



SUMMARY

ENVIRONMENTAL IMPACT STATEMENT

PROPOSED SEGMENT FACTORY

September 2019



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INTRODUCTION

Snowy Hydro Limited (Snowy Hydro) proposes to develop Snowy 2.0, a large-scale pumped hydro-electric storage and generation project which would increase hydro-electric capacity by almost 50% within the existing Snowy Mountains Hydro-electric Scheme (Snowy Scheme). Snowy 2.0 would link the existing Tantangara and Talbingo reservoirs within the Snowy Scheme through a series of underground tunnels and a new hydro-electric power station.

Snowy 2.0 is the largest committed renewable energy project in Australia and is critical to underpinning system security and reliability as Australia transitions to a decarbonised economy.

Snowy 2.0 has been declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under Part 5, Division 5.2 of the New South Wales (NSW) Environmental Planning and Assessment Act 1979 (EP&A Act). SSI may be declared to be CSSI if it is of a category that, in the opinion of the NSW Minister for Planning and Public Spaces, is essential for the State for economic, environmental or social reasons. As a CSSI project, Snowy 2.0 is subject to Part 5, Division 5.2 of the EP&A Act which requires the preparation of an environmental impact statement (EIS) and the approval of the NSW Minister for Planning and Public Spaces.

Separate applications are being submitted to the NSW Department of Planning, Industry and Environment (DPIE) by Snowy Hydro for different phases of Snowy 2.0, including Exploratory Works for Snowy 2.0 (the Exploratory Works) and Snowy 2.0 Main Works (the Main Works). Approval for Exploratory Works was issued by the then NSW Minister for Planning on 7 February 2019 and construction has commenced. Staged submission and separate approval is appropriate for a project of this magnitude, due to its complexity and funding and procurement processes. Submission of the application and subsequent approval of Exploratory Works ahead of Main Works was critical as it will obtain detailed geological data about the rock types, conditions, ground temperature and stress conditions to inform the detailed design of the underground power station cavern. Snowy Hydro lodged its EIS for the Main Works with DPIE on 13 September 2019.

Precast concrete segments are essential to line the tunnels for Snowy 2.0 that would be excavated by tunnel boring machines (TBMs), including the tunnels being excavated for Exploratory Works and Main Works. Accordingly, Snowy Hydro proposes to construct and operate a factory which will manufacture the concrete segments required for Snowy 2.0 (the proposed segment factory) on industrial zoned land in Polo Flat, an industrial area located to the east of Cooma (the site). The proposed segment factory is the subject of this EIS.

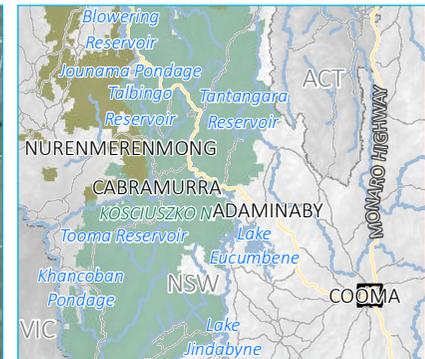
The location of the site of the proposed segment factory is shown in Figure 1.

The objectives of the proposed segment factory are:

- to construct and operate a factory to produce high quality segments to line the tunnels of Snowy 2.0;
- to site the factory on land that is zoned to facilitate industrial development;
- to maximise the economic and social benefits of the factory in an area proximate to Snowy 2.0;
- to minimise potential amenity impacts of the factory on nearby and surrounding residents; and
- to minimise the potential impacts of the factory on the local environment.

As the proposed segment factory will be ancillary to the construction of Snowy 2.0, it falls within the CSSI declaration for the 'Snowy 2.0 and Transmission Project' pursuant to clause 9(6) of Schedule 5 of the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). Accordingly, the proposed segment factory is subject to Part 5, Division 5.2 of the EP&A Act and requires the preparation of an EIS and the approval of the NSW Minister for Planning and Public Spaces.

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- KEY**
- Site boundary
 - Rail line
 - Main road
 - Local road or track
 - Watercourse
 - Cadastral boundary
 - NPWS reserve

Location of site in local context

Snowy 2.0
Environmental Impact Statement
Proposed Segment Factory
Figure ES1



Source: EMM (2019); Snowy Hydro (2019); DFSI (2017); LPMA (2011)



PROJECT DESCRIPTION

The proposed segment factory would be constructed and operated by Future Generation Joint Venture (FGJV) on behalf of Snowy Hydro. FGJV has been contracted by Snowy Hydro to construct Snowy 2.0.

In developing Snowy 2.0, Snowy Hydro and FGJV considered a range of alternative designs, layouts and locations for the proposed segment factory. In developing the layout of the factory, an iterative and risk-based design and assessment process was adopted, referred to as a design integration and assessment approach (DIAA). This DIAA process was undertaken with the guiding principles of avoiding and minimising environmental impacts where possible.

Ultimately, the site and layout of the proposed segment factory was determined by Snowy Hydro and the FGJV to be the preferred option because it:

- utilises land that is zoned for industrial uses;
- is likely to provide the best opportunities for the local community with regards to direct employment and additional flow on economic benefits from using other local companies and facilities;
- minimises potential environmental impacts of the proposed segment factory, particularly to native grasslands and operational noise to nearby residents;
- is located outside the Kosciuszko National Park (KNP) and therefore reduces the amount of land (and, in turn, amount of clearing) that would otherwise be required in park; and
- minimises travel distance for raw material supply.

The site, which has an area of about 31.6 hectares (ha), is surrounded by industrial development to the north and west and predominantly vacant land to the south and east. Notwithstanding this, an abattoir is located immediately to the east of the site. A photograph of the site and surrounding development can be seen in Photograph 1.

The proposed segment factory would contain a concrete batching plant (CBP), building for the manufacture of the segments (the precast building), uncovered storage areas for raw material and segments, vehicle parking areas and associated offices and workshops. The layout of the proposed segment factory can be seen in Figure ES2.

The construction phase of the proposed segment factory would last about five months utilising a workforce of about 30 people. Construction vehicle movements would comprise construction workers' light vehicles as well as heavy vehicles transporting equipment, building and construction materials, waste, and fill material if required.

The proposed segment factory would operate over a period of about 3.5 years utilising a workforce of about 125 people.



