

Irrigation Tariff Review

September 2019



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I. Executive Summary

This report is the outcome of the Irrigation Tariff Review that was announced as part of the Government's *Energy on Farms* policy. Consultation has been undertaken with key stakeholders to consider the competitiveness of and appropriateness of the irrigation tariff arrangements in Tasmania.

An analysis of tariffs paid by Tasmanian irrigators compared with those paid by irrigators in other jurisdictions has been undertaken as part of the review. This has concluded that current tariffs for irrigation customers are competitive with those on the mainland.

The review has highlighted a number of issues with the structure of the current irrigation tariff arrangements which are detailed in the report. It should be noted that the Government has little control over the setting of retail irrigation tariffs given that competition exists in the retail electricity market. While Aurora Energy is the sole regulated offer retailer in the State by virtue of the requirement in the *Electricity Supply Industry Act 1995* that a retailer must have a least 50 000 customer to be a regulated offer retailer, other retailers are able to offer equivalent rates through market contracts. Therefore tariffs cannot be set which result in uncompetitive pricing by the Government owned regulated offer retailer.

In addition, the significant network component of the tariff is regulated by the Australian Energy Regulator (AER) and must be consistent with the requirement of the National Electricity Rules. While TasNetworks is a Government owned business, the Government has no control over the national framework. In any event, any attempt to reduce the network component would result in cross subsidisation by other users.

That said, there are specific issues with the structure of the Tasmanian tariffs which could be analysed further. These include:

- determining the most effective time structure, both seasonally and daily, that best meets the needs of irrigators and the network provider;
- whether a concession arrangement for multiple connections would be appropriate without creating cross subsidies between customer classes;
- a review of billing options by retailers; and
- whether concessions for the upfront provision of connection assets is an effective mechanism to assist irrigators.

Key findings of the review include:

- the cost of using the electricity network needs to be fairly allocated to users by the recovery of network costs through the tariff structure;
- customers should discuss billing options with their retailer to obtain the most suitable billing arrangement for their needs;
- irrigation customers already receive a significant cashflow benefit from not being required to pay the upfront cost of a transformer for new connections;
- the potential impact of the irrigation tariff structure on river flows for smaller river systems should be further analysed;

- the pricing signal provided to irrigators is proving effective to reduce overall peak network demand and reduce costs to all customers;
- irrigation activity is not a major contributor to Tasmanian peak demand;
- the structure of the peak, shoulder and off-peak periods may create practical operational issues for smaller farmers;
- Tariff 75 and Tariff 94 options available to the Tasmanian irrigation customers are competitive with Momentum Energy’s Victorian tariff offering to members of the Victorian Farmers Federation;
- generally irrigators with large annual usage benefit from being on Tariff 75, while the smaller irrigators would benefit from transitioning to Tariff 94; and
- customers should seek advice from their retailer or an independent advisor to assist in determining the most appropriate tariff for their particular needs.

Further detailed analysis is required to determine potential changes to the irrigation tariff structure as noted above. This naturally falls to TasNetworks to undertake, being the entity which sets the network tariffs and has access to customer and system load data.

It is understood that TasNetworks is proposing to conduct an “Empowering Farms Trial” to understand the challenges faced by customers in the agriculture sector in relation to energy management. It will also gather information and insights into the relationship between time-of-use irrigation tariffs and potential impacts on modern farming practices and the environment.

The Empowering Farm Trial will be a significant step towards further exploring the issues faced by irrigators in Tasmania, which have been identified as part of this review.

2. Introduction

As part of the Government's 2018 *Energy on Farms* election policy, the Government committed to a review of the current irrigation tariff structure. The aim of the review was to "set irrigation tariffs that are more suitable to modern irrigation enterprises and offer a competitive advantage to Tasmanian irrigators, including ensuring tariffs are available which are equal to or lower than Momentum's offers on the mainland. This includes tariffs that enable better energy and water utilisation, support flexibility and enable farmers to lower their energy costs to suit different farming enterprises."

The Department of Treasury and Finance has undertaken the review. The objective of the review, as outlined in the Terms of Reference included in the Background Paper in Appendix I, is to provide a well-considered and balanced report to Government that highlights the costs and benefits of any amendments to the irrigation tariff structure. Policy recommendations are to be made in the context of the Government's *Energy on Farms* policy.

The review has included consultation with key stakeholders to consider:

- the competitiveness of Tasmanian irrigation tariffs;
- the appropriateness of the irrigation tariff arrangements in Tasmania;
- the costs and benefits of the current irrigation tariff arrangements and the costs and benefits of any proposed changes to those arrangements; and
- the expected impacts of any changes to the irrigation tariff arrangements.

An analysis of tariffs paid by Tasmanian irrigators compared with those paid by irrigators in other jurisdictions has been undertaken. This includes a comparison between tariff options available to irrigators in Tasmania and tariffs offered by Hydro Tasmania's electricity retail subsidiary Momentum Energy to Victorian customers.

Ensuring irrigation tariffs are competitive is only one part of the Government's target to grow the annual farm gate value of the agricultural sector to \$10 billion per year by 2050. The Government has in place various measures to support and assist farmers in Tasmania to improve both on-farm energy efficiency and productivity. These include:

- *Facilitating Irrigation Scheme Development* - The Government established Tasmanian Irrigation to build and operate irrigation schemes in the State to increase agricultural productivity. To date, the Tasmanian and Australian Governments have contributed \$355 million towards construction of 15 schemes across the State. While Tasmanian Irrigation is a significant user of electricity for pumping within its schemes, it contracts with a retailer for its electricity use and therefore irrigation tariffs do not apply to it. However, the cost of electricity used is built into the operating cost of supplying water which is charged to irrigators.
- Although outside the scope of this review, the impact of rising electricity costs has previously been highlighted by Tasmanian Irrigation as a challenge to its cost structure. Some irrigation schemes are exposed to variable cost increases driven by water purchased from Hydro Tasmania, with pricing based on the opportunity cost of the water if Hydro could export the energy to the mainland. Rising electricity costs increase pumping costs for schemes, which results in a pass-through of higher variable costs for its customers.
- *Sustainable On-farm Energy* - The \$5.5 million Tasmanian Irrigation Renewable Energy Program, which involves Tasmanian Irrigation Pty Ltd working with irrigators to construct

mini and micro hydro-electric systems, has the potential to reduce irrigator's energy bills and reduce reliance on diesel generators. Tasmanian Irrigation is currently finalising the engagement of a consultant to develop the business case.

- *Farm Energy Advocate* - The Farm Advocate works directly with farmers to help develop minimal cost energy supply options, including optimising tariffs that best suit their business and farming enterprises. It also provides support to farmers for consolidation of electricity accounts, by putting connections onto a single statement. Aurora Energy has been engaging with stakeholders and customers to discuss their energy usage and the benefits of interval metering. Over 100 customer sites have been analysed with 75 per cent of those likely to benefit from change of tariff and/or contract arrangements.
- *On-farm Energy Audit Program* - The program provides a subsidy to assist farmers to engage a qualified professional to review their farm energy use, infrastructure and systems, and to identify savings strategies. In July 2019, the Minister for Primary Industries and Water and Minister for Energy, announced that 80 applications amounting to \$560 000 had been approved and a further 15 applications are being currently assessed. Also an additional \$250 000 will be made available to specifically help dairy farmers achieve energy savings.
- *AgriGrowth Loan Scheme* - The scheme provides low interest loans of between \$100 000 to \$3.0 million to Tasmanian farm businesses and agri-food businesses to fund projects that otherwise could not be financed under normal banking arrangements. Since the introduction of the scheme in September 2014, 41 loan applications have been approved amounting to a total of over \$30 million and around 31 loan applications worth \$18 million are currently being assessed.
- *Subsidisation of irrigation connections* - concessional arrangements are in place for customer contributions for new irrigation customers. Under TasNetworks' irrigation connection policy, the installed cost of a dedicated transformer is not included in the upfront connection charge. A copy of TasNetworks' Irrigation Concessional Arrangement Guideline is attached at Appendix 2.
- *Tasmania First Energy Policy* - Tasmanian electricity customers have benefited from the Government's actions to minimise increases in electricity prices through the regulated tariff price cap. A 2.0 per cent increase was approved for 2019-20. Large unregulated electricity customers have been protected from volatile prices through the Energy Rebate Scheme which has been extended for 2019-20. A review of wholesale energy pricing is also in progress.

3. Irrigation Tariffs

A number of electricity pricing options are available for irrigators in Tasmania. Regulated tariffs are available for small customers through the regulated offer retailer. In addition, market contracts are also available where an electricity consumer can negotiate a contract with their preferred retailer.

As part of the suite of regulated tariffs, Tasmania offers specific irrigation tariff for farmers, unlike most other jurisdictions.

The Tasmanian Economic Regulator sets the regulated tariffs which aim to recover the total cost of the whole electricity supply chain. Regulated tariffs are set through a building block approach which comprises of a number of components. For the irrigation tariff:

- around 42 per cent of the retail price includes the wholesale energy cost, which the retailer has to buy from the generators. In recent years, Tasmanian consumers have been protected from the rise in wholesale electricity costs in the NEM due to Government intervention through the setting of the wholesale electricity price;
- the transmission and distribution costs, which are regulated by the AER, account for about 35 per cent of the total retail price. The AER regulates the prices to ensure efficient delivery of network services for the long-term interest of consumers;
- the retail price also includes an allowance for the purchase of renewable energy certificates from the market to comply with the national Renewable Energy Target; and
- the remainder of the retail standing offer price comprises of market charges, metering charges and retail costs.

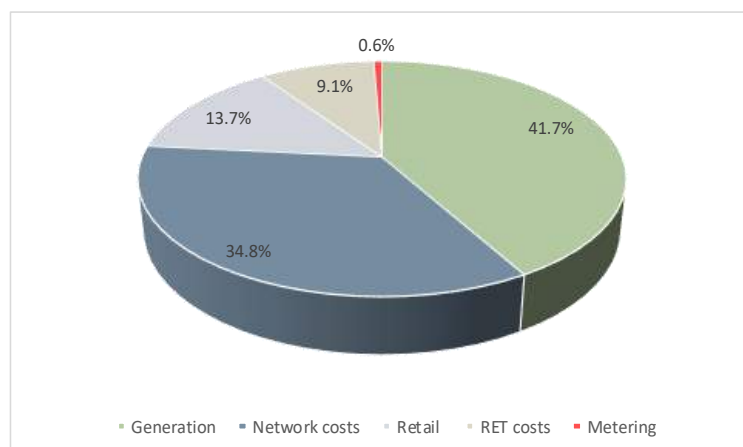


Figure 1: Cost components of a typical Tariff 75 electricity bill, 2018-19 (Source Aurora Energy)

The National Electricity Rules changed in December 2014, requiring regulated network businesses to transition to cost reflective tariffs based on consumers' differing usage patterns. Cost reflective pricing provides incentives for customers to shift electricity consumption to reduce network costs. It helps network businesses to lower peak demand on the network, thereby reducing the investments needed for network augmentation.

In line with the regulator's expectations and the industry trend at the national level, TasNetworks is currently undertaking a major reform of its network tariff structure, including a long term transition to more cost reflective pricing. Therefore, any changes to irrigation tariffs

need to consider the impact on the tariff reform agenda and the expectations that any historical cross subsidies are reduced over time to achieve equitable outcomes for all customers.

3.1. Current retailers

While the Tasmanian electricity market is open to full competition where any authorised retailer in the NEM can participate, the number of active participants in the market is small, but has recently been increasing. Aurora Energy, as the regulated offer retailer, has the majority of customers. Aurora Energy and ERM Power have been active in the business sector for some time, with both retailers providing offers to irrigation customers.

More recently, IstEnergy has begun operations in the State providing retail competition for residential customers in Tasmania for the first time and is also active in the small business sector and therefore could provide offers to irrigation customers.

