



825 Ann Street, Fortitude Valley QLD 4006
PO Box 264, Fortitude Valley QLD 4006

ergon.com.au

Ref: JD/KC/PP

28 October 2015

Mr Chris Pattas
General Manager
Networks (Investment and Pricing)
Australian Energy Regulator
GPO Box 520
MELBOURNE VIC 3001

Email: chris.pattas@aer.gov.au

Dear Mr Pattas

**ERGON ENERGY CORPORATION LIMITED APPLICATION FOR A RING-FENCING
WAIVER UNDER SECTION 21 OF THE ELECTRICITY DISTRIBUTION: RING-
FENCING GUIDELINES**

Ergon Energy Corporation Limited (Ergon Energy) is writing to the Australian Energy Regulator (AER) to formally seek a waiver from Section 1(b) of the AER's Final Determination Electricity Distribution Ring-Fencing Guidelines, September 2000¹ (the Ring-Fencing Guidelines). Section 1(b) of the Ring-Fencing Guidelines provides:

that a distribution network service provider that provides prescribed distribution services in Queensland must not carry on a related business within that legal entity.

The term related business in the Ring-Fencing Guidelines includes the business of producing, purchasing or selling electricity.

Specifically, this waiver application relates to the ownership and operation of Grid Utility Storage System (GUSS) units to augment Single Wire Earth Return (SWER) feeders and remove the need for traditional pole and wire upgrades. GUSS uses smart electronics coupled with energy storage.

¹ <http://www.aer.gov.au/node/12976>. Queensland ring fencing guidelines (September 2000)

Background to Application

The Ergon Energy distribution network covers approximately 97% of Queensland and consists of over 160,000km of power lines, servicing over 733,000 customers. Of the 160,000km of power lines, 65,000km (40%) of the network is SWER which supplies only 26,000 customers (3.5%). The SWER is an aging network, mainly built in the 70s and 80s as a cheap but effective method to supply electricity to rural areas of Queensland. The primary purpose of those SWER network was to accommodate basic domestic and farm loads.

These networks are being challenged by a number of issues such as:

- load growth beyond original design capacity;
- changing customer demographics and expectations;
- changes in customer appliance technology;
- asset condition declination with age; and
- ongoing safety considerations.

Traditionally Ergon Energy has dealt with these problems by augmenting the SWER line – for instance by reconductoring power lines, installing voltage regulators and upgrading isolation transformers - often to satisfy a short peak demand. These are expensive solutions and asset utilisation is often low. The total cost of equivalent traditional upgrades if GUSS isn't installed has been estimated at \$■ million². This cost would put upward pressure on network costs and thus electricity prices and Community Service Obligation (CSO) payments. To not address the issues would mean failure to meet Ergon Energy customers' expectations for electricity supply in rural Queensland.

SWER Network and GUSS

Since 2012 Ergon Energy has been transitioning all new SWER load growth to alternative solutions. Over this time a number of emerging technologies solutions, including GUSS, have been identified for trials to determine their suitability and feasibility.

The concept of a Grid Utility Storage System was first conceived in the 1990s. When Ergon Energy first embarked in this area, there was no fit-for purpose product available to suit the GUSS concept. A research and development project was initiated to develop and trial the concept of GUSS. After a long period of industry review a product development and trial arrangement was met with Western Australian company, Magellan Power Electronics, to build the GUSS concept. As part of the agreement with Magellan, they provided a 6kVA development inverter in 2009 and two trial systems to Ergon Energy in March 2011. These trial systems were designed and built for research purposes only. They were, and still are, **not** intended for operational deployment.

The results from the trials showed *“the potential of GUSS, with the right control, to reduce the demand on the SWER by using battery storage. The capability to shift load from one time to another is a key step in unlocking the potential solution of energy storage for the network. There were valuable development learnings and product refinement through the trial, with the battery technology and inverter system shown to operate reliably and both systems cycling daily for over 1 year”³.*

² This estimate includes allocated overheads.

³ Taken from GUSS Final Report Conclusion

Whilst GUSS was designed initially to support peak capacity constraints, additional trials and modelling have demonstrated it can provide voltage support which further increases its ability to be a beneficial tool on Ergon Energy’s SWER networks. These results proved the concept of a GUSS was a sound solution and consistent with the vision outlined in Ergon Energy’s SWER Strategy. Costs are now at the point where the deployment of GUSS as a network product is appropriate and desirable.

These trial systems will continue to provide test data for the remainder of their useful life (estimated to be within the next two to three years). They will not be part of the planned operational deployment of GUSS units.