Photograph 1 The site as viewed from the west – the site is located behind the industrial development located in the middle-ground of the photograph

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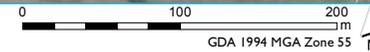
KEY

- Site boundary
- Indicative site layout
- Local road or track
- Cadastral boundary
- Precast yard, concrete plant, aggregates area, precast warehouse, segment storage
- Bus stop and parking
- Offices, guard house and first aid
- Mechanical and plant workshop with parking
- Trailer parking
- Storage area
- Emergency storage area
- Detention basin
- Drainage

Proposed layout

Snowy 2.0
 Environmental Impact Statement
 Proposed Segment Factory
 Figure ES2

Source: EMM (2019); FGJV (2019); Snowy Hydro (2019); DFSI (2017); GA (2011); LPMA (2011)



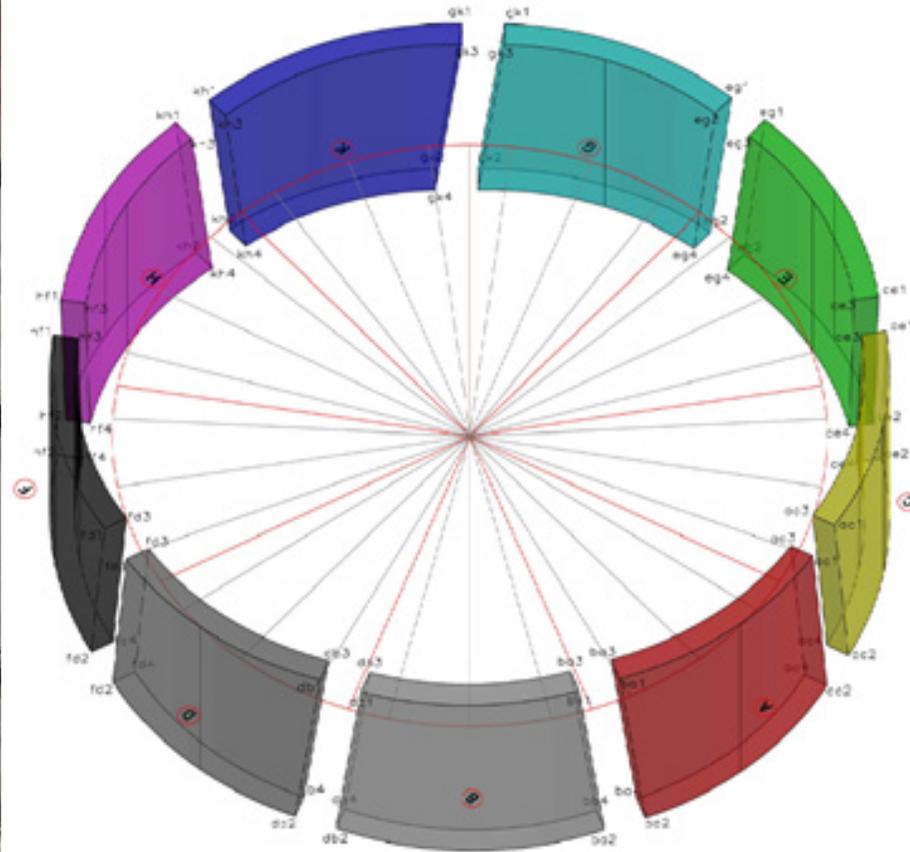


Figure 3 Typical segments and tunnel ring

Approximately 130,500 segments making up about 14,500 precast concrete tunnel rings would be manufactured over the operational period of the proposed segment factory for exclusive use as part of Snowy 2.0. Each tunnel ring would consist of nine segments as shown in Figure 3.

Primary inputs for the proposed segment factory include aggregate, sand, cement and rebar steel. Primary outputs include the precast tunnel segmental linings which would be transported to the construction sites of Snowy 2.0 within KNP.

Operational vehicle movements will comprise light vehicles (worker's vehicles and service vehicles) and heavy vehicles required for the transportation of the main inputs for the segments and for the transportation of the segments.



STRATEGIC CONTEXT

Need for Snowy 2.0 in the NEM

During the Feasibility Study for Snowy 2.0 and in the lead up to its final investment decision (FID), Marsden Jacob Associates (MJA) carried out independent market modelling to understand upcoming trends and the future NEM in which Snowy 2.0 will operate. The findings of these studies confirm the strategic justification and need for Snowy 2.0 to provide large-scale storage that facilitates firming and reliability to the NEM, as the NEM decarbonises over the next few decades.

While the MJA modelling in the lead up to FID in late 2018 is still very relevant and underpins the strong economic case for the project since this time, the energy market has evolved and changed much more quickly than originally anticipated even just a year ago.

The likelihood of coal-fired generators closing earlier than previously anticipated is increasing (Aurora Energy Research 2019) and concurrently, the rapid uptake of intermittent renewables due to favourable economics is changing the energy market landscape. For example, investment in large-scale renewable energy projects doubled in 2018 compared to a previous record-breaking 2017, increasing from \$10 billion to \$20 billion (Clean Energy Council 2019). NSW is likely to have one of the greatest requirements for energy replacement and capacity, as several coal-fired power plants are confirmed to be retired within the next decade. As the likelihood of new coal-fired power stations is considered to be low, much of the replacement of coal-powered generation will be from renewable sources and to a lesser extent gas.

A changing energy system and market

The strategic context of Snowy 2.0 relates to its critical significance for the national electricity market (NEM), key State and Commonwealth government plans and policies, and economic, social and environmental trends driving a paradigm shift in the energy market.

