

Introducing a new class of LEI for renewables

Consultation on proposed assessment requirements to obtain the new class May 2023



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Summary

From 5 April 2024, licensed electrical inspectors (**LEIs**) who inspect and certify electricity generation systems or battery systems will be required to hold a new specialised class (**RE class**) on their licence. LEIs will no longer be able to inspect and certify these systems under the general class (**G class**).

The introduction of the RE class is intended to ensure that LEIs who inspect and certify renewable electricity systems have the appropriate knowledge, skills and experience to ensure safe outcomes. This is important as Victoria transitions to greater reliance on renewable generation, storage and use and new safety risks may arise with new and evolving renewable technologies.

We are seeking feedback on our proposed assessment requirements to obtain the RE class as outlined in table 1, which have been informed by a short survey of LEIs in late 2022. LEIs will be required to hold the G class to be eligible to obtain the RE class. This ensures all LEIs who hold the RE class have a good base understanding of testing methods and safety in a broad range of electrical installations. Therefore, our proposed assessment requirements are targeted at testing understanding and competence specifically for renewable electricity systems.

We are also seeking feedback on our proposed option for LEIs who inspect and certify electricity generating sets driven by internal combustion engines to obtain a restricted RE class without assessment. LEIs provided feedback in a survey that definitions adopted in the regulations to introduce the RE class capture these non-renewable electricity generators whereas the intent was to target renewable electricity systems. LEIs will still be required to hold the G class to be eligible to obtain the restricted RE class.

Table 1: Summary of proposed assessment requirements to obtain the RE class

LEI category	Proposed assessment requirements	
LEIs who hold the G class as at 5 April 2024	We will review an LEI's performance history under the G class and use data from Solar Victoria's audit program or targeted audits as necessary to inform our decision as to whether to grant the RE class to an LEI.	
	Where we are satisfied based on the information available that the LEI has a detailed understanding of safety in electricity generation systems and battery systems to ensure safe outcomes, we will grant the RE class without requiring the LEI to undertake further assessment.	
	Where we are not satisfied based on the information available, we will require the LEI to undertake a written (theoretical) examination to demonstrate that they have a detailed understanding of safety in electricity generation systems and battery systems to ensure safe outcomes.	
LEIs who obtain the G class after 5 April 2024	We will review an LEI's performance history under the G class and require the LEI to undertake a written (theoretical) examination to demonstrate that they have a detailed understanding of safety in electricity generation systems and battery systems to ensure safe outcomes.	
	We will supplement this through our compliance programs by auditing renewable electricity systems inspected and certified by RE class holders with the aim of identifying any performance concerns that warrant action.	

LEIs who hold the G class licence at any time and only want to inspect and certify non-renewable electricity generators

We will grant the RE class without requiring the LEI to undertake any assessment. The RE class will have a condition that restricts the LEI to inspecting and certifying electricity generating sets that are driven by internal combustion engines.

We will also need to establish continuing professional development (**CPD**) requirements for the RE class, which will apply to licence renewals. These will be determined after we have finalised the assessment requirements for obtaining the RE class.

How to provide feedback

Interested parties are invited to provide written submissions on the proposed assessment requirements or on any other matter relevant to our implementation of the RE class by 7 July 2023.

Submissions can be emailed to consultation@energysafe.vic.gov.au or posted to:

Consultations
Energy Safe Victoria
PO Box 262
Collins Street West, Victoria 8007

All submissions will be treated as public and assumed able to be published on our website unless the submitter requests confidentiality. Any information that is commercially sensitive or confidential should be clearly marked. Names and other personal information will be removed from submissions prior to publication.

We are also open to meeting with individual stakeholders to discuss specific feedback.

If you have any questions or would like to arrange a meeting, please contact us at consultation@energysafe.vic.gov.au.

Background

Victoria is experiencing a significant uptake of renewable electricity systems, such as solar photovoltaic (**PV**) systems and battery systems. In fact, Victoria's renewable electricity generation is expected to increase from 25 per cent in 2020 to 56 per cent by 2030. It is critical that appropriate mechanisms are in place to continue to ensure safety as Victoria transitions to renewable generation, storage and use.

Legislative framework to ensure safety

One of the safety mechanisms contained in the *Electricity Safety Act 1998* (Vic) (**Act**) is a requirement for all prescribed electrical installation work to be inspected and certified by an LEI before it is energised or before it is first used after the work is carried out. Prescribed electrical installation work is more complex and/or higher risk such as work involving consumers' mains and main earthing systems, generation systems and battery systems. Inspection by an LEI is intended to provide additional assurance that the electrical work done by the electrician is compliant and safe before the electricity supply is switched on.

