



Electricity Distribution Code review

Approach paper

17 April 2019



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Contents

1. Introduction	3
1.1. Purpose of this paper	3
1.2. What is our role?	3
1.3. Distribution businesses operating in Victoria	4
1.4. What is the Electricity Distribution Code?	5
2. Purpose and approach of our review	6
2.1. Purpose of our review	6
2.2. Our approach to the review	7
2.2.1. Initial areas of focus	8
2.2.2. Related work	9
2.2.3. Our approach to consultation	9
3. Timings and next steps	11
3.1. Timing considerations	11
3.2. Contact details	13
Glossary	14
Appendix A: Overview of provisions in the Electricity Distribution Code	15
Customer protections	15
Technical standards	16
Information provision and processes	17
Appendix B: Summary of recent changes and reviews of the code	19

1. Introduction

1.1. Purpose of this paper

The purpose of this paper is to set out the Essential Services Commission's (the commission) approach to reviewing the Electricity Distribution Code (the code).

1.2. What is our role?

The commission is Victoria's independent economic regulator. Our key objective is to promote the long-term interests of Victorian consumers with respect to the price, quality and reliability of essential services.¹

Among other things, we are responsible for granting licences to anyone wishing to generate, transmit, distribute or retail electricity in Victoria. We may grant licences subject to any conditions we consider appropriate having regard to our objectives under the:

- Electricity Industry Act (2000) and the
- Essential Services Commission Act (2001).²

Licenced electricity distributors are required to comply with energy rules that we set out for them.

These rules are set out in codes and guidelines and include (but are not limited to):

- Electricity Distribution Code
- Guideline 14: Electricity Industry – Provision of services by electricity distributors
- Guideline 15: Electricity Industry – Connection of Embedded Generation

National electricity legislation

In addition to state laws (for example safety laws) and our regulations, some of the functions of electricity distribution businesses are governed under the national regulatory framework.³ This framework is established under the National Electricity Legislation (NEL) and the National Energy Rules (NER).⁴ Figure 1.1 provides an overview of the state and national regulatory framework that

¹ Essential Services Commission Act (2001), section 8, (1), (2).

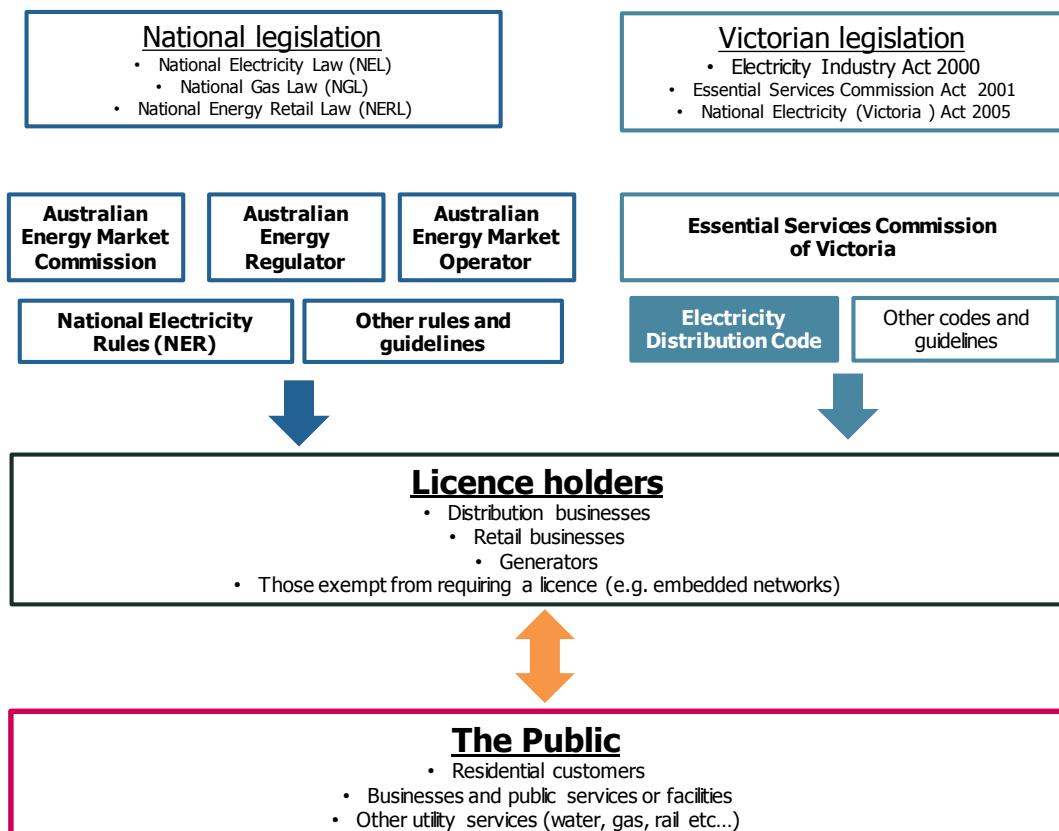
² Electricity Industry Act (2000), sections 19–20.