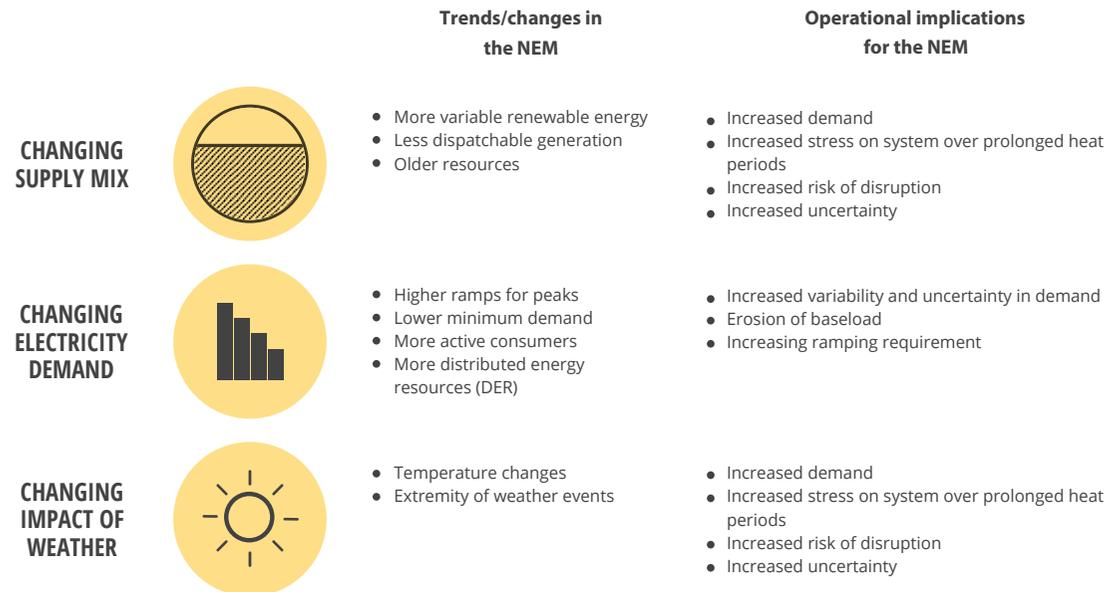


Figure 4 Key system changes in the NEM. Source: AEMO

In recognition of the need to manage the transition and future energy mix in the NEM, Snowy 2.0 was declared CSSI by the former NSW Minister for Planning under the NSW EP&A Act in March 2018. It was declared as critical for the energy security and reliability needs of NSW. At the time of the declaration the Minister stated that Snowy 2.0 was “essential for the future security of our energy system, the economy and the environment.” The declaration signifies the critical role that Snowy 2.0, together with the upgrades to the NSW transmission network, will play in providing reliable on-demand energy and large-scale storage to NSW as it transitions to a low emissions economy. Snowy 2.0 is the largest committed renewable energy project in Australia. By expanding the current Snowy Scheme’s renewable energy capacity by almost 50%, the NEM will be served with an additional 2,000 megawatt (MW) generating capacity.

Key Benefits

In terms of the future energy market, the key benefits of Snowy 2.0 are summarised as follows:

- Snowy 2.0 provides low emission on-demand energy and will underpin the continued decarbonisation of the economy;
- Snowy 2.0 provides deep storages to allow more flexibility to respond to seasonal variability when compared to other variable renewable energy and batteries;
- Snowy 2.0, being a closed system, can move water between reservoirs and not rely on natural inflows that may vary seasonally, offering valuable seasonal storage and insurance against drought risk. This is because Snowy 2.0’s pumping capabilities work in a ‘closed’ system- water is recycled between the two dams so the same water can be used to generate power more than once, making the most of available water;
- Snowy 2.0 will have the capability to run for over seven days continuously before it needs to be ‘recharged’. By comparison, small and large-scale batteries have limited storage (typically one to four hours);

- Snowy 2.0 will improve the overall efficiency of the NEM by absorbing and storing excess energy from the system at times of excess demand (through pumping) and generate at the critical times of peak times; and
- Snowy 2.0 has a 100 year design life and will generate power for the generations to come.

The net result of Snowy 2.0 being developed is improved market efficiency, more reliable market operation, the provision of large-scale energy storage, encouragement of more variable renewable energy generation to enter the NEM and lower emissions at the lowest cost.

The tunnels for Snowy 2.0 would be constructed using TBMs. These tunnels are required to be lined with concrete tunnel segments that are proposed to be produced at the proposed segment factory. The proposed segment factory is therefore critical to Snowy 2.0.

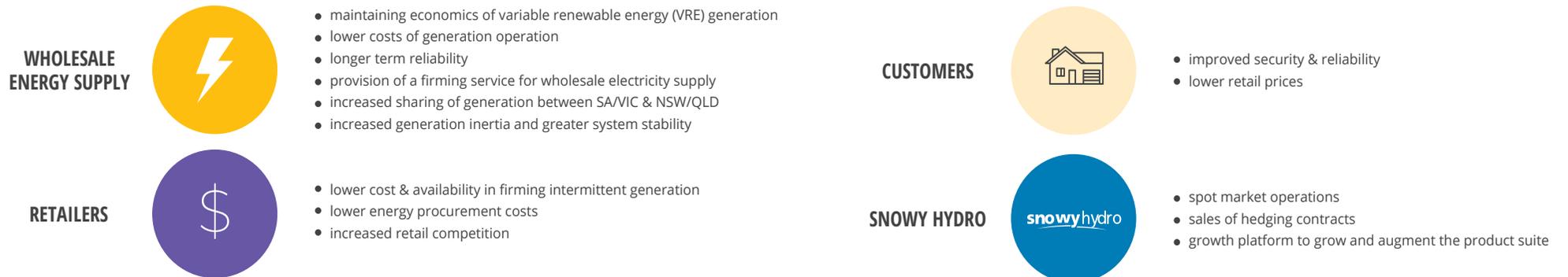


Figure 5 Key benefits of Snowy 2.0 in the NEM. Source: Snowy Hydro Limited (2019)



STATUTORY FRAMEWORK

New South Wales

As previously stated, Snowy 2.0 has been declared to be SSI and CSSI under Part 5, Division 5.2 of the EP&A Act because the Minister is of the opinion that it is essential for the State for economic, environmental or social reasons. An application for CSSI must be accompanied by an EIS and the NSW Minister for Planning and Public Spaces is the determining authority

Separate applications are being submitted by Snowy Hydro for different phases of Snowy 2.0, including the Exploratory Works and the Main Works. This EIS accompanies a separate application for the proposed segment factory that would manufacture precast concrete segments that would line the tunnels being excavated for Snowy 2.0, and is therefore development that is ancillary to Snowy 2.0.

The EIS has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued by DPIE on 31 July 2019, which captures the requirements of key regulatory authorities.

The EIS considers potential environmental, social and economic impacts and benefits of the project, and describes measures identified to minimise and avoid impacts.

In addition to the approval from the NSW Minister for Planning and Public Spaces under the EP&A Act, two other approvals are required under NSW legislation before the proposed segment factory can be constructed and operated. The first is an approval for the construction of an access road and its connection to Polo Flat Road required under the NSW Roads Act 1993. The second is the granting of an environment protection licence for the operation of the factory pursuant to the NSW Protection of the Environment Operations Act 1997. In accordance with section 5.24 of the EP&A Act, if CSSI approval is granted for the proposed segment factory, both of these approvals cannot be refused if they are necessary to carry out the approved CSSI development, and must be substantially consistent with the CSSI approval.

Commonwealth

On 26 June 2019, Snowy Hydro referred the proposed segment factory to the Commonwealth Minister for the Environment under the provisions of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Following an assessment of the referral, the Acting Assistant Secretary Assessments and Waste Branch of the Commonwealth Department of the Environment and Energy (DEE), as delegate of the Minister, determined on 13 August 2019 that the proposed segment factory is 'not a controlled action' and therefore does not require further assessment or approval under the EPBC Act.



