To Whom It May Concern

RE: Discussion Paper Response (Review of Queensland's Electrical Safety Act 2002)

I write in reference to the call for feedback in relation to the Discussion Paper as part of the 2021 Review of Queensland's Electrical Safety Act 2002 (the Review). I note too, the 83 recommendations in the Review, and that Energy Skills Queensland is preparing a response to these for the deadline of 15 August 2023.

I acknowledge the focus of the Discussion Paper is on three aspects of new and emerging technologies, namely:

- electrical safety considerations of new and emerging technologies (recommendations 1, 4 & 13 (part));
- the changing landscape of electricity and the workforce (recommendations 5, 6, 7 & 17(a) and (c)); and
- electrical safety and electric vehicles (recommendations 2, 8 & 74(c)).

Energy Skills Queensland has sought to address these specific topics and questions in its feedback below. We offer it in good faith, and with a desire to advance this important action.

Energy Skills Queensland is a not-for-profit centre for energy excellence established in 2008 to focus on the workforce planning and skilling needs of Queensland's Gas, Telecommunications, and Electrotechnology Sectors within the context of the Energy Industry.

Energy Skills Queensland observes the increasing deployment of off-grid systems such as electric vehicles, static home batteries, or even home electrolysers to generate and store hydrogen for use by a hydrogen fuel cell in the home or as part of an emerging alternative to electric vehicles. These 'power units' are being supplemented and are complementary to other power sources, whether linked to the grid or stand-alone within an increasing number of home/commercial premises. All have implications for safety with direct downstream implications for the provision of a safe workplace for employees, and with relevance to employer duties of care. All efforts must go hand-in-hand with the preparation of and provision of relevant complementary Australian Standards.

1. Electrical safety considerations of new and emerging technologies (recommendations 1, 4 & 13 (part)):

We applaud Government action to reduce the risk of exposure to industry and the community posed by new and emerging electrical technologies, to its efforts to withstand the ever-changing landscape in these technologies, and to encourage technological growth and innovation in the Energy Industry. It is absolutely appropriate to modernise the Act and incorporate a definition of electrical equipment/installation for solar PV modules and battery cells (when connected having a combined voltage greater than extra low voltage), as this will elicit a need for appropriate safety deliberations for workers and the community exposed to these installations.

Moreover, Energy Skills Queensland supports the creation of a general category of exception to the "extra low voltage (ELV)" threshold for the definition of "electrical equipment" - for the safety of those working with such equipment and installations - including off-grid systems which will be deployed in greater numbers within the community. Energy Skills Queensland's Industry Reference Group – Telecommunications/IoT (IRG – Telecommunications/IoT) has specifically raised the issue of power over the ethernet which was traditionally ELV, however we understand now operating above ELV levels. The ELV marketplace is also advancing swiftly in its applications including eScooters, e-bikes and many other lithium-ion battery utilisations.

Obviously, the impact of such awareness raising efforts to ensure a safe workplace has a cost consideration – training costs and time spent in training – and this will be reflective of the complexity of the skills needs of the workers. That said, such foundational knowledge and in some instances skills, can be offered and assessed in online formats reducing the cost and time needed to lift workers to an appropriate level. Energy Skills Queensland also notes that there are emerging virtual reality/augmented reality advances that offer a change in the paradigm of practical training/assessment which should be explored. Of course this, as well as online training will not be achievable in all

instances and so as each technology evolves, there will be a need to examine and match skills requirements with quantifying cost-benefit aspects for employers.

Perhaps the Electrical Safety Office's Education Committee might be empowered to review such skilling/training needs, and make recommendations on these requirements to the Electrical Safety Office Board. This could be undertaken concurrently with the Electrical Safety Office's Electrical Equipment Committee which might first deal with the inclusion or otherwise of the proposed "general category of exception" in relation to specific ELV equipment to be managed alongside the LV/HV equipment register (and with them the adoption/need for relevant Australian Standards). The committees' composition may need to be reviewed to ensure sufficient industry supply chain representation is included to better help balance the cost-benefit aspects for employers.