³ For example, the economic regulation of electricity distribution services is governed under chapter 6 of the National Electricity Rules.

⁴ The 'national' electricity framework is not enshrined in commonwealth legislation. Rather, the NEL was initially passed in South Australia under the National Electricity (South Australia) Act 1996 (SA) and was then adopted in each of the participating states by their own legislation.

applies to electricity distribution businesses. The Victorian law and elements of the national law are established under Victorian law and apply concurrently.⁵

Figure 1.1 Overview of the regulatory framework applicable to electricity distribution



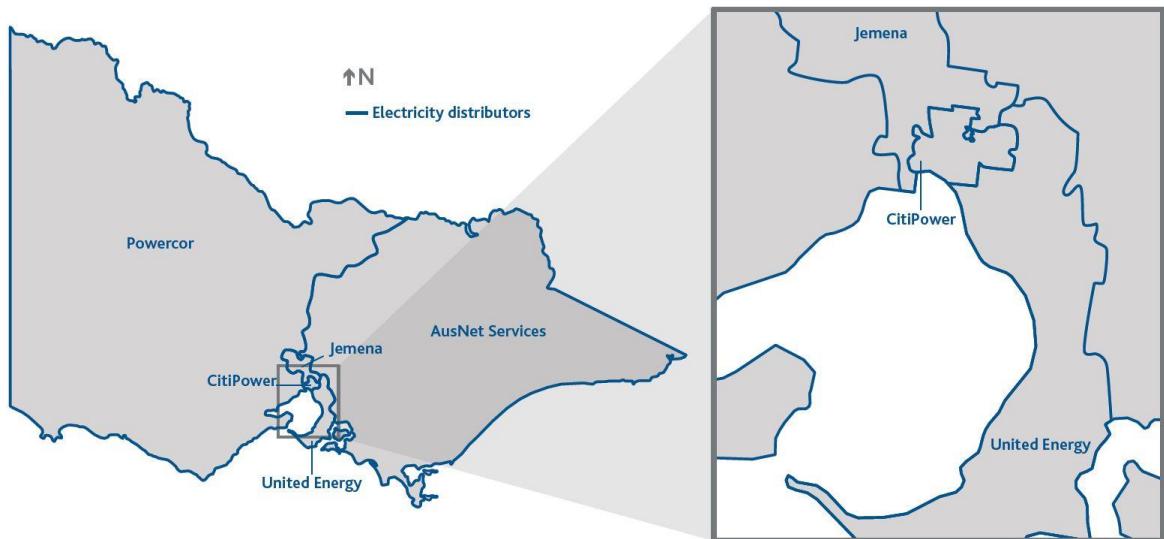
1.3. Distribution businesses operating in Victoria

The distribution businesses own and operate the poles and wires used to distribute electricity as well as connect customers to the distribution system. In Victoria, there are five distribution businesses. They are AusNet Services, CitiPower, Jemena, Powernet and United Energy. Each business supplies a unique geographic area of Victoria (figure 1.2):

- AusNet Services supplies the outer south eastern suburbs of Melbourne and eastern Victoria
- Jemena supplies some inner Melbourne suburbs and some north western suburbs
- CitiPower supplies many inner Melbourne suburbs
- Powernet supplies the western suburbs of Melbourne and the central and western areas of Victoria
- United Energy supplies the Southern suburbs of Melbourne and the Mornington Peninsula.

