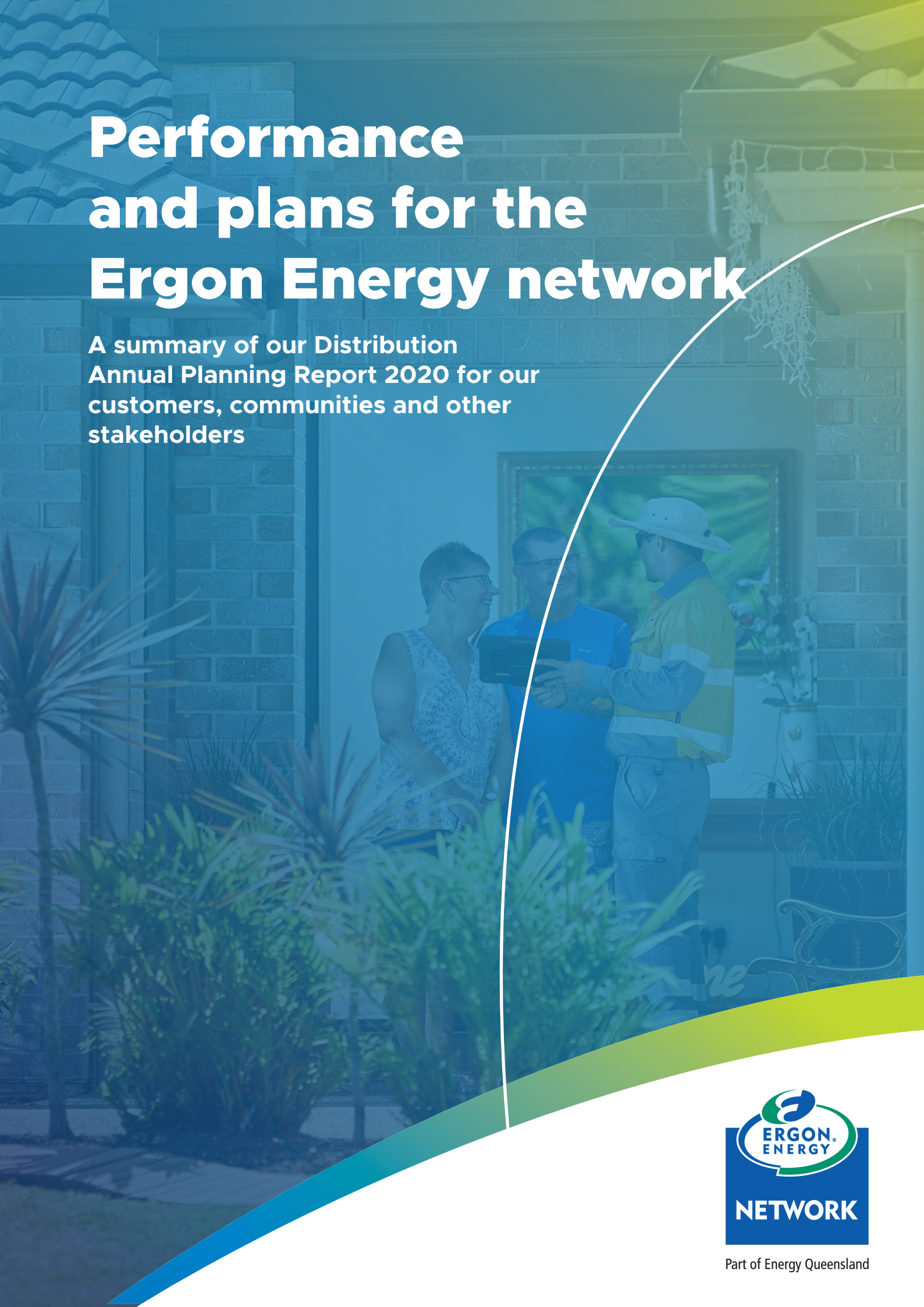


Performance and plans for the Ergon Energy network

A summary of our Distribution Annual Planning Report 2020 for our customers, communities and other stakeholders

ERGON ENERGY NETWORK

Part of Energy Queensland

Purpose

Ergon Energy Network's Distribution Annual Planning Report (DAPR) explains how we are continuing to safely and efficiently manage the electricity distribution network in regional Queensland.

This summary outlines the content in our planning report with links to specific chapters you can refer to for more information.

The full report details the network's performance in 2019- 20 and our plans for 2020-21 to 2024-25. It provides insights into the key challenges we face and our responses to them, highlighting the areas where we are seeking to work closely with our customers, the community and different industry partners. It provides information to assist interested parties to:

- understand how the electricity network works
- provide input to the future development of the network
- identify locations that would benefit from significant electricity supply capability or demand side management and non-network initiatives
- identify locations where major industrial loads would be best located.

This information is also supported by our online interactive map of the electricity network and information provided in our Demand Management Plan and Demand Side Engagement Strategy.

Contents

Message from our Executive

I am pleased to share this summary of Ergon Energy's Distribution Annual Planning Report for 2020.

Each year we publish our plans to build on the dialogue we have with our many different stakeholders. They cover the key factors shaping our plans, the current and forecasted electricity demand, the state of our networks and service performance trends, as well as our investment intentions for the coming years.

Many of our customers are telling us their primary concern is affordability and that we shouldn't spend any more than is necessary on maintaining, operating and upgrading our network. Through the many customer advocate groups we engage with, we know this means we must work more closely together with all of our stakeholders to balance affordability with other critical customer and community outcomes that need to be achieved.

Engagement has become even more important with the advent of COVID-19 restrictions and subsequent downturn in the economy. This has brought 'energy inclusion and vulnerability' as well as 'economic development and jobs' to the foreground.

