

**ENERGY IN TASMANIA
ANNUAL SECURITY REVIEW
2020–21 WATER YEAR**



NOVEMBER 2021

MONITOR AND ASSESSOR FOR ENERGY SECURITY

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Published November 2021

ISBN 978-0-7246-5534-2

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EXECUTIVE SUMMARY

The role of Monitor and Assessor for Energy Security (the Monitor and Assessor) was established under the *Energy Co-ordination and Planning Act 1995* (the Act) to report on energy security in Tasmania and, when necessary, commence the process for managing risks to energy security. Section 8A of the Act provides that the Tasmanian Economic Regulator is the Monitor and Assessor.

The Monitor and Assessor is required to carry out an annual energy security review and prepare a report which sets out the Monitor and Assessor's findings from its review of the most recent 12 month period, together with an assessment of the forthcoming 12 month period. As in earlier reports, this report covers the period from 1 November to 31 October of the following year, defined as the water year. This report reviews the period from 1 November 2020 to 31 October 2021 and makes an assessment of energy security in Tasmania for the following 12 month period.

The Act establishes two profiles for total energy in storage for Hydro Tasmania's system of dams across the year. The lower level profile, defined as the High Reliability Level (HRL), is set such that mainland Tasmania could withstand a six-month Basslink outage, coinciding with very low inflows to energy in storage. If storage levels fall below the HRL, there would be concerns about Tasmania's energy security over the medium-term. The higher level profile, the Prudent Storage Level (PSL), allows for an additional reserve above the HRL such that there is a low likelihood of the level of energy in storage falling below the HRL under normal operating conditions.

Energy in storage levels were above the PSL for all of the 2020-21 water year and increased strongly in the second half of the year due to very high inflows into Hydro Tasmania's dams. Consequently, the risks to energy security over 2020-21 were very low. At the end of the 2020-21 water year, energy in storage was 7 580 GWh, approximately 13 percentage points above the PSL for October and approximately 20 percentage points above the HRL for the month. The volume of energy in storage at the conclusion of the 2020-21 water year was 52.5 per cent of the maximum usable energy in storage, the highest level in the past five years. The 2021-22 water year has therefore commenced with very high levels of energy in storage.

Some recent developments have impacted, or have the potential to impact, on Tasmania's electricity supply and demand balance over the medium-term, including the 2021-22 water year. The completion of the Granville Harbour and Cattle Hill wind farm projects has significantly increased electricity generation the State. At the same time, there has been substantially reduced electricity generation at Hydro Tasmania's Tamar Valley Power Station (TVPS). Hydro Tasmania is currently in discussions with the Tasmanian Gas Pipeline Pty Ltd on future gas transportation capacity, reflecting its planned reduced reliance on TVPS for electricity generation.

The second issue relates to the status of Basslink. On 12 November 2021, companies in the Basslink group entered into voluntary administration. The Monitor and Assessor has been advised by the receivers that Basslink will continue to operate its business as usual and there will be no disruption to Basslink's operations. The Monitor and Assessor continues to monitor this situation closely.

Taking these factors into account, Tasmania's available electricity supply is expected to be sufficient to meet demand over the coming 12 months. With the current level of energy in storage and Tasmania's on-island electricity generation capacity, Tasmania energy security rating is assessed as high over 2021-22, including in the event of a temporary loss of generation from the Tamar Valley Power Station (TVPS) or a Basslink outage.

The Monitor and Assessor considers that there is a very low likelihood that energy in storage will fall below the HRL in 2021-22. In the unlikely event that energy in storage falls below the PSL in 2021-22, it is expected that this would be for short periods only. In summary, the Monitor and Assessor does not

expect that Tasmania will face energy security issues related to the level of energy in storage in the 2021-22 water year.

The Monitor and Assessor also does not expect that Tasmania will face supply issues relating to the natural gas market in Tasmania.

The Monitor and Assessor conducted a review of the PSL and HRL profiles during the 2020-21 water year, following the completion of the Granville Harbour Wind and Cattle Hill wind farms and the resultant impact on Tasmania's electricity generation. As required under the Act, the Monitor and Assessor reported on the outcome of the review to the Minister for Energy and Emissions Reduction, the Hon Guy Barnett MP (the Minister), in May 2021. The review proposed a new set of PSL and HRL profiles and the Minister accepted the Monitor and Assessor's advice.

The making of the Energy Co-ordination and Planning Order 2021 was published on 1 September 2021 and the revised profiles commenced as at 1 September 2021. Consequently, this report assesses energy in storage levels against the original profiles from November 2020 to August 2021 and against the revised profiles for the remainder of the water year. Further details regarding the Regulator's review are provided at section 4.3.

During the 2020-21 water year, the Monitor and Assessor released monthly dashboards reporting energy in storage levels against the relevant PSL and HRL on the Tasmanian Economic Regulator's website. Hydro Tasmania was not required to prepare any recovery plans during 2020-21.

KEY STATISTICS

Table 1: Key statistics for the water year (1 November 2020 to 31 October 2021) in GWh¹

	2019-20	2020-21
Energy in storage (as at end of water year)	6 411	7 580
Total inflow to Hydro Tasmania's storages	9 238	10 037
Tasmanian consumption ²	10 672	10 825
Hydro generation	9 809	8 910
Wind generation	1 419	1 927
Gas generation	100	31
Distributed generation	197	224
Basslink imports	1 101	1 404
Basslink exports	1372	1 398
Basslink net imports/(exports)	(271)	5

¹ Sources: 2019-20 and 2020-21 energy in storage and inflow data were sourced from Hydro Tasmania. Electricity demand and generation data were sourced from NEMreview.

² These values refer to the level of electricity generation required to meet annual consumption and therefore include transmission and distribution network losses.

I INTRODUCTION

Electricity generation in mainland Tasmania is dominated by hydro generation, which results in risks to energy security due to rainfall variability in hydro catchments and in the requirement for Hydro Tasmania to maintain appropriate levels of energy in storage.

During 2015-16, Tasmania experienced two concurrent low probability events that impacted on energy security, with the Basslink Interconnector out of service and record low rainfall during spring. These events resulted in Hydro Tasmania's water storages falling to historically low levels. Amongst other measures, the Tasmanian Government established the Tasmanian Energy Security Taskforce (Taskforce) to advise the Government on how it can better prepare for, and mitigate against, the risk of future energy security events.

The Taskforce's Final Report was released in 2017.³ The Report contained a range of recommendations, including a clearly defined framework for assessing and managing Tasmania's energy security (the Framework). A key element of the Framework is the monthly public reporting of energy in storage levels in Tasmania against the PSL and the HRL, details of which are set out in section 3.1.1.

The Tasmanian Economic Regulator was formally assigned the role of Monitor and Assessor under section 8A of the Act.

The Monitor and Assessor's functions under the Act are as follows:

- to monitor and provide reports in relation to energy in storage and other sources of energy;
- to evaluate, on a monthly basis, whether there is sufficient energy in storage and associated generation capacity to meet forecast electricity demand in the Tasmanian region of the National Electricity Market (NEM);
- to require Hydro Tasmania to provide recovery plans;
- to provide the Energy Security Co-ordinator with a copy of any recovery plan and the Monitor and Assessor's advice on the quality of that plan;
- to notify the Energy Security Co-ordinator when energy in storage levels are likely to drop below the HRL;
- to monitor and evaluate the PSL and HRL and advise the Minister whether changes in the levels are required; and
- such other functions as may be prescribed.

The Monitor and Assessor therefore provides an additional layer of public reporting on energy security matters. If the energy security risks are elevated, the Monitor and Assessor determines when Hydro Tasmania is required to prepare recovery plans. This public reporting includes monthly dashboards and this annual report. The annual report contains a review of the most recent water year and an assessment of the forthcoming water year, together with a summary of the Monitor and Assessor's performance during the year.

³ https://www.stategrowth.tas.gov.au/energy_and_resources/tasmanian_energy_security_taskforce/final_report

The Monitor and Assessor is also required to review any significant changes to the Tasmanian energy supply and demand balance and provide advice to the Minister to ensure that the framework for energy security remains appropriate.

The Act refers to energy security in the Tasmanian region of the NEM, which excludes the Bass Strait Islands. In most instances, such as in the assessment of energy in storage, references to Tasmania in this report are therefore to mainland Tasmania. Electricity supply on the Bass Strait Islands is the responsibility of Hydro Tasmania.