⁵ National Electricity Victoria Act (2005), section 6.

Figure 1.2 Electricity distributors in Victoria



1.4. What is the Electricity Distribution Code?

The code is a regulatory instrument issued by the commission that largely focuses on the activities of distribution businesses. As a condition of their licence distribution businesses must comply with the code. The code focuses on various matters relating to the operation and management of the electricity distribution system. It includes provisions related to:

- customer protections
- technical standards and
- exchanging of information and business processes.

Although the code primarily applies to distributors, other parties such as energy retailers, embedded generators, a person who may be exempt from requiring a licence and customers are also required to comply with the relevant provisions of the code.⁶ An overview of the provisions of the code can be found in appendix A.

⁶ Electricity Distribution Code, clauses 1.3.1 – 1.3.4.

2. Purpose and approach of our review

The Electricity Distribution Code (the code) has been in effect for many years when the network was designed for a different operating environment. For example, the network was planned and designed for a system where a small number of large generators in specific locations that are close to fuel sources supplied almost all of the electricity demand in Victoria. The network was then primarily focussed on transmitting and distributing that power efficiently across the state.

The electricity industry is now facing unprecedented transformation, which affects the operation of the network. One such change is the growth in the uptake of technology that allows customers to generate or manage their own electricity, such as solar panels and batteries. This means that the planning, design and operation of the network will need to change to deliver electricity to Victorian customers.

2.1. Purpose of our review

We recognise the changes facing the electricity industry and aim to review the code so that it remains fit for purpose for the long-term interests of Victorian customers. However, we are conscious that changes to the code cannot be done in isolation and must consider the wide-ranging initiatives being undertaken by the Victorian government and other regulatory agencies. Many of these initiatives are progressing at the same time as our review of the code, for example:

- The Victorian government recently introduced the Solar Homes program, which involves the potential installation of more than 650,000 solar photovoltaic (PV) systems and 10,000 battery storage systems across the state over the coming decade.
- The Australian Energy Market Commission (AEMC) is conducting their annual economic regulatory framework review for electricity networks. This review will explore how networks could better consider alternative approaches to deliver comparable distribution services in light of the transforming sector and how things like distributed energy resources⁷ may play a role.
- The Australian Energy Regulator (AER) is currently undertaking initiatives to explore ways to improve customer engagement for the sector and identify opportunities for regulatory innovation. One such initiative is the ‘New Reg’ project. This project aims to embed customer consultation into the processes distribution businesses use in their investment decision making processes. For example, distribution businesses are currently working with customers to decide

⁷ Distributed Energy Resources (DER) includes energy from residential solar and batteries. Other ways such as reducing electricity consumption on peak days (described as demand management) may produce a comparable outcome.

where investments need to be made so as to integrate more electricity from distributed energy resources.

- The Australian Energy Market Operator (AEMO) is currently undertaking a national project, Open Energy Networks, to explore how the operating framework could integrate more distributed energy resources in to the electricity system.

Our review of the code will consider these current initiatives and the transformation facing the electricity industry. Despite the changes facing the electricity industry, many of the technical standards and obligations placed on distribution businesses remains relevant for the operation of the network. However, we also recognise the need to review the code to ensure that its technical standards and provisions consider industry ‘norms’ and recent technological changes.

In recent years, the commission has reviewed and made some changes to specific parts of the code. Some of the reviews include:

- a review of voltage standards for bushfire mitigation technology (2018)
- a review into the timely electricity connections of new developments (2018)
- an inquiry into the value of distributed generation – network value (2017)
- a review of the guaranteed service level payment scheme (2015) and
- a process to harmonise the code with the National Energy Customer Framework, where relevant (2014).