The *Electricity Safety (Registration and Licensing) Regulations 2020* (Vic) (**Regulations**) set out the different classes of electrical inspection work that LEIs can hold on their licence, as outlined in table 2, with relevant definitions outlined in table 3. The classes represent the level of complexity and/or risk associated with particular prescribed electrical installations.

Table 2: Classes of electrical inspection work

Class	Scope of class
V class	High voltage electrical installations.
G class	 Low voltage electrical installations, except for: those covered by the H, M or (from 5 April 2024) the RE class, and electric fences intended primarily for the control or containment of animals.
H class	Electrical installations located in hazardous areas and electrical equipment associated with the protection of the hazardous area.
M class	Electrical installations located in patient areas.
RE class	 electricity generation systems (excluding stand-alone power systems with a power rating that is less than 500 voltamperes), or battery systems.

Table 3: Definitions relevant to classes of electrical inspection work

Term	Definition	
High voltage	A voltage exceeding low voltage.	
Low voltage	A voltage exceeding extra low voltage (50 volts alternating current or 120 volts ripple-free direct current) but not exceeding:	
	1000 volts alternating current, or1500 volts direct current.	

Electricity generation systems	An a.c. electricity generation system or a d.c. electricity generation system.
a.c. electricity generation system	An electricity generation system (other than a battery storage energy system) that has a nominal operating voltage exceeding 50 volts alternating current.
d.c. electricity generation system	An electricity generation system (other than a battery storage energy system) that has:
	a nominal operating voltage or open circuit voltage exceeding 50 volts direct current, and
	an individual or combined rated generation capacity equal to or greater than 240 watts.
Battery system	A battery or battery energy storage system that has:
	a nominal operating voltage exceeding 12 volts direct current, and
	an individual or combined rated storage capacity equal to or greater than one kWh.
Battery energy storage system	Has the same meaning as "battery energy storage system BESS" has in AS/NZS 5139.

Energy Safe is responsible for granting licences. The Regulations provide that we may issue a licence to a person if they have:

- demonstrated to our satisfaction that they have the qualifications, experience, competence and proficiency
- satisfactorily completed any course of instruction that we require
- satisfactorily completed any practical or theory examinations that we require.

With respect to the required qualifications, proficiency and experience for the RE class the regulations specify that an LEI must:

- Have the qualifications, proficiency and experience for the person to be issued a licence to carry out G class electrical inspection work.
- A detailed understanding of safety in electricity generation systems and battery systems.
- Testing methods for electricity generation systems and battery systems.
- The requirements of the Regulations relating to electricity generation systems and battery systems.

If we are satisfied that a person has only demonstrated qualifications, experience, competence and proficiency in some areas, the Regulations provide that we may impose conditions on a licence specifying the type of installations that the person can inspect.

The Regulations also allow us to specify CPD requirements for renewal of a licence. The CPD requirements must not exceed for any one class:

- 8 hours of skills maintenance activities
- 8 hours of skills development activities.

Safety concerns leading to the introduction of the RE class

The Regulations were amended in 2022 to introduce the RE class following a Regulatory Impact Statement (**RIS**) process led by the Department of Environment, Land, Water and Planning (**DELWP**). The changes mean that, from 5 April 2024, LEIs who inspect and certify electricity generation systems or battery systems will be required to hold the RE class on their licence.

¹ DELWP become known as the Department of Energy, Environment and Climate Action (DEECA) on 1 January 2023.

Audits and reviews, such as our <u>Review of the Electrical Inspection Regime</u>, identified that some LEIs with the G class are failing to identify unsafe and non-compliant renewable electricity systems. The reviews raised concerns that the broad remit of the G class meant renewable electricity systems were not being inspected by LEIs with sufficient proficiency in these systems to reduce the risk of unsafe installations being certified and energised.

Through the RIS process, DELWP consulted on options to introduce the RE class and sought feedback on a number of matters including:

- the introduction of the RE class
- the scope of the RE class
- whether the G class should be a pre-requisite for the RE class
- whether other changes were necessary to assist in the oversight and compliance regime for the RE class.

DELWP and the Minister for Energy, the Environment and Climate Action subsequently decided to introduce the RE class. The submissions and DELWP's statement of reasons are available on the Engage Victoria website.