2 THE MONITOR AND ASSESSOR'S PERFORMANCE DURING 2020-21

As required under section 8C(2) of the Act, the Monitor and Assessor is to report on the performance of its functions and the exercise of its powers for the preceding 12 months. The Monitor and Assessor's functions, as set out under the Act, are detailed below, together with a report on the performance against each function for the preceding 12 months.

(a) to monitor and provide reports in relation to energy in storage and other sources of energy;

The Monitor and Assessor published monthly reports (dashboards) on Tasmanian's energy security on the Regulator's website in the first week of each month. These dashboards set out Tasmania's energy in storage levels at the start of each month against relevant PSL and HRLs, together with the electricity generation mix for each month.

(b) to evaluate, on a monthly basis, whether there is sufficient energy in storage and associated generation capacity to meet forecast electricity demand in the Tasmanian region of the NEM;

The monthly energy security dashboards evaluated whether there was sufficient combined energy in storage and generation capacity from other sources to meet forecast electricity demand in the Tasmanian region of the NEM. The dashboards also considered whether any additional activity by the Monitor and Assessor was required, such as increased monitoring or directing Hydro Tasmania to prepare a recovery plan.

(c) to require Hydro Tasmania to provide recovery plans and provide the Energy Security Co-ordinator with a copy of any recovery plan and the Monitor and Assessor's advice on the quality of the plan;

Under the Act, the Monitor and Assessor may require Hydro Tasmania to prepare a recovery plan if the level of energy in storage is below the PSL, and the Regulator is of the opinion that it is reasonably possible that it will fall below the HRL. The Regulator must require Hydro Tasmania to prepare a recovery plan if the Regulator is of the opinion that it is probable that the level of energy in storage will fall below the HRL.

During 2020-21, energy in storage did not fall below the PSL. The Monitor and Assessor therefore did not require Hydro Tasmania to provide a recovery plan.

(d) to notify the Energy Security Co-ordinator when energy in storage levels are likely to drop below the HRL;

During 2020-21, the Monitor and Assessor did not consider that energy in storage levels were likely to drop below the HRL and therefore no notification was issued to the Energy Security Co-ordinator.

(e) to monitor and evaluate the PSL and HRL and advise the Minister whether changes in the levels are required;

The Monitor and Assessor conducted a review of the PSL and HRL profiles during the 2020-21 water year, due to the commencement of the two new large scale wind farms in 2019-20. Revised profiles were provided to the Minister in May 2021 and these profiles were accepted and implemented as at September 2021. The review is discussed in more detail in Chapter 4.

(f) such other functions as may be prescribed.

No other functions have been prescribed.

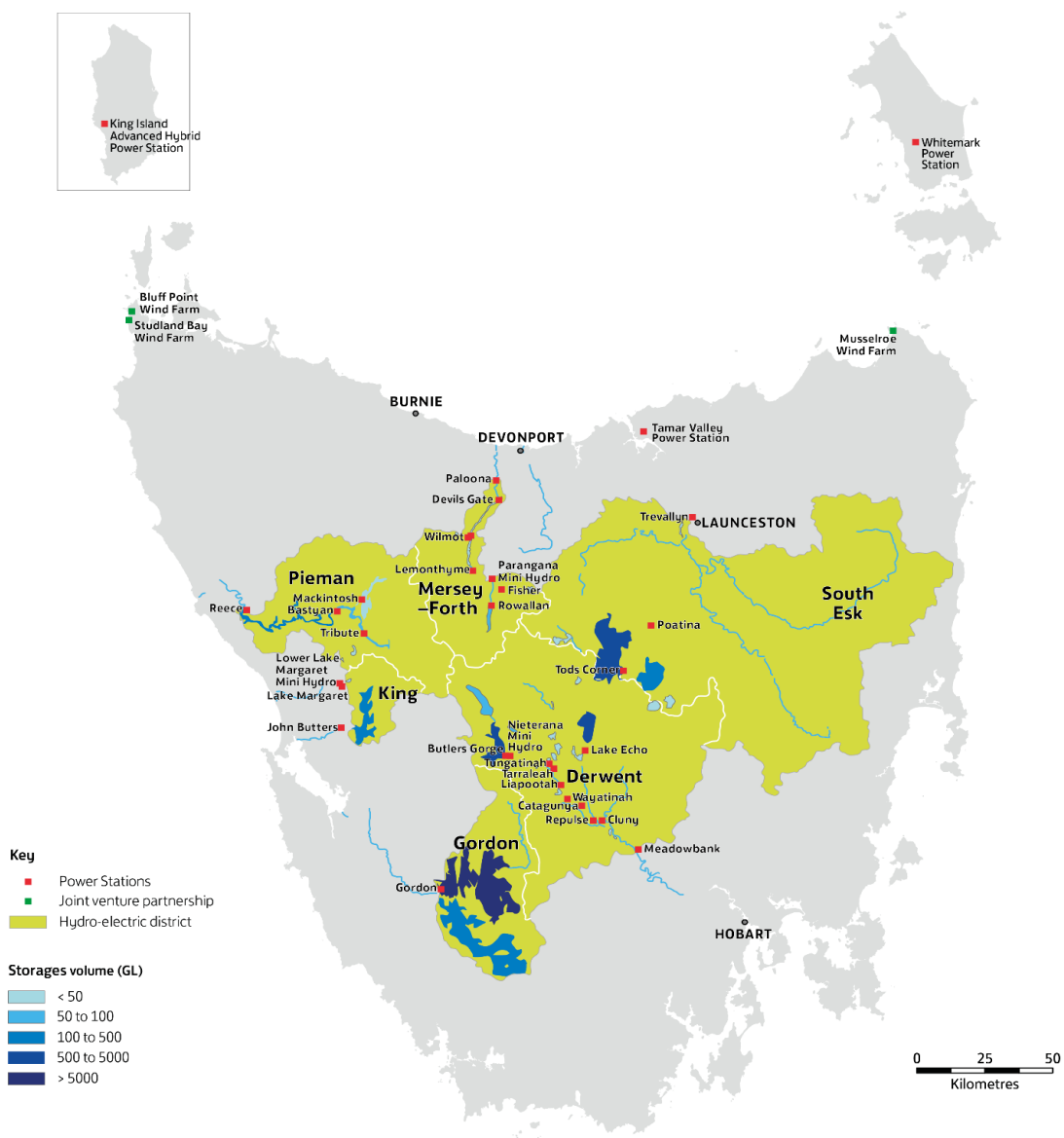
The Monitor and Assessor was not required to exercise any powers under the Act other than those necessary to perform the functions as set out above.

3 WATER YEAR 2020–21

3.1 Energy in storage

Hydro Tasmania’s hydro generation power stations are in six separate catchment areas. Most energy in storage is in *yingina*/Great Lake and Lake Gordon/Lake Pedder. Hydro Tasmania’s power stations are supported by several seasonal water storages and some run-of-river systems that use seasonal flows. Figure 1 below shows Hydro Tasmania’s catchment areas and major generators within the state, with the exception of Cattle Hill wind farm in central Tasmania, and Granville Harbour wind farm in western Tasmania.

Figure 1: Hydro Tasmania’s catchment areas and power stations



3.1.1 Storage level profiles

The HRL is a set of monthly storage levels above which Tasmania's electricity supply would be sufficient to meet expected demand in the event of a six-month Basslink outage concurrent with very low inflows to energy in storage, while avoiding extreme environmental risk to *yingina*/Great Lake.

The PSL incorporates additional storage above the HRL such that there is a low likelihood of energy in storage entering the HRL under normal operating conditions.

The Monitor and Assessor conducted a review of the PSL and HRL profiles during the 2020-21 water year, due to the commencement of exports from the Granville Harbour Wind Farm and the Cattle Wind Farm and the resultant impact on Tasmania's energy mix. As required under the Act, the Monitor and Assessor reported on the outcome of the review to the Minister in May 2021. The review proposed a new set of PSL and HRL profiles and the Minister accepted the Regulator's advice. The making of the *Energy Co-ordination and Planning Order 2021* was subsequently published on 1 September 2021, and the revised profiles commenced as at 1 September 2021. As such, this report assesses energy in storage against the original profiles from November 2020 to August 2021, and the revised profiles from September 2021. Further detail regarding the Regulator's review is provided at section 4.3.