Snowy 2.0
Precast facility

energy20
WHY WE NEED SNOWY 2.0
The energy system is changing. In the future, as we have more renewable energy and more electric vehicles, we will need a new power source. The Snowy 2.0 project will help us meet this need. It will provide a reliable source of power that can be used to generate electricity continuously, without emitting carbon dioxide.
Snowy 2.0 is a fast-track, hydro storage and renewable energy storage project. It will provide a reliable source of power that can be used to generate electricity continuously, without emitting carbon dioxide.
Snowy 2.0 will work with renewable energy to provide a reliable source of power that can be used to generate electricity continuously, without emitting carbon dioxide.

energy20
WHAT IS SNOWY 2.0?
Snowy 2.0 is a fast-track, hydro storage and renewable energy storage project. It will provide a reliable source of power that can be used to generate electricity continuously, without emitting carbon dioxide.

Westinghouse
Innovation you can rely on



5 STAKEHOLDER ENGAGEMENT

Snowy Hydro has adopted a proactive and flexible stakeholder engagement strategy for Snowy 2.0, which is applicable to all phases of Snowy 2.0, including the proposed segment factory.

Identified stakeholders

Engagement activities specific to the proposed segment factory have been, and will continue to be implemented. These comprise:

- the distribution of letters;
- the distribution of information sheets on the proposed segment factory to the broader community;
- the development of a survey;
- consultation sessions with the community in late July 2019;
- Social Impact Assessment (SIA) workshops in late July 2019;
- general community consultation such as face-to-face meetings;
- meetings with State and Commonwealth government agencies, and Snowy Monaro Regional Council (SMRC) and Snowy Valleys Council (SVC); and
- engagement with the Aboriginal community, groups, and organisations around mobilisation for opportunities associated with the proposed segment factory.

Engagement activities and tools

Consultation has demonstrated that Snowy 2.0 in general, and the proposed segment factory, has overwhelming support from stakeholders given its beneficial effect on employment and business opportunities, especially the possibility of increased traineeship opportunities and business expansion in the area. Notwithstanding this, some concerns were raised by stakeholders which they wanted addressed by the project. These related to traffic matters, including the way in which the proposed segment factory may affect road conditions. Other matters raised included dust, service provision, access to recreation and accommodation supply.

Matters raised during stakeholder engagement activities are addressed in the EIS.

A large network of stakeholders and existing communication channels are in place for Snowy 2.0, providing opportunities for targeted and broad engagement and communications activities for the proposed segment factory.

Snowy Hydro and FGJV will continue to engage with adjacent landowners, and businesses and the local community in accordance with the framework outlined in FGJV's Snowy 2.0 Community and Stakeholder Engagement Plan.



6 ENVIRONMENTAL IMPACT ASSESSMENT

Transport

A Traffic and Transport Assessment (TTA) was undertaken that addressed the impacts of the proposed segment factory on the capacity, condition, safety and efficiency of the local, national park and State road network. The assessment included a Road Safety Audit.

The assessment focused on the sections of the Snowy Mountains and Monaro highways, as well as the connecting local road network (including Polo Flat, Tantangara, Link and Lobs Hole Ravine roads), that comprise the haulage route between the site of the proposed segment factory at Polo Flat and the construction sites within KNP.

Daily and seasonal traffic volumes were determined using available RMS traffic counts (where available) and Snowy 2.0 specific mid-block and intersection counts. Seasonality of traffic flow, including an assessment of winter peak traffic conditions, was determined by undertaking mid-week, off-peak counts, during winter school holiday periods and over the June long weekend that in 2019 coincided with an early start to the snow season. Counts were undertaken at critical intersections (namely the Snowy Mountains Highway/Kosciuszko Road intersection, the Sharp Street intersections with Bombala and Vale streets and the Monaro Highway/Polo Flat Road (north end)) and key locations (such as along Link Road) that provides access for winter holiday recreational traffic to parts of the KNP and the Selwyn Snow Resort.

Predicted impacts

Predicted traffic and transport impacts were based on estimates of operational vehicle movements for the proposed segment factory and for the construction of the Exploratory and Main Works. Estimates were provided on a monthly basis and comprised both light and heavy vehicles.

A worst-case traffic and transport scenario was developed (based on the peak project traffic conditions in 2022) for the proposed segment factory and potential traffic and transport impacts determined using:

- an intersection warrant review;
- SIDRA intersection modelling; and
- a safe intersection sight distance (SISD) review.

Mitigation measures

Through the TTA, it was determined that consideration should be given to upgrades to identified intersections, including the roundabouts at the intersections of Sharp Street with Bombala and Vale streets in Cooma.

In addition, the project will require two new intersections providing access to Snowy 2.0 worksites (at the Polo Flat and Rock Forest sites).

Elsewhere across the study area, recommendations have been made for mitigation measures to address residual impacts. Typical mitigation measures include:

- reduced speed areas where minimum sight distances cannot be achieved;
- intersection improvements and upgrades to accommodate the combined impact of assumed 2022 traffic volumes and estimated project traffic (including traffic volumes associated with winter peak traffic conditions; and
- road maintenance provisions, requirements for traffic controls and associated community consultation.

These measures would be the result of detailed design, with guidelines, principles and management provisions set out in traffic management plans, determined prior to operation.

A Road Safety Audit was also undertaken of the haul route between the site of the proposed segment factory at Polo Flat and the construction sites within KNP. Further investigations and further discussions are required with road authorities to determine the audit outcomes that should be undertaken as part of this project.

The project is continuing to engage with roads authorities (SMRC and RMS) to determine the most appropriate measures to address traffic performance issues identified during the consideration of proposed segment factory activities as well as intersection capacity assessment undertaken in the TTA.



Amenity

Noise

A Noise and Vibration Impact Assessment of the proposed segment factory was undertaken in accordance with a number of guidelines and policies by the NSW Environment Protection Authority (EPA). It included noise modelling to predict operational noise, construction noise, construction vibration and road traffic noise.

Following preliminary noise modelling, the design and operational management of the proposed segment factory was amended to minimise noise impacts to residences located on Carlaminda Road. As a result, modelling demonstrates compliance with relevant construction and operational noise criteria for most of the time. Where there are exceedances, these are considered to be acceptable. In addition, during consultation residents on Carlaminda Road indicated that they were not concerned with potential noise impacts associated with the project.

Construction

Construction is proposed over an approximate five-month period (estimated to start March 2020). Construction would be undertaken from Monday to Saturday for 10 hours per day. Access to the site would generally start at 6 am for pre-starts and toolbox talks, and construction activities would commence at 7 am.