Survey of LEIs

Energy Safe is responsible for implementing the RE class, which includes determining the assessment requirements to obtain the RE class and CPD requirements for licence renewals. We undertook a short survey of LEIs in late 2022 to obtain initial feedback on matters relating to the assessment requirements to obtain the RE class. We received a total of 43 responses – 38 from individual LEIs and 5 from LEI industry representatives. The following provides a summary of the responses, noting that in many cases multiple LEIs made the same or similar comment and so are not repeated in the tables.

Issue 1: Sub-classes

Whether sub-classes should apply

We asked whether sub-classes should apply for the RE class such that an LEI should be able to apply to inspect and certify only certain categories of renewable electricity systems (e.g. < 30kW systems only or solar PV systems only).

Chart 1: Whether sub-classes should apply

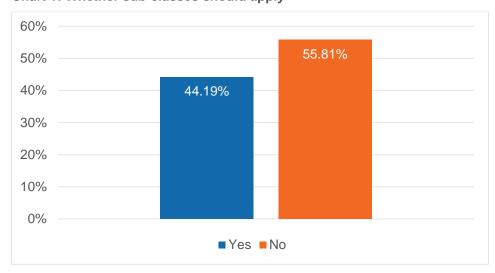


Table 4: Summary of comments on whether sub-classes should apply

Yes	No
 Larger systems, particularly off-grid ones, are quite complex and involve multiple standards so a higher level of experience should be required. 	There should be no limit to solar installation type or size as long as the LEI has the required licence accreditation to obtain the RE class.
• Domestic solar is very different to a 4MW wind turbine, for example. Should keep the RE class to under 30kW and create another special class for wind turbines and other types.	 Once competent for one size, competent for all. While there may be unique components for larger systems, an LEI can learn those components. Having limited knowledge of certain systems can lead to poor advice and
There should be a defined category for each renewable energy type as each type has different compliance requirements.	outcomes. Sub-classes could also make getting an LEI difficult if there are too many varied options.
	LEIs should be trained and assessed to the highest possible standard.
	CPD is important and can be used to upskill LEIs.

How sub-classes should be categorised

We also asked, if sub-classes did apply for the RE class, how those sub-classes should be categorised (e.g. by capacity or size of system or by type of system).

Chart 2: How sub-class should be categorised

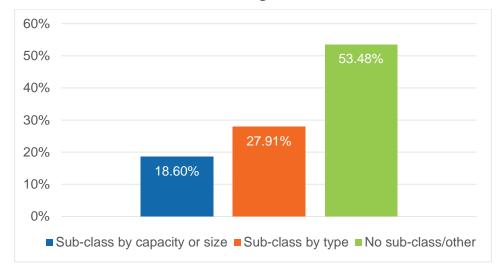


Table 5: Summary of comments on how sub-classes should be categorised

Sub-class by capacity or size	Sub-class by type	No sub-class/other
Basic domestic/small commercial systems are not the same as larger installations with different	 Each technology can be very different and different skills are required. 	Renewable sector is so broad that a higher level of skill and experience is needed for all of it.
switchgear and switchboard requirements.More training is required as voltage increases.	Different generation sources require different knowledge and standards, a LEI must know about the technology they are inspecting.	 Should have sub-classes by both capacity/size and type. Prior to inspecting any installation a LEI should
	Complexity of different supply systems are vastly different to grid-connect installations.	familiarise themselves with the associated rules and standards. LEIs will have demonstrated via their initial assessments that they understand where to find the correct information.
		It will simplify the system and give access to more inspectors with the required skills.

Issue 2: Assessment requirements

What type of assessment requirements should apply

We asked whether LEIs should be assessed using written (theoretical) examinations, practical examinations a combination of both or some other method.