Figure 2: Energy in storage during the 2020-21 water year

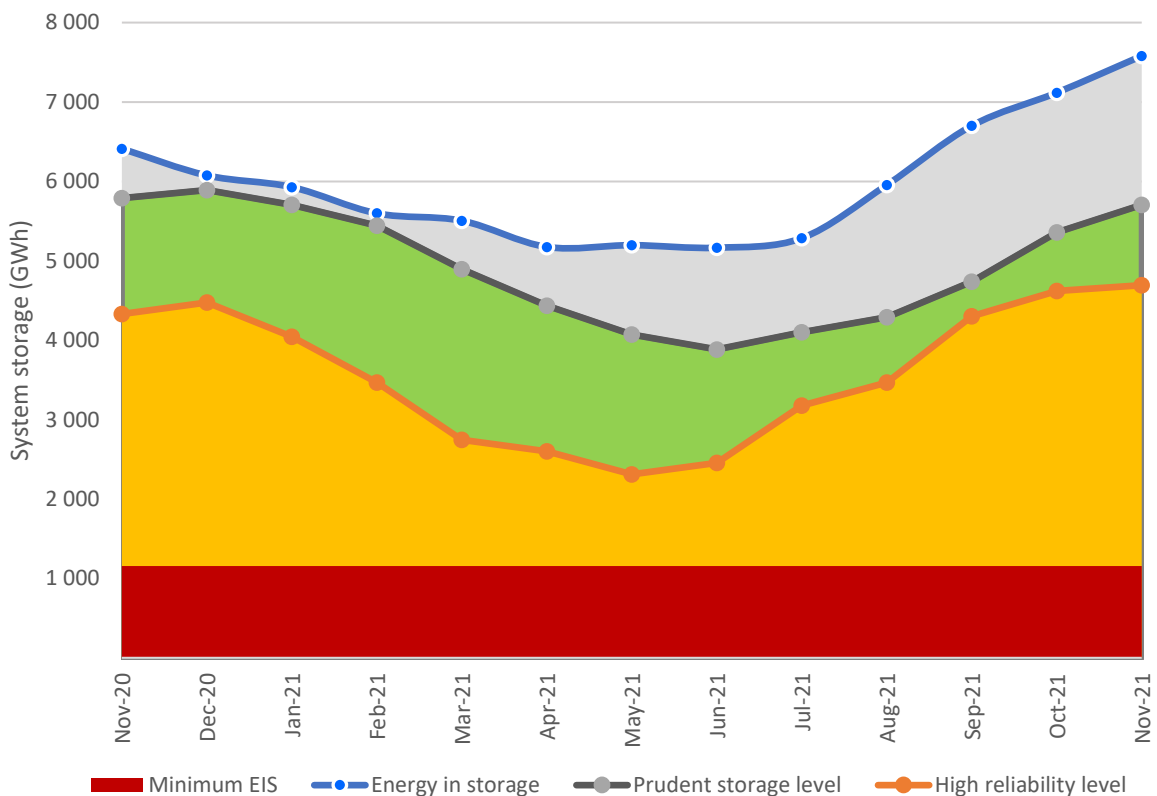


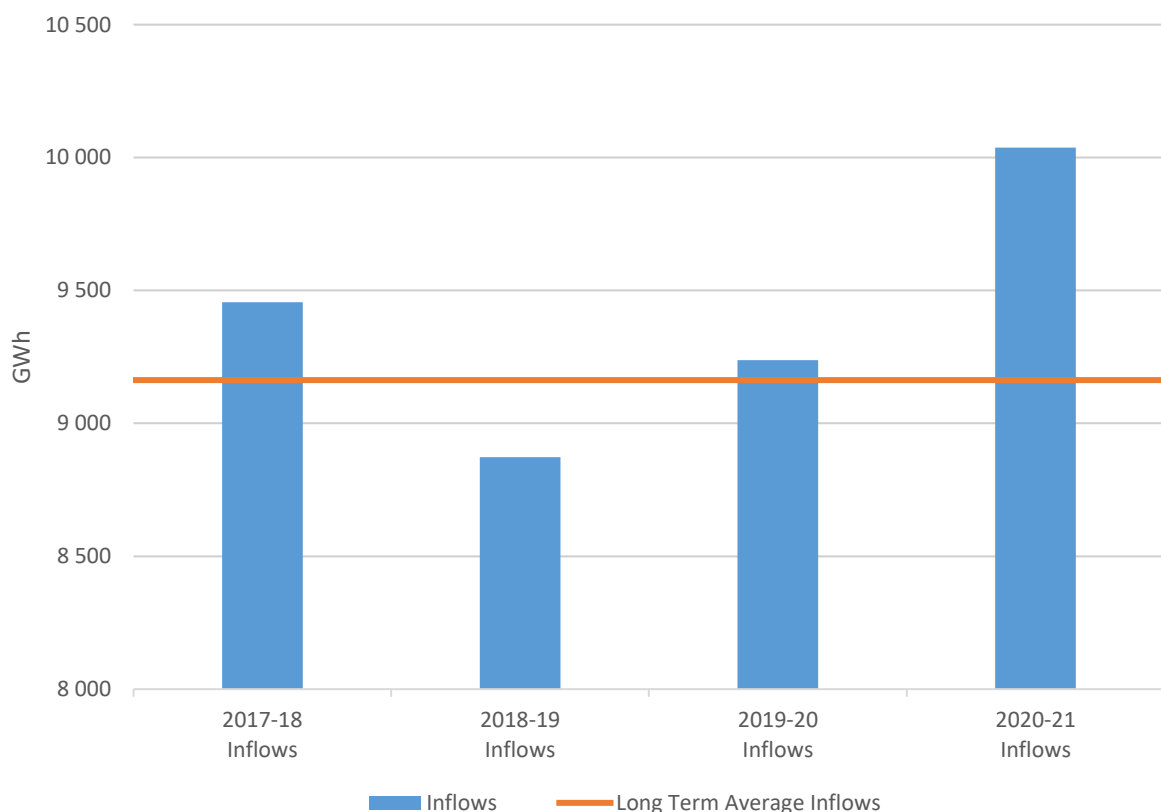
Figure 2 above depicts the total energy in storage in Tasmania at the beginning of each month compared to the HRL and PSL for that month, as well as the minimum energy in storage (EIS), for the 2020-21 water year. The minimum EIS, also known as the Great Lake Extreme Environmental Risk Zone, is the minimum level at which extreme risks to aquatic biota and their environment can be avoided. For November 2020 to August 2021, the original profiles are displayed. For September and October 2021, the revised profiles are displayed.

As shown in Figure 2, monthly levels of energy in storage remained above the PSL over the 2020-21 water year. As at 1 November 2021, energy in storage was 7 580 GWh, representing 52.5 per cent of total usable energy in storage. This was approximately 13 percentage points above the PSL and approximately 20 percentage points above the HRL for that month. This was the highest level of energy in storage in the past five years.

3.1.2 Inflows into Hydro Tasmania storages

Total inflow, or yield, for the 2020-21 water year was 10 037 GWh, which was 8.7 per cent higher than the 2019-20 level and 11.5 per cent above the long-term (24 year) average (Figure 3).

Figure 3: Total inflows into Hydro Tasmania’s storages (GWh)



3.1.3 Electricity consumption

Tasmania’s electricity consumption is dominated by large industrial customers involved in industries such as metal smelting, mining and paper production. According to the Energy Security Taskforce, four large major industrial customers account for 54 per cent of the State’s electricity load. Residential and business customers connected to the distribution network account for 19 per cent and 23 per cent of Tasmania’s load respectively.⁴