The NSW Department of Environment Climate Change (DECC) 2009, The Interim Construction Noise Guideline (ICNG) recommends standard construction hours where noise from construction activities is audible at residential premises (ie assessment locations), as follows:

- Monday to Friday 7 am to 6 pm;
- Saturday 8 am to 1 pm; and
- no construction work is to take place on Sundays or public holidays.

The ICNG acknowledges that works outside standard hours may be necessary.

Accordingly, construction activities for the proposed segment factory (excluding pre-starts and toolbox talks) that fall outside of the recommended standard construction hours are only 5 hours on a Saturday (7 am to 8 am and 1 pm to 5 pm) for a period of about 5 months.

Construction noise from the project was predicted to satisfy relevant noise criteria at all assessment locations during standard construction hours (Monday to Friday 7 am to 6 pm and Saturday 8 am to 1 pm) except at one residential location to the south-east of the site on Carlaminda Road, where an exceedance of 2 dB is predicted. An exceedance of 2 dB is considered to be negligible as changes to noise levels +/-2 db are not discernible to the average noise receiver.

Construction noise levels outside of standard construction hours are predicted to satisfy noise management levels at all assessment locations except at three residences located to the south-east of the site on Carlaminda Road (R15, R16 and R17). The exceedances at R15 and R17 are a negligible 2 dB. The exceedance at R16 is 7 dB.

Given the limited construction period outside of standard construction hours (ie 5 hours on Saturday for a period of 5 months) and given this period is during the day, the exceedance of the NMLs at the residences at Carlaminda Road is considered acceptable.

The project would notify R15, R16 and R17 of construction works and undertake noise monitoring during the initial stages of construction to determine actual construction noise levels.

Vibration impacts from construction at residential assessment locations are highly unlikely.

Operation

For operational noise, noise criteria are satisfied at all assessment locations during the day. A residual (but negligible) exceedance of 2 dB has been predicted at one rural residence on Carlaminda Road to the south-east of the site during the evening and night after the implementation of all feasible and reasonable mitigation measures.

Traffic

Road traffic noise levels are predicted to comply with the noise criteria for most of the operational period during the day and night. During the peak of operations, which are predicted to occur for 2-3 months, there is a potential for a minor exceedance of the noise criteria at night on some sections of the transport route. Given the exceedances of the would occur on discrete sections of the transport routes and for a discrete period of time (2-3 months), the exceedances are considered to be acceptable.

Decommissioning

Decommissioning activities are expected to be limited to removal of plant and equipment during standard day hours in accordance with the ICNG. Noise from these activities would be less than levels predicted for construction activities and are not anticipated to result in any adverse noise impacts at the identified assessment locations.

Visual

A Landscape Character and Visual Impact Assessment of the proposed segment factory was prepared in accordance with the Environmental Impact Practice Note: Guideline for Landscape Character and Visual Impact Assessment (RMS 2018).

It is noted that the proposed segment factory would be constructed on industrial zoned land and the size and scale of the proposed buildings are consistent with the size and scale of adjoining industrial development to the north and west.

The assessment considered potential visual impacts as a result of likely changes to the landscape associated with construction and operation of the proposed segment factory. It considered changes from 12 viewpoints of the site.

The assessment found that the impact to the landscape character for the site and surrounds would be moderate, and the extent of the impact would only be temporary until the completion of Snowy 2.0.

Mitigation measures have been recommended to reduce surface reflectivity of built structures and to minimise light spill.

Air

An Air Quality Impact Assessment was undertaken in accordance with the EPA's Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales. It included air quality dispersion modelling to predict potential impacts from operations of the proposed segment factory. Air emissions estimation and dispersion modelling was completed for one operational scenario corresponding to peak operations at the proposed segment factory.

Emissions of total suspended particulates (TSP), particulate matter less than 10 micrometres (μm) in aerodynamic diameter (PM10), particulate matter less than 2.5 μm in aerodynamic diameter (PM2.5) and nitrogen dioxide (NO₂) were estimated and modelled and assessed against applicable impact assessment criteria which are designed to maintain ambient air quality that allows for the adequate protection of human health and well-being.

The results of the modelling show that the predicted concentrations and deposition rates for particulate matter (TSP, PM10, PM2.5 and dust deposition) and NO₂ are below the applicable impact assessment criteria at all residential assessment locations.

Cumulative impacts were assessed by combining modelled proposed segment factory impacts with recorded ambient background levels. The cumulative results also demonstrated compliance with applicable impact assessment criteria at all residential locations, despite a range of conservative assumptions in the emission calculations and dispersion modelling techniques. Three industrial locations were predicted to experience a maximum of two additional days over the impact assessment criterion, however these exceedance days occur when the background was elevated and are not considered to be significant.

Annual average total greenhouse gas (GHG) emissions (Scope 1, 2 and 3) generated by the proposed segment factory represent approximately 0.008% and 0.002% of total GHG emissions for NSW and Australia, respectively. These emissions are considered to be insignificant.



Biodiversity

A Biodiversity Development Assessment Report was prepared to assess potential impacts of the proposed segment factory on terrestrial biodiversity. It was undertaken in accordance with the NSW Biodiversity Conservation Act 2016 (BC Act), the Biodiversity Offsets Scheme (BOS) and Biodiversity Assessment Method (BAM).

Extensive field surveys show that the site is dominated by grassland, with past land uses such as cattle and sheep grazing and mowing resulting in a significant infestation of African Lovegrass. In the Monaro region African Lovegrass is identified as a priority weed. Overall, the site is in poor condition and has limited ecological value.

Notwithstanding this, the site contains small patches of Natural Temperate Grassland of the South Eastern Highlands (Natural Temperate Grassland) which is a grassland community listed as a critically endangered ecological community (CEEC) under the EPBC Act. These patches are heavily degraded due to weed species, support a lower abundance and diversity of non-grass species when compared to other patches of Natural Temperate Grassland, and are separated (greater than 100 metres (m)) from patches that are higher in quality. There are no endangered ecological communities (EECs) or CEECs within the site that are listed under the BC Act.

As a result of the DIAA process, the proposed segment factory has been located in an area that supports the lowest quality areas of Natural Temperate Grassland on the site.

Natural Temperate Grassland provides potential habitat for the threatened Mauve Burr-daisy, Creeping Hop-bush, Monaro Golden Daisy, Silky Swainson-pea, Striped Legless Lizard and Grassland Earless Dragon. Preliminary

flora and fauna surveys were undertaken in mid-2019, including targeted surveys for reptiles and preliminary flora surveys.