Chart 3: Assessment requirements

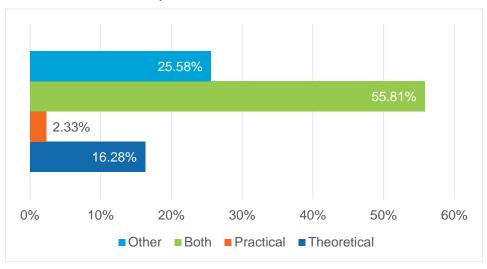


Table 6: Summary of comments on assessment requirements

Theoretical	Practical	Both theoretical and practical	Other
 As long as exams are fair and reasonable, this would be a good way to demonstrate competency. An LEI's ability to determine a defect and clearly describe and prove a clause can easily be covered by theoretical assessment. 	 The majority of LEIs have never installed a renewable energy system from start to finish. This makes for gaps in knowledge and experience. Practical assessment is critical to ensure safety in installations being inspected by LEIs. If you sit in a class room, you can read what is required, but in the field is completely different. Practical assessments should be based on real life faults/case studies. 	 It is imperative for an LEI to have a thorough understanding of the installation they are testing and signing off. This can only be proven by using both theoretical and practical examinations. Theory should make up the majority of assessment. Practical examination should be used to demonstrate basic testing and safe access to heights. LEIs need to be competent. Theory and practice achieve a documented outcome. 	 Should use CPD to deal with the issues. Existing LEIs should be required to do refresher training and can be audited. New LEIs should be required to complete theory and practical assessments. No assessments should be required. The audit process highlights the LEIs who need to be further educated. Historical performance and experience should be taken into account for existing LEIs.



Whether existing LEIs should have the same assessment requirements as new LEIs

We also asked whether existing LEIs, and particularly those with a history of inspecting and certifying renewable electricity systems, should be subject to the same assessment requirements as new LEIs.

Chart 4: Assessment requirements for existing LEIs

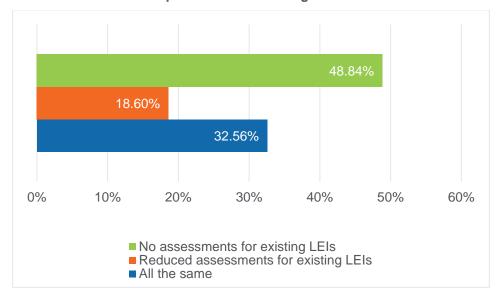


Table 7: Summary of comments on assessment requirements for existing LEIs

No assessments for existing LEIs	Reduced assessments for existing LEIs	All the same
 If they are already proven competent why put them through another assessment? We may end up with not enough inspectors with the new class at the start date. Some may not take up the extra class for fear of the assessment process. Industry experience far outweighs any assessment. If you can demonstrate CEC licences and installation competence you should be exempt from the assessment. 	 Even existing LEIs don't understand the technology and compliance requirements, therefore they should demonstrate experience in this area. Could recognise prior learnings but still be required to demonstrate competence by the fundamental testing and compliance assessments. History should play some part for current LEIs. However there should still be some form of theoretical assessment. An existing LEI who has performed inspections will have gained knowledge through experience and through other forums with the support of organisations such as NECA and Future Energy Skills. 	 Most LEIs are quite weak in solar. Just because they are experienced, does not prove they are competent. To create a safer outcome for all parties involved it should be a requirement that all inspectors are trained the same, regardless of whether they are currently inspecting solar. The options listed are too broad. Has the inspector had their licence for 1 year or 20 years? Have they attended regular training and conferences? These are all relevant considerations.

Issue 3: Non-renewable electricity generators

We allowed LEIs to provide comments on any other matter relevant to our implementation of the RE class. The comments mainly related to electricity generating sets that are driven by internal combustion engines, summarised as follows:

- Concerned about generating sets being included in the RE class. They should remain in the G class as they are now.
- Generating sets, as defined in AS/NZS 3010, should not be included in a renewables class. Internal combustion generators have virtually no relevance to solar, wind or battery systems.
- LEIs who want to inspect generating sets may not have any interest in renewables and will not want to do renewables training to obtain the renewables class.
- Inspectors may be forced to abandon their generator work if they are not willing to do renewables training, which will reduce the available pool of inspectors.
- The impact will be that LEIs not wishing to maintain skills in emerging renewable technologies such as PV and battery storage will be excluded from inspecting generating sets driven by internal combustion engines.

Proposed approach

Here we outline our proposed approach and assessment requirements to obtain the RE class, which have been informed by the survey of LEIs in late 2022 as summarised in the previous section. Our proposed assessment requirements are summarised in <u>table 1</u> at the beginning of this paper.

G class will be a pre-requisite to obtain the RE class

The Regulations require LEIs who hold the RE class to, amongst other things, have the qualifications, proficiency and experience to be issued the G class. For this reason, we will require LEIs to hold the G class to be eligible to obtain the RE class.

The G class ensures all LEIs who hold the RE class have a good base understanding of testing methods and safety in a broad range of electrical installations. Therefore, our proposed assessment requirements discussed below are targeted at testing understanding and competence specifically for renewable electricity systems.