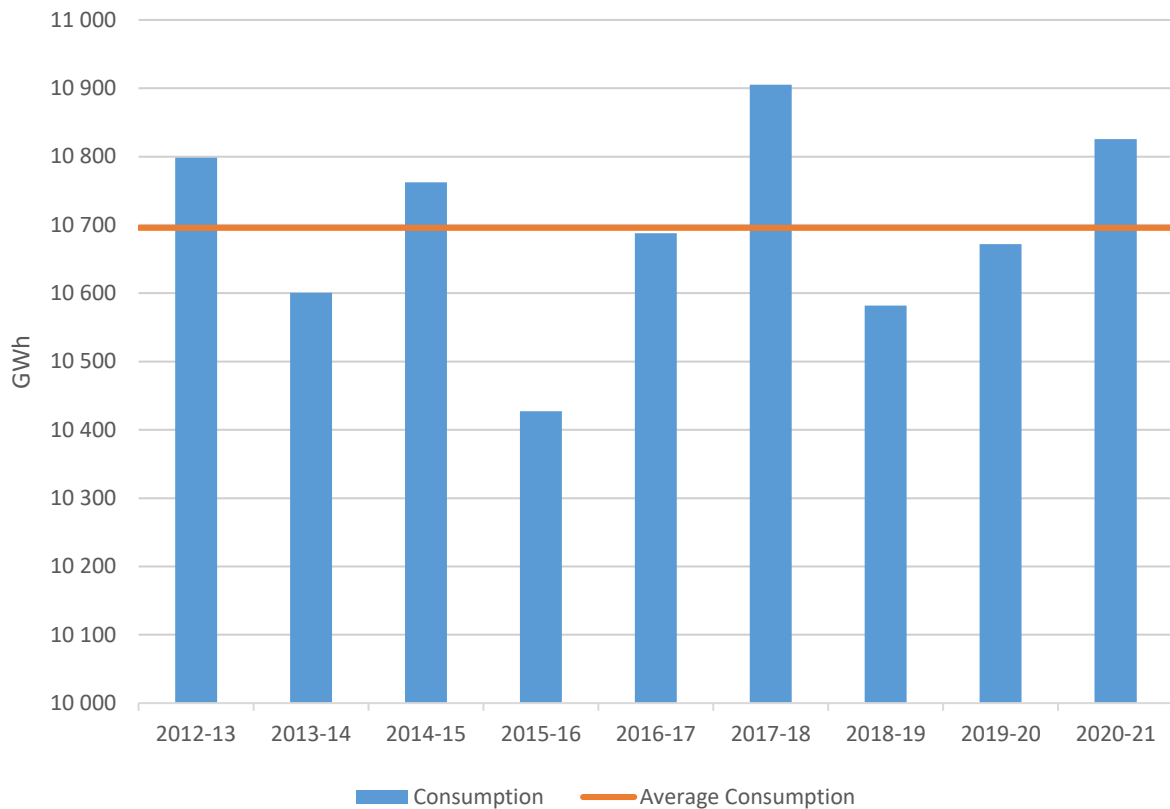
Tasmania’s electricity consumption for the 2020-21 water year was 10 825 GWh, representing a 1.44 per cent increase on the 2019-20 water year (10 672 GWh). These consumption estimates include

⁴ Tasmanian Energy Security Taskforce Final Report, 2017, page 83.

transmission and distribution network losses and therefore represent the total volume of generation needed to satisfy demand.

Year-to-year variations in consumption are due to several factors, including the weather in Tasmania and changes in load for larger commercial and industrial customers. Tasmanian annual consumption over the previous nine years has been relatively stable at around 10 700 GWh, with no discernible upward or downward long term-trend (Figure 4).

Figure 4: Tasmanian annual electricity consumption (GWh) since the 2012-13 water year



3.1.4 Basslink

Basslink is a high voltage direct current electricity interconnector that connects the Tasmanian power system to the Victorian power system via transmission assets and transfer stations. Basslink allows the export of Tasmanian generated electricity into the NEM and the import of mainland-generated electricity into Tasmania. There were no unplanned outages over the 2020-21 water year.

3.1.5 Electricity generation mix

Table 2 below shows the generation mix in Tasmania for the 2019-20 and 2020-21 water years.

Table 2: Tasmanian generation mix (GWh)

Generation source	2019-20	% of total	2020-21	% of total
Hydro	9 809	85.11%	8 910	80.33%
Wind	1 419	12.31%	1 927	17.37%
Gas	100	0.87%	31	0.28%
Distributed Generation ⁵	197	1.71%	224	2.02%

Over the 2020-21 water year, hydro generation accounted for 80.3 per cent of total on-island generation. Despite high inflows into Hydro Tasmania's dams, hydro generation was almost 10 per cent below the level of the previous water year. This accounts for the strong increase in the level of water in storage by the end of the year.

Wind generation provided 17.4 per cent of on-island generation. The share of wind generation increased, partly due to the contributions from the Cattle Hill and Granville Harbour windfarms, which commenced operations during the 2019-20 water year but ramped up electricity generation in 2020-21 with the completion of the projects.

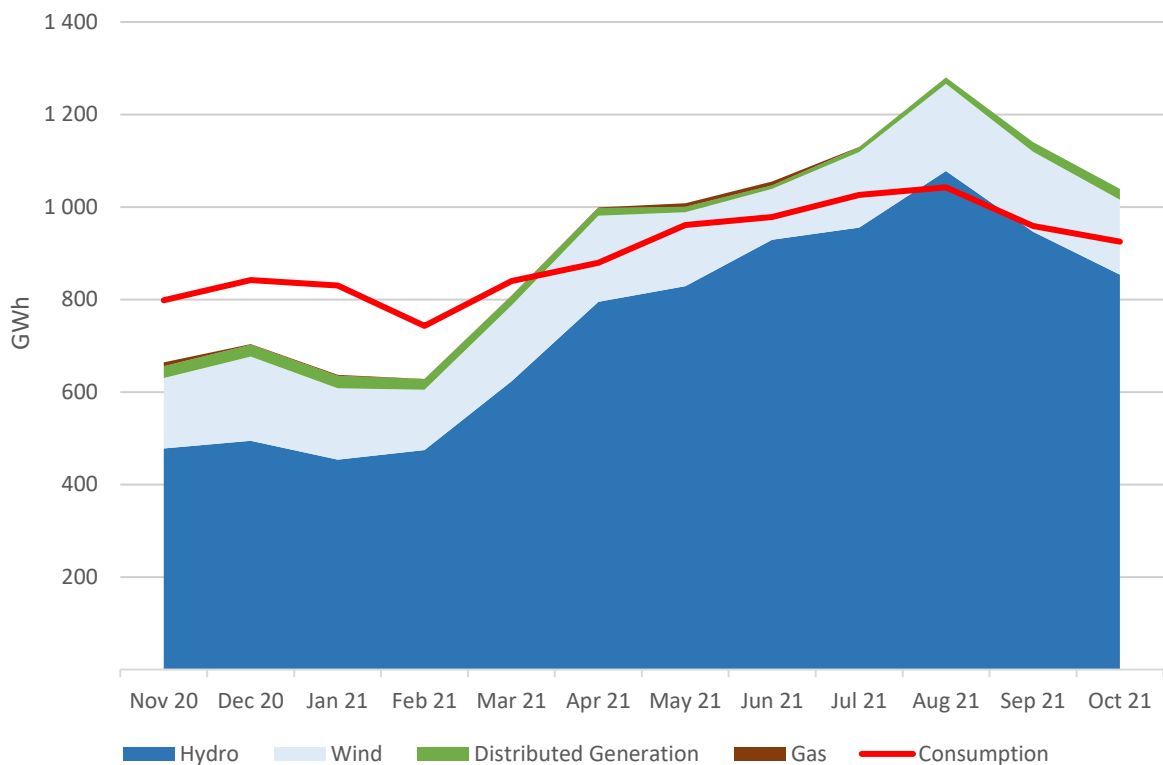
Output from distributed generation systems reduces the requirement for generation from other sources. Table 2 shows that distributed generation makes a small contribution to total generation in Tasmania. Gas-fired electricity generation at the TVPS continued to decline in 2020-21. In 2019-20 and 2020-21 the contribution provided by distributed generation exceeded that provided by TVPS.

Figure 5 shows Tasmanian consumption and the generation mix during 2020-21. Basslink was in net export mode (from Tasmania), on a monthly basis, when total generation exceeded consumption in Tasmania (generation above the red line) and in net import mode when total generation was less than consumption (generation below the red line).

For the first five months, Basslink was largely in net import mode, while for the following seven months it was in net export mode. Overall, imports marginally exceeded exports (by 5 GWh) for the 2020-21 water year. This compares with net exports of 271 GWh for the 2019-20 water year.

⁵ Distributed generation is the total non-scheduled generation in a region and comprises small-scale wind, solar and hydro plant.