It is possible that other retailers could enter the market, thus increasing competition. The Government supports competition in the energy sector which will provide Tasmanian consumers with greater choice.

3.2. Specific Irrigation Tariffs

Unless noted otherwise, all prices are based on published 2018-19 prices and are inclusive of GST. Load data is based on 2017-18 actual load as provided by TasNetworks.

Previous Irrigation Tariff

Prior to July 2015, Aurora Energy offered irrigation customers a specific irrigation tariff, Tariff 73/74, which incentivised customers to use electricity during off-peak periods. The tariff was underpinned by a specific network tariff which was discontinued in 2013-14. As a result, the tariff is now obsolete and has effectively been replaced by Tariff 75,

Unlike the current irrigation Tariff 75, Tariff 73/74 had no price variation based on seasonality. The fixed daily charge paid by irrigation customers was significantly higher in comparison to today's offering.

For comparison purposes, the table below sets out the tariff structure and the 2013-14 standing offer prices.

Irrigation – Tariff 73/74 (Obsolete)

Time periods	All year
Fixed charge	354.986c per day
Any Day (07:00 – 20:00) (Monday – Sunday)	Day rate 33.718c per kWh
Any Day (20:00 – 7:00) (Monday – Sunday)	Night rate 14.815c per kWh

Current Irrigation Tariff

The current regulated Tariff 75 offered by Aurora Energy is based on TasNetworks' low voltage time-of-use network irrigation tariff. Tariff 75 applies only to irrigation pumping for approved agricultural purposes and includes a daily service charge and a consumption based usage charge.

The consumption charge varies depending on whether the electricity is consumed during peak, shoulder or off-peak periods, which are defined differently during the summer and winter months.

The table below sets out the tariff structure and the standing offer prices.

Irrigation Time-of-Use (ToU) - Tariff 75

Time periods	Summer (1 Oct – 31 Mar)	Winter (1 Apr – 30 Sep)	Energy Rate (per KWh)
Daily supply charge	285.540c per day		
Week Day (07:00 – 22:00) (Monday – Friday)	Shoulder	Peak	Peak: 31.032c
Weekend Day (07:00 – 22:00) (Saturday and Sunday)	Off-peak	Shoulder	Shoulder: 22.598c
Any Day (22:00 – 07:00)	Off-peak	Off-peak	Off-peak: 14.120c

During the "summer season" (typically the peak irrigation period), irrigators can access off-peak energy rates except between the hours of 7:00 and 22:00 on Monday to Friday. Shoulder rates apply for this period. Peak rates only apply during the "winter season" between the hours of 7:00 and 22:00 on Monday to Friday, which is generally the period when the peak system wide load occurs, driven by residential heating demand.

Tasmania has a winter peak energy demand. Other jurisdictions generally have a summer peak that is driven by air conditioning usage. Due to the unique winter peaking Tasmanian system demand, TasNetworks is able to offer competitive network pricing arrangements to irrigation customers during the high use summer period. Irrigation activity in Tasmania predominantly occurs in summer months, when the constraints on the electricity network are lower.

Alternative Tariff Options

Irrigation customers also have the option of taking electricity supply under a number of other options. Generally irrigation customers choose Tariff 75 and some have moved to the Business Time-of-Use tariff, Tariff 94. Some customers are still on Tariff 22 which is unlikely to be cost effective for most irrigation customers. These options are discussed below:

General Business Low Voltage Tariff - Tariff 22

This tariff applies to premises that are not used, wholly or principally, as private residential dwellings.

This tariff consists of a daily service charge and a charge for each unit of energy consumed. The consumption charge does not vary based on the time of day or time of year the energy is consumed.

The table below sets out standing offer prices for Aurora Energy’s General Business Low Voltage Tariff (Tariff 22).

Time periods	All year
Daily supply charge	101.926c per day
First 500 kWh per quarter	33.863c per kWh
Remainder	25.051c per kWh

Business Time-of-Use (TOU) - Tariff 94

This tariff consists of a daily service charge and a charge for each unit of energy consumed. The consumption charge varies based on whether energy is consumed during peak, off-peak or shoulder periods. Unlike Tariff 75, the tariff structure is the same throughout the year.

The table below sets out the tariff structure and the standing offer prices for Aurora Energy’s Business Time-of-Use (TOU) - Tariff 94.

Time periods	All year	Energy Rate (per KWh)
Daily supply charge	110.407c per day	
Week Day (07:00 – 22:00) (Monday – Friday)	Peak	Peak: 27.886c
Weekend Day (07:00 – 22:00) (Saturday and Sunday)	Shoulder	Shoulder: 20.141c
Any Day (22:00 – 07:00)	Off-peak	Off-peak: 11.781c

Market Contracts

Customers have the option of entering into unregulated market contracts with retailers. Depending on the customer load profile and the prevailing market conditions, the market contract prices may be lower than standing offers. Any retailer can offer a market contract based on their published prices or through direct negotiation with the customer.

4. Irrigation Customers

As part of the review, consultation was undertaken with key stakeholders including the peak agricultural bodies representing irrigation customers in Tasmania. This included the Tasmanian Farmers and Graziers Association (TFGA), Fruit Growers Tasmania, Tasmanian Poppy Growers Inc, the Tasmanian Agricultural Productivity Group and Wine Tasmania which collectively represent Tasmanian farmers and graziers in the dairy industry, vegetable and other crop producers, poppies and fruit and wine producers.

Irrigation is used in a range of farming activities. Irrigation systems used by farmers are heavily reliant on electricity for pumping. Different technologies and irrigation techniques are used by irrigators depending on the type of farming activity being undertaken. For example, fruit growers primarily use drip irrigation systems, which is regarded as a very efficient irrigation technique. Farmers growing crops and pastures typically use overhead pivot systems. Some irrigators also use tanks or storage dams which are filled using off-peak electricity at competitive prices and provide a source of gravity-fed water for irrigation as required.

For some of the large producers with storage and packaging facilities, around 50 per cent of the electricity consumed relates to the irrigation activity. On the other hand, for some of the smaller primary producers, up to 95 per cent of their electricity cost could be related to irrigation according to stakeholder feedback.

The amount of electricity consumed for irrigation purposes varies significantly depending on the size of the enterprise. For example, those irrigation customers on Tariff 75 have a wide range of electricity consumption with over 25 per cent of sites using less than 10 MWh per annum. For 2017-18 the highest level of consumption at a single connection point was recorded at 4.3 GWh per annum. The average annual consumption for 2017-18 was approximately 42 MWh per annum. Figure 2 below shows the spectrum of irrigation consumption in Tasmania.

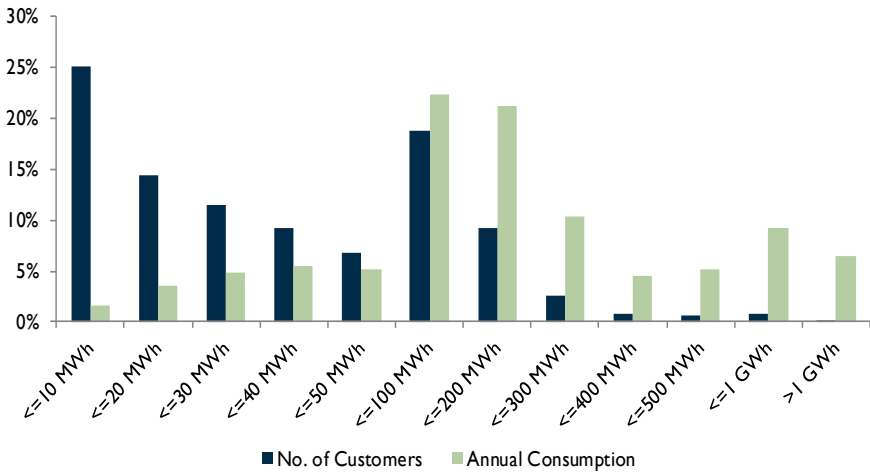


Figure 2: Irrigation Consumption Usage Spectrum

There are approximately 3 500 irrigation sites in Tasmania, which together consume around 148 GWh per annum. Of these sites around 60 per cent are on the regulated tariff, while the remainder have entered into market contract arrangements.

The TFGA conducted a survey of its member base to better understand the issues faced by irrigators in Tasmania. TFGA received 29 survey responses from participants providing useful insights and suggestions.

Following are some of the insights based on the survey results:

- On average electricity costs account for between 1 and 20 per cent of the total farm operation costs. Some farmers are more impacted by the rise in electricity costs than others.
- The respondents indicated that between 50 to 95 per cent of electricity costs incurred by the farmer relates to irrigation type activity.
- 79 per cent of respondents irrigate at night-time during the Off-Peak period and 48 per cent do so because the rates are more cost effective.
- 93 per cent of respondents irrigate during the months between September and March with 38 per cent needing to extend their main irrigation season to April.

5. Consultation and Key Themes

The following key stakeholders were invited to provide input into the review:

- Aurora Energy;
- ERM Power;
- TasNetworks;
- Hydro Tasmania (including Momentum Energy);
- Department of Primary Industries, Water and Environment:
 - Agrigrowth Unit; and
 - Water Policy and Planning Unit;
- Department of State Growth - Food and Agribusiness Unit;
- Tasmanian Irrigation;
- Fruit Growers Tasmania;
- Tasmanian Poppy Growers Inc;
- Tasmanian Agricultural Productivity Group;
- Tasmanian Farmers and Graziers Association; and
- Wine Tasmania.

A Background paper was prepared and provided to key Stakeholders. A copy of the paper is provided at Appendix I. Treasury also held discussions with a number of individual irrigators to gain direct understanding of the issues faced by farming operators.

The key themes that were raised during the consultation process can be broken down into the following issues:

- Multiple Connections;
- Billing;
- Connection Costs;
- Water Usage;
- Electricity Demand;
- Tariff Structure and Time periods; and
- Reliability of supply.

These issues are discussed further below.

In addition, the competitiveness of prices paid by Tasmanian irrigators compared to mainland counterparts was raised. Section 6 provides a tariff comparison with other jurisdictions.

Multiple Connections

Modern farming practices have seen an increase in the use of technology and in particular investment in on-farm electricity generation such as solar panels. A key issue raised by on-farm solar proponents is that in order to maximise the benefits, all electricity generated should be able to be used on the farm. For efficiency, most farmers would prefer to consolidate on-farm generation at a single site. However, doing this prevents them from utilising the electricity generated in other areas of the farms where it could be used unless an embedded network is installed by the farmer across the property. Therefore, any excess electricity generated is exported to the grid at the feed-in tariff rate. They then have to pay the full retail cost of electricity for each other connection they have on the property.

The current arrangements do not allow for electricity usage to be offset across multiple connection points. Proponents have been advocating for this to be changed so that smart metering systems could be used to allow electricity generated from solar systems when not fully utilised, to be used to offset usage at other areas of the property.

While this may seem reasonable at face value, the delivered cost of electricity to a connection point includes other components, not just the wholesale cost of electricity. In particular, network costs are a significant component of the retail price. While it could be argued that the electricity is being generated on the property, the network still needs to be used to transport the electricity to the other connection points on the property. In some cases, the connection point could be on an associated property which is not adjacent to the property where the embedded generation is situated.

The survey conducted by the TFGA of its members show that 88 per cent of respondents prefer daily charges being charged only once for multiple meters on the same farm and has recommended either providing a rebate or a discount to customers with multiple connections to increase cost effectiveness.

TasNetworks notes that network businesses incur infrastructure costs in providing connection services to customers with multiple connection points. The daily service charge is levied to recover the cost of this investment. If a discount is provided to irrigation customers with multiple connections, it would be at the expense of other customers.