Sub-classes will not apply to the RE class

Renewable electricity systems covered by the RE class are many and varied, and include:

- solar PV systems
- wind generation systems
- · hydro generation systems
- battery systems.

Solar PV systems and battery systems are already relatively common in small-scale residential and commercial settings, which typically involve generation/storage capacity of up to and including 30 kW. However, we are also seeing an increase in the installation of larger-scale systems exceeding 30 kW and wind and hydro generation systems. New risks are likely to emerge as renewable technologies continue to evolve over time.

The RIS issued by DELWP noted that it may be impractical to require applicants to demonstrate competency and experience in all types and sizes of renewable electricity systems. The RIS suggested that sub-classes could potentially apply to the RE class. For example, the RE class could be further broken down by generation/storage capacity or system type. If there were sub-classes, an LEI could apply for one or multiple sub-classes. The LEI would have to demonstrate that they have the appropriate knowledge, skills and experience for each of the sub-classes that they sought to hold.

We note the majority of LEIs who responded to our survey in late 2022 did not support having subclasses. A prominent theme was that LEIs should be trained and assessed to the highest possible standard that allows them to inspect the various capacities and system types. Additionally, that CPD could be used to improve knowledge of new and emerging renewable technologies and risks. There were also concerns about there not being enough LEIs to inspect particular systems if sub-classes applied.

For these reasons, while we note the differences between renewable electricity systems, we do not propose to apply sub-classes to the RE class at this point in time. We agree that a better outcome would be to focus on ensuring that LEIs have the knowledge, skills and experience that enables them to inspect and certify the broad range of renewable electricity systems and ensure safe outcomes. As with other classes, LEIs are expected to remain up to date with safety requirements and the introduction of mandatory CPD for licence renewals will provide an additional avenue to reinforce

knowledge and support skills development. This approach would also simplify the pathway for an LEI to obtain the RE class and minimise complexity for industry participants who need to engage an LEI.

We will ensure our compliance programs and systems enable us to capture data to effectively monitor and evaluate the performance of the RE class over time. We could revisit this issue or consider other action where we identify emerging issues that warrant action.

Written (theoretical) assessments will apply to obtain the RE class

The Regulations provide that we may issue a licence to a person if we are satisfied that they have:

- the appropriate qualifications, experience, competence and proficiency
- satisfactorily completed any course of instruction that we require
- satisfactorily completed any practical or theory examinations that we require.

We note the LEIs who responded to our survey in late 2022 provided mixed views on the assessment requirements for the RE class. While the majority supported the use of both written (theoretical) and practical assessments, others suggested that no additional assessments were necessary and that an LEI's historical performance would be the best indicator. Those who supported assessments highlighted the importance of an LEI being able to demonstrate a thorough understanding of the requirements for inspection and testing as well as being able to demonstrate the application of that knowledge. Some responses suggested that, rather than assessments, CPD could be used to address any knowledge gaps or that there should be mandatory training to obtain the RE class.

Noting that the G class will be a pre-requisite to obtain the RE class, we consider the G class assessments establish a good baseline of theoretical and practical competency to inspect and test a broad range of electrical installations. Notably, the G class assessments involve:

- G Theory a written examination on a broad range of electrical knowledge (3.5 hours)
- G Practical inspection and testing of domestic/commercial/industrial electrical installations (2.5 hours, plus 15 minutes reading time)
- Safe Approach inspection and testing of electricity supply for construction purposes (1 hour and 20 minutes, plus 10 minutes reading time)

We therefore propose to review an LEI's performance history under the G class to determine whether there are any performance concerns. We will also use written (theoretical) assessments to test their understanding of the core concepts, principles and standards relating to renewable electricity systems. This would include any specific testing requirements for these systems as required by the applicable standards.

We will supplement this through our compliance programs by auditing renewable electricity systems inspected and certified by RE class holders with the aim of identifying any performance concerns that warrant action.

Existing LEIs may be granted the RE class without completing written (theoretical) assessments

We recognise that existing LEIs are currently able to inspect and certify renewable electricity systems under the G class. We therefore considered it appropriate to explore whether alternative forms of assessment should apply for existing LEIs.

We note the majority of LEIs who responded to our survey in late 2022 indicated that data from compliance programs could be used to determine whether an LEI should be granted the RE class without undergoing assessments. However, some responses suggested that assessments should apply regardless of whether an LEI currently inspects and certifies renewable electricity systems to

ensure everyone who holds the RE class has demonstrated competence to the same minimum level. The length of time someone has been an LEI and whether they have undertaken other relevant training were also suggested as possible factors to take into consideration.