Whilst a full apprenticeship may be an overreach for unlicensed workers in some settings envisaged in the Paper, microcredentials and other accredited training may suffice. This would be the balance that these Electrical Safety Office committees would have to achieve, and so, hand-in-hand with the above suggestion relating to these committees' representation, Energy Skills Queensland advocates a combination of Option 2 and Option 3 as referred to in the Discussion Paper. Under Option 3 it is important to note that the costs are more than just time, but will also incorporate a charge for training, hence the need for balance in the committees' composition and role.

Energy Skills Queensland also believes strongly, that as these new skills are acquired, for Industry planning purposes, gap analysis work and general upskilling of the workforce over time, all skills should be captured formally at every opportunity so as to underpin and support continuing professional development (CPD) and to allow for formal maintenance of currency with renewal reminders.

2. The changing landscape of electricity and the workforce (recommendations 5, 6, 7 & 17(a) and (c)):

Change will be the only constant in the Electrical Sector going forward. With new and emerging technologies as well as the introduction of Artificial Intelligence (Ai) - yet to really take hold in any significant way - the landscape of how work is conducted across the electrical workforce will carry with it enhanced risks, simply due to the technological advances and the pace of change.

Drivers for Government action are supported by Energy Skills Queensland in relation to the workforce. Whether it be to amend existing exemptions under the 'electrical work' definition, to reduce electrical risks to workers, industry and the community, or to encourage technological growth and innovation whilst maintaining an effective and efficient electrical safety framework, efforts to prevent risk to life and property need to be paramount.

The specific recommendation to include solar PV panels within the definition of electrical equipment and so define them as "electrical work" is supported, with all connections and testing of PV module cabling as well as earthing and bonding work performed by competent licensed electrical worker/s. The installation of cabling to be carried out by a licensed electrical worker or an unlicensed person assisting a licensed electrical worker and working under their direct supervision is also supported. Finally, the mounting, fixing, and locating of solar PV modules and arrays should be carried out by a 'competent person' under the direct supervision of a licensed electrical worker.

The principle of performing high risk electrical work under the direct supervision of a licensed electrical worker is without question. Clarifying miscellaneous work requiring specific supervision by a licensed electrical worker, should be the domain of the Electrical Safety Office – under regulation - taking into consideration trending data on fatalities/injuries or lead data on the prospect of an injury or fatality including near misses and general non-compliance reporting. The resultant register that would emanate from that work would be reviewed annually, with submissions called in advance and considered, and then published at least three-months in advance of any change. A staged implementation might also be appropriate depending on the nature of the change.

Embracing the need for electricians to understand and then to manage increasing deployment of new technologies as well as their impact on individual workers either under supervision or as appropriately qualified personnel, is all part of strengthening a safer workplace. The pressure to embrace these new technologies, maintain currency and

prepare for the future, only serves to reinforce the call for a system of formal CPD. Moreover, the call for a move for the Certificate III UEE30811 - Certificate III in Electrotechnology Electrician to Certificate IV, is clear. All trades are lifting expectations and requirements, but none so evident as those required by the Electrical Sector. There are cost impacts (as well as benefits) for advocating this enhancement which will require additional work and action. The Powering Skills Organisation Limited (PSOL) Jobs Skills Council will be well placed to assist this as well as national harmonisation which should be advanced more quickly as a priority national scheme.

Specifically, Option 2 (a partial legislative response requiring supervision by a licensed electrical worker for the locating, mounting and fixing renewable energy generation and storage technology), as well as the non-legislative response, Option 4 (awareness and education – electrical safety considerations of locating, mounting and fixing of renewable energy generation and storage technology) are appropriate responses to this second area of concern being dealt with by this Discussion Paper. Both should be prepared under the watchful eye of the Electrical Safety Office.

3. Electrical safety and electric vehicles (recommendations 2, 8 & 74(c)):

Energy Skills Queensland acknowledges the need for a specific examination of the electrical safety risks presented in electric vehicles, and by the Discussion Paper's definition, hydrogen-powered electric vehicles. Energy Skills Queensland also notes the relative weakness in specific DC (Direct Current) knowledge across the Electrical Sector generally, but as a 'high voltage (HV)' apparatus there needs to be consideration as to the inclusion of electric vehicles in the scope of the regulation by the Act.

The Act must also demarcate the role of motor mechanics from electricians in the future of electric vehicles as a transport mode (mechanics need to be made aware and trained appropriately in the management of electric vehicles as defined in the Discussion Paper and will need to undertake further training in certain circumstances). The emerging ubiquity, diversity and interest to consumers, industry and various regulators requires a clear policy position within the context of the Act.