Treasury's assessment

- The cost of using the electricity network needs to be fairly allocated to all users by the recovery of network costs through the tariff structure and minimise cross subsidisation.
- On-farm solar customers have the option to invest in infrastructure to create an embedded network or invest in battery storage technology in order to utilise surplus energy generated using solar systems.
- TasNetworks, as the network provider, is best placed to review connection arrangements to determine if concession arrangements for multiple connections would be appropriate without creating cross subsidies between customer classes.

Billing

Concerns have been raised in regard to the administrative burden of having multiple bills for multiple connections. Irrigators with multiple connection points may prefer to receive a single, aggregated electricity bill, rather than separate bills for each installation.

Figure 2 below shows how Tariff 75 irrigation customers have multiple connections on their property, which may include connections to other tariffs, for purposes other than irrigation.

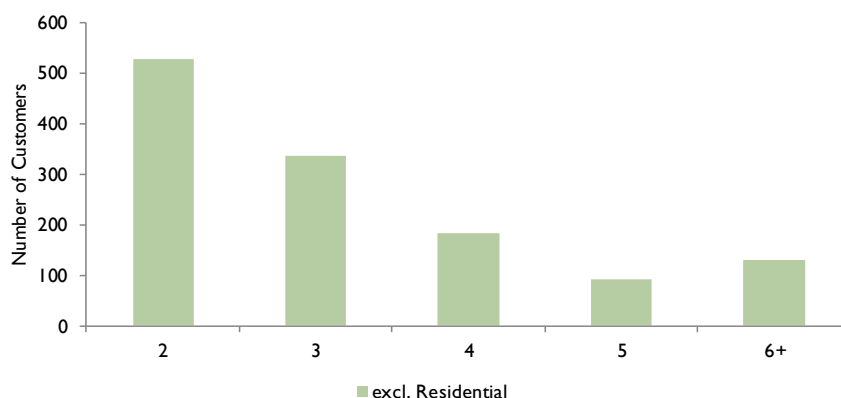


Figure 2: Tariff 75 Multiple Connections (Source TasNetworks)

Billing issues were raised with the retailers, who appear to be receptive to customising accounts for individual customers within the scope of their billing systems to reduce the administrative burden of receiving multiple accounts.

Options include customisation of accounts, allowing farm business customers to choose the name that best describes each of their connections and allowing customers to choose the day of the month they would like to receive their statement.

Treasury's assessment

- Customers should discuss billing options with their retailer to see if a more suitable arrangement for their needs is available.

Connection Costs

In line with guidance from the State Government in 2015, TasNetworks continues to provide the concessional arrangements to reduce the up-front customer contributions for new irrigation customers. The cost associated with the provision of the necessary transformer capacity to meet the pumping loads of the customer and related irrigator equipment is generally the largest component of the charge for a new connection.

The irrigation connection charge does not include the installed costs of a dedicated transformer. The estimated cost for a dedicated transformer ranges between \$15 000 to \$50 000, which potentially gives rise to a significant cashflow benefit to irrigators. It is understood that such arrangements do not exist in the other regions of the NEM.

These arrangements have been included in TasNetworks' regulatory price determination through to 2024.

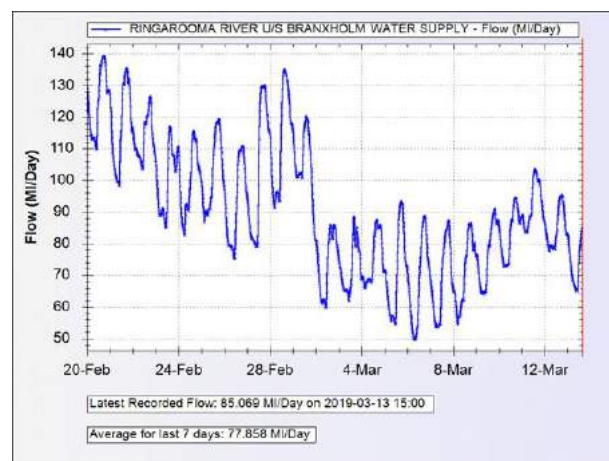
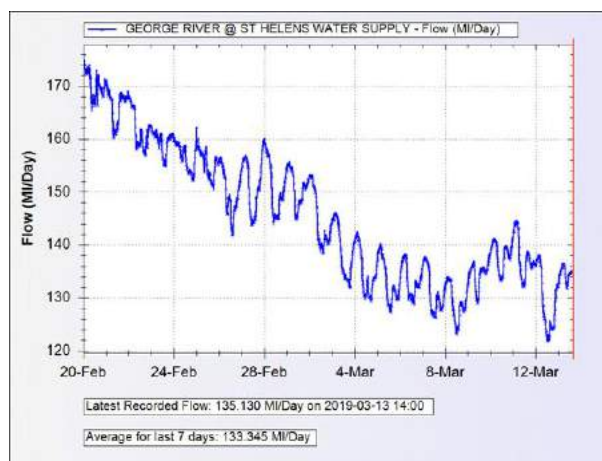
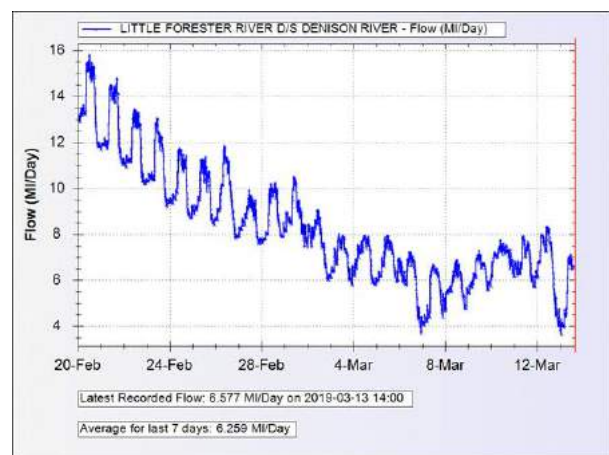
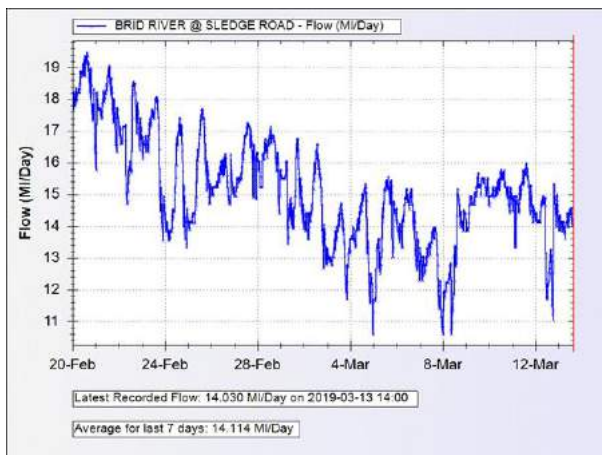
Treasury's assessment

- Irrigation customers receive a significant cashflow benefit from not being required to pay the upfront cost of a transformer for new connections.

Water Usage

DPIPWE noted the current irrigation tariff structure has the potential to lead to pulsing tidal flow patterns in some river systems which is a possible outcome of the off-peak pricing signal that incentivises irrigators to pump at night. DPIPWE also suggested that some farming communities are voluntarily adopting odd-even day irrigation patterns to minimise the impact.

Below are examples of river flow charts provided by DPIPWE for rivers within the state where the possible pulsing impact of irrigation can be seen. These are generally smaller river systems with no irrigation restrictions. Care should be taken when considering the charts noting the relevant scales. Actual volatility may not be as extreme as depicted.



Larger river systems are generally not impacted by irrigation activity due to the volume of water in the river. Water flow was not considered an issue where irrigation is predominately achieved through micro irrigation techniques which is generally used by fruit growers. It was suggested that water management could be an issue in drier areas such as the east coast of Tasmania.

Treasury's assessment

- There is a potential impact of the irrigation tariff structure on river flows for smaller river systems.
- Further work needs to be done to better understand this causal relationship between river flows and the irrigation activity.
- Alternative solutions such as water licencing restrictions or irrigator education in some river systems may need to be explored, noting that there may be some legacy issues.

Electricity Demand

TasNetworks highlights that, in line with the objectives of network tariff reform nationally, the time-of-use element of the Tariff 75 irrigation tariff is placing downward pressure on network costs, which is in the long term interest of all customers. TasNetworks has undertaken consumption pattern analysis for 471 irrigation customers with smart meters.

Figure 3 provides a diagrammatic representation of the electricity consumption for these customers. The green area indicates time of the day when irrigation pumps are operational and red indicates time periods when irrigation pumps are off.

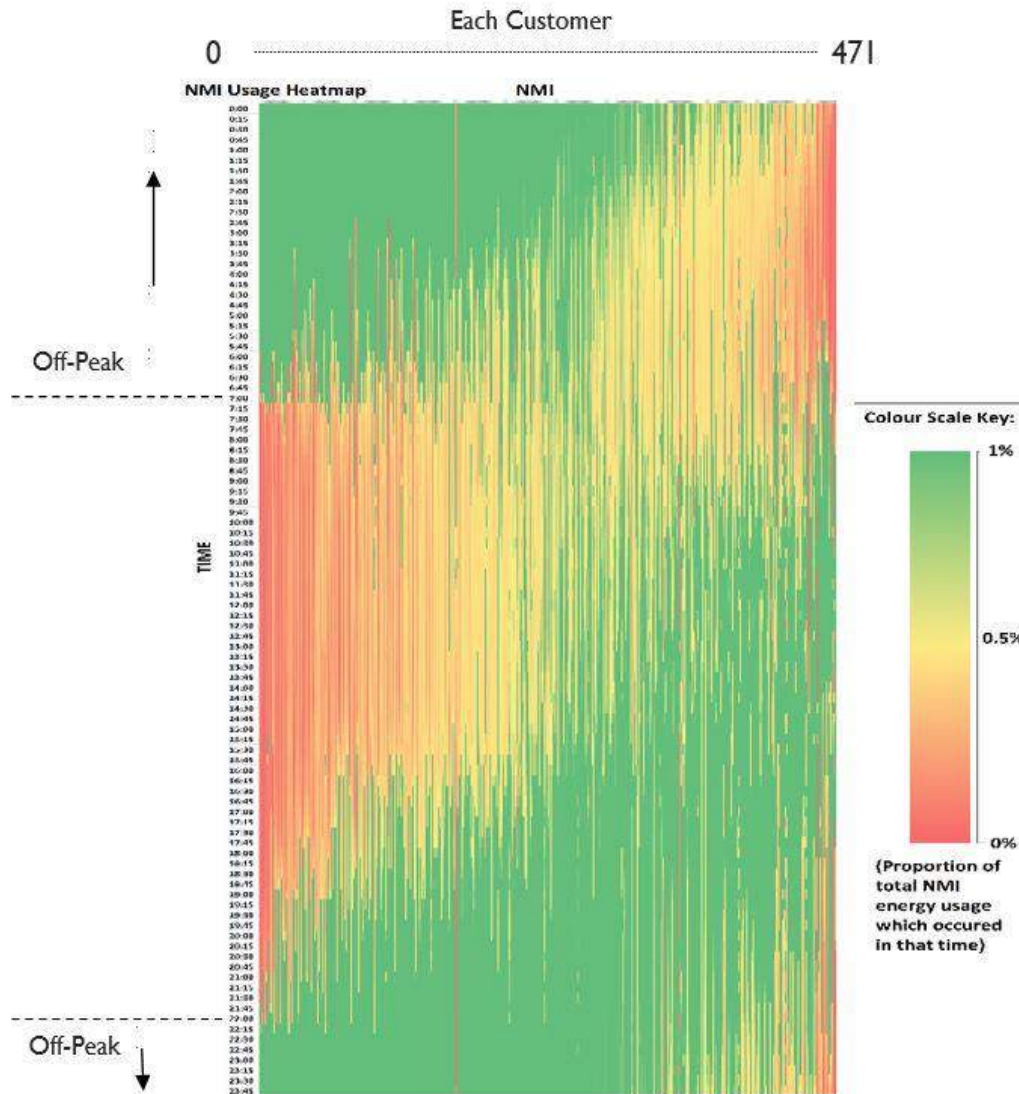


Figure 3: Irrigation customers consumption pattern (Source TasNetworks)

The analysis looks at how individual irrigation customers react to the time-of-use price signal in a 24 hour time window. It demonstrates the diversity of irrigation load. Some customers minimise their cost by only irrigating in the off-peak time periods. On the other hand there are large numbers of customers who irrigate when they have to irrigate, irrespective of the tariff pricing signal. However, in aggregate, the diversity of consumption patterns avoids system peaks, reducing the need for additional capital expenditure and thereby minimising overall costs for customers.