Figure 5 - Tasmanian generation mix and consumption (GWh) over the 2020-21 water year



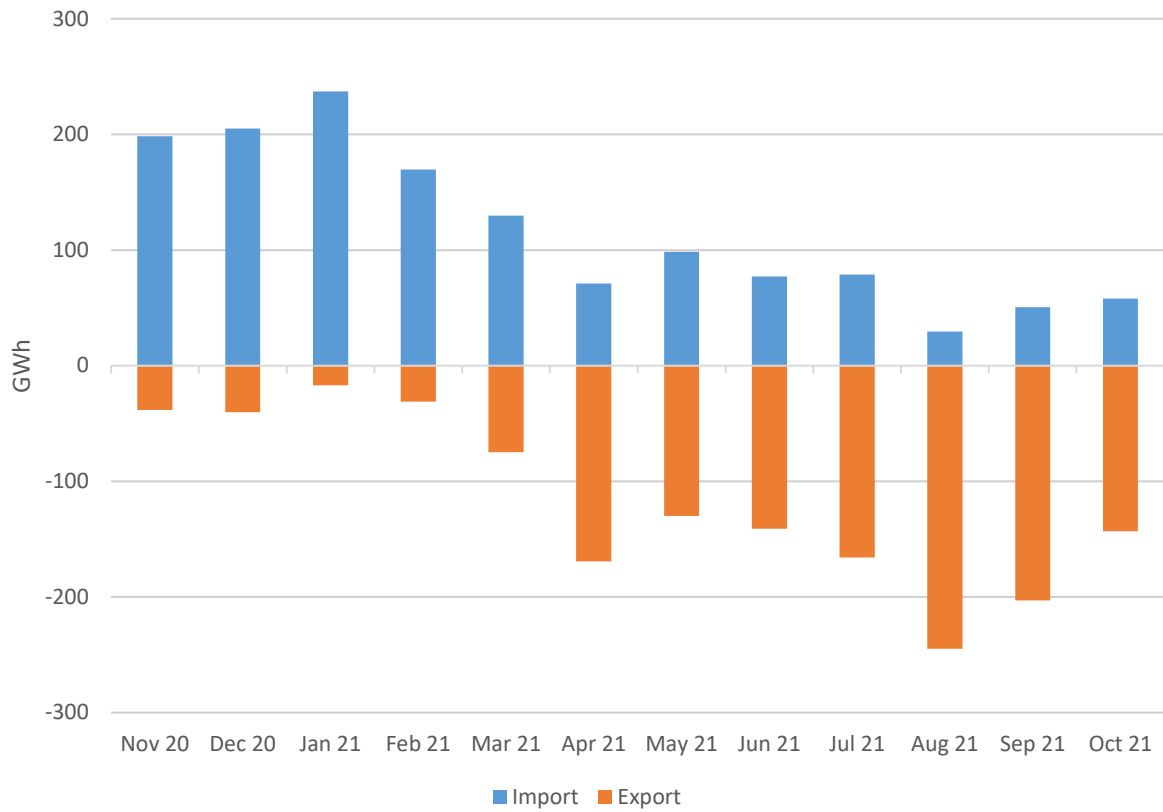
3.2 Discussion

At the start of the 2020-21 water year, total energy in storage was 44.4 per cent of the maximum storage level, which was 4.3 percentage points above the PSL that then applied.⁶

Inflows were lower than in the previous year during the first half of the year but much higher than in the previous year during the second half of the year. This resulted in net imports during the first half of the year and net exports during the second half of the year. This is shown in Figure 6 below.

⁶ The revised PSL for January is almost identical to the original PSL.

Figure 6 - Tasmanian imports and exports (GWh) over the 2020-21 water year



The Monitor and Assessor did not increase monitoring activities over 2020-21 and did not require Hydro Tasmania to prepare a recovery plan. Therefore, the Monitor and Assessor was not required to exercise any powers under the Act during 2020-21.

4 ENERGY SECURITY OUTLOOK

4.1 Forecast energy in storage

Given the high energy in storage at the start of the 2021-22 water year, the Monitor and Assessor considers that there is a low likelihood that energy in storage will fall below the HRL in 2021-22. Inflows into Hydro Tasmania's dams would have to be significantly below long-term average levels for this to occur.

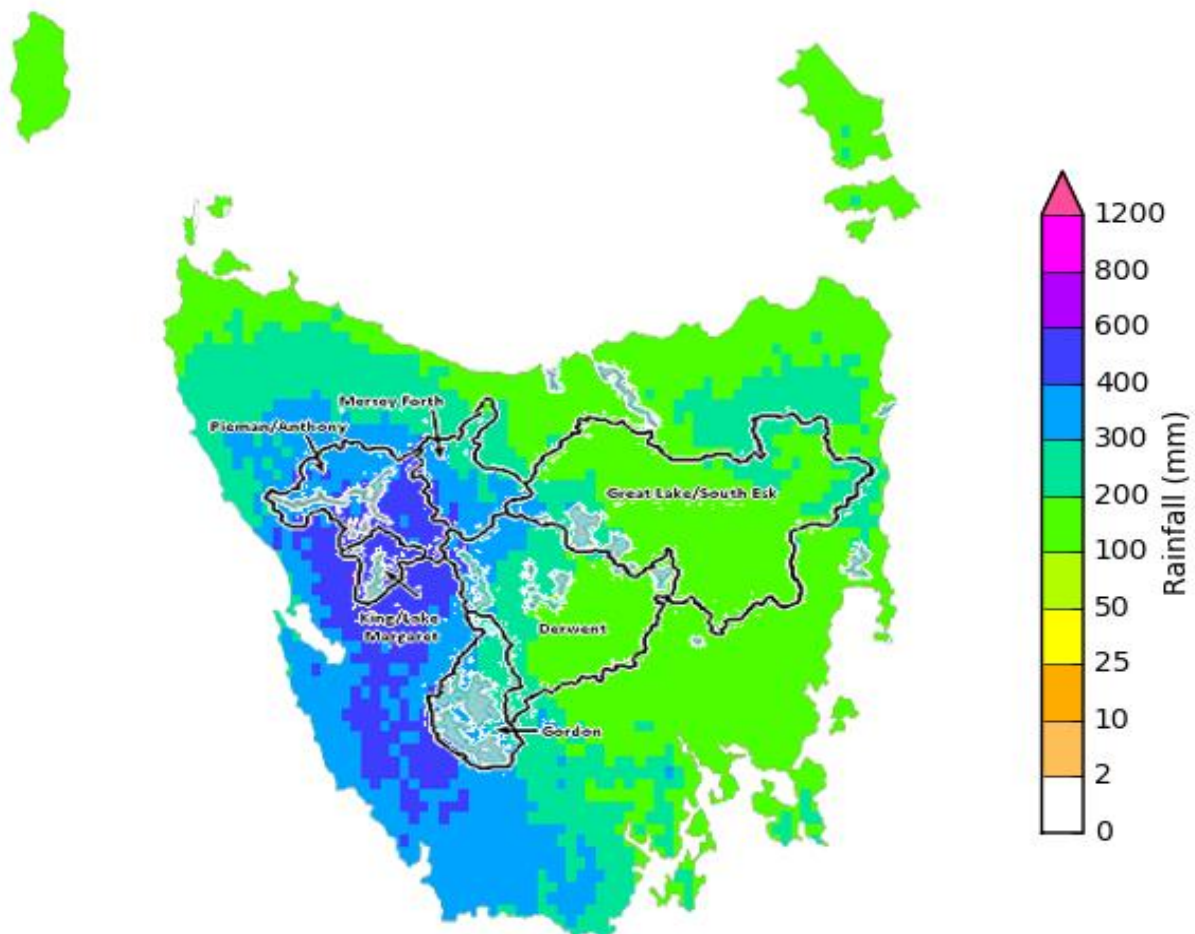
Having consulted with Hydro Tasmania, the Monitor and Assessor considers that it is unlikely that energy in storage will fall below the PSL in 2021-22. This would only occur if there were periods of unusually low rainfall and a corresponding decrease in inflows. If energy in storage does fall below the PSL, it is likely to be for short periods only.

The following sections set out the basis for this assessment.

4.1.1 Forecast rainfall in Hydro Tasmania catchments

Rainfall levels are consistently and significantly higher on the western side of Tasmania, which is where the catchment areas for Hydro Tasmania's larger dams are located. Figure 7 shows the median rainfall levels across Tasmania as estimated by the Bureau of Meteorology (BOM).