GUSS technical specifications

The GUSS is an energy storage system optimised for SWER systems. The main functions of GUSS are:

- Peak Load reduction on the SWER; and
- Voltage support of the SWER

Thus it provides a solution to relieve both capacity and voltage constraints as an alternative to traditional poles, wires & transformer upgrades.

The GUSS are essentially an energy storage system consisting of a 25kVA four quadrant inverter and 100kWh of Lithium Ion batteries (a battery capacity of over 100kWh was specified to meet a 4 hour load at 25kVA). The system has a flexible control system which allows timed real or reactive power export and charge to help reduce demand on the network. The specifications of the GUSS are shown in Table 1 below.

Table 1: GUSS specifications

Peak power output	25kVArms @ 50°C ambient
Total energy storage	100kWh (available)
Real and reactive power capability	The GUSS shall be designed to operate in all four power quadrants at rated power magnitude (kVA); real and reactive power in or out
AC-AC Efficiency	Above 80% (including all losses) based on a full rated energy cycle at rated power magnitude (kVA); real and reactive power in or out
Energy storage lifetime	Minimum 10 years
Electronics lifetime	Minimum 15 years
Maintain frequency	No less than 1 year
Enclosure	Suitable for the Environmental Conditions on our SWER lines

The GUSS is contained in a single enclosure as an integrated turn-key solution from the manufacturer. Electrically the GUSS is connected to Ergon Energy’s network via a dedicated SWER transformer and placed on a customer property under a wayleave agreement.