In 2017-18, only 5 per cent of total irrigation electricity consumption took place in the peak period. In response to the strong pricing signal, 60 per cent of irrigation consumption occurred in the off-peak period and the remainder in the shoulder period.

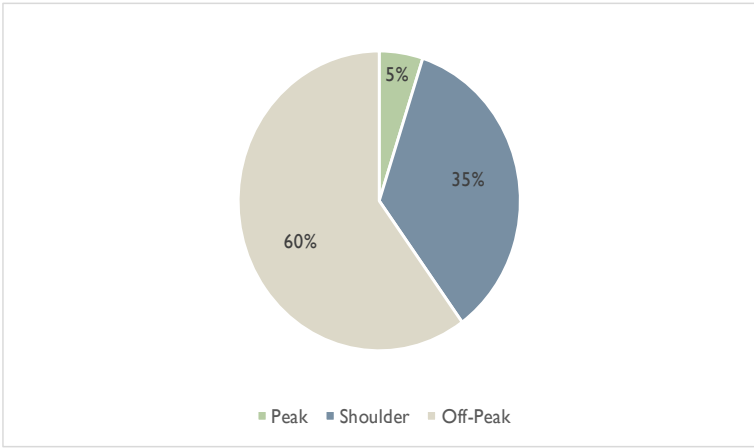


Figure 4: Irrigation Electricity Consumption Split 2017-18 (TasNetworks)

Irrigators have argued that due to changing farming practices and drier conditions, there has been a need to irrigate more in the winter months. In 2017-18, the total energy consumption on the irrigation tariff was 148 GWh. However 85 per cent was consumed in the summer months and 15 per cent of irrigation electricity consumption took place in the winter months. This indicates that the bulk of irrigation activity in Tasmania still peaks in the summer months.

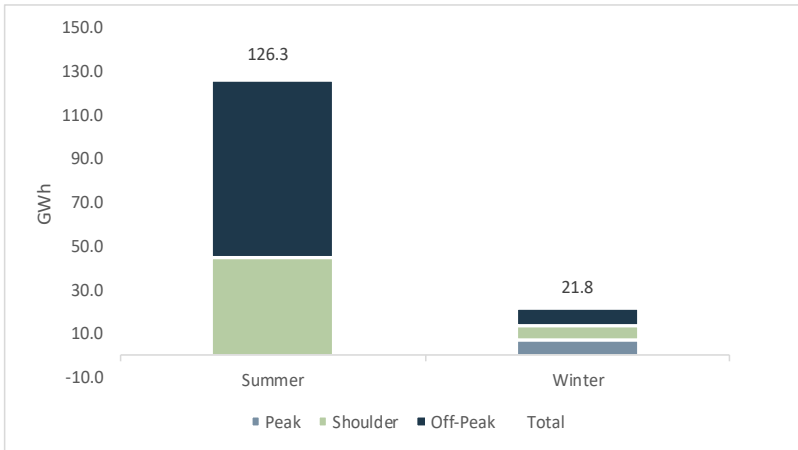


Figure 5: Irrigation electricity consumption summer vs winter months 2017-18 (Source TasNetworks)

Treasury’s assessment

- TasNetworks’ analysis indicates that the pricing signal provided to irrigators is proving effective to reduce peak network demand.
- Irrigation activity is not a major contributor to Tasmanian peak demand in winter.
- Any change in the tariff structure needs to be carefully considered to avoid any future unintended electricity network outcomes.

Tariff Structure and Time Periods

The current off-peak time periods applicable for the Tariff 75 structure are not considered convenient by irrigation customers. As the off-peak times do not align with normal working hours, small farmers find it costly to employ staff during non-standard working hours. Stakeholders have also raised safety issues with farmers having to irrigate at night time. Some larger farming operations have invested in technology that enables optimising irrigation activity based on pricing signals by remotely managing irrigation devices.

In relation to the time periods applicable for Tariff 75 the TFGA made the following recommendations in its submission:

- *“Adjust the Off-Peak Tariff to be longer to include daylight hours.*
- *Streamline the current levels of Peak, Shoulder and Off-Peak to just Peak and Off-Peak to be more in-line with the rest of the country.*
- *Review the current months of the year offering more cost-effective irrigation as the results from the TFGA survey indicate irrigation months are extending due to climate change and cost saving strategies.”*

Stakeholders also made comparisons with the current off-peak periods and Momentum Energy’s tariff structure. Momentum Energy charges off-peak rates for weekends throughout the year. For Tariff 75, although weekends are considered off-peak for ‘summer months’, 07:00 am to 22:00 pm on weekends in winter months is charged at the shoulder rate.

As the definition of ‘summer months’ for Tariff 75 is the six months from October to March, stakeholders have asserted that this is not suitable for farming practices needing to irrigate in the late winter and early spring seasons in response to the drier winter months experienced in recent times.

TasNetworks has advised that the time periods were reviewed as part the recent regulatory determinations approved by the AER and were designed based on time-of-use principles to reduce network constraints.

Treasury’s assessment

- The TFGA asserts that the current tariff time periods create practical operational issues for smaller farmers.
- Further analysis should be undertaken to determine the most effective tariff time structure, both seasonally and daily, that best meets the needs of both irrigators and the network provider.

Reliability of Supply

Stakeholders also raised the issue of reliability of supply experienced by farmers and downstream processors in regional areas. Although reliability of supply may not directly impact irrigators, it could cause operational issues for some farm processing facilities. This is generally a network issue and may be localised depending on the strength of the network in the area.

Treasury’s assessment

- Farm operators facing reliability of supply issues should engage with TasNetworks as a network service provider, who would be best placed to provide specific network solutions.

6. Tariff Comparison

Stakeholders have raised concerns about the competitiveness of the irrigation tariffs available to farmers in Tasmania. For example the TFGA suggests that “the current Tasmanian Electricity Irrigation Tariff rates are not cost effective and are not in line with the rest of the country, with Tasmania paying more than double of some of the mainland counterparts”.

In line with the irrigation tariff review objectives, Treasury has reviewed the competitiveness of the Tasmanian irrigation tariffs through a comparison of the tariffs available in other jurisdictions. In particular, comparison has been made with Momentum Energy’s tariff offered to the members of the Victorian Farmers Federation.

Tasmania is one of only two jurisdictions within the NEM that offers tariffs specifically designed for irrigators or farmers. Network businesses in Queensland are presently offering specific irrigation tariffs to farmers.

The final retail tariff paid by the customer comprises of various components which can vary significantly between jurisdictions. For example the electricity network businesses in Victoria benefit from a higher customer density, which helps lower the cost to serve per customer. In addition, there is potentially a significant variation in wholesale energy price within regions of the NEM which could be impacted by the generation mix and other contributing factors.

Caution needs to be exercised when comparing prices with other jurisdictions. It is important to take into account the timing of when the retail price was issued to appropriately benchmark retail prices. For example, a retail contract entered into by a customer can vary significantly due to the variability in wholesale energy prices and based on the consumption pattern. It is also important to take into account the size and the shape of the irrigation customer’s load. Comparing head-line rates can be misleading as it does not take into account the timing of usage for time-of-use tariffs. In addition, larger irrigation customers have the ability to negotiate directly with the retailers.

Jurisdictional differences in pricing may also be seen because of the geographic dispersion of electricity customers and the impact it can have on the cost to serve for the network businesses. For example in Victoria, Citi Power, United Energy and Jemena are distribution network businesses with predominantly urban customer bases. On the other hand, Power Corporation and AusNet services are distribution networks which service close to 60 per cent rural customers.

In addition, total electricity bills will vary across jurisdictions as water usage will be dependent on climatic and soil conditions. The same size irrigation area in different locations may need vastly different amount of water and therefore require different quantities of electricity.

Origin Energy’s irrigation tariff (Tariff 65) (Transitional) - Queensland

The following table sets out the tariff structure and the 2018-19 standing offer prices for Origin Energy’s irrigation tariff (Tariff 65) (Transitional), based on the underlying Energex’s network tariff.

Time periods	All year	Energy Rate (per KWh)
Daily supply charge	82.368c per day	
Any Day (07:00 – 19:00) (Monday – Friday)	Peak	Peak: 38.951c
Any Day (19:00 – 07:00)	Off-peak	Off-peak: 21.461c

No new customers are supplied under this tariff. Due to the cost reflective tariff reforms being undertaken following changes to the National Electricity Rules, the tariff offerings will become obsolete from 2020-21. Although the daily supply charge is lower when compared with Tariff 75, the peak and off-peak rates are considerably higher.

Momentum Energy's tariff offering in Victoria

Indicative pricing was received from Momentum Energy to compare with the competitiveness of Tasmanian irrigation tariff. Momentum Energy's tariff structure and indicative market offer prices to members of the Victorian Farmers Federation is set out in the table below. It should be noted that the tariff structure is based on the average of the underlying network tariffs provided by Powercor and AusNet and may not be directly comparable with published prices. The discount offered by Momentum Energy to the members of the Victorian Farmers Federation is included in the prices below.

Time periods	All year	Energy Rate (per KWh)
Daily supply charge	266.20c per day	
Week Day (07:00 – 23:00)	Peak	Peak: 28.181c
Week Day (2300 – 07:00)	Off-peak	
Weekend Day (all day)	Off-peak	Off-peak: 14.068c

Momentum Energy has made the following pricing assumptions to come up with its representative tariff offering for Victorian Farmers Federation Members:

- Momentum Energy does not provide a specific irrigation tariff offering in Victoria. However, it offers business customer rates and rates for Victorian Farmers Federation members that could be utilised for the purposes of irrigation pumping. These rates have been used for the comparative analysis.
- Momentum provides offers to rural customers across different regional distribution networks. Offers to customers vary significantly due to the differing distribution network charges. The pricing provided by Momentum for the purpose of this analysis is based on an average of price structures across the two predominately rural Victorian network providers, Powercor and Ausnet Services. These two distribution networks service over 97 per cent of Momentum's Victorian Farmers Federation customers.
- The Victorian Farmers Federation member rates factor in the differentiated cost to serve and cost to acquire that are applicable to the arrangement.
- Wholesale price inputs and retail pricing are structured in the same way as any other group of customers. Momentum does not have control over all the cost components which make up the final tariff offering. For example Momentum Energy's offering takes into consideration a number of other inputs including distribution charges, environmental obligations and usage profiles.

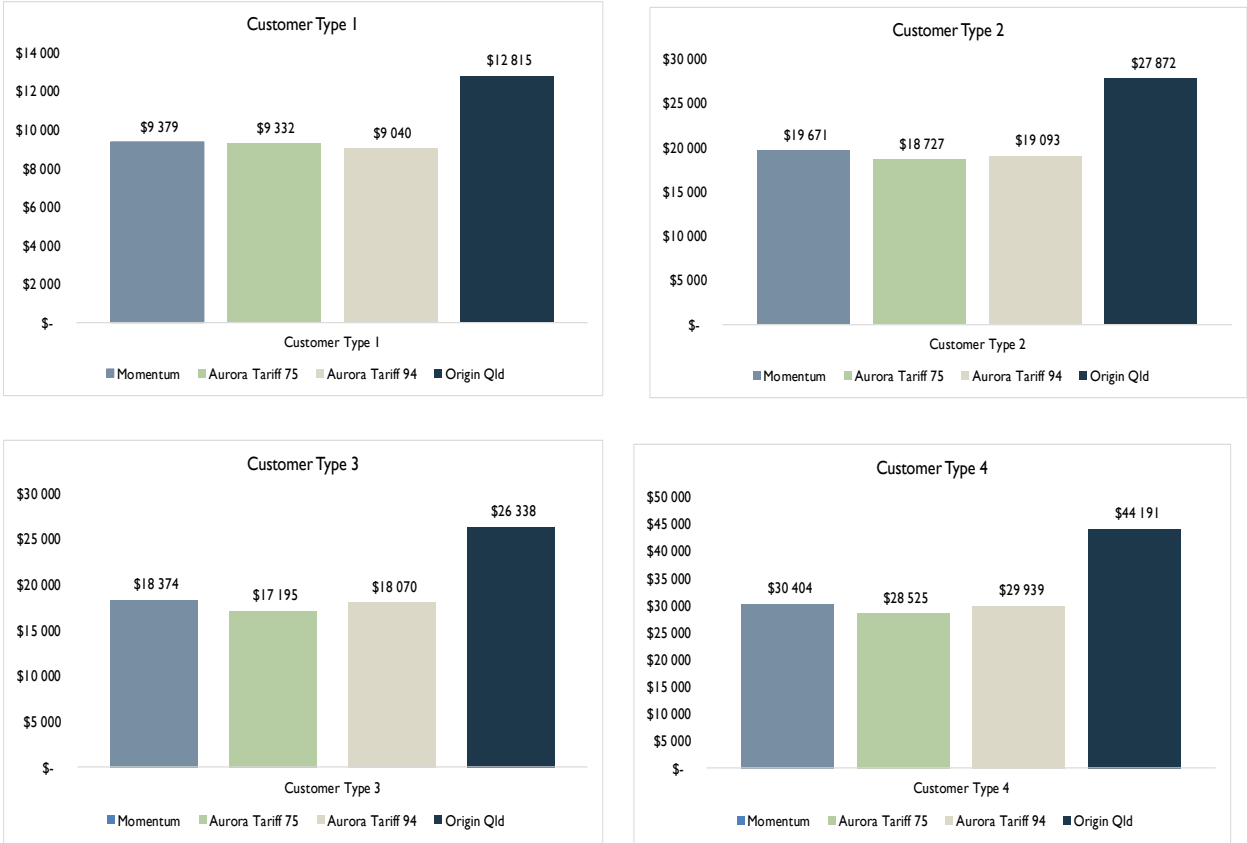
Tariff comparison analysis and findings

As discussed earlier, irrigators in Tasmania have alternative tariff choices which may be suitable for their individual circumstances. For example, Business Low Voltage Time of Use (Tariff 94) is a cost reflective tariff which consists of a daily service charge and a charge for each unit of energy consumed during peak, off-peak and shoulder periods. Unlike Tariff 75, the Tariff 94 tariff structure is consistent throughout the year. The preliminary analysis shows that irrigators with higher consumption in winter months relative to summer months may benefit from being

on Tariff 94. Due to the lower daily service charge, it may also be a suitable option for irrigators with lower consumption levels.

Given the majority of irrigation activity takes place in the summer months, a large number of irrigators may find the current Tariff 75 structure attractive because of the competitive shoulder pricing in the summer months. Tariff 75 does not have peak pricing in the summer months. This is particularly important when comparing tariffs between Tasmania and other jurisdictions.

A comparison of the bill outcome for four representative irrigation customers on Momentum Energy’s Victorian market offer, Aurora Energy’s Tariff 75 and Tariff 94 (time-of-use) and Origin Energy’s irrigation tariff in Queensland is shown below. Appendix 3 outlines the load characteristics of representative customer types used for this analysis.



The key findings from the comparative analysis of the irrigation tariffs include:

- Tariff 75 and Tariff 94 options available to the Tasmanian irrigation customers are competitive with Momentum Energy’s Victorian tariff offering to members of the Victorian Farmers Federation;
- the shoulder rate for electricity that is applicable in the summer months for Tariff 75 is very competitive. The irrigators with consumption peaking in summer months would generally benefit from Tariff 75;
- irrigators with low consumption levels would potentially benefit from other tariff options such as Tariff 94 (time-of-use), due to the lower daily service charge.

- customers with irrigation activity predominantly in winter months may also benefit from Tariff 94 (time-of-use); However irrigation activity in Tasmania in winter months is very low.
- Origin Energy’s irrigation retail offering in Queensland is not competitive due to the significantly higher price in the peak period; and
- the review has identified that some irrigators are currently on the Business Low Voltage General (Tariff 22) and are likely to be better off on alternative tariffs like Tariff 75 and Tariff 94.

Tariff 75 vs Tariff 94 comparison

Tariff 75 and Tariff 94 are cost effective tariffs for Tasmanian irrigators. It is noted that some irrigation customers on Tariff 22 may benefit by transitioning to an alternative tariff depending on their individual usage patterns.

Customer analysis was performed to compare a customer bill on Tariff 75 vs Tariff 94, using 2017-18 consumption data. It indicates that on average, 49 per cent of Tariff 75 customers may be better off on Tariff 94, mainly due to lower daily fixed charges with a likely average annual saving of \$500.

Around 51 per cent of the Tariff 75 customers benefit from the existing arrangements saving approximately \$1 800 per annum relative to Tariff 94. It is generally found that customers with large annual usage benefit from the dedicated irrigation Tariff 75, while the smaller irrigators would benefit from transitioning to Tariff 94. The average consumption for a typical customer who would likely find Tariff 94 cost effective is estimated to be 21.9 MWh per annum. This is because of the lower daily charge under Tariff 94 structure.

There is significant variation in customer usage profiles for irrigation customers. It is therefore important for individual customers to analyse their consumption data before choosing a particular tariff option. The farm advocacy role established by the Government within Aurora Energy would be an effective mechanism to assist irrigation customers to make an informed assessment in order to choose an appropriate tariff and other strategies to minimise on-farm electricity costs. Based on information provided, the customer could then choose their preferred retailer.

Tariff Option	Customers better-off	Avg Savings	Avg kWh	Total kWh
Tariff 75	1 470	51%	1 837	93 733
Tariff 94	1 433	49%	540	21 897

Table 1: Tariff 75 vs Tariff 94 comparison for irrigation customers (Source TasNetworks)

Treasury’s assessment

- The comparative analysis indicates that the irrigation tariff offers available to Tasmanian irrigators are competitive.
- Customers should seek advice from their retailer or an independent advisor to assist in determining the most appropriate tariff for their particular need.

7. Conclusion

A review of irrigation tariffs has been undertaken as part of the Government's *Energy on Farms* policy. The review has involved consultation with key stakeholders and has primarily considered the following:

- issues identified by key stakeholders;
- the competitiveness of Tasmanian irrigation tariffs; and
- the appropriateness of the irrigation tariff arrangements in Tasmania.

Stakeholders raised a number of issues with irrigation tariffs, although a number of them are not supported by the information obtained through the review. In particular, no information has been provided to support the assertion that irrigation tariffs are not competitive with those on the mainland and in particular those offered by Momentum Energy to members of the Victorian Farmers Federation, is not accurate according to Treasury analysis.

It is acknowledged that individual circumstances differ, but the analysis undertaken suggests that the standard tariff offering in Tasmania is more cost effective for irrigators than comparable offerings by Momentum Energy to Victorian customers.

That said, there are specific issues with the structure of the Tasmanian tariffs which could be analysed further. These include:

- determining the most effective time structure, both seasonally and daily, that best meets the needs of irrigators and the network provider;
- whether a concession arrangement for multiple connections would be appropriate without creating cross subsidies between customer classes;
- a review of billing options by retailers; and
- whether concessions for the upfront provision of connection assets is an effective mechanism to assist irrigators.

Any proposed changes need to take into account the impact on the electricity network and other customers to ensure that the distribution network remains robust without the need for cross subsidisation from other customer classes.

Broader implications raised in the review relate to water usage and potential environmental impacts of concentrated irrigation due to incentives within the tariff structure to irrigate at specific times. This appears to be more of a localised issue in certain areas which would be difficult to deal with purely through changes to the tariff structure, and may require other measures.

The review has also highlighted the significant assistance that is currently provided to the agricultural sector in the State to promote growth and efficiencies.

The Terms of Reference also included the consideration of:

- the costs and benefits of the current irrigation tariff arrangements and the costs and benefits of any proposed changes to those arrangements; and
- the expected impacts of any changes to the irrigation tariff arrangements.

The Government has little control over the setting of retail irrigation tariffs given that competition exists in the retail electricity market. While Aurora Energy is the sole regulated offer retailer in the State by virtue of the requirement in the *Electricity Supply Industry Act 1995* that a retailer must have a least 50 000 customers to be a regulated offer retailer, other retailers are able to offer equivalent rates through market contracts. Therefore tariffs need to be set which do not result in uncompetitive behaviour by the regulated offer retailer.

In addition, the significant network component of the tariff is regulated by the AER and must be consistent with the requirement of the National Electricity Rules. While TasNetworks is a Government owned business, the Government has no control over the national framework. In any event, any attempt to reduce the network component would result in cross subsidisation by other users.

This leaves the Government with little capacity to change the end retail tariff structure. However with further analysis of customer loads and the impact on the provision of network services, there may be opportunities to redefine the current network tariffs.

Accordingly, further detailed analysis is required to determine potential changes to the network irrigation tariff structure as noted above. This naturally falls to TasNetworks to undertake being the entity which sets the network tariffs and has access to customer and system load data.

It is understood that TasNetworks is proposing to conduct an “Empowering Farms Trial”. The trial, which will commence in 2019-20, aims to understand the challenges faced by customers in the agriculture sector in relation to energy management. It will also gather information and insights into the relationship between time-of-use irrigation tariffs and potential impacts on modern farming practices and the environment.

The trial will also explore the feasibility of offsetting the use of solar generation across multiple connection points to reduce costs. The data gained from the trial is likely to be valuable in determining whether tariff structures can be created that have a positive benefit to customers and other stakeholders. An example is reducing peak demand on the network and providing electricity to irrigators as cheaply as possible at the most appropriate times.

The Empowering Farms Trial will be a significant step towards further exploring the issues faced by irrigators in Tasmania, which have been identified as part of this review.

Appendix I - Background Information Paper

Review of Irrigation Electricity Tariffs

Background Information

January 2019

Background

Under the *Energy on Farms* policy, the Government has committed to review the current irrigation tariff structure and set prices that are more suitable to modern irrigation enterprises and offer a competitive advantage to Tasmanian irrigators. The policy states that:

New irrigation systems are heavily reliant on electricity to run pumps and irrigators. Working with the Tasmanian Farmers and Graziers Association we will review the current tariff structure and set irrigation tariffs that are more suitable to modern irrigation enterprises and offer a competitive advantage to Tasmanian irrigators, including ensuring tariffs are available which are equal to or lower than Momentum's offers on the mainland. This includes tariffs that enable better energy and water utilisation, support flexibility and enable farmers to lower their energy costs to suit different farming enterprises.

Terms of Reference

The Department of Treasury and Finance is tasked with undertaking a review of irrigation tariff arrangements in Tasmania.

The objective of the review is to provide a well-considered and balanced report to Government that highlights the costs and benefits of any amendments to the irrigation tariff structure. Policy recommendations are to be made in the context of the Government's *Energy on Farms* policy.

Stakeholder consultation is to be undertaken to consider:

- the competitiveness of Tasmanian irrigation tariffs;
- the appropriateness of the irrigation tariff arrangements in Tasmania;
- the costs and benefits of the current irrigation tariff arrangements and the costs and benefits of any proposed changes to those arrangements; and
- the expected impacts of any changes to the irrigation tariff arrangements.

Following stakeholder consultation, a report will be prepared for the Treasurer in regard to potential options and arrangements for setting irrigation tariffs.

The review is to be completed by 30 June 2019.

Objectives

The review will consider how tariffs can be set to enable better energy and water utilisation, support flexibility and enable farmers to lower costs to suit different farming enterprises.

The review will also consider a number of policy issues including:

- competitiveness of Tasmanian irrigation tariffs through a comparison of the tariffs paid by Tasmanian irrigators with those paid by irrigators in other jurisdictions.
- cross subsidisation of tariffs - whether there is any cross subsidisation across tariffs and if so the impact on different customer classes;
- the impact of tariff reform and the move to cost reflective network tariffs noting that changes to the National Electricity Rules require distribution network companies, such as

TasNetworks, to structure their prices to better reflect the usage of individual customers and the demands they place on the network.

Current irrigation tariff arrangements in Tasmania

Irrigation tariffs for both regulated and unregulated customers are based on an underpinning network tariff that is specifically intended for irrigation use. The current regulated tariff offered by Aurora Energy for irrigation customers is Tariff 75, which is based on TasNetworks' low voltage time of use network irrigation tariff.

Tariff 75 applies only to irrigation pumping for approved agricultural purposes and includes a daily service charge and a consumption based usage charge. The consumption charge varies depending on whether the electricity is consumed during defined peak, shoulder or off-peak periods, which are themselves defined differently during the summer and winter months.

Time period	Summer (1 Oct - 31 Mar)	Winter (1 April - 30 Sept)
Week Day (07:00 – 22:00) (Monday – Friday)	Shoulder	Peak
Weekend Day (07:00 – 22:00) (Saturday and Sunday)	Off-peak	Shoulder
Any Day (22:00 – 24:00) (Monday – Sunday)	Off-peak	Off-peak
Any Day (0:00 – 07:00) (Monday – Sunday)	Off-peak	Off-peak

During the “summer season” (typically the peak irrigation period), irrigators can access off-peak energy rates except between the hours of 7:00 and 22:00 on Monday to Friday. Shoulder rates apply for this period. Peak rates only apply during the “winter season” between the hours of 7:00 and 22:00 on Monday to Friday.

The table below sets out the 2018-19 standing offer prices for Aurora’s irrigation tariff (Tariff 75).

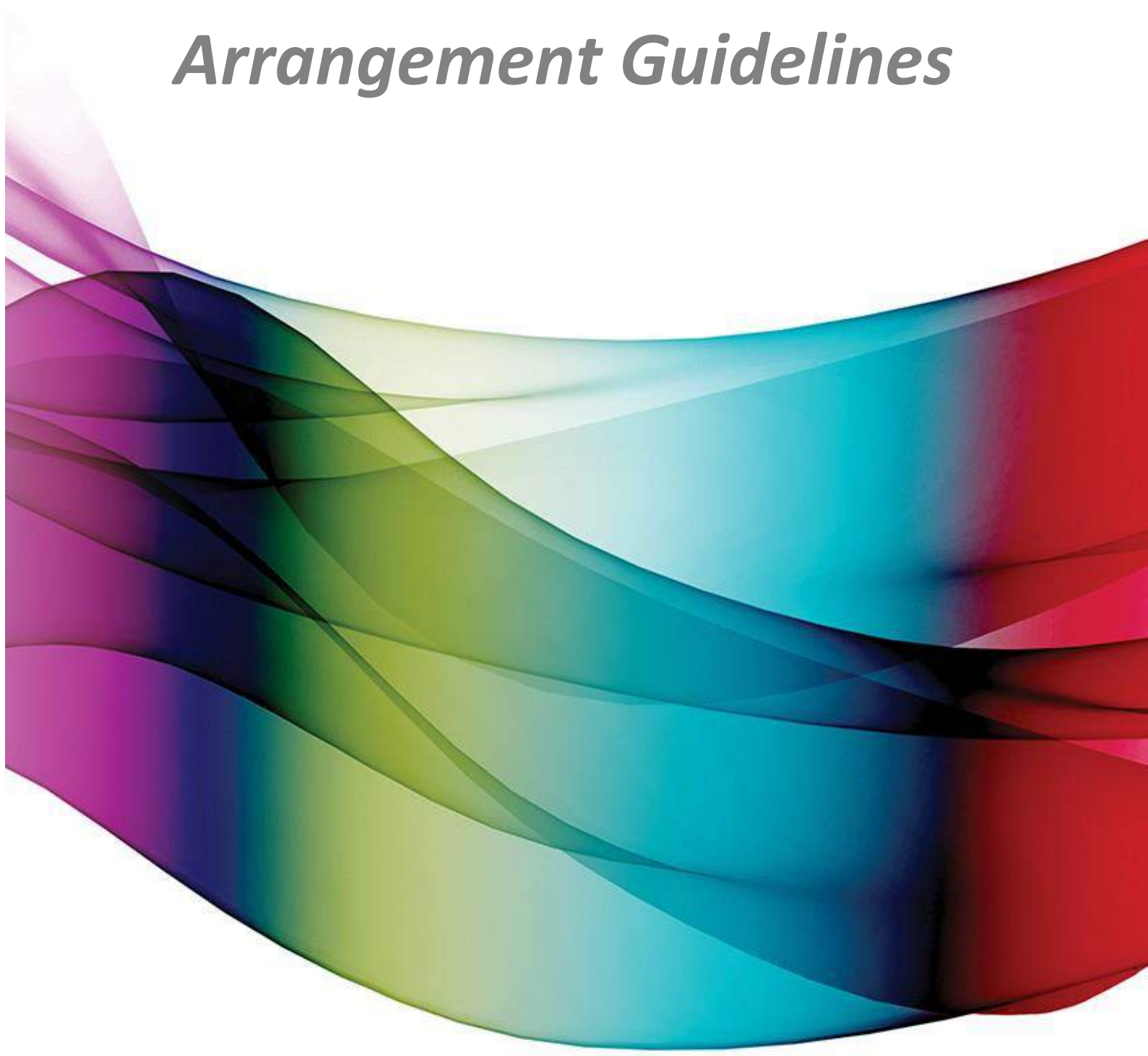
Charge type	Aurora
Daily supply charges	285.540 ¢/ day
Peak energy	31.032 ¢/ kWh
Shoulder energy	22.598 ¢/ kWh
Off-Peak energy	14.120 ¢/ kWh

The daily supply charges are levied per connection. So, a farmer with multiple connections using Tariff 75 would pay additional charges for each connection.

It should be noted that irrigation customers can also choose to enter into a market contract with a retailer for their electricity supply.



Irrigation Concessional Arrangement Guidelines



Irrigation Concessional Arrangement Guidelines

The aim of this Guideline is to provide additional detail and context when interpreting the Distribution Connection Pricing Policy when managing irrigation connections. This Guideline should assist in ensuring our practices align with the Tasmanian Government's policy on irrigation subsidies.

Who is an Irrigator customer?

A customer in respect of an installation for which all or a significant part (>90%) of the anticipated load is required for the purposes of pumping water:

- to irrigate crops or pasture; or
- that is subsequently used as part of an irrigation scheme to irrigate crops or pasture.

Irrigators are treated in a similar manner to all other customers requiring load connections, but, in line with State concessional arrangements where they receive a range of subsidies, TasNetworks has "allowances" which should be netted off their customer capital contribution for new connections.

The allowances for both small and large new irrigator connections are not applicable to modifications to existing irrigator connections except for the transformer allowance.

New irrigation connections

Irrigation projects with demand below the augmentation threshold (equivalent of a basic or standard customer project) are not required to contribute to augmentation services.

The cost associated with the provision of required transformer capacity necessary to meet the pumping loads of irrigation customers and related irrigator equipment is generally the largest component of extension services charges.

An irrigator requesting a connection service that requires extension services (other than transformers) should pay the direct costs associated with the provision of those assets, less any incremental revenue rebate.

Irrigation projects below the augmentation threshold are exempt from any augmentation charges.

Irrigation connection modification/alteration

A large irrigator requesting a modification to an existing connection is to pay the direct costs associated with any modification of connection assets required to accommodate that request and the costs associated with any augmentation required to accommodate that request.



Irrigation Concessional Arrangement Guidelines

Sometimes it will be necessary to alter the physical configuration of the existing distribution network to allow the construction of a network extension or complete a connection alteration. If a network alteration is required to allow connection of a irrigation customer project, the costs associated with this physical reconfiguration of the distribution network should be borne by the irrigator.

The costs include all costs associated with any work on the existing distribution network (other than network augmentation) necessary to allow a network extension or connection alteration for a large irrigator may include:

- any costs associated with extra assets to reinforce the mechanical strength of the distribution network to accommodate the connection, such as tee-off stays, tee-off stay-poles, tee-off cross-arms and tee-off insulators; less
- a cost equal to the depreciated value of any existing recoverable assets that need to be replaced.

Allowances

Connection Asset allowance

This allowance is provided to irrigation connections where the application for low voltage supply require TasNetworks to install an service. The allowance varies depending on the number of phases for an overhead service and the terminating enclosure for an underground service. The allowance includes:

- Service conductor or cable;
- Service fuse equipment;
- Service terminating equipment;
- Service enclosure equipment e.g. turret or cabinet

Irrigation customers should provide a customer capital contribution towards the cost of design

Network extension allowance

This allowance is up to \$10,000. It is based on the estimated cost of a 2-span extension along a public road. It includes variables such as vegetation clearing, live line work, traffic management, stays any easements etc. The \$10,000 is the maximum allowance. If the costs of the network extension are less than \$10,000 then the allowance equals those costs. Any 'underspend' cannot be used to offset costs in other areas.



Transformer allowance

TasNetworks will size transformer assets to meet the expected load of the irrigation installation.

- **Additional transformers**

If an irrigation installation requires more than one transformer, the customer is required to pay for each additional transformer, except for:

Centre pivot installations

Centre pivot installations that require a separate transformer for the centre pivot are not required to provide a customer capital contribution towards the cost of that transformer.

Centre pivot installations will therefore receive a second transformer allowance for the provision of that transformer for the centre pivot only. *This provision will only apply to large irrigation installation connections.*

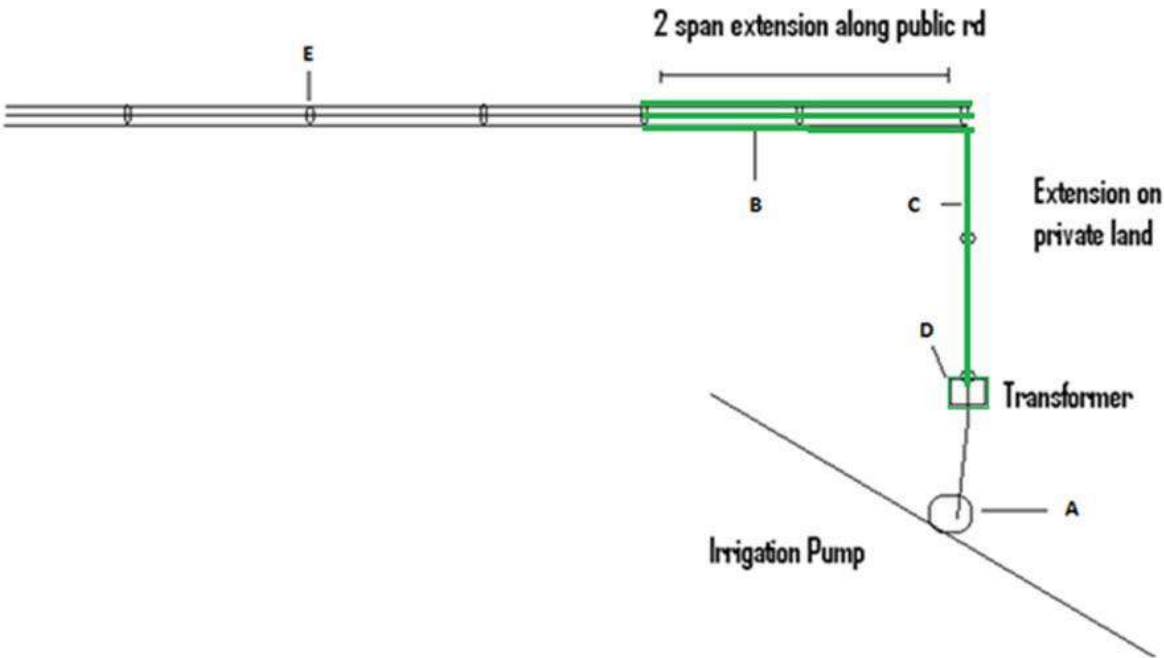
Irrigation connections are not required to provide a customer capital contribution towards the cost of a single dedicated transformer for an irrigation installation. *This allowance is only available if it is impractical to supply the pump from an existing transformer.*



Appendix

Diagram Example 1:

150 kVA connection, no augmentation costs, includes extension on public road and private land + transformer



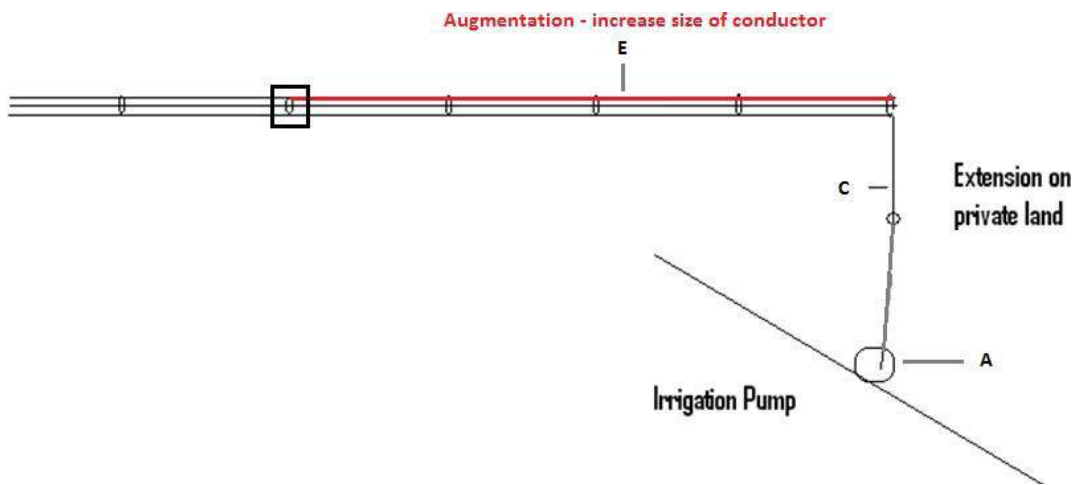
Example: 1 – 150 kVA connection, no augmentation costs, includes extension on public road and private land + transformer

Complex Irrigation Project			
Item	Component	Cost	Customer Charge
A	Connection service	\$750 (single span + fuses)	\$0
	Extensions		
B	<ul style="list-style-type: none"> Extensions to the network Public Road (Excl Tx) 	2 spans (\$9,000)	\$0 (equivalent 2 free spans)
C	<ul style="list-style-type: none"> Extensions to the network across Private Property (Excl Tx) 	2 spans (\$9,500) (*But only where above network extension allowance)	\$9,500
D	<ul style="list-style-type: none"> Transformer extension services 	\$18,400	\$0
E	Augmentation services Including transformation	\$0 No augmentation works	\$0
	Revenue Rebate	Revenue Rebate = offset on item B, 2 spans along public road \$9,500	Used for item B
	Totals	Total project cost \$37,650	Customer charge \$9,500



Diagram Example 2:

120 kVA connection, augmentation costs, includes extension on private land only



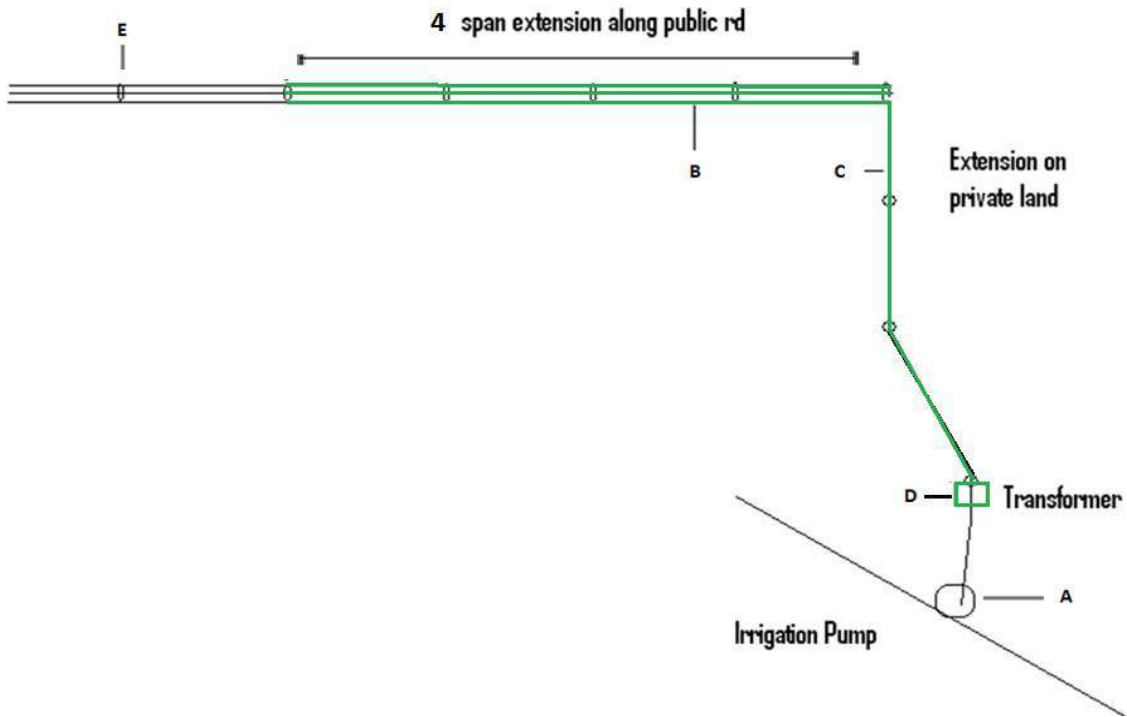
Example: 2 – 120kVA connection, augmentation costs, includes extension on private land only

Complex Irrigation Project			
Item	Component	Cost	Customer Charge
A	Connection service	\$750 (single span + fuses)	\$0
	Extensions		
B	<ul style="list-style-type: none"> Extensions to the network Public Road (Excl Tx) 	N/A	\$0 (equivalent 2 free spans)
C	<ul style="list-style-type: none"> Extensions to the network across Private Property (Excl Tx) 	1 span (\$5,000) (*But only where above network extension allowance)	\$5,000
D	<ul style="list-style-type: none"> Transformer extension services 	N/A	\$0
E	Augmentation services Including transformation	Upgraded size of conductor (est \$12,000)	= (demand estimate – threshold allowance) x unit rate = (120-70) * \$298 = \$14,900
	Revenue Rebate	Revenue Rebate noting no public road extension = the greater of 1/3 of the public road extension offset (\$10,000), or individually calculated rebate. = Individually calc assessment assume \$7,000	\$7,000
	Totals	Total project cost \$17,750	Customer charge \$12,900



Diagram Example 3:

200 kVA connection, no augmentation costs, includes extension on public road and private land + 200 kVA transformer



Example: 3 – 200kVA connection, no augmentation costs, includes extension on public road and private land + 200 kVA transformer

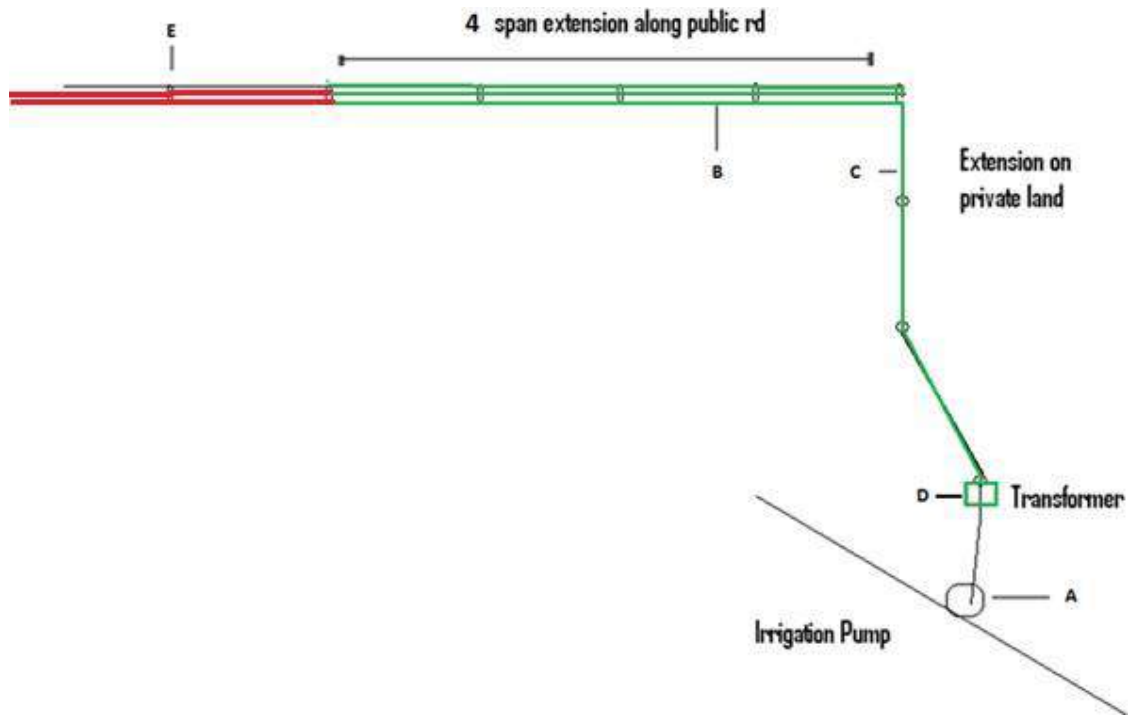
Complex Irrigation Project

Item	Component	Cost	Customer Charge
A	Connection service	\$750 (single span + fuses)	\$0
	Extensions		
B	<ul style="list-style-type: none"> Extensions to the network Public Road (Excl Tx) 	4 spans \$22,000	\$11,000 (equivalent 2 free spans)
C	<ul style="list-style-type: none"> Extensions to the network across Private Property (Excl Tx) 	3 spans = \$18,000	\$18,000
D	<ul style="list-style-type: none"> Transformer extension services 	\$22,400	\$0
E	Augmentation services	N/A	\$0
	Revenue Rebate	Revenue Rebate = = the greater of the public road extension offset (est \$10,000), or individually calculated rebate. \$11,000 offset on item B, 2 spans along public road	Used for item B
	Totals	Total project cost \$63,150	Customer charge \$29,000



Diagram Example 4:

60 kVA connection requires upgrade SWER line to 3 phase - augmentation costs, includes extension on public road and private land + 100 kVA transformer



Example: 4 – 60kVA connection requires upgrade SWER line to 3 phase – augmentation costs, includes extension on public road and private land + 100KVA transformer

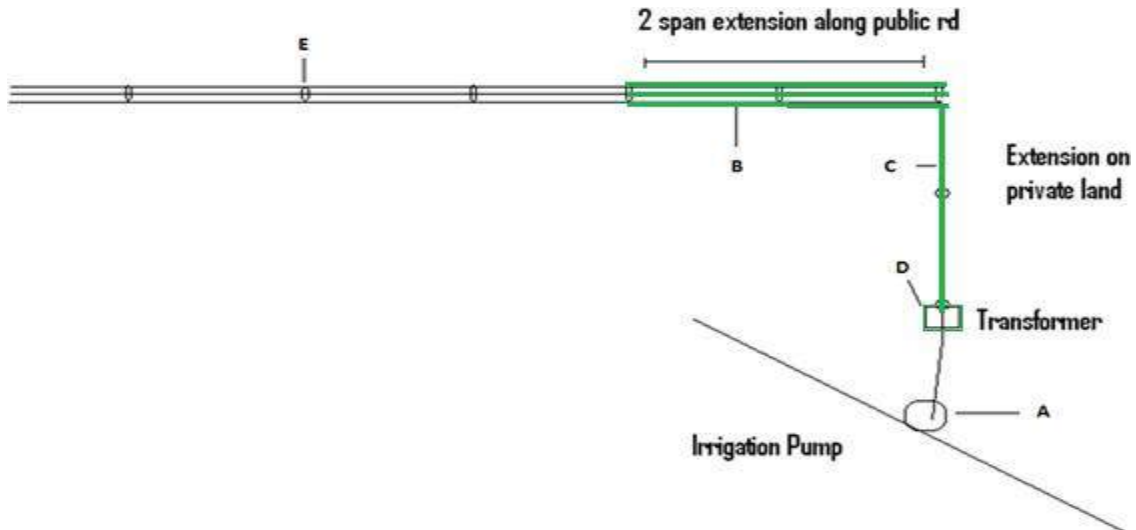
Complex Irrigation Connection			
Item	Component	Cost	Customer Charge
A	Connection service	\$750 (single span + fuses)	\$0
	Extensions		
B	<ul style="list-style-type: none"> Extensions to the network Public Road (Excl Tx) 	4 spans \$22,000	\$11,000 (equivalent 2 free spans)
C	<ul style="list-style-type: none"> Extensions to the network across Private Property (Excl Tx) 	3 spans = \$18,000	\$18,000
D	<ul style="list-style-type: none"> Transformer extension services 	\$12,400	\$0
E	Augmentation services While connection only 60KVA – threshold is 25 kVA for SWER lines	\$20,000	\$0 = (demand estimate – threshold allowance) x unit rate = (60-25) * \$298 = \$10,430
	Revenue Rebate	Revenue Rebate = = the greater of the public road extension offset (est \$10,000), or individually calculated rebate. \$11,000 offset on item B , 2 spans along public road	Used for item B
	Totals	Total project cost \$73,150	Customer charge \$28,430

Note: Because the connection is to an existing SWER line the 25kVA threshold applies.



Diagram Example 5:

60 kVA connection – no augmentation costs, includes extension on public road and private land + 100 kVA transformer



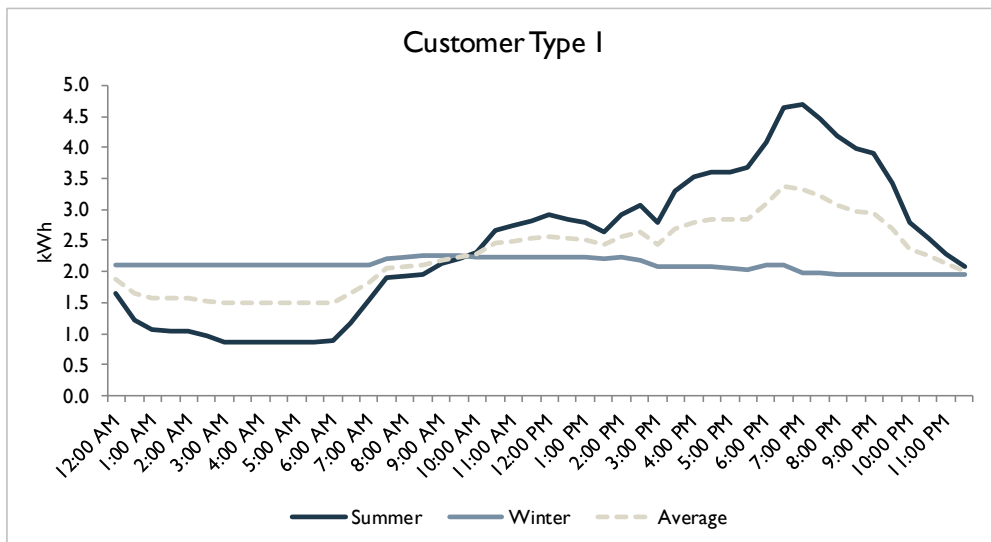
Example: 5 – 60kVA connection, no augmentation costs, includes extension on public road and private land + 100KVA transformer

Standard Irrigation Project

Item	Component	Cost	Customer Charge
A	Connection service	\$750 (single span + fuses)	\$0
	Extensions		
B	<ul style="list-style-type: none"> Extensions to the network Public Road (Excl Tx) 	2 spans \$9,000	\$0 (equivalent 2 free spans)
C	<ul style="list-style-type: none"> Extensions to the network across Private Property (Excl Tx) 	2 spans = \$11,000	\$11,000
D	<ul style="list-style-type: none"> Transformer extension services 	\$12,400	\$0
E	Augmentation services	N/A	\$0
	Revenue Rebate	Revenue Rebate = = the greater of the public road extension offset (est \$10,000), or individually calculated rebate. \$11,000 offset on item B, 2 spans along public road	Used for item B
	Totals	Total project cost \$33,150	Customer charge \$11,000

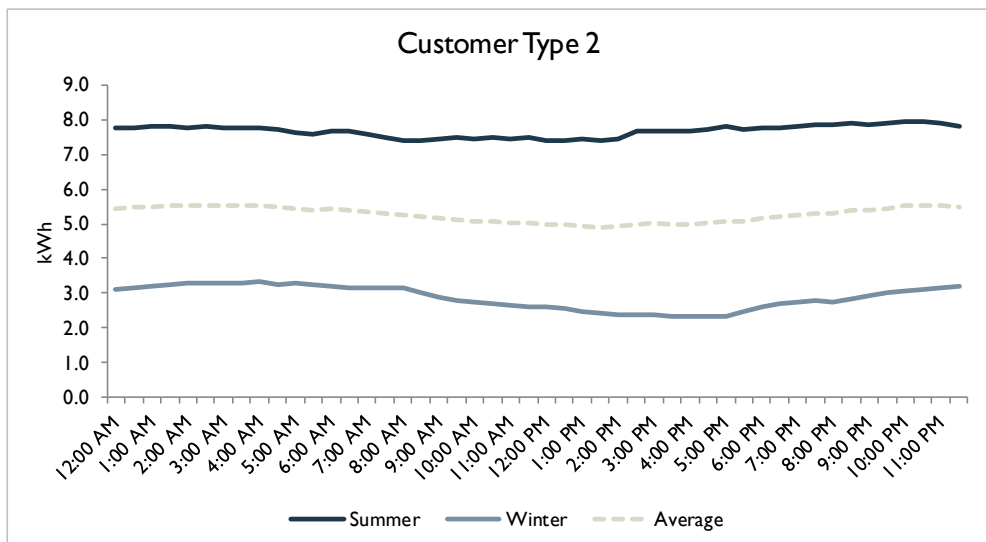


Appendix 3 - Load Characteristics



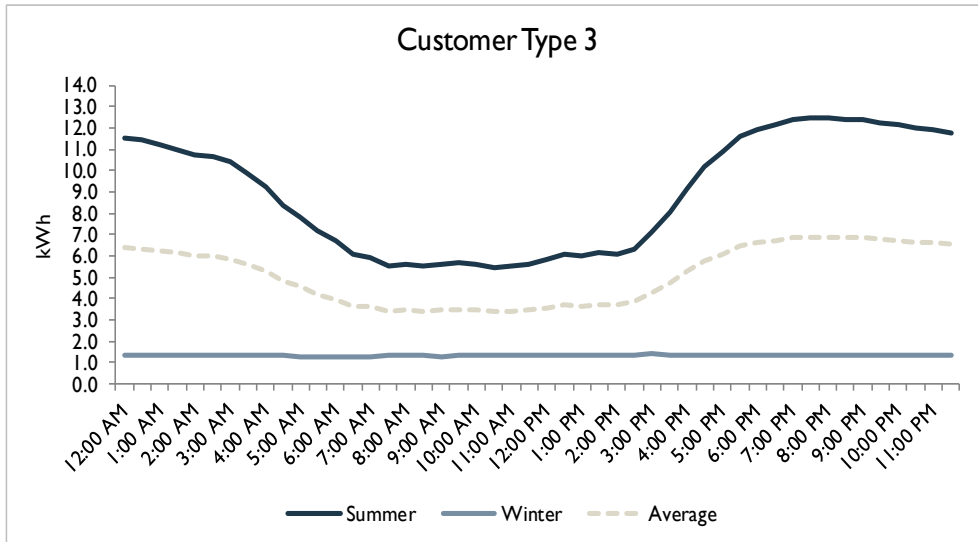
Load Characteristics:

- Medium annual usage (approximately 40 MWh per annum)
- About 54 per cent of consumption is in summer and 46 per cent in winter
- Approximately 20 per cent annual usage occurs during Tariff 75 peak times
- Flat daily profile during winter and gradually increasing consumption with a mid-evening peak during summer



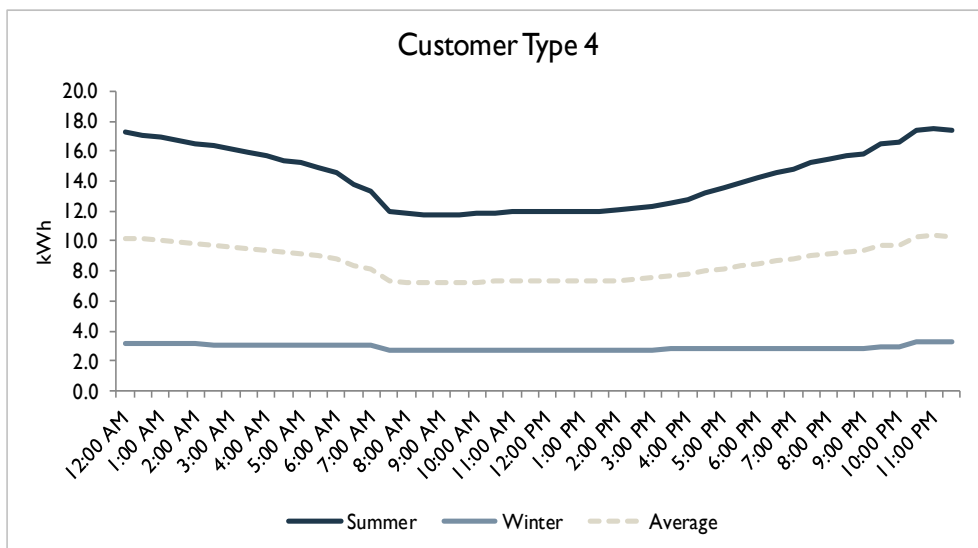
Load Characteristics:

- Medium to high annual usage (approximately 92 MWh per annum)
- Significant usage during summer (73 per cent)
- Approximately 12 per cent annual usage occurs during Tariff 75 peak periods
- Flat daily profiles during summer and winter



Load Characteristics:

- Medium to high annual usage (approximately 90 MWh per annum)
- 87 per cent of usage occurs during summer months
- Approximately 6 per cent annual usage occurs during Tariff 75 peak periods
- Installed solar generation offsets usage in the middle of the day during summer months



Load Characteristics:

- Medium to high annual usage (approximately 150 MWh per annum)
- 83 per cent of usage occurs during summer months
- This customer profile is likely to be representative of the overall irrigation customers in Tasmania. It is an average half hourly load profile for irrigation customers with interval data.





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