A summary of these reviews are provided in appendix B.

2.2. Our approach to the review

Given the changes affecting the planning, design and operation of the electricity network, our review of the code (and supporting guidelines) will be a staged process over several years.

However, based on the December 2018 forum, stakeholder comments and conversations, we will focus on updating the code to ensure it is fit for purpose and affords appropriate consumer protection and is in line with industry practices and standards where deemed appropriate.

The proposed multi-stage approach for the code review is as follows:

1. We will review the **initial areas of focus** commencing now and through 2019-20. This part of the review will begin with an issues paper focussing on certain topics described in section 2.2.1.
2. We will consider a **wider review** of the code in context of the changes facing the industry. This part of the review is expected after the initial areas of focus are completed. Throughout 2019-20, stakeholders will be free to provide feedback on areas for wider review into 2020-2021.

Our review will also be guided by our legislative objective to promote the long-term interests of Victorian consumers with regards to the price, quality and reliability of essential services. When making decisions, we must also have regard to certain matters to the extent they are relevant. These include the efficiency of the industry, relevant health, safety, environmental and social legislation, and the benefits and costs of regulation.⁸ We are also committed to engaging and consulting with all our stakeholders on a regular basis, as set out in section 2.2.3.

2.2.1. Initial areas of focus

On 10 December 2018, we conducted a forum with a wide range of stakeholders to consider the potential themes that the code could focus on. Informed by this forum, we have identified the following initial areas of focus:

- **Reviewing customer protections:** Customer protection schemes such as the guaranteed service level (GSL) framework were last reviewed in 2015 for the 2016-20 regulatory control period.⁹ It is timely for the commission to conduct a review of the GSL framework with the next regulatory period to be decided in late 2020. This review may also consider whether the scheme should be applied to new energy business models, including embedded networks. We are also aware that the value of GSL payments may be subject to the AER's current review of the value of customer reliability, which is due to be completed in December 2019.¹⁰
- **Review of technical standards:** The existing technical standards in the code may allow distribution businesses to manage their networks. However, we recognise that some of the technical standards of the code have not changed for more than a decade, and some may have been superseded by new Australian or international standards. Our review of these technical standards is also timely given recent technological developments such as the increasing uptake of residential solar PV and batteries. We will also consider how the code interacts with other legislation, codes and guidelines where appropriate.

We intend to begin individual reviews of these initial areas of focus starting with the review of life support customer obligations from May 2019. Further information about the overall timings of the code review is discussed in section 3.1

⁸ Essential Services Commission Act 2001 (Vic), section 8, 8A.

⁹ Distribution businesses are required to submit to the AER the forecasted the amount of revenue they will require for a five-year period. This period is known as the regulatory control period.

¹⁰ The value of customer reliability (VCR) is a financial figure used by distribution businesses when planning and making network investment decisions in asset replacement or upgrades.

2.2.2. Related work

It should be also noted that the commission is and will be undertaking work that may be related to electricity distribution, as follows:

- **Update of life support provisions:** New rules relating to life support customers came into effect in the national framework on 1 February 2019.¹¹ We intend to review the changes introduced in the national framework to consider how these changes may be appropriate in the Victorian regulatory framework. This review will begin from May 2019 and will consider both the Energy Retail Code and the Electricity Distribution Code.
- **Improved connection processes:** In 2018, the commission provided advice to the Victorian government on ways to ensure new property developments receive electricity connections within certain timeframes. The commission is currently monitoring the delivery of a commitment agreed to by distributors and the industry to improve these timeframes.

2.2.3. Our approach to consultation

The code affects the way that electricity is distributed to residential and business customers across Victoria. It is important that we consult and engage with our stakeholders when reviewing and making changes to the code.