At all times these issues must be balanced while continuing to ensure the safety of the communities we serve across regional Queensland, including our employees, by managing the risks associated with the electricity network.

Enabling greater choice and control

Across the 765,000 homes and business connected to the Ergon Energy network, many are taking greater control over their electricity solutions by investing in solar and other emerging technologies. Our challenge in managing the network is to leverage this growing level of customer-led investment to improve and complement our own efficient investment.

In response to this, we have developed Future Grid plans anticipating an energy environment characterised by rapid technological change, as well as ongoing high penetrations of renewable energy resources.

These factors are shaping our plans as we work to ensure the efficient investment in, and operational use of, the regional electricity networks for the long-term interests of our customers and the broader community.

Thanks. You're part of a bright future

I would like to thank all of the customers and other stakeholders who have engaged with us on our plans over the past year, and participated in our programs, especially the industry partners who are central to our demand management program and enabling network connections.

I look forward to continuing to work together as we evolve our investment and operational programs to best deliver a bright future for Queensland.

Peter Price
Executive General Manager
Engineering

Our Network

259
zone substations

103,300
distribution transformers

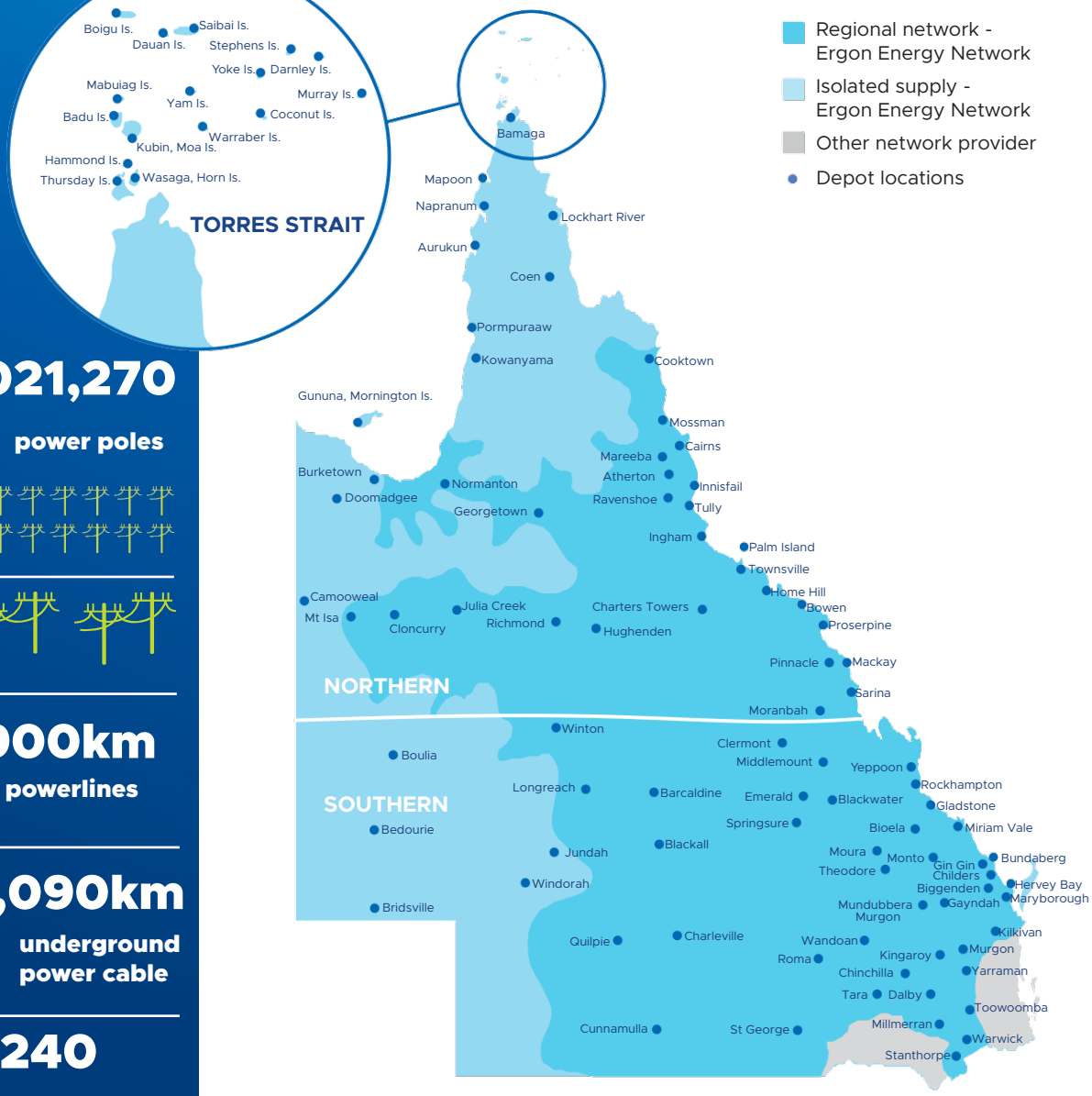
1,021,270
power poles

143,900km
Overhead powerlines

9,090km
underground power cable

765,240
connected customers

Our Service Area



What is shaping our plans?

To ensure we're meeting the needs of our customers and communities, we invest in listening to their expectations, concerns and ideas.

We continue to hear that safety should never be compromised and that electricity affordability remains the core overriding concern for many. At the same time, in addition to keeping the lights on, it is clear our customers want greater choice and control around their energy solutions, with a strong interest in renewables and other energy-related technologies.

These insights are shaping our plans.

Our engagement program

To ensure we're meeting the unique and diverse needs of our communities and customers, in a period where our industry is undergoing rapid transformation, a coordinated, performance measured, multi-channel community and customer engagement program is required.