Figure 7 - Median rainfall levels in Tasmania (1990 to 2012)

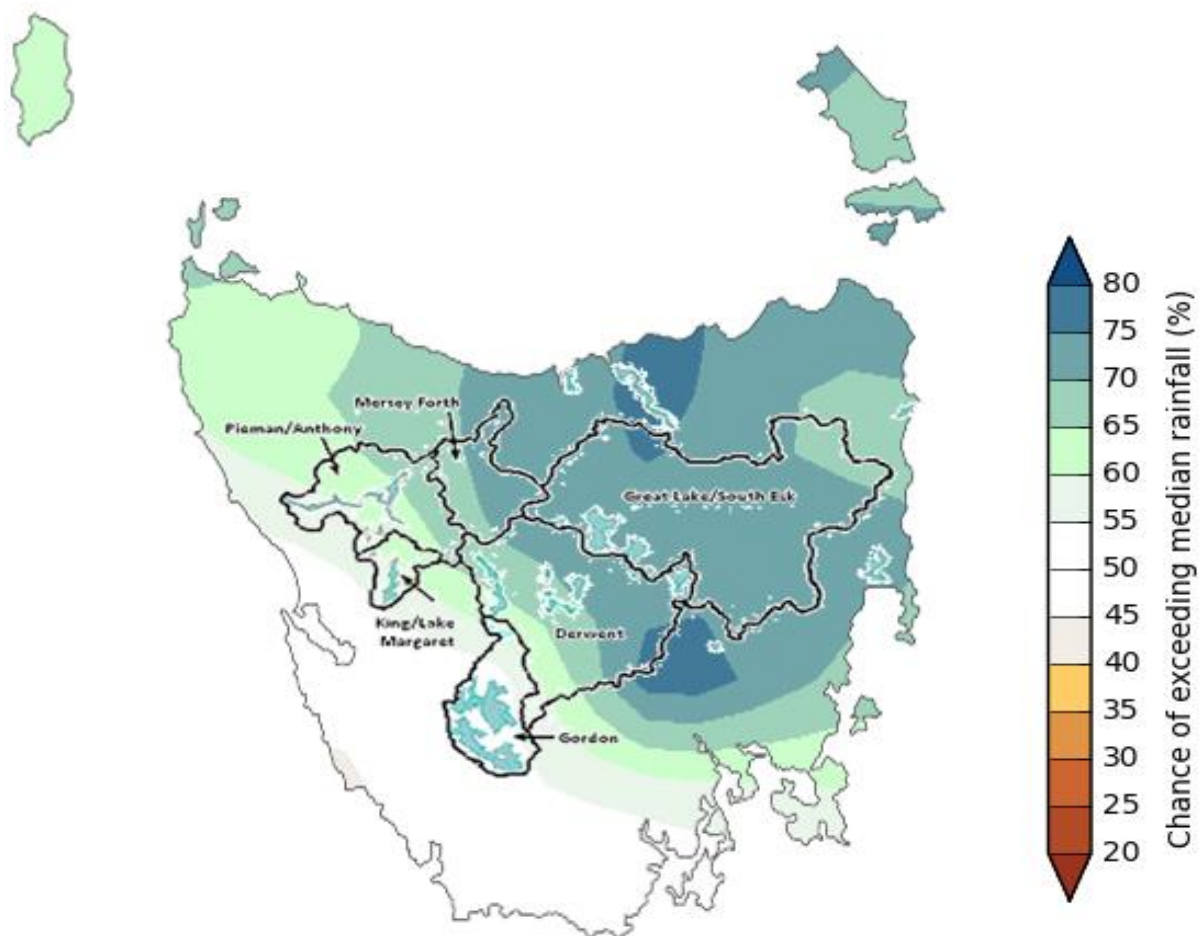


Source: Bureau of Meteorology

The BOM makes regular assessments of whether Tasmania’s rainfall is likely to be above or below the median levels over a following three month period. The most recent assessment from the BOM, for the period from December 2021 to February 2022, is that there is a greater than 60 per cent probability that rainfall will be above the median level across most of Tasmania, apart from in south-west Tasmania where there is roughly equal chances of rainfall being above or below the median (Figure 8). As most of the catchment areas are located in central and West Tasmania, this suggests higher than average inflows into Hydro Tasmania’s storages.

It should be noted, however, that over this three month summer period, rainfall levels tend to be lower than over some other three month periods, those that include the winter and spring months.

Figure 8: Rainfall in Tasmania - Bureau of Meteorology assessment of the likelihood of above median levels from December 2021 to February 2022



[Source: Bureau of Meteorology](#)

4.1.2 Forecast consumption

The most recent electricity consumption forecasts from the Australian Energy Market Operator, prepared for the Electricity Statement of Opportunities and released on 30 August 2021, are for consumption in Tasmania at around 10 788 GWh in 2021-22 and for a marginal increase to 10 963 GWh in 2022-23. These forecasts include allowances for network losses. A pro-rata adjustment of these forecasts to obtain an estimate for the 2021-22 water year produces a consumption estimate of 10 846 GWh, which is almost identical to the 2020-21 consumption level of 10 825 GWh.

4.1.3 Tamar Valley Power Station

The TVPS at Bell Bay provides an additional source of electricity generation and therefore contributes to Tasmania's energy security. Electricity generation has been decreasing at TVPS, which has coincided with the development of wind generation in the State.

Hydro Tasmania owns and operates the TVPS, which is the only large thermal generator in Tasmania and runs on natural gas supplied by the Tasmanian Gas Pipeline (TGP). The pipeline transports natural gas from the Longford Plant in Victoria to Bell Bay.

The TVPS consists of a combined cycle gas turbine (CCGT) generation plant with a 208 MW generating capacity and four open cycle gas turbine (OCGT) units with a combined generating capacity of 178 MW. Three of the OCGT units can also act as synchronous condensers⁷ providing system control.

The CCGT is operated when, for Hydro Tasmania, it makes commercial sense to do so. When it is not in regular service Hydro Tasmania can return the CCGT to service at its discretion with less than three months' lead time. The OCGT units remain available at all times, providing quick start generation capability.

As noted in section 3.1.5 above, output from the TVPS accounted for approximately 0.3 per cent of electricity generation in Tasmania during 2020-21, continuing the decline in its contribution to Tasmania's generation mix over the previous four years.

The current gas transportation contract between Hydro Tasmania and Tasmanian Gas Pipeline Pty Ltd, the owner of the TGP, ends on 31 December 2021. The parties are currently engaged in commercial negotiations over options for post-2021. Hydro Tasmania has advised that it plans to reduce its use of TVPS for electricity generation.

The review of HRL and PSL profiles during 2020-21, discussed in Chapter 4, included significantly lower levels of electricity generation from TVPS than in the initial HRL and PSL profiles, reflecting the recent generation from TVPS.

4.1.4 Energy supply capability

This section compares the forecast available energy supply against the 12 month demand forecast for the 2021-22 water year. The assumptions underlying this approach are set out in Table 3 below.

⁷ A synchronous condenser is a large machine with a spinning shaft, electromechanically coupled to the grid, that can boost system strength and assist with voltage control and inertia (<https://energylive.aemo.com.au/Energy-Explained/Synchronous-condensers>).

Table 3: Energy supply capability assumptions for the 2021-22 water year

Parameter	Assumptions
Consumption ⁸	10 846 GWh
Wind generation	1 941 GWh
Energy in storage above HRL at the start of 2021-22	2 888 GWh
Low inflow scenario	6 665 GWh
Basslink net imports under low inflow scenario	2 714 GWh
TVPS generation low inflow scenario	140 GWh
Average inflow scenario	9 084 GWh
Basslink net imports under average inflow scenario	1 000 GWh
TVPS generation average inflow scenario	70 GWh

Average hydro inflows are assumed to be 9 084 GWh per annum, derived using Hydro Tasmania supplied data from 1997 to 2019.⁹ The low inflow scenario, at 6 665 GWh, is the mean annual inflow minus two standard deviations. This implies there is around a 97.5 per cent probability that the inflow in 2021-22 will be above the low inflow level.

Total wind generation is assumed to be 1 941 GWh for the 2021-22 water year. This estimate assumes that all turbines in each large-scale wind farm operating in Tasmania are operating during the 2021-22 water year.

Average annual Basslink imports are the equivalent of an additional source of electricity generation for Tasmania and in recent years have been around 1 000 GWh. This level has been assumed for the 2020-21 water year. This is equivalent to 228 MW of average imports across Basslink for 50 per cent of the year. The low inflow scenario assumes 2 714 GWh of Basslink imports, equivalent to 413 MW of average imports for 75 per cent of the year. Basslink has a long-term average import capacity of around 450 MW.

Generation from the TVPS is assumed to be 70 GWh under the average inflow scenario, reflecting recent generation levels at TVPS. Under the low inflow scenario, TVPS output is assumed to be 140 GWh. The average inflow assumption is consistent with the estimate used in the Monitor and Assessor's review of the HRL and PSL profiles, approximately equivalent to the average gas usage during the 2019-20 and 2020-21 water years.

Generation from distributed generation systems such as solar PV and other behind-the-meter energy sources are not included. This is because the estimates of demand used in this report do not include consumption from distributed generation systems as the purchase of this energy is not from AEMO and is therefore not reported as being made via the NEM. As the absolute level of generation in Tasmania from distributed generation systems is relatively small, at an estimated 2 per cent of total generation, annual changes in output from distributed generation systems are not expected to have a material effect on overall energy security.

⁸ This value refers to the level of electricity generation required to meet forecast annual consumption and therefore includes transmission and distribution network losses.