The commission has a formal process of consultation related to reviews of our energy rules. Stakeholders, including the public, have formal opportunities to make written submissions to papers or draft decisions that we publish. For the review of the code, we anticipate the following papers to be published:

- **Issues papers.** We will release issues papers capturing the range of matters related to the stream of work being undertaken and the operation of the electricity network and how it may relate to the code. This is the first opportunity for stakeholders to provide formal feedback on the matters we have identified for the reviews. We will be seeking feedback on these to inform us further in our considerations.
- **Draft decisions.** We will release draft decisions that outline our proposed changes to the code, and the reasons for the changes. Stakeholders can provide formal submissions on the proposed changes we outline in those draft decisions. We anticipate that separate draft decisions will be released for specific topics, where relevant.
- **Final decisions.** After considering the formal submissions to each of our draft decisions, we will make final decisions which will result in changes to the code.

¹¹ National Energy Retail Amendment (Strengthening protections for customers requiring life support equipment) Rule 2017 No. 3

The commission's approach to consultation is set out in our Charter of Consultation and Regulatory Practice (2018), as well as clause 1.7 of the code. Further information on our approach to public consultations is available at <http://www.esc.vic.gov.au/about-us/stakeholder-engagement-framework>. We are also always open to hear from stakeholders about matters related to the Electricity Distribution Code.

3. Timings and next steps

The indicative timings of the review of the Electricity Distribution Code are shown in figure 3.1.

As described in section 2.2, we propose to undertake the review in two broad stages. In 2019-20, we will focus our review on the specific areas of technical standards and customer protections. Each topic will involve a draft and final decision published by the commission.

We also aim to release an issues paper in mid-2019 summarising the views from stakeholders as part of our December stakeholder forum, as well as setting out the intended scope of our reviews into technical standards and customer protections.

The issues paper will also describe the possible areas for wider review, with a focus on the transformation facing the electricity network. We are open to receiving stakeholder comments and submissions into this part of the review throughout 2019-20.