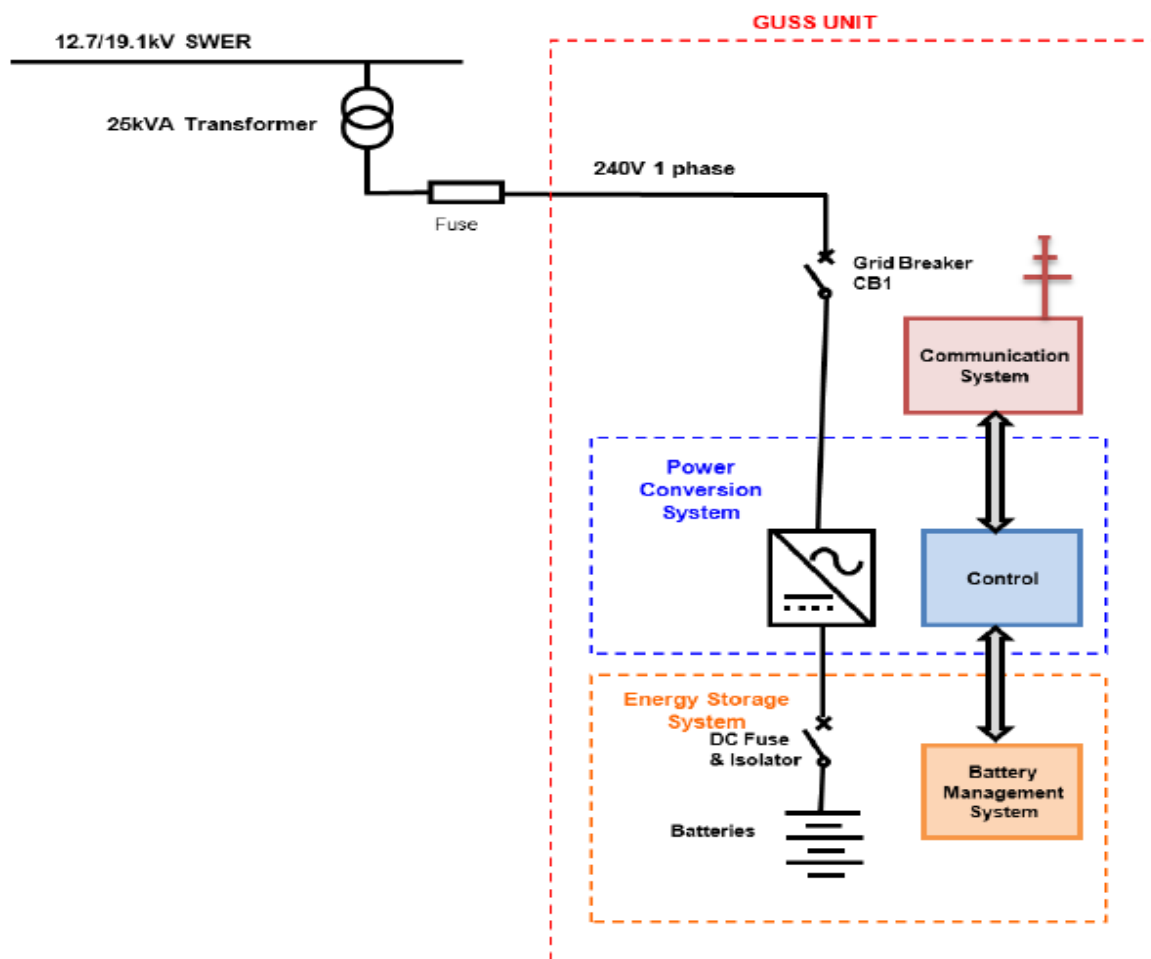


Figure 1: Basic components of GUSS

The automatic control of the GUSS unit is critical in its ability to provide network support. Due to poor communications on our SWER lines an external controller instructing the GUSS is not suitable to ensure operation as required. To overcome this, the GUSS unit has embedded locally in the unit a control methodology which manages the operation of the unit and when to inject and charge. The main input to the controller which drives the GUSS is the locally measured voltage where the unit is installed and if communications are available the Isolator load is used to optimise the output.

The basic concept of the control is:-

- Inject real and reactive power in appropriate amounts and at appropriate times to optimally support the network voltage;
- Inject real and reactive power during peak load periods to reduce the peak load on the feeder;
- Use times of high network voltages and/or low network loads to charge the batteries / energy storage devices; and in the future,
- Potentially integrate PV into the solution in cases where charging of the batteries from SWER may present problems.

As the GUSS has been installed to remove the need for traditional augmentation the system must be available at all times. If the system is offline or has depleted reserves at the time when it is needed to support the network the whole case for the installation of

GUSS is invalidated. To ensure that this doesn't occur the GUSS is set up to always operate in the automatic control scheme

While the GUSS product will not change customer energy usage, it will reduce the load seen by the SWER isolator (main component of the network that needs upgrading due to load) and on the network, and reduce the need to upgrade this equipment as load grows. The GUSS will also assist when new load is added by helping to improve the network voltage seen without the need to install a voltage regulator or upgrade conductor to reduce the voltage drop.

In short, GUSS offers benefit to our Asset Managers (lower cost solution) and our customers (supply quality improvement).

Deployment

Ergon Energy plans to locate between one and three GUSS towards the end of each selected SWER network (for optimal voltage support). The total number of GUSS required has currently been assessed as 20 units across 12 separate SWER Schemes. To date, two units have been installed and are in the process of being energised. A further 18 units are planned to be installed over the next year. The GUSS is portable, so could be moved to another SWER if the constraint disappears. This provides the business with increased flexibility and significantly reduces the risk of stranded assets.

Ergon Energy has not received any external funding or Government grants to purchase, deploy or maintain the proposed deployment of GUSS. Ergon Energy will be funding the GUSS through its own operating and capital expenditure, through deferment of existing capital works.

Costs will include the GUSS unit purchase price, transportation costs, communication equipment, payroll and labour costs and other employee costs (e.g. travel and accommodation, transport, training). Depreciation, monitoring, maintenance and miscellaneous costs will also be incurred. Overheads were applied as relevant. These costs are estimated at approximately \$█M total for 20 units over three years. Ultimately, assets owned by Ergon Energy will include the GUSS units as well as the associated meters and communication equipment for the GUSS.

Importantly, no 'sale of electricity generated' will be undertaken (or able to occur due to the control methodology), and the ongoing operations of GUSS are not aimed at making profits. The GUSS units will be used as a network support device to avoid significant augmentation network costs. They will be owned and operated by Ergon Energy and their control is based on the voltage on the network only.

Issues

Obligation 1(b) of the Ring-Fencing Guidelines provides that a distribution network service provider (DNSP) that provides prescribed distribution services in Queensland must not carry on a related business⁴ within that legal entity.

Ergon Energy acknowledges there may be some suggestion that the GUSS units could be considered to be units which produce electricity (given a chemical reaction occurs in the release of stored energy) and may therefore be deemed as generation assets. However, the Ring Fencing Guidelines applicable to Ergon Energy (developed some time ago) do

⁴ related business means the business of producing, purchasing or selling electricity

not specifically consider such assets in the context of the term (generation). In any case, it is not necessarily clear that the use of these units can be classified as a related business for the purpose of the Ring-Fencing Guidelines. Although a legal definition of 'business' is not readily identifiable, dictionary meanings include:

- one's occupation, profession, or trade;
- the purchase and sale of goods and services in an attempt to make a profit;
- commercial activity; and
- an established or going enterprise or concern.