Most recently, we have refreshed our understanding and prioritisation of the economic, governance, social and environmental topics that matter most to our different stakeholders – building on our extensive engagement undertaken previously as well as ongoing in 2019-20, while focusing upon the network businesses' investment plans; the Regulatory Determination for 2020-25 plus our network tariff reform program.

As part of our planning process for our Regulatory Determination, we responded to our community and customer insights with a set of commitments for 2020 and beyond.

Our Customer Commitments:

- Affordability – we continue to seek ways to make electricity more affordable
- Security of supply – we're here to keep the lights on -providing the peace of mind of a safe, reliable electricity supply
- Sustainability – we support you in the selection of your energy solutions
- Prioritization – we continue to prioritize our investment plans, including the strategies and specific investments reflected in this report.

For more on our engagement program go to: Chapter 3 Community and Customer Engagement

Safety first - a no compromise approach

Safety is considered to be of the utmost importance by Ergon and the community. As our networks age and the risk of equipment failure towards end-of-life increases, our focus on maintaining safety outcomes for our staff, customers and communities is paramount.

We are taking a no compromise approach to community and staff safety, leveraging innovative solutions that enable continuous improvement. We're continuing to focus on improving safety in our maintenance and replacement practices across all asset categories. We also continue to invest in new technology trials that have the potential to deliver improved, safer or more efficient outcomes for our customers.

Making electricity more affordable

Our customers have told us that affordability is their primary concern – for both cost of living and business competitiveness. Affordability is more than part of our purpose statement, it is a fundamental consideration in how we manage our network.

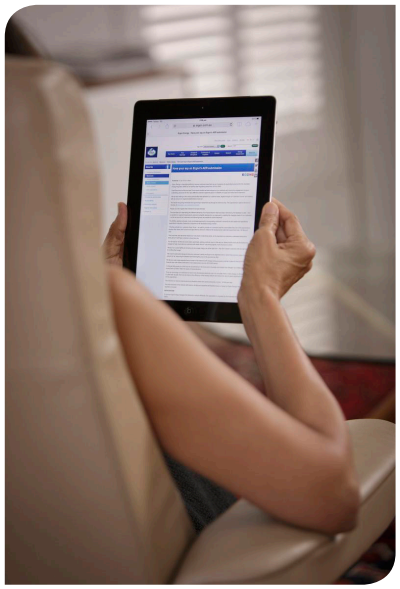
As a result, we can report that all residential consumers are now saving, on average, about $84 per year on their power bill, and small business customers about $75.

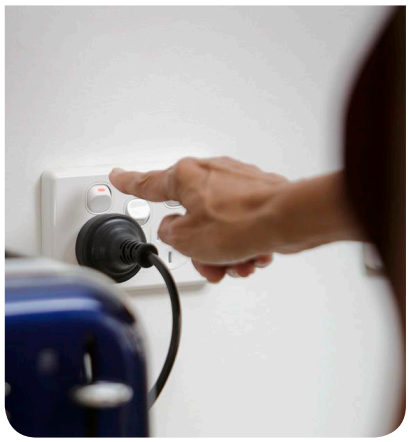
While the new regulated revenue allowances will create ongoing challenges for us, this is a good outcome for customers.

Our forward investment program, in the current regulatory period, remains focused on minimising costs to customers, while still ensuring that we meet the outcomes that our customers expect.

Our asset management strategies aim to balance our customers' need for a safe, secure and reliable electricity supply, as well as their desire for this service to be provided at minimal cost.

A key part of this process is to optimise the economic benefits of network improvement, while always considering the potential for non-network solutions, such as demand management.





The growth in solar energy

Queensland has one of the highest penetrations of roof top solar energy systems in the world. The rapid uptake of photovoltaic system (PV) has changed the distribution of electricity; impacting the LV network and creating a number of system design and operation challenges.

As at the end of June 2020, 179,030 solar PV systems, from <1kW to 50MW, were connected to the Ergon Energy network with a total installed capacity of 1,708MVA. The volume of new solar PV connections and total solar PV capacity over the past 12 months was around 12% and 38% higher, compared to the previous year, respectively. Strategic planning initiatives, such as the implementation of the 230V LV Standard, help us manage voltages across the network and enable further uptake of solar PV. For more information on solar energy growth go to:

- Chapter 4 Strategic Forecasting
- Chapter 10 Power Quality or
- Chapter 11 Emerging Network Challenges and Opportunities

1,500

new solar energy connections per month

179,000

small-scale solar energy systems connected to the network

1,700MVA

solar generation capacity on the network

30%

of all regional Queensland residential detached houses have rooftop solar energy

The changing use of the network

The increase in the distributed solar energy resources is changing the way the network is used; with two-way energy flows and new daily load profiles emerging across the network.

In some areas this has been quite significant with the 'hollowing out' of demand at the substation level during daylight hours and a reduction in traditional afternoon electricity peak demands, as represented in the demand profile graph below.

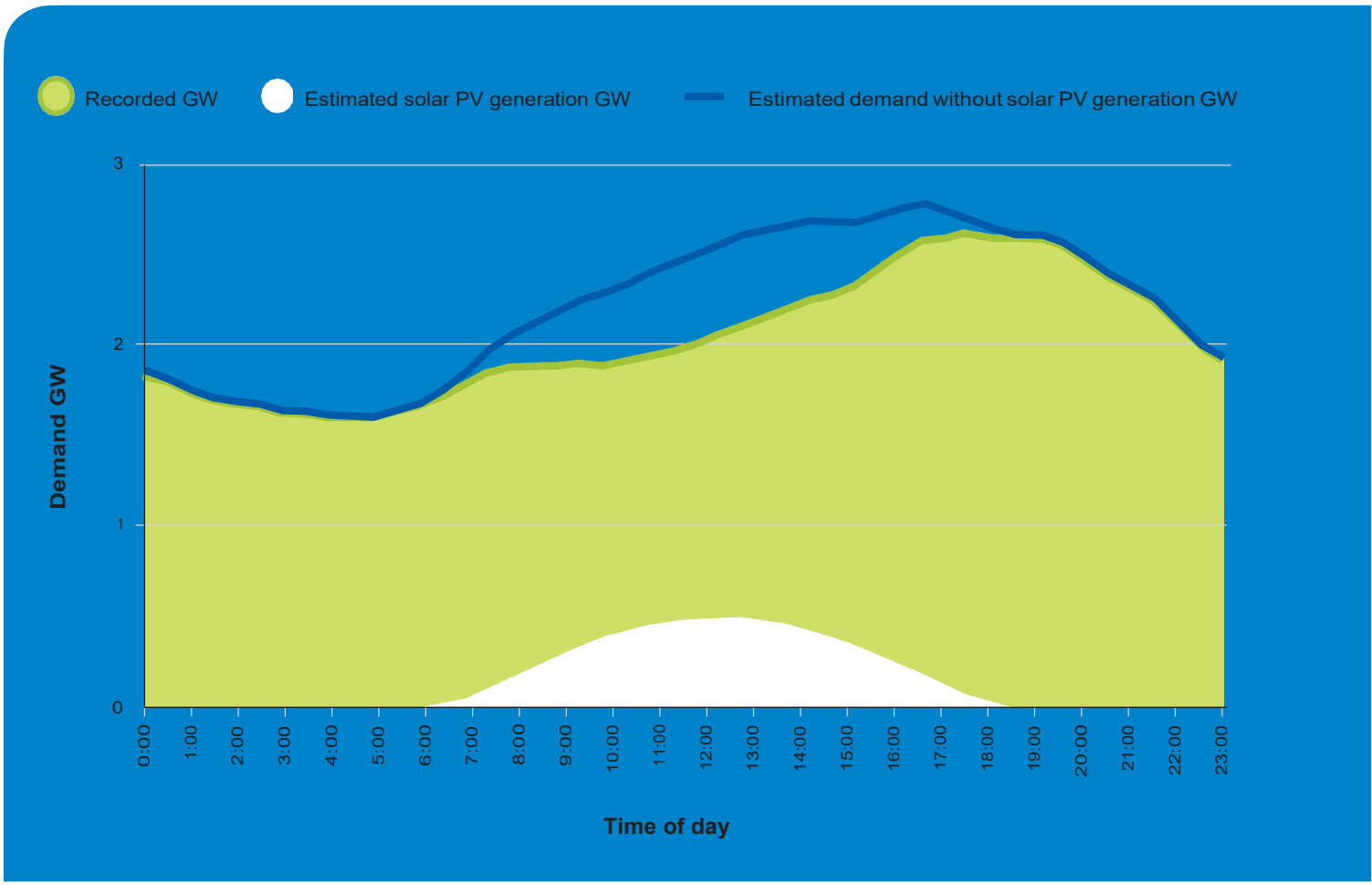
While this occurs, significant two-way flows of electricity along local 'poles and wires' are experienced in residential areas as homes and businesses share their energy output to meet the community's energy needs, which continues to peak as 'school gets out' and 'mealtime' begins.

Also shown in the demand profile graph below, is how generated solar PV energy helps address the network peak in early afternoons. As the sun and solar generation fades later in the day however, a 'de facto' peak presents itself (albeit lower than what it would have been earlier without the benefit of solar).

It is important to understand that this effect can be very different on a day-to-day basis with demand on the network returning, often dramatically, when cloud cover reduces the local solar energy output. Where there are high levels of solar, quality of supply or voltage issues also need to be addressed. These challenges are also shaping our network plans.

For further information please refer to:

- Chapter 4 Strategic Forecasting
- Chapter 10 Power Quality or
- Chapter 11 Emerging Network Challenges and Opportunities



Looking at trends in electricity use

Ergon forecasts are based on scenarios with varying economic and demographic assumptions. They indicate that it is likely we will see little change in peak demand and the volumes of electricity delivered through the regional Queensland electricity network over the next few years. However, this masks growth in customer numbers (and network expansions to connect them) being offset by increases in solar PV installation and energy efficiency.

Over the medium to longer term, the trend in energy usage from the network will depend on the uptake of other emerging technologies – like battery storage, electric vehicles and the next generation of home and commercial energy management systems.

Electric Vehicles

The growth of Electric Vehicles (EVs) in Queensland as a new class of electrical load presents both challenges and opportunities. Our aim is to ensure we're enabling the charging of Plug-in Hybrid Electric Vehicles (PHEVs) and Battery Electric Vehicles (BEVs) or EVs by our customers, while leveraging them to enhance network utilisation (avoiding peaks in demand by charging at times when there is extra capacity available on the network) and place downward pressure on electricity prices.

Currently, EV uptake in in Australia is among the lowest amongst developed countries. On 30 June 2020, EVs accounted for only 0.12% of all registered cars in Queensland, and 1.0% of cars sales over the previous 12 months. The uptake rate of EVs has recently risen dramatically, and will rise further in 2021 due to a number of new models being released, the increased availability of public EV fast and ultra-fast charging stations and growing consumer appetite.

The rapid development, and resulting lower costs, of lithium-ion and other battery technologies will also make EVs increasingly attractive to more customers. Accordingly, Ergon Energy is collaborating with relevant stakeholders to create access to optimal private and public charging solutions based on the affordability and convenience priorities of EV owners.

EVs are at the heart of our 'Electric Life' strategy. We are implementing EV specific activities around buyer education and research, engaging with the EV industry, connecting EV charging stations and monitoring the impacts of this new technology on the network.

All of these efforts encourage a safer, more efficient and environmentally cleaner transport option for Queensland.

For more on the emerging challenges go to: Chapter 11 Emerging Network Challenges and Opportunities

How is the network performing? Where are we focusing?

We're always at the ready for whatever Queensland's challenging summer season delivers. We're continually maintaining and if needed, renewing our network to ensure the safety, security and reliability of supply.

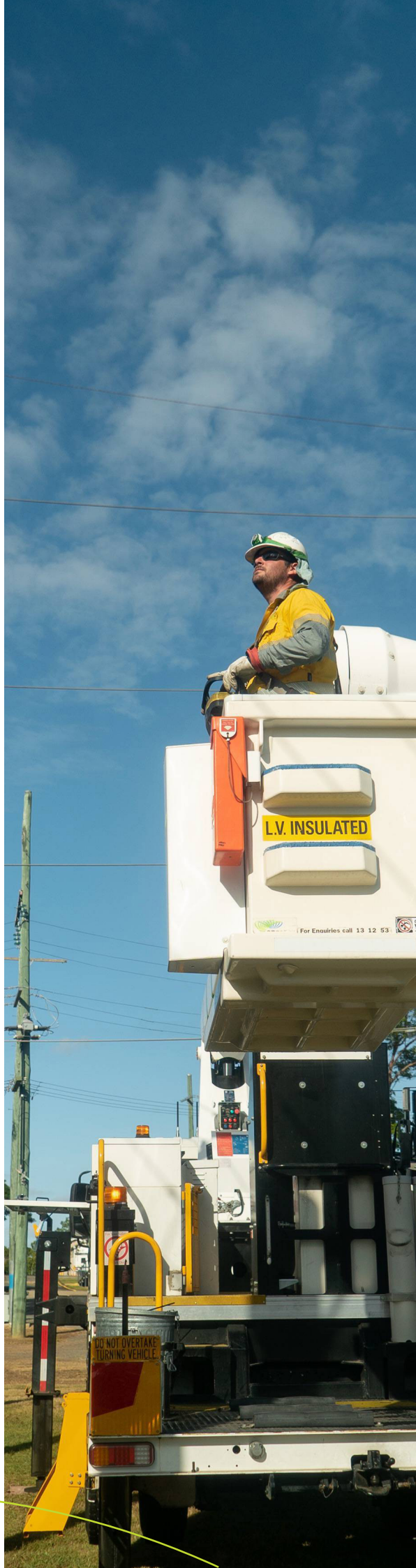
And we're focusing on using technology to do things smarter, more safely, more efficiently while delivering great customer experiences.

Our disaster response

Our response capability is constantly tested by a range of severe weather events across the state, and each event is unique in terms of scale and impact. During the 2019-20 season Ergon Energy experienced three significant bushfires across the network.

Long Rural network lines were also highly influenced by high voltage conductor failures with a significant proportion occurring during severe weather events.

For more on our network forecast go to: Chapter 4 Strategic Forecasting



Did you know

We supply power to over 100 hospitals and 1,000 schools

The QLD Government has set a target of 50% renewable energy by 2030

We supply over 765,000 customers

Our network stretched out would circle the Earth 4 times

Ergon network reliability

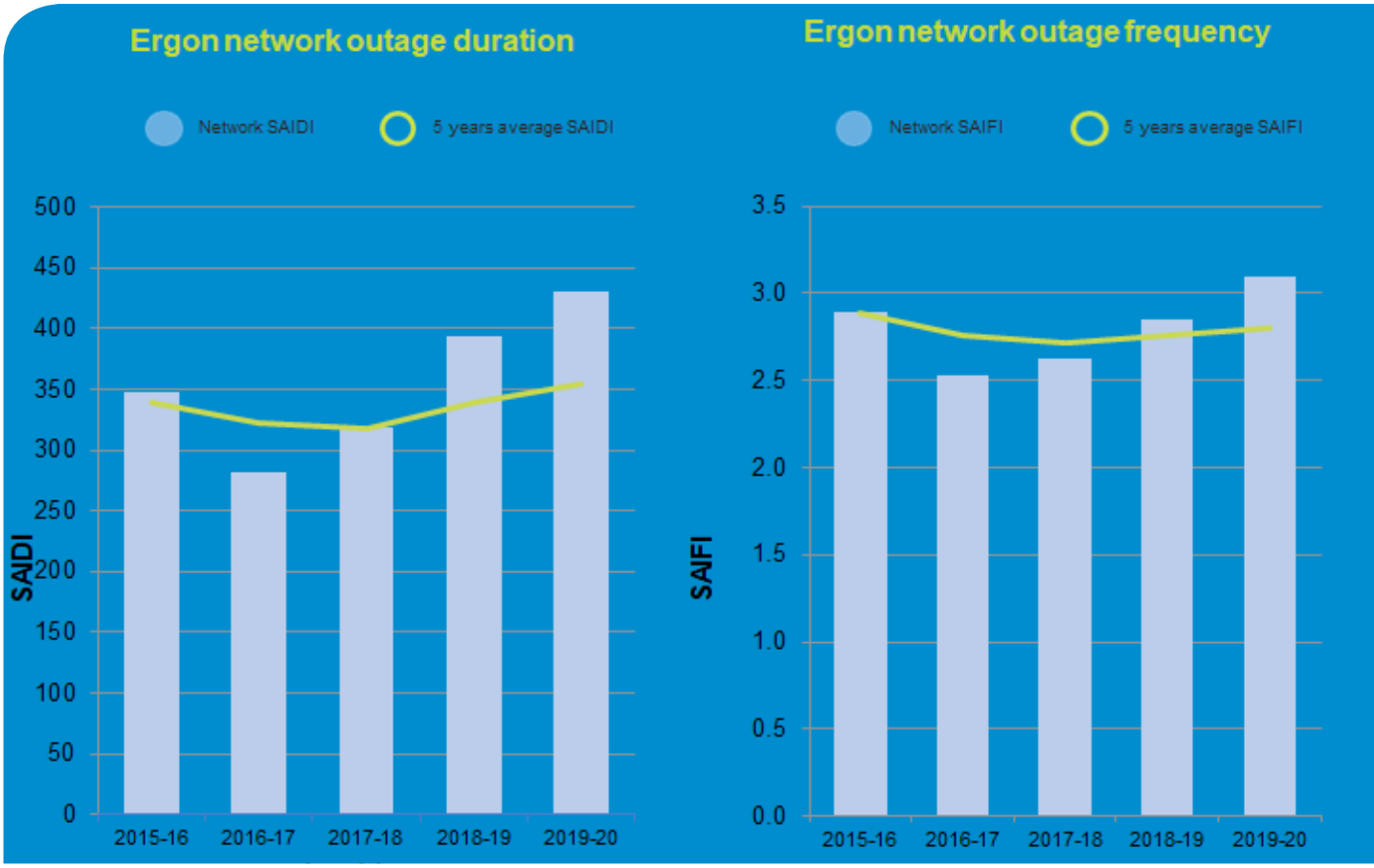
In 2019-20, Ergon Energy's reliability of supply was favourable on four of the six measures related to duration and frequency of power outages quantified by the System Average Interruption Duration Index (SAIDI) and the System Average Interruption Frequency Index (SAIFI) respectively.