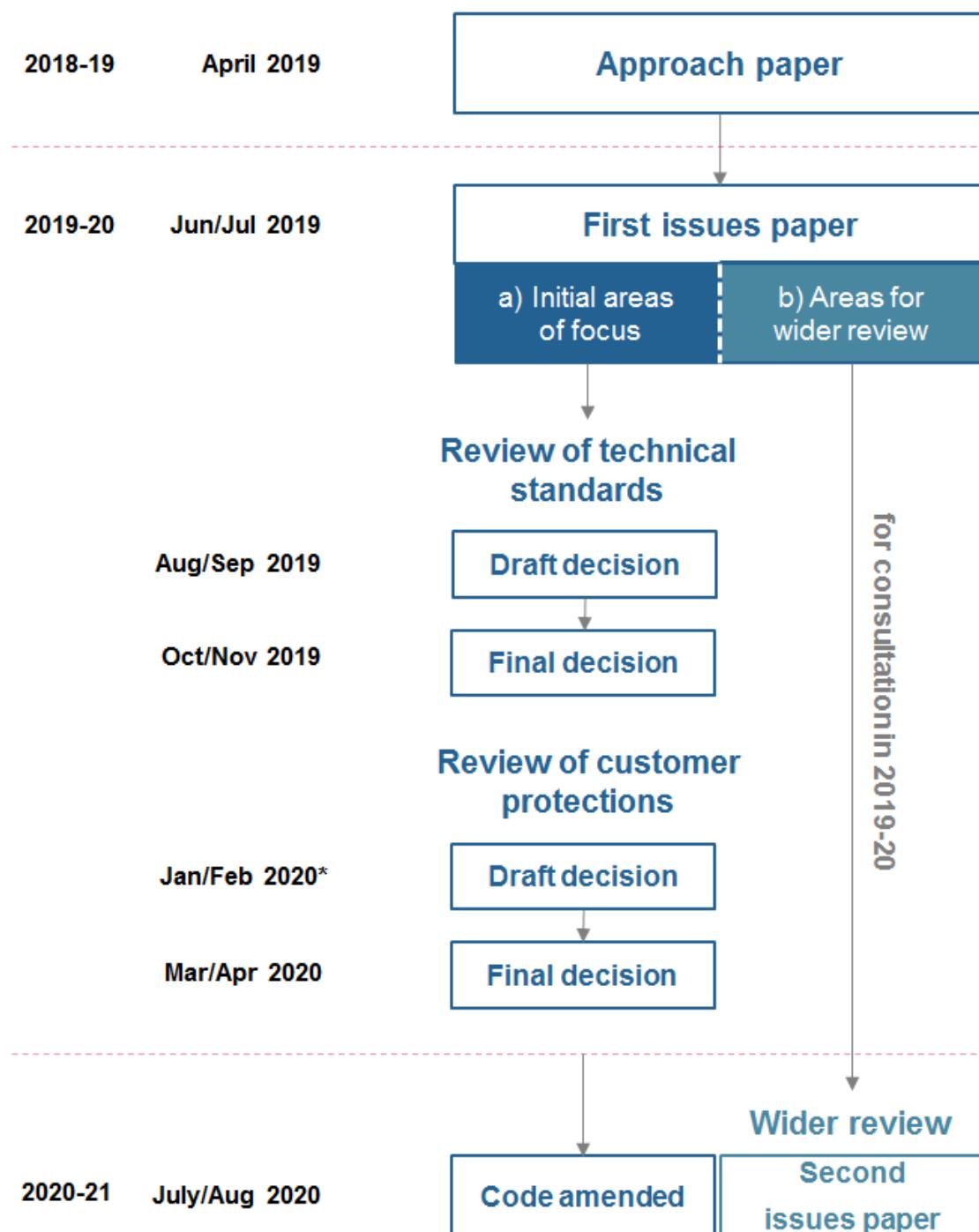
3.1. Timing considerations

We are also aware that the review of the code takes place during a number of other processes that may interact with our potential decisions. We have considered the timing of these processes, particularly with regards to the following in the context of the 2020 – 2025 regulatory control period distribution businesses may be affected by:

- **The Electricity Distribution Price Reset:** This is a once every five-year cyclical process administered by the Australian Energy Regulator (AER) where the distributors propose their funding requirements for the next forward five-year period. The AER's draft decision for the price reset is currently scheduled for March 2020, with a final decision in October 2020. Potential changes to our code might affect the AER's considerations as part of this price reset process.
- **The Value of Customer Reliability (VCR) review:** The AER is currently scheduled to make a decision on the VCR by December 2019. VCR is measure of the willingness of customers to pay for the supply of energy in the event of an outage. VCR is relevant to the code review in an economic context as the GSL compensation scheme takes into consideration VCR as an input into developing the GSL.

We have considered the timing of these reviews, particularly when considering the parts of the code we aim to review in the coming months.

Figure 3.1 Timings of the Electricity Distribution Code review



***Note**

The AER are scheduled to complete its review of the Value of Customer Reliability by December 2019

Other related works such as the review of life support provisions and the improved connection process review have been omitted from figure 3.1 for clarity.

Timing and next steps

3.2. Contact details

We can be contacted in the following ways:

Phone: 03 9032 1300

Fax: 03 9032 1303

Email: edc.review@esc.vic.gov.au

Post: Attention: Energy Division

Essential Services Commission

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Melbourne VIC 3000

Glossary

Select and overwrite, or delete if not required.

Terms	Definition
AC	Alternating Current
AER	Australian Energy Regulator
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
DER	Distributed Energy Resources
EDPR	Electricity Distribution Price Reset
GSL	Guaranteed Service Level
NECF	National Energy Customer Framework
REFCL	Rapid Earth Fault Current Limiter
VCR	Value of Customer Reliability

Appendix A: Overview of provisions in the Electricity Distribution Code

Customer protections

The code contains various provisions and distributor obligations that provide protections for customers when interacting with the electricity network. These obligations set out the minimum standards that distributors must adhere to when it comes to topics such as notