunity to strengthen its relationship with Snowy Hydro through the signing

of the new Gas Storage Services Agreement.

"This important agreement will underpin Lochard's Heytesbury Underground Gas Storage project through which we will further expand the Iona Gas Storage Facility to continue to provide critical energy storage services in Victoria."

Gas storage is essential to ensure the supply of gas to meet peak electricity demand in seasonal markets, to supply gas to peak power generators including Snowy Hydro, and to ensure security of supply in the event of supply disruption.

The Snowy Hydro gas storage agreement with Lochard Energy will start in January 2028.

Powering Taronga to save wildlife

For five years, Red Energy has been a principal partner of Taronga, supporting its vital conservation work, supplying both Sydney and Dubbo zoo with 100% renewable electricity, and powering the Seals for the Wild Presentation.

Taronga Zoo Sydney's much-loved seals steal the spotlight at the daily presentation with species including the Australian sea lion and the long-nosed fur seal climbing, diving and catching fish while visitors learn about their marine environment.

The audience is encouraged to think about the impact of their everyday choices and take small steps by choosing Marine Stewardship Council (MSC) certified seafood or supporting renewable energy.

In 2023, Taronga Zoo Sydney and Taronga Western Plains Zoo became the first zoos in NSW to be powered by 100% renewable electricity, seven years ahead of their 2030 goal. Taronga Conservation Society Australia's landmark switch to renewable electricity from Red Energy means that every year from now, approximately 7,000 tonnes of CO2 is no longer released into the atmosphere. The annual emissions saved is equivalent in weight to about 300 humpback whales.

Taronga Conservation Society Australia CEO Cameron Kerr said clean energy is a step towards helping secure a future for all animals.

"By switching to Red Energy as our electricity provider, Taronga has taken a huge step on our journey to Net Zero by 2030. Taronga is also directly supporting clean electricity generation from a solar farm that is local, on Wiradjuri Country near Taronga Western Plains Zoo in Dubbo. By doing so, Taronga and Red Energy are directly supporting the transition to clean energy in NSW."

Seals

for the

Equipment at Taronga's Wildlife Hospital used to treat injured wildlife is now powered by renewable electricity, as is the pump that reuses water for seal enrichment, and the heat lamps providing warmth for many primates to bask in.

Red Wildlife Saver Plan

Residential electricity customers who sign up to the Red Wildlife Saver plan can help Taronga save wildlife with Red Energy contributing \$5 every month, up to the value of \$60 per year to Taronga Conservation Society Australia.*

The plan comes with a renewable matching promise, which means every unit of electricity bought from Red Energy will be matched by Snowy Hydro Limited generating one unit of electricity from a renewable source.

Customers on the Red Wildlife Saver plan have helped contribute more than \$65,000 (and growing!), which in turn helps Taronga in their conservation efforts of many endangered native species, including koalas, marine turtles and platypus.

* Offer available to residential electricity customers signing up to the Red Wildlife Saver plan. Red Energy will contribute \$5 per electricity account to Taronga Conservation Society Australia (ABN 41 733 619 876) for each calendar month you are on the Red Wildlife Saver electricity plan, starting from and including the date Red Energy becomes responsible for your electricity supply. Eligibility criteria and conditions apply.

REGIONAL WORKS

Blowering Power Station

With its single 80 megawatt generating unit, Blowering Power Station is one of Snowy Hydro's smaller power stations and plays a different role to its larger siblings across the Snowy Scheme.

Blowering Dam, which feeds the power station, is operated by Water NSW and provides storage of water for town water supplies, irrigated agriculture and the environment along the Murrumbidgee River. A valve house adjacent to Blowering Power Station is able to release water into the Tumut River independently of the power station.

Built between 1966 and 1969, Blowering Power Station operates whenever Water NSW releases water for downstream irrigation demand, rather than to meet the peak demand for electricity.

When needed, irrigation water is released through the power station, which drives the turbine and generates electricity. This captures the energy of the water which would otherwise be wasted if it bypassed the power station when released via the valve house.

While the irrigation season varies depending on rainfall in the irrigation area, water is typically released for irrigation over the warmer months between August and April. Outside those months is the optimum time for any maintenance to take place at Blowering Power Station.

During the non-release months this year, Snowy Hydro conducted internal inspections which required the unit to be isolated and drained before hatches could be opened.

Snowy's maintenance teams enter the internal spaces to visually inspect areas and where physical access is difficult or unsafe, drone technology is used.

During the maintenance window, teams also carry out inspections and test the high-voltage assets including the generator, transformer, circuit breaker and switchyard.

Record speed

Blowering Dam is well-known in the world of boating as the location where Australian Ken Warby set the world water speed record in 1978. Warby's mind blowing speed of 511.11km per hour, piloting his home built, jet-powered

Ken's son David Warby is one of several water speed pilots around the world attempting to set trials at Blowering Dam in recent years.

Above: Blowering switchyard maintenance Below: Measuring guide vane clearances







snowy hydro

Hunter Power Project

Progress continues at the Kurri Kurri site of the Hunter Power Project with all four balance of plant tanks now constructed.

Balance of plant is the area of the site with the equipment that provides fuel (diesel), water and air to Power Island, where power generation will occur at the Hunter Power Project.