Ergon's Urban and Long Rural SAIDI measured unfavourably compared with the Minimum Service Standards (MSS) Limit having been significantly impacted by an increase in the duration and frequency of planned supply interruptions required to accommodate high priority defect remediation and repairs across regional Queensland.

Additionally, the Long Rural network was also highly influenced by high voltage conductor failures, with a significant proportion occurring during severe weather.

Our overall reliability unplanned performance has improved since the inception of Service Target Performance Incentive Scheme (STPIS) in 2010 with both the duration and frequency of overall unplanned outages reducing by 16.6% and 14.3% respectively. This is a reflection of the targeted investment made during the last two regulatory control periods towards achieving the regulated MSS. The graphs below illustrate the five-year trend in outage duration and frequency.

For more on our network's performance go to: Chapter 9 Network Reliability



Using technology to deliver smarter solutions

Ergon Energy is building it's capability with an ongoing investment into technologies that deliver improvement in risk outcomes and efficiency.

These efforts include utilising LiDAR data from the aerial asset and vegetation monitoring management technology. This aircraft-based laser and imaging capture system provides spatial mapping of the entire overhead line network. The data captured is processed to enable identification and measurement of the network and surrounding objects such as buildings, terrain and vegetation. This system creates a virtual version of the real world to allow the fast and accurate inspection and assessment of the physical network and the surrounding environment, particularly vegetation (see above).

The integration of this information into our decision framework and works planning processes is increasingly delivering productivity and efficiency improvements for vegetation management and other network analytics such as clearance to ground analysis, clearance to structure analysis, pole movement and leaning poles analysis. Other innovative identification systems are also being developed.

For more on our maintenance approach go to: Chapter 8 Asset Life-Cycle Management

Managing an ageing network

Our networks are ageing and require regular inspections and condition monitoring. Ergon Energy continues to employ condition and risk-based asset inspection, maintenance, refurbishment and replacement strategies. End-of- economic-life replacement and life-extension refurbishment decisions are informed by risk assessments considering safety, history, performance, cost, and other business delivery factors.

Our assets are inspected at scheduled intervals to detect physical indications of degradation that lead to impending failures. Typical examples of inspection and condition monitoring activities include:

- Analysis of power transformer oil to monitor for trace gases produced by internal faults
- Inspection of customer service lines
- Assessing the extent of decay in wood power poles to determine residual strength
- Inspection of timber cross-arms to detect visible signs of degradation
- Electrical testing of circuit breakers.

Ergon Energy has a well-established asset inspection program to meet regulatory requirements. All assets are inspected in rolling period inspection programs.

Due to age and degrading safety profiles, as part of our long-term strategy Ergon's refurbishment program includes an increased volume of safety driven defect works, including pole replacement and nailing, crossarm rectification, small copper conductor replacement and improving network clearances to ground and structure.

Major projects 2019-20

During 2019-20, our teams continued to deliver a large program of work to ensure the network remained safe and reliable. Our capital program aims to improve and reinforce electricity supplies across regional Queensland to meet our customers' evolving needs.

During the year, we progressed the following major projects:

Tennyson substation

Refurbishment and reliability of supply in Mackay

Dysart substation

Refurbishment and security of supply

Finding the best solutions together

To move to a more sustainable energy system we know our network needs to enable customer choice in electricity supply. This requires an intelligent grid and a focus on making it easier to connect to the network.

We are open to exploring the alternatives

Before investing in significant network projects, we explore if non-network options could provide an efficient alternative solution by engaging the market through a Regulatory Investment Test for Distribution (RIT-D) process.

The following projects, listed on Ergon Energy's Current Consultations website, are being taken through this process:

- Addressing Customer Demand Requirement in Western Grid/ Barcaldine
- Reliability and Capacity Reinforcement for the Cloncurry supply area
- Reliable Provision of Electricity to the East Bundaberg area
- Reliable Provision of Electricity to the Maryborough Supply area
- Reliable Provision of Electricity to the Pialba (Hervey Bay) area
- Pittsworth Regional Reinforcement
- Reliable Provision of Electricity to Point Vernon (Hervey Bay) area
- Addressing reliability requirements in the Cannonvale network area
- Addressing Reliability Requirement in the Cape River network Area
- Ensuring Reliability of Electricity Supply and Managing Network Asset Risks in the Douglas Shire Area
- Addressing reliability requirements in the Garbutt network area
- Emerging Distribution Network Limitations in the Gracemere area
- Reliable Provision of Electricity to the Kilkivan Supply Area
- Reinforcement for the North Toowoomba network
- Toowoomba Network Planella Substation Reinforcement
- Reliability of Electrical Supply and Network Asset Risk Management in the Wide Bay Burnett Area.