Energy Skills Queensland additionally notes, the need to move earlier than the experience seen in recent years in preparing Emergency Services for the advent and uptake of new technologies and how to deal with them when the performance outcomes of such innovations do not live up to expectations (or evolve over time from a lower than expected baseline). To maintain confidence across the community for its quest to zero emissions, training and awareness, albeit not always perfect as content is ever changing, must start with those who must deal with moments where the technology does not work to expectation (for example, how to prepare for thermal runaway events and subsequent fires in lithium-ion battery technology deployment such as in electric vehicles). This support should be overseen by the Electrical Safety Office (ideally overseen nationally), with investment to include market vendors in relevant training for Emergency Service personnel.

The consideration and integration of standards under the Australian Standards regime - be it in building codes, electrical codes and even codes pertaining to the deployment of electric vehicles as modes of transport (where they may be parked, the location of charge or refilling infrastructure, and the use of these vehicles in offering power downloads into home or commercial premises, to nominate a few) – needs to be better coordinated and embraced by all parts of industry.

As the Electrical Safety Office engages with other relevant Queensland and Australian regulators to scope and avoid both regulatory gaps and duplication, they must certainly embrace electric vehicles within the definition of "electrical equipment". Vendor training must also play a part in the future of electric vehicle servicing, particularly with the pace of innovation envisaged. However, it is a legislative change (Option 2) to capture work on electric motors within the definitions of 'electrical equipment' and 'electrical work' for the purposes of licensing requirement that Energy Skills Queensland supports, concurrently with a strong awareness and education campaign (Option 3) that also incorporates vendor training (that is, training offered by manufacturers and suppliers) in a manner that will assist the training community with the detailed training that they will require. Again, Energy Skills Queensland notes

that the Option 3 route does not just involve time, but also the cost of training materials and actual training costs. In Energy Skills Queensland's view, an industry contribution including from vendors needs to underpin such awareness and educational training.

Again, as with the second area being dealt with by this Discussion Paper, the Electrical Safety Office utilising lead and lag data to direct its behaviour will be the most appropriate forum for determining if licensed electrical workers need formal qualifications to carry out the electrical work on the electrical components of an electric vehicle when the vehicle is serviced and/or repaired, or in managing on-road break-down work, and to support and clarify standards that apply to electrical installations.

The objective of Government action to minimise the risk of harm to persons and property, and to encourage the transition to a net-zero economy is admirable and supported. If the Act can underpin relevant regulation that is able to be sufficiently agile to keep pace with industry innovation and community uptake, then Energy Skills Queensland is in full support and advances the importance of the role of the Electrical Safety Office in such deliberations. The problem as identified, is real.

Again, as with efforts under area one of this paper - to ensure a safe workplace - there is obviously a cost implication – both training costs and time spent in training – and this will be reflective of the complexity of the skill needs of the workers. Foundational knowledge and in some instances skills themselves, can be offered and assessed in online formats reducing the cost and time aspects to lift workers to an appropriate level. There is also emerging virtual reality/augmented reality advances that offer a change in the paradigm of practical training/assessment which should be explored. As acknowledged previously, online training will not be the panacea in all instances and so as each technology evolves, there will be a need to examine and match skills acquisition with quantifying the cost-benefit aspects for employers. The role of the Electrical Safety Office committees, with the appropriate makeup, is part of this solution.

Whatever the final makeup of training, it should be agile, non-exclusionary (meaning specific to the technology, not the vehicle type such as car, truck, bus or motorcycle), should incorporate a restricted licence (specified training) unless it can be demonstrated that it must be part of a full licence need (full apprenticeship). Defining the equipment within the definition of "electrical equipment" will assist the delineation of the need for a restricted licence for performing work on non-propulsion components of a vehicle as the evolution of this technology proceeds.

Energy Skills Queensland will now prepare and submit ahead of the deadline of 15 August 2023, its specific feedback on 2021 Review of Queensland's Electrical Safety Act 2002 (the Review), noting that this Discussion Paper has dealt with 10 (in full or in part) of the 83 recommendations contained within the Review.

We offer our feedback to the Discussion Paper in good faith.

Yours sincerely

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Energy Skills Queensland