Based on this definition, Ergon Energy proposes that the ongoing operation of these assets does not constitute a 'business'. In particular, their (ownership and) operation does not represent a commercial activity and there is no attempt to make profits from ownership or operation of the assets.

To the extent that the continued (ownership and) ongoing operation of the GUSS are not deemed as a 'business', the associated Ring-Fencing obligations may not apply.

Notwithstanding the above, Ergon Energy recognises that the AER may adopt a different view of the term 'generation' (in relation to battery storage devices) and what constitutes a 'related business' (in relation to their (ownership and) operation) and may therefore consider that the assets are subject to the Ring-Fencing Guidelines.

Accordingly, Ergon Energy seeks a Ring-Fencing waiver in relation to its ownership and operation of the GUSS units currently under deployment. The Ring-Fencing waiver will fulfil the necessary compliance obligations associated with these assets.

Waiver Requirements

Section 22 of the Ring-Fencing Guidelines states that a Distribution Network Service Provider (DNSP) may apply to the AER requesting the AER to issue a notice under section 21. This provides that the AER may by notice to a DNSP, waive any of a DNSP's obligations under section 1, provided that the AER is satisfied that the DNSP can demonstrate that the administrative cost to the DNSP and its associates of complying with the obligation outweighs the benefit or any likely benefit to the public.

Whilst Section 21 of the Ring-Fencing Guidelines sets out the criteria to be used in determining whether a waiver should be granted, Ergon Energy submits that these criteria should be considered in conjunction with an examination of the historical treatment of such assets.

Reasons for Seeking a Waiver

In relation to obligation 1(b) of the Ring-Fencing Guidelines, Ergon Energy submits that:

- establishment of a separate subsidiary company to own and operate the relevant GUSS assets would require a lengthy consultation process involving the Queensland Government. The Government is hesitant about establishing new GOC companies, unless they can assess that there is both an absolute necessity at law and a net public benefit to be derived;
- the *Government Owned Corporations Act 1993* sets out the mechanism for creating GOCs. An approval for the establishment of a GOC Subsidiary Company is ultimately at the discretion of the Shareholding Ministers;

- from historical experience, Ergon Energy estimates the costs of establishment of a new GOC subsidiary company to house the assets and minimum associated budgeted annual operating costs to be \$████ and \$████ respectively (Appendix 1). Depending on the classification of the assets and associated expenditure, additional costs involved with the establishment and operation of a new subsidiary would need to be passed on to customers; and
- housing GUSS system assets in a separate legal entity will not deliver any significant improvement to the benefit over and above what is currently occurring.

In addition, Ergon Energy considers that (if the view is taken that generation is occurring) the continued (ownership and) operation of the GUSS units:

- does not have a National Electricity Market impact⁵;
- does not result in Ergon Energy entering the generation or retail markets, despite net output of the units going into the grid;
- is not of significant capacity such that it could be construed to be re-integrating the electricity industry functions;
- does not interfere with Ergon Energy's legislative requirements; and
- provides a lower cost solution than traditional network augmentation with supply quality improvement for our customers.

Ergon Energy notes the cost of establishing a new legal entity was not the sole driver for the AER's previous decision to grant a waiver in relation to Ergon Energy owned PV installations. In its Final Decision on Ergon Energy owned PV installations the AER also considered that:

- the solar PV systems, due to their size, are unlikely to have a negative impact on the competitive outcomes in the generation or retail markets to the public detriment. This is because the solar PV systems are not being used by EECL to enter these markets (despite all generation currently going into the grid); and
- installation of solar PV systems by a DNSP should be encouraged, insofar as these initiatives fall within its corporate responsibilities.

Ergon Energy submits that this waiver application is reasonable on the grounds that the additional costs, bureaucracy and complexity involved in order to maintain the GUSS in a separate legal entity is not commensurate with the benefits to be derived (if any) to the public.

Should you require further information, please contact Kim Casey, Manager Regulator Affairs – Performance and Reporting on 0428 197 012.

⁵ The National Energy Market (NEM) impact is increased kWh through the SWER network. Assuming an average of 50kWh a day usage, this means each unit would pull approximately 22,812kWh and return 18,250kWh per annum. AEMO states on their website estimates that the NEM supplies about 200 TWh of energy to businesses and households each year. Therefore, the impact of the GUSS on the NEM is immaterial (<0.00001%).

Yours sincerely



Jenny Doyle

GROUP MANAGER REGULATORY AFFAIRS

Telephone: 07 3851 6416
Facsimile: 07 3851 6780
Email: jenny.doyle@ergon.com.au