We consider an LEI's historical performance to be an effective indicator of whether they have sufficient knowledge, skills and experience to ensure safe outcomes. We therefore propose to consider an LEI's historical performance when deciding whether to grant the RE class. For example, where an LEI has been inspecting and certifying electricity generation systems and battery systems under the G class, we will consider whether audit data provides evidence of the LEI having ensured safe outcomes.

For LEIs who participate in the Victorian Government's solar programs, we can use data from Solar Victoria's audit program to inform our decision. As part of the Solar Victoria audit program, an independent auditor attends the site of Solar Homes and Solar for Business installations and checks whether the installation complies with safety and quality standards. The auditor may rate the installation as 'unsafe' or 'needs rectification'. Solar Victoria aims to inspect a sample of 5 per cent of all Solar Homes and Solar for Business installations.²

To ensure sufficient audit data to make an informed decision, we will require:

- an LEI to have regularly inspected and certified renewable electricity systems (e.g. more than 104
 a year, equating to an average of two a week)
- the LEI's work to have been subjected to audit (e.g. more than ten renewable electricity systems inspected and certified by the LEI subject to audit each year)
- the audit data to show no significant adverse findings (e.g. no more than one 'unsafe' finding in a vear).

For LEIs who do not participate in the Victorian Government's solar programs or where there is insufficient audit data available from Solar Victoria, we can undertake targeted audits of installations they have inspected and certified as necessary.

We may also seek other information from an LEI relating to their work with electricity generation systems and battery systems. For example, where an LEI has not necessarily been inspecting and certifying electricity generation systems and battery systems but has otherwise been involved in ensuring the safety of these systems (e.g. auditing LEIs for Solar Victoria or Energy Safe), we will take this into account.

Where we are satisfied based on the information available that an LEI has sufficient knowledge, skills and experience to ensure safe outcomes, we will grant the RE class without requiring the LEI to undertake further assessment. However, where we are not satisfied based on the information available, we will require the LEI to undertake a written (theoretical) examination as above.

LEIs wanting to inspect and certify non-renewable electricity generators can obtain a restricted RE class without completing assessments

The Regulations define the scope of the RE class as:

- electricity generation systems (excluding stand-alone power systems with a power rating that is less than 500 voltamperes), or
- a battery system.

We note feedback in the survey of LEIs that scope of the RE class captures non-renewable electricity generators, as defined in AS/NZS 3010, whereas the intent of the RE class was to target renewable electricity systems. Responses suggested they should remain covered by the G class.

² https://www.solar.vic.gov.au/audits

AS/NZS 3010 sets out the minimum safety requirements related to the use of generating sets that are driven by internal combustion engines, and forms any of the following:

- Normal supply source for electrical installations.
- Alternative supply source for electrical installations.
- Electrical supply source for the connection of electrical appliances and portable tools.
- Supply sources that operate in parallel with the normal supply in the electrical installation.

AS/NZS 3010 defines a generating set as an alternator, d.c. generator or combination thereof, including an internal combustion engine and associated switchgear and control equipment.

We acknowledge that the intent of the RE class is to target renewable electricity systems and that internal combustion engines, which are fuel-based, are not the target. We therefore propose to allow LEIs who want to inspect and certify electricity generating sets driven by internal combustion engines to obtain a restricted RE class without being subject to assessment. LEIs will still be required to hold the G class to be eligible to obtain a restricted RE class.

The Act and Regulations allow us to use conditions on licences to specify the types of electrical inspection work and LEI may carry out under the licence. Therefore, where we grant a restricted RE class, will place a condition on the licence that restricts the LEI under the RE class to inspecting and certifying electricity generating sets that are driven by internal combustion engines.

Next steps

Interested parties are invited to provide written submissions on the proposed approach and assessment requirements or on any other matter relevant to our implementation of the RE class by 7 July 2023. Details on making a submission are at the <u>beginning of this paper</u>.

We will issue a final decision on the assessment requirements after considering the feedback received on our proposed approach, ensuring sufficient time for LEIs to complete assessments where necessary and apply for the RE class ahead of 5 April 2024.

We will also need to establish CPD requirements for the RE class, which will apply to licence renewals. These will be determined after we have finalised the assessment requirements for obtaining the RE class.