Whilst no threatened species were recorded during these surveys, further surveys will be undertaken in spring and summer of 2019. For the purposes of determining credits, a precautionary approach was adopted for the BDAR which assumed that these species are present within the site. Further surveys will reduce this assumed impact and resultant credit requirements.

Residual impacts following implementation of all avoidance and minimisation measures include:

- direct impacts to 0.83 ha of poor condition native vegetation;
- indirect impacts to 0.56 ha of poor condition native vegetation; and
- impacts to 0.83 ha of potential habitat for six threatened species.

A total of 22 ecosystem credits and 66 species credits under the BOS are required to offset these impacts. Snowy Hydro intends to meet the project's ecosystem and species credit requirements through one, or a combination of, the following:

- establishment of a biodiversity stewardship site, managed under a stewardship agreement;
- purchase and retire credits available on the biodiversity credit register; or
- payment into the Biodiversity Conservation Fund.

There is a potential for vehicles accessing the site to transfer weeds, particularly African Lovegrass, off-site. To minimise this a range of mitigation measures are proposed which includes the operation of a weed wash-down station on the site.

Land

Contamination

A Contamination Assessment of the proposed segment facility was undertaken which included both visual and intrusive investigations of the site. Intrusive investigations included sampling of soils and groundwater for contaminants.

Soil samples reported poly fluoroalkyl substances (PFAS), hydrocarbons, metals, and sundry contaminants as present at concentrations below the relevant assessment criteria. Asbestos was not recorded as being present in soil samples, however asbestos containing material (ACM) fragments were found on the surface of the site at various locations.

Groundwater samples reported PFAS as present at concentrations below the relevant assessment criteria. Asbestos and hydrocarbons were not recorded as being present in groundwater samples.

Concentrations of metals in all shallow groundwater bores were reported in exceedances of the relevant assessment criteria, however deeper bore sampling reported lower concentrations.

A risk assessment was undertaken to assess the likelihood and impact of the creation of an exposure pathway between known or potential sources of chemical contamination and humans or the environment as a result of the proposed segment factory.

Mitigation measures such as the removal of the ACM fragments prior to construction activities would be implemented by the project. After implementing appropriate mitigation measures potential impacts from contamination were assessed as being low.

Soils

A Land and Soils Assessment of the proposed segment factory was undertaken to assess the impacts of the proposed segment factory on land resources and soils. It was undertaken in accordance with a range of NSW policies and guidelines.

A detailed soil survey was undertaken on the site to characterise landform, vegetation, surface characteristics, topsoil, and subsoil. The survey found that there are six main soil types that are mostly formed on lower slopes of basalt and dacite soils. Additionally, there is some minor alluvium soil along the unnamed drainage line. A detailed description of the soil types can be found in the assessment.

Soil samples were collected and analysed. The soils were found to have moderate to high fertility, neutral to alkaline pH, and do not have any significant subsoil constraints such as salinity, acidity/alkalinity, sodicity or magnesian horizon. Further, soils were found to not tend to disperse and have a slight to high class of erosion hazard.

There is a very low potential for acid sulfate soils to occur at the site.

Biodiversity and contamination surveys undertaken for the project show that the soil resource on the site, particularly topsoils, are contaminated with a high seed bank of African Lovegrass and ACM which may have weathered and subsequently caused contamination of the soil. Where required, contaminated soils may need to be removed and disposed off-site or buried.

The key risks to the soil and land resources associated with the construction and operation of the proposed segment factory are likely to relate to soil erosion and water quality related impacts, and impacts to land and soil capability.

The Land and Soils Assessment found that potential impacts to the soil and land resources can be managed through the development and implementation of soil and water mitigation and management measures, including measures to address contaminated soils.

Water

A Water Assessment was prepared to assess the likely impacts to surface water and groundwater, including flooding impacts, from the construction and operation of the proposed segment factory as well as address the relevant SEARs.

A proposed water management system has been designed for the segment factory with the key objectives of diverting stormwater from upstream catchments around or through the site, separating potentially contaminating materials from the site stormwater system, providing detention to mitigate increases in peak flows from impervious areas, providing water quality treatment, enabling harvesting and reuse of stormwater to reduce reliance on mains supply and minimise stormwater discharges and associated water quality risks.

The performance of the proposed water management system was assessed through water quality and water balance modelling. Water quality modelling demonstrated that industry standard pollution reduction targets were achievable for the majority of the project duration in the event that harvested stormwater is suitable for use in concrete production.

Stormwater discharges will occur due to overflows from the water management basin. The water quality of overflows is expected to be similar to the water quality of the unnamed creek on the site and immediate downstream areas, with no significant departures expected.

Hence, occasional short duration overflows from the basin are not expected to materially change or degrade the water quality of the unnamed creek or immediate downstream areas. No significant impact to water quality or river flow objectives is expected.

Water balance modelling demonstrated the likely demand for water from various sources (mains supply and stormwater harvesting) under average annual rainfall conditions and that harvesting stormwater has the potential to substantially reduce mains water demand should it prove feasible to use stormwater for concrete production.

The Water Assessment concluded that impacts on groundwater are expected to be negligible and impacts to surface water quality would be minor and manageable with the design of the water management system and implementation of proposed mitigation measures. The assessment also determined that some minor offsite flooding impacts will be experienced in industrial properties west of the site that should be minimised to the extent practicable for events up to and including the 1% AEP as part of future detailed design. A flood emergency response plan will also need to be developed to manage residual flood risks during construction and operation of the site.

Heritage

An Aboriginal and Historic Cultural Heritage Assessment Report of the proposed segment factory was undertaken in accordance with the DPIE's Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW. The assessment included a review of heritage databases and a comprehensive field survey.

The site is drained by an ephemeral third order creek which was unlikely to have provided Aboriginal land users with water other than immediately after rain. It is located at a considerable distance from a source of reliable and abundant water, the Murrumbidgee River, where focused Aboriginal occupation in the local area is expected to have occurred.

In addition, it is situated within a generally amorphous landscape devoid of focal features that Aboriginal people may have been attracted to. In an Aboriginal land use context, the site possesses very low biodiversity. Given this, the site is unlikely to have been targeted by Aboriginal people for intensive occupation which would result in significant levels of artefact discard. The site is therefore assessed to be of very low archaeological sensitivity.

There are no Aboriginal objects on the site listed on DPIE's Aboriginal Heritage Information Management System. The nearest listing is a site about 1 kilometre (km) to the north-east. Further, there are no Aboriginal items listed on the site under the NSW State Heritage Inventory and the Australian Heritage Database.