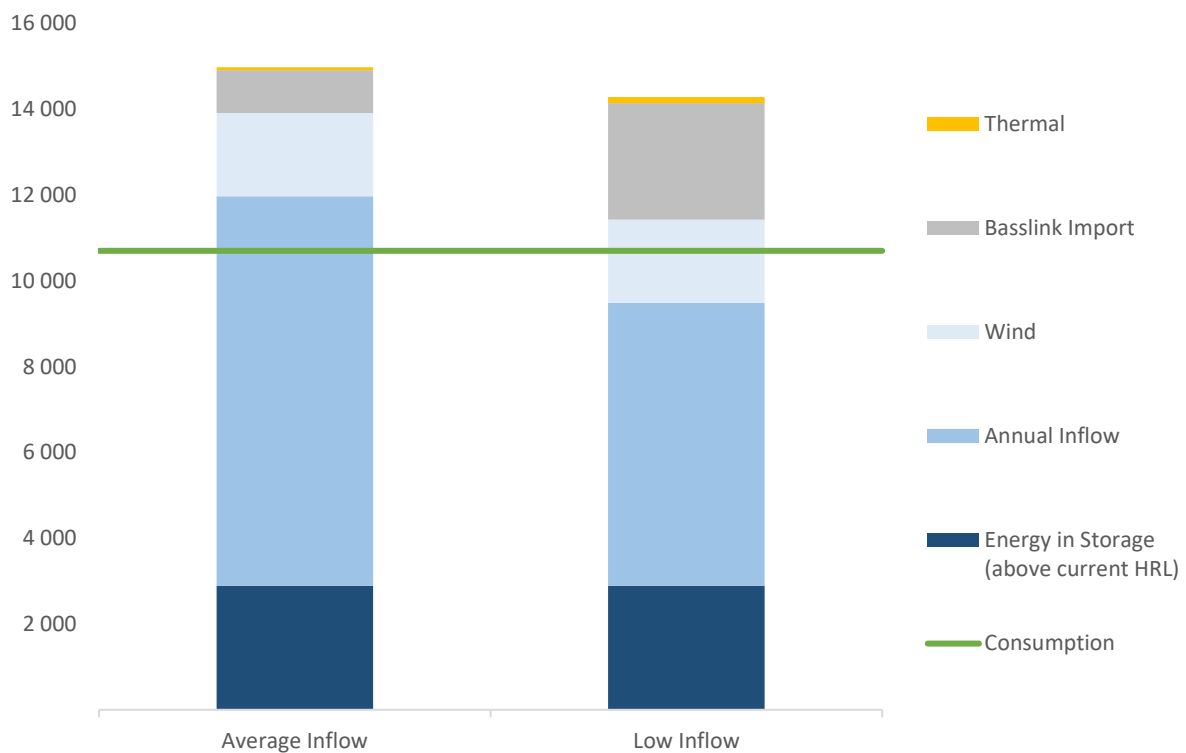
⁹ Tasmanian Energy Security Taskforce Final Report, 2017.

At the start of the 2021-22 water year, energy in storage was around 2 888 GWh above the HRL. This represents additional energy supply capability that can be utilised without incurring an unacceptable energy security risk. It is assumed that other sources of energy, as set out above, would be utilised before energy in storage falls below the HRL level.

The results are presented in Figure 9 below. Under both the low inflow and the average inflow scenarios, energy supply capability in Tasmania in 2021-22 is expected to be significantly above forecast demand.

Hydro Tasmania has advised that energy in storage is unlikely to fall below the PSL and it has options available to return energy in storage to levels above the PSL in the short to medium-term. The likelihood that energy in storage could decline below the HRL, which is substantially below the PSL, during the 2021-22 water year has been assessed by Hydro Tasmania as very low. The Monitor and Assessor agrees and has assessed the overall level of energy security risk as very low over the 2021-22 water year.

Figure 9: Energy supply capability in Tasmania 2021-22 water year (GWh)



4.2 Potential future developments

This section discusses potential future developments that may affect Tasmania's long-term energy security.

The Energy Co-ordination and Planning Act was amended in 2020 to include targets for the generation of electricity using renewable energy sources in Tasmania. These targets are 15 750 GWhs by 2030 and 21 000 GWhs by 2040. This compares with 11 061 GWhs produced by renewable energy resources in the 2020-21 water year. A significant increase in generation from renewable energy sources is therefore required to meet these targets.

4.2.1 Basslink

On 12 November, 2021, the Basslink group announced that it had been placed in voluntary administration. The contract between Hydro Tasmania and Basslink Pty Ltd contains provisions which enable the interconnector to continue to operate through this process.

The receivers and managers, at KPMG, wrote to the Monitor and Assessor on the same day advising that Basslink will continue to operate its business as usual and that there will be no disruption to the operations of the interconnector as a result of the appointment of the receivers. They further advised that they intend to ensure that Basslink will continue to comply with all of its obligations under its Tasmanian Transmission Licence.

The Monitor and Assessor will continue to closely monitor any developments relating to Basslink and their likely future impact on Tasmania's energy security.

4.2.2 The proposed Marinus Link

Marinus Link is a proposed 1 500 MW capacity undersea electricity interconnector that would provide a further interconnection between Tasmania and Victoria. This represents around three times the capacity of Basslink. The Marinus Link would provide substantially increased opportunities for renewable energy from Tasmania to contribute to meeting energy demand in mainland Australia.¹⁰

The effect of an interconnector such as the Marinus Link is that the Victorian and Tasmanian electricity markets would be much more closely integrated than they currently are. The total capacity of the interconnectors, based on the Marinus Link proposal, is greater than the maximum demand recorded in Tasmania to date.

Tasmania's energy security prospects would be improved significantly if the Marinus Link interconnector were constructed. A second interconnector would, for example, significantly reduce the risk that Tasmania would not be able to import electricity from Victoria. The Marinus Link could also lead to significantly higher investment in renewable electricity generation in Tasmania due to greater export-potential to the larger, mainland NEM jurisdictions, which would further decrease energy security risk in Tasmania.

The Monitor and Assessor will continue to monitor the project's development and its potential impact on Tasmania's energy security, noting that the proposed commencement date is not until the late 2020s.

¹⁰ <https://www.marinuslink.com.au/>

4.2.3 New wind generation

There are additional large-scale wind projects proposed for construction in Tasmania. The most significant of these are the Robbins Island wind farm with a generation capacity of up to 900 MW, and Jim's Plains Renewable Energy Park with a generation capacity of up to 240 MW (up to 200 MW of wind generation and up to 40 MW of solar energy).¹¹ These projects would more than double Tasmania's wind generation capacity. Some of these projects may be driven by large increases in load growth in Tasmania, while others may be contingent on an additional interconnector from Tasmania to Victoria such as the proposed Marinus Link.

4.2.4 Battery of the Nation

Battery of the Nation is a suite of projects being developed by Hydro Tasmania to examine how Tasmania's hydro-electric power system can be redeployed and augmented with pumped hydro energy storage to meet the needs of the transitioning national power system.

Hydro Tasmania has stated that it has hundreds of megawatts of latent capacity and opportunities to optimise its existing asset base and build pumped hydro energy storage to increase its electricity exports to mainland Australia. Hydro Tasmania has also stated that additional interconnection such as the Marinus Link would support the expansion of Tasmania's hydroelectric power system.¹²

In January 2021, Hydro Tasmania announced that Lake Cethana had been selected as Hydro Tasmania's preferred site of its top three Tasmanian pumped hydro opportunities and that it will now progress to the last stage of its feasibility study. A pumped hydro site is planned to be commissioned in line with the completion of the proposed Marinus Link.

Tasmania's energy security prospects would be improved if these projects result in increased hydro generation. The Monitor and Assessor will continue to monitor Hydro Tasmania's progress with its Battery of the Nation projects and their potential impact on Tasmania's energy security.

4.2.5 Hydrogen production in Tasmania

The Tasmania Government is seeking to establish a hydrogen production industry at Bell Bay in northern Tasmania under its Green Hydrogen Hub Project. Several hydrogen production plants are being considered that would increase electricity demand by around 100 MW (around 880 GWh annually) to 300 MW (around 2 630 GWh annually) per plant. The project could comprise more than one hydrogen production plant.

The Monitor and Assessor has been advised that it is not expected that any plants would be in operation until mid-2023 at the earliest and that to accommodate more than 300 MW additional demand, major transmission upgrades would be required.

This would result in substantially increased electricity consumption in Tasmania. As an example, the annual consumption of one 300 MW plant represents around one quarter of Tasmania's total electricity consumption in recent years.