Improving our connection process

During 2019-20, we continued to align the connection process more generally for Energex and Ergon Energy Network to deliver consistent customer experiences and increased efficiencies.

This has included a major system investment and administration reviews focused upon improvements to the customer experience which will enable customer and industry partners access to information and improve the network connections process.

We are also working with stakeholders to evolve regulations around connection requirements to enable innovation for new electricity supply solutions that deliver balanced outcomes.

For more information go to: Chapter 11 Emerging Network Challenges and Opportunities

Large scale solar

Ergon Energy is supporting the connection of a large number of major renewable energy projects and has established formal connection agreements with major generators that will provide more than 1.2GW of renewable energy. We are also working with a number of other generation proponents in the application phase that could further extend committed generators totalling 1.9GW in the coming years.

For a more in depth look at our approaches to large scale solar farms visit: Chapter 11 Emerging Network Challenges and Opportunities

Sustainability - the future is in an intelligent grid

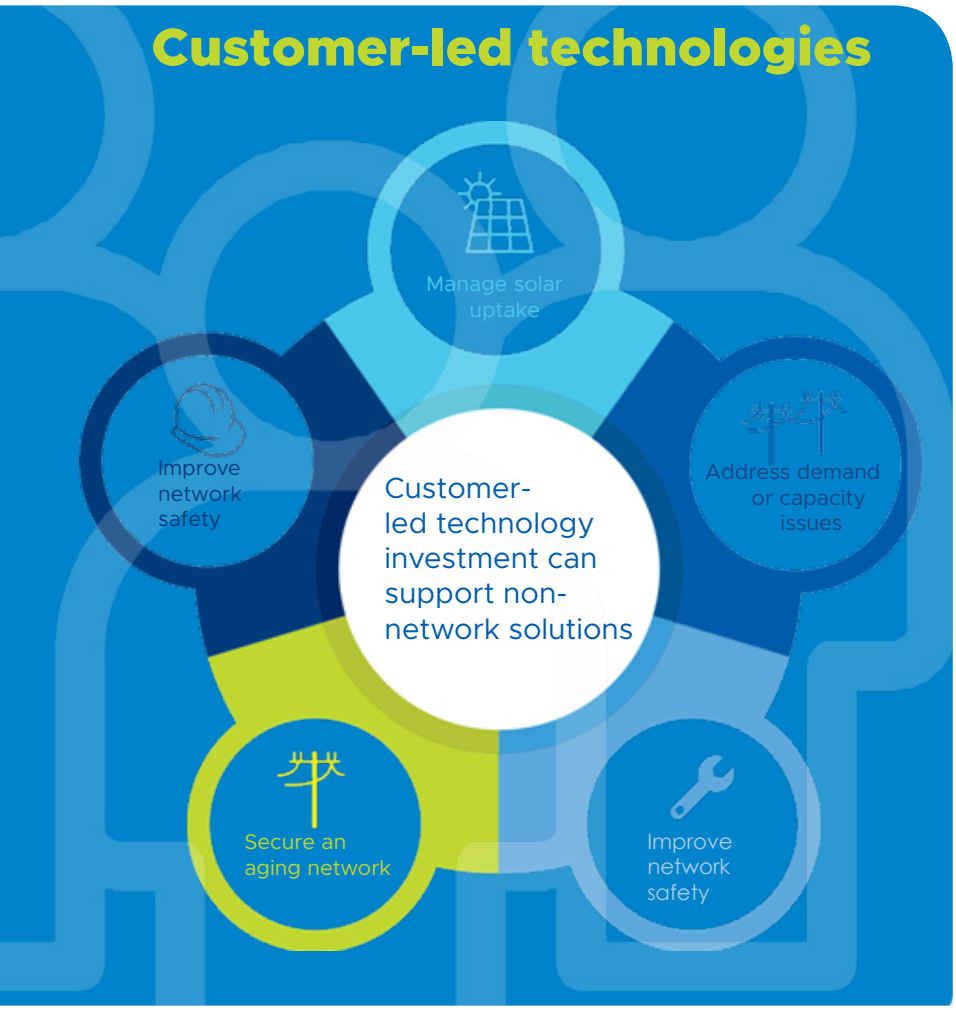
We continue to transform our networks into an intelligent grid so that our customers can leverage the many benefits of digital transformation and distributed energy resources and other emerging technologies (like solar, battery storage and electric vehicles), as well as the next generation of home and commercial energy management systems.

We see this as fundamental to our role in the future which has been supported by our customers' feedback as part of recent engagements. More importantly, we see ourselves increasing our collaboration with our customers and market proponents, to help leverage the benefits of this new technology in our network and deliver overall improved outcomes for customers.

Demand management and other non-network solutions

Our Demand Management program forms part of an integrated approach that also includes our forecasting, planning, intelligent grid and tariff strategies to help lower electricity charges for our customers. When it is efficient to do so, the implementation of non-network solutions will replace or complement the need for network investment. This involves working with end use customers and our industry partners to reduce demand to maintain system reliability in the short term and over the longer term, improve and complement efficient investment in the network. The implementation of a non-network alternative is commonly referred to as demand management. Through our Demand Management Plan customers are incentivised to reduce demand.

For more on Demand Management go to: Chapter 7 Demand Management Activities



Fringe of grid customers

Ergon Energy's infrastructure includes one of the largest Single Wire Earth Return (SWER) networks in the world with approximately 62,000 kilometres supplying 4 per cent of its total customer base. The majority of this SWER network was installed in the 1970's and 1980's and is largely situated in sparsely populated Western Queensland.