Two of the tanks contain water (one demineralised and one service water) and two contain diesel. Each tank is approximately 11 metres high with an internal diameter of 15 metres and a capacity of between 1.9 and 2.5 million litres.

The two water tanks passed testing in June which involved filling them with water to ensure there were no leaks. A total of 46 B-double trucks delivered 42,000L of water each from Colongra Power Station to fill the tanks. The total distance travelled by the trucks over the two-week process was 5,520km, or the equivalent of travelling from Kurri Kurri to Perth and halfway back again.

The service water tank is for potable (drinking) water used across the project, while the demineralised water tank will hold demineralised water of extremely high purity for use in the power generation process.

The two diesel tanks are required to hold the back up fuel to keep the turbines going when gas is not readily available.



At Power Island, things are heating up (and cooling down) with the installation of Fin Fan Coolers. These closed-loop cooling systems weigh 30 tonnes each.

Each of the Hunter Power Project's gas turbines has a dedicated closed-loop cooling water system. These systems circulate demineralised water treated with corrosion-inhibiting chemicals to cool the generator and other parts of the gas turbines.

Snowy Hydro's Hunter Power Project is currently under construction in the NSW Hunter Valley. When commissioned, the plant will add a further 660 MW of gas fired power to Snowy's generation portfolio.

STEM Career Insights

For students considering a career in the STEM fields of science, technology, engineering and mathematics, speaking to those already in STEM roles can help further clarify the employment opportunities.

A team from the Hunter Power Project recently attended the Youth Express STEM Expo at Maitland Town Hall to talk to students about the career paths they followed to land their mechanical engineering, civil engineering, commissioning and environmental roles. They also shared information about early stage career programs at Snowy Hydro, including work experience and traineeships.

Planning a future beyond school is a pivotal time for students and we wish them well as they take their next exciting steps out into the world of work and further study.

WATER AND WEATHER

Measuring snow depth



For Snowy Hydro, Australia's alpine weather is always crucial for supplying the water needed to generate clean hydro power, but winter and spring are particularly significant. Around two thirds of inflows into Snowy Hydro's reservoirs come from rain, snowfall and subsequent snowmelt and runoff during the cooler months. During this time, snowpack conditions and weather forecasts are closely monitored by Snowy Hydro's water and weather teams to help predict inflows and reservoir storage levels.

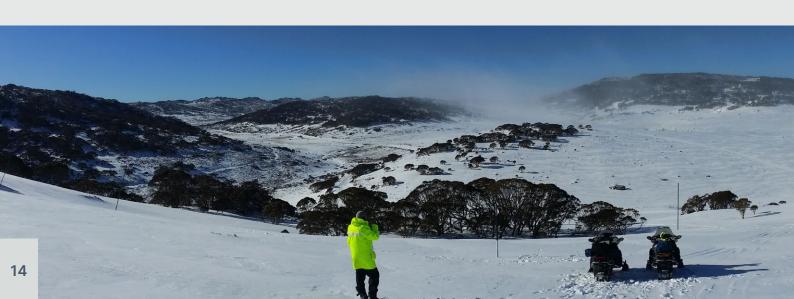
Following a rigorous process review and impact analysis of snow measurement methods, changes and improvements to data collection and public reporting have been introduced.

Snowy Hydro is investing in new instrumentation across the Scheme to enable more frequent snow depth readings. A new experimental site near the Spencers Creek snow course can measure snow depths accurately up to three metres. Automated readings from this experimental site are available online.

Conditions of the snowpack can vary significantly depending on elevation and aspect, and can change throughout the season. Characteristics such as snow depth and density indicate the amount of water in the snowpack. Snowy hydrologists use this information to calculate the water density and how the season's snowfall will contribute to the total amount of water flowing into the Scheme's streams, tunnels, aqueducts and reservoirs.

Snow depth measurements for 2024 began in June in the NSW Snowy Mountains with Snowy Hydro conducting manual readings at Spencers Creek, between Perisher and Charlotte Pass. These readings continue weekly or fortnightly, depending on snowfall. Manual readings at Deep Creek (between Cabramurra and Khancoban) and Three Mile Dam (near Mt Selwyn) will be conducted as needed, supplemented by automated instrumentation. Readings will step up in the latter part of the season when snow depths peak and the spring snowmelt increases.

Safety remains the top priority. Maintaining a level of flexibility in manual data collection and introducing automated data feeds reduces the need for staff to travel to remote locations in poor weather conditions.









Cloud seeding pause

Snowy Hydro has been conducting successful cloud seeding activities since 2004 to enhance snowfall over the Snowy Mountains during the cold months. Increased snowfall contributes to more available water during spring melt to produce clean, renewable energy. The program is backed by extensive scientific research, independent reviews and stringent environmental regulation.

Snowy Hydro recently announced it will pause cloud seeding activities in 2024 to undertake a full review of the program.

During the break in operations, Snowy Hydro is undertaking a comprehensive assessment of the program's activities and infrastructure. An update will be provided prior to winter 2025.

Cloud seeding operations at Snowy Hydro are authorised by the Snowy Mountains Cloud Seeding Act 2004 (NSW) and carried out in accordance with an Environmental Management Plan approved by the NSW Environment Protection Authority.



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