¹¹ <https://robbinsislandwindfarm.com/about/>

¹² <https://www.hydro.com.au/clean-energy/battery-of-the-nation/>

At this stage, no project has been confirmed and any projects would add to Tasmania's energy demand after the 2021-22 water year. In light of the scale of these projects, the Monitor and Assessor is monitoring developments closely and confirmation of a hydrogen production plant is likely to trigger a review of the PSL and HRL by the Monitor and Assessor.

4.3 PSL and HRL review

In June 2017, the Tasmanian Energy Security Taskforce released its Final Report, recommending a clearly defined framework for assessing and managing Tasmania's energy security. A key element of the Taskforce's framework is the monthly public reporting of energy in storage levels in Tasmania against appropriate PSL and HRL profiles.

The Report recommended that one of the conditions necessary for a review of the profiles is a material change to either supply or demand equivalent to two per cent (around 300 GWh) of total energy in storage in the Tasmanian region of the National Electricity Market.

The Monitor and Assessor is not bound by the recommendations of the Taskforce. However, the recent completion of the Cattle Hill and Granville Harbour windfarms, which are capable of producing a combined 860 GWh annually, prompted the Monitor and Assessor to review the profiles, consistent with the recommendation of the Taskforce.

As required under the Act, the Monitor and Assessor consulted with Hydro Tasmania at all stages during the review. In particular, the Monitor and Assessor requested that Hydro Tasmania model a number of different scenarios that accounted for the additional wind generation, and also update other inputs including gas usage, in-flows and demand.

The Office of the Tasmanian Economic Regulator also used the model developed by the Taskforce to prepare separate estimates of the PSL and HRL, to compare against the results of Hydro Tasmania's modelling. Ultimately, Hydro's proposed profiles were more conservative, and were chosen as the revised profiles on this basis. Comparisons of the original and revised HRL and PSL are provided in Figures 10 and 11 below.

Figure 10: Comparison of the previous and revised High Reliability Level profiles

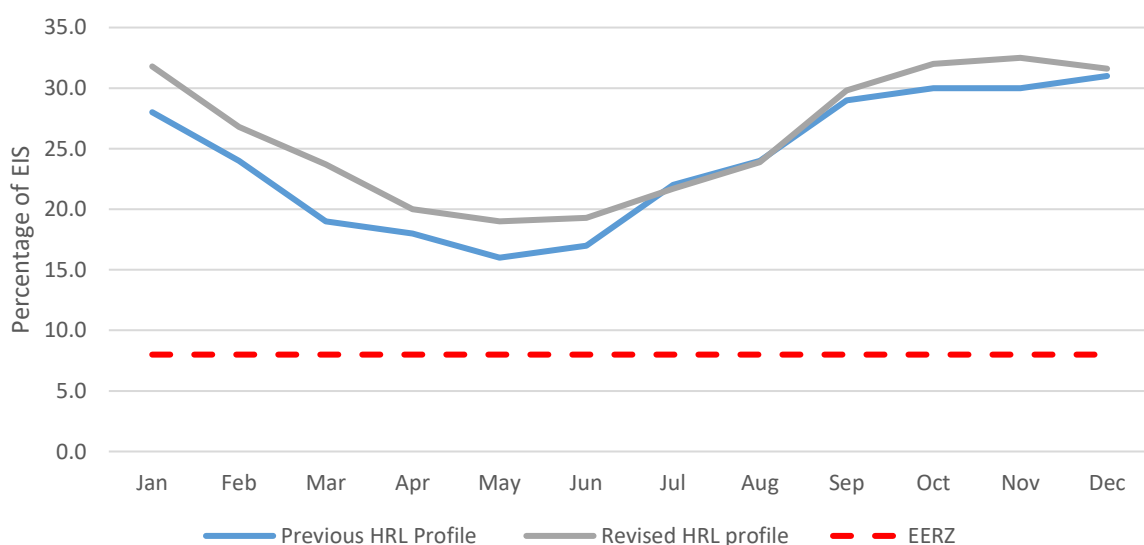
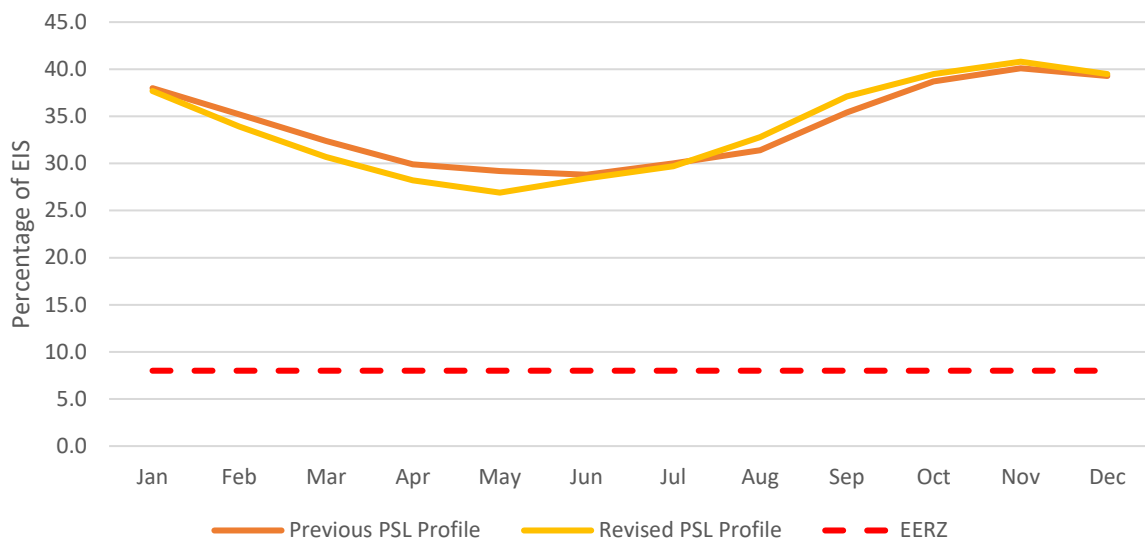


Figure 11: Comparison of the previous and revised Prudent Storage Level profiles



As can be seen above, the difference between the original and revised HRL and PSL profiles is minimal. This is because the additional wind generation assumed from increased exports by the Cattle Hill and Granville Harbour Windfarms is offset by an assumed reduction in gas generation. That is, while an additional 1 041 GWh of annual wind generation was added, 1 685 GWh of annual gas generation was removed from the model. This has resulted in an average increase of 2 per cent in the HRL and an average decrease of 0.3 per cent in the PSL across the year.

On 20 May 2021, the Regulator provided the outcomes of its review and its advice to the Minister. The Minister accepted the Regulator's advice and instructed the Department of State Growth to prepare an Order setting out the revised profiles.

The making of the *Energy Co-ordination and Planning Order 2021* was published on 1 September 2021, with the revised profiles, shown in Table 4 below, taking effect as at 1 September 2021.

Table 4: Revised HRL and PSL Levels

Profile	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
HRL (%)	31.8	26.8	23.7	20.0	19.0	19.3	21.7	23.9	29.8	32.0	32.5	31.6
PSL (%)	37.7	33.9	30.7	28.2	26.9	28.4	29.7	32.8	37.1	39.5	40.8	39.5

4.4 Natural gas

In its 2021 Gas Statement of Opportunities (GSOO), AEMO forecasts demand and uses information from gas producers about reserves and forecast production to project the supply-demand balance and potential gaps under a range of plausible scenarios for eastern and south-eastern Australian gas markets to 2040.

AEMO considers that supply from existing and committed gas developments is forecast to provide adequate supply to meet gas demands nationally until 2025. AEMO has not identified any major risks to natural supply in south-east Australia over the short to medium-term.

AEMO is forecasting a modest increase in the demand for natural gas in Tasmania. The projected increase is primarily driven by forecast new connections growth in households and commercial businesses. Large industrial consumption is also expected to increase in the short term, then remain relatively flat until the end of the forecasting horizon.

Gas supply adequacy forecasts have also increased for the next five years compared to the forecasts in the 2020 GSOO, largely due to the recent commitment of the Port Kembla Gas Terminal. According to producers' forecasts of existing and committed maximum daily production obtained by AEMO, capacity is expected to be sufficient to avoid domestic peak day gas shortfalls until at least 2026 under most circumstances, provided all developments proceed to schedule.

The Monitor and Assessor does not expect that Tasmania will face energy security issues related to the natural gas market in the short to medium-term.