Providing cost-effective and reliable electricity supply in remote locations is challenging and as the network comes to the end of its life, alternative future supply options are being investigated. Stand Alone Power Systems (SAPS) is one of our initiatives focused on delivering alternate supply model solutions for our fringe-of-grid (i.e. remote) customers.

SAPS typically include renewable generation (predominately solar PV) and battery storage with back-up diesel generation. Advances in battery management systems and reductions in the cost of battery technologies are enabling SAPS to become increasingly economically viable compared to traditional network supply by poles and wires in remote locations.

These technologies will help improve the service experience, particularly for remote customers who are supplied electricity over long distances, while providing the opportunity to lower ongoing future service costs. We are trialling SAPS as an alternative to network supply for individual customers supplied by long SWER lines and exploring alternate long-term opportunities.

Our online interactive network map

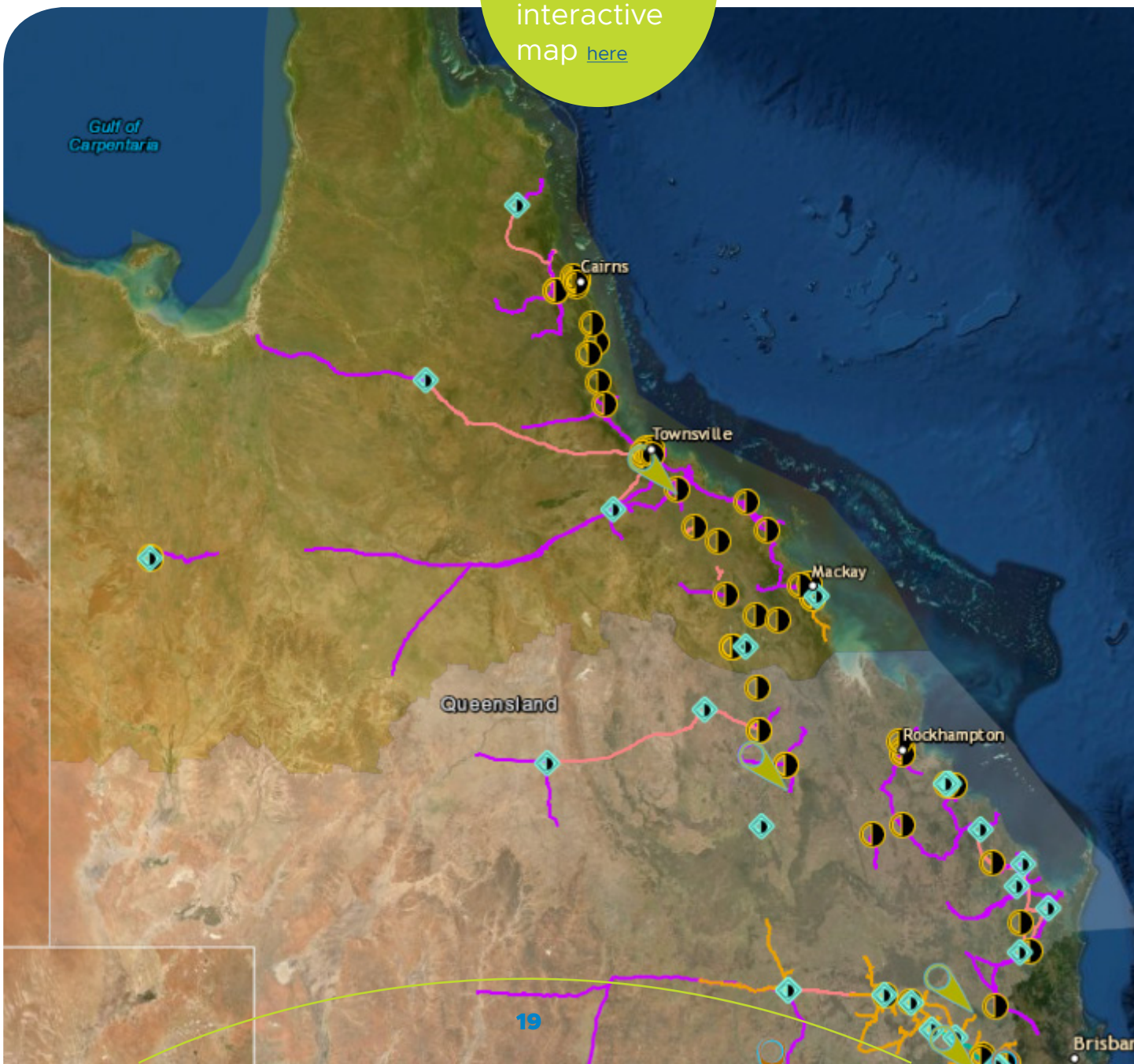
Ergon Energy's Emerging Network Limitations Map shows the distribution network and the areas forecast to have emerging network limitations.

They aim to enable interested parties to understand how the electricity supply system supports customer and participant needs as well as provide input into future development plans. They also show stakeholders where significant electricity supply capability or demand side and non-network initiatives could assist, or where major industrial loads would be best located.

Ergon Energy's DAPR and Interactive Network Limitations Map are prepared and made available solely for information purposes, to support effective engagement around our network planning processes. Importantly, they do not show how the network is operated electrically.

All information should be independently investigated, reviewed, analysed and verified, and must not be relied upon in connection with any investment proposal or decision

Visit the interactive map here



Our belief

We believe our customers are part of the solution to the challenges we face together, and trust that the DAPR provides our stakeholders with the opportunity to review our plans and engage with us on our path forward. It is only through collaboration that we will be able to properly target our future investments and be able to work together to deliver the best outcome for regional Queensland.

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ERGON ENERGY NETWORK

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