The site forms part of an airfield which was originally established in 1921. It was developed in the late 1950s and 1960s to service the Snowy Scheme. It became the base for the Snowy Mountains Hydro-electric Authority's flying unit and aircraft. By 1976 the fleet was reduced to one aeroplane, but the Polo Flat airstrip was still maintained. The original hangers and terminal buildings are extant on the northern part of Lot 14.

Lot 14 was sold by Snowy Hydro in 1998 where it continued use as a private airfield. Snowy Hydro purchased the land again in early 2019.

There are no historic heritage items on the site that are listed on heritage registers, including the Australian Heritage Database, State Heritage Register and the State Heritage Inventory.

A comprehensive field survey was undertaken on the site, including the unmade road corridor, over two separate days. No items of Aboriginal or historic heritage were recorded during the survey.

No impacts to Aboriginal or historic heritage are expected as a result of the proposed segment factory.

Hazards

To determine whether the proposed segment factory is potentially hazardous, a risk screening was undertaken in accordance with DPIE's guideline Hazardous and Offensive Development Application Guidelines Applying SEPP 33 (Applying SEPP 33). This risk screening considers the type and quantity of potentially hazardous materials to be stored on the site and the distance of the storage area to the nearest site boundary, as well as the expected number of transport movements, to determine whether a Preliminary Hazard Assessment (PHA) is required to be prepared.

The risk screening demonstrates that there would not be any potentially hazardous materials transported, stored or handled at the proposed segment factory, and as such, it is not defined as a potentially hazardous industry. Accordingly, a PHA of the proposed segment factory is not required.

In addition, as a result of the outcomes of the noise, air quality and water assessments undertaken for the proposed segment factory, the risk screening also demonstrates that the factory is not defined as offensive development.

Social

A Social Impact Assessment (SIA) of the proposed segment factory was prepared in accordance with the Social impact assessment guideline: For State significant mining, petroleum production and extractive industry development (DPE 2017).

A study of the existing social conditions in the study area was conducted to obtain an understanding of the pre-existing community strengths and vulnerabilities against which potential social impacts from the proposed segment factory can be identified and analysed.

Both potential negative and positive impacts have been considered in regard to social impacts.

Consultation on Snowy 2.0, including consultation on the proposed segment factory, has demonstrated overwhelming support for the project and there is an expectation from stakeholders that the proposed

segment factory would provide economic benefit to the local area. These benefits have been quantified in the economic assessment and are likely to be significant in the context of the local economy.

The key social impacts described relate to economic benefits, but also negative impacts associated with housing, access to recreation activities and public safety. Mitigation measures have been provided to reduce the negative social impacts and enhance measures for positive impacts, however many of the negative impacts identified related to existing social issues such as lack of housing, homelessness, pressures on health services and underemployment.

Factors that would be outside of the responsibility of Snowy Hydro.

As such, mitigation and management strategies have been identified for identified social impacts, along with responsible parties and potential delivery partners.





Economic

An Economic Assessment was undertaken for the proposed segment factory.

Construction of the proposed segment factory is estimated to cost \$55 million (M), with 35% of costs spent on site preparation and 65% spent on construction of the factory. The construction workforce is estimated to be 30 people for five months, with an expected 80% (24 people) sourced locally. The direct and indirect local economic impact of this level of expenditure in the local economy is estimated to be:

- \$8 M in annual direct and indirect output or business turnover;
- \$3 M in annual direct and indirect value added;
- \$1 M in annual direct and indirect household income; and
- 46 direct and indirect jobs.

The proposed segment factory will operate for approximately 3.5 years, employ 125 people (with an expected 80% or 100 people sourced locally) and have an average annual turnover of \$115 M. The direct and indirect local economic impact of this level of expenditure in the local economy is estimated to be:

- \$147 M in annual direct and indirect output or business turnover;
- \$46 M in annual direct and indirect value-added;
- \$21 M in annual direct and indirect household income; and
- 252 direct and indirect jobs.

In a broader context the economic benefits of Snowy 2.0 are significant. The Economic Assessment of the Snowy 2.0 Main Works indicate that it will deliver substantial economic benefits to the local region, NSW and NEM states, with key drivers being the direct investment to establish the project, wage expenditure, reduced ongoing electricity fuel costs, and reduced electricity costs. The greatest effect will be experienced by the NSW/ACT economies with GSP expected to increase by \$2,692 M. The aggregated beneficial effect across the remaining NEM participants is predicted to be an increase in GSP of \$4,176 M. The local economies of Snowy Monaro Regional and Snowy Valleys LGAs will also benefit from Snowy 2.0 Main Works, increasing the average annual additional wage expenditure by \$8 M.

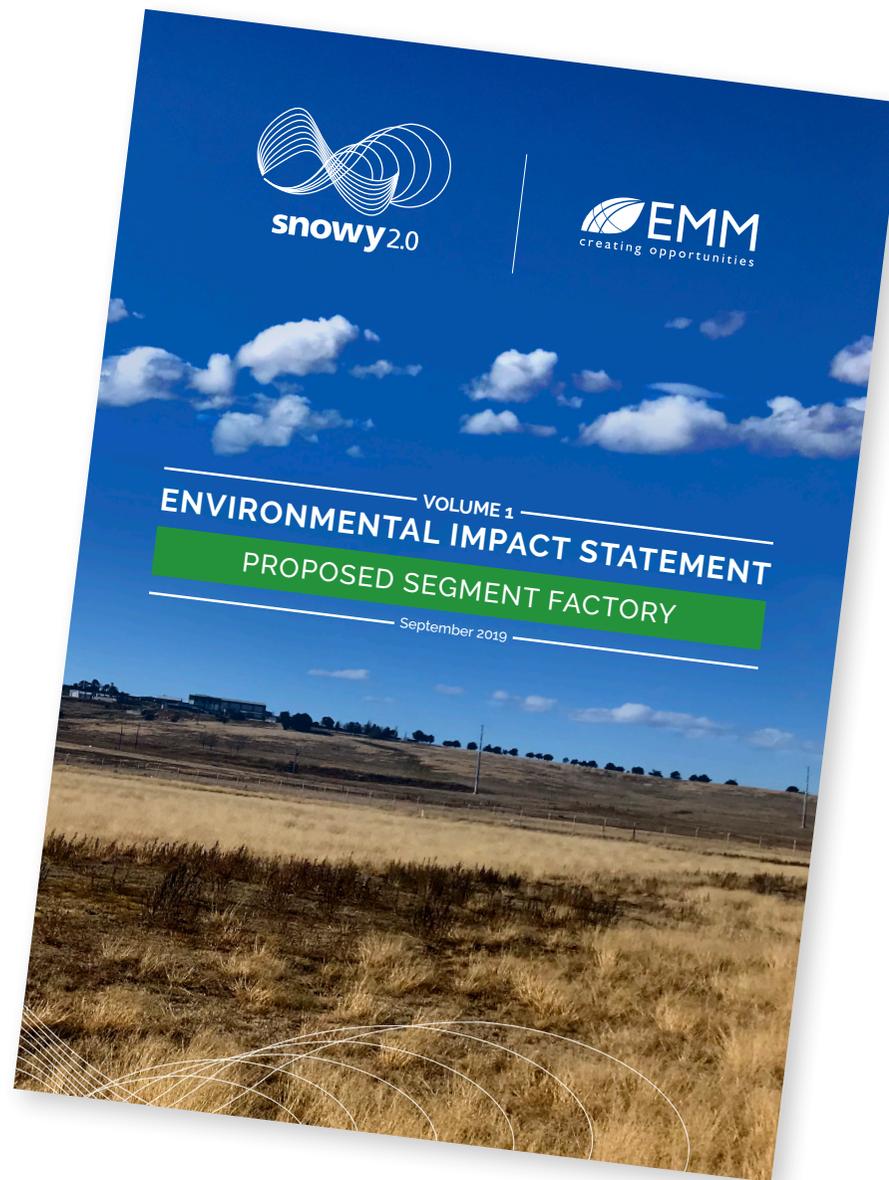
The decommissioning of the proposed segment factory at the conclusion of construction of Snowy 2.0 may result in a contraction in local economic activity. The significance of this contraction would depend on the economic structure and trends in the local economy at the time. Notwithstanding the above, Snowy Hydro aims to find an alternative industrial use of the site following the decommissioning phase. This use would be subject to a separate application and assessment process. One of the aims of an alternative use would be to maintain, where possible, the economic stimulus that the proposed segment factory has on the local economy.

Overall, the economic assessment demonstrates that the proposed segment factory would have a positive economic impact on the local economy during both its construction and operational phases.

7 MITIGATION MEASURES



An Environment Protection Licence (EPL) would be obtained for scheduled activities undertaken at the site and an Environmental Management Plan (EMP) would be prepared and implemented for activities relating to construction and operational impacts. The mitigation measures outlined in the EIS will be incorporated into the detailed design and construction of the proposed segment factory, and into the EMP.





8 JUSTIFICATION AND CONCLUSION

The development of Snowy 2.0 will help meet the future needs of the changing NEM and is consistent with Commonwealth and NSW strategic planning and policy objectives, including the NSW Renewable Action Plan.

With the planned retirement of coal-fired generation and new renewable generation coming online, the development of Snowy 2.0 will underpin the stability and reliability of the NSW electricity market and the broader NEM and ensure an orderly transition in a cost-effective way. Overall, the project will provide:

- 2,000 MW of dispatchable generating capacity and approximately 350,000 MWh of storage available to the NEM, enough to ensure the stability and reliability of the NEM even during prolonged weather events, such as wind or solar 'droughts';
- increased security and reliability of supply, firm capacity for more variable and lower energy costs which will ultimately benefit consumers; and
- social and economic benefits to the region.

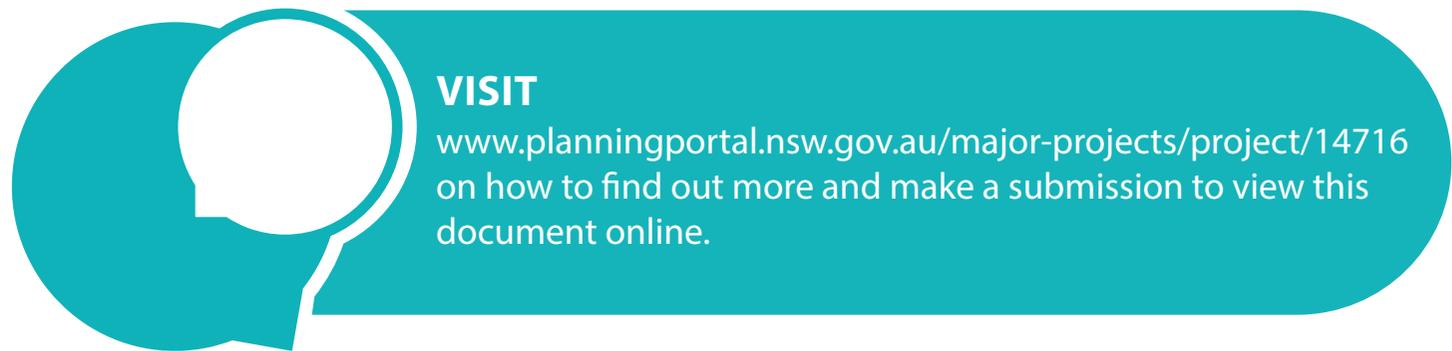
The proposed segment factory is critical to realise the potential benefits of Snowy 2.0, as it would produce concrete segments that are required to line the tunnels being excavated for the project.

In developing Snowy 2.0, Snowy Hydro and FGJV considered a range of alternative designs, layouts and locations for the proposed segment factory. In developing the layout of the factory, a DIAA process was undertaken with the guiding principles of avoiding and minimising environmental impacts where possible. Ultimately, the site and layout of the proposed segment factory was determined to be the preferred option because of the economic benefits the factory will make to the local community and the way it responds to the environmental conditions of the site and its surrounds.

Snowy Hydro's consultation on Snowy 2.0 with key stakeholders and the community commenced in mid-2017 and is ongoing. The results of stakeholder engagement for the proposed segment factory indicates that, in general, all stakeholders are supportive of the project due to the economic and social benefits that it would bring to the local area. These views have been confirmed by the economic assessment which demonstrates that the proposed segment factory would generate \$8 M in business turnover and 46 direct and indirect jobs during the construction phase, and \$147 M in business turnover annually and 252 direct and indirect jobs during the operational phase.

Notwithstanding the above, some stakeholders raised concerns regarding potential impacts associated with the proposed segment factory, particularly impacts associated with the increase in traffic movements.

Consistent with the principles of ecologically sustainable development, the proposed segment factory has been designed to avoid and minimise impacts where possible. Through the implementation of proposed mitigation, management and offsetting measures, this EIS demonstrates that the proposed segment factory could be undertaken without any significant impacts on the local environment. As such, the proposed segment factory is considered to be in the public interest.

A teal speech bubble graphic with a white circular callout on the left side. The callout contains the word "VISIT" in bold white text. To the right of the callout, the URL "www.planningportal.nsw.gov.au/major-projects/project/14716" is written in white, followed by the text "on how to find out more and make a submission to view this document online." in white.

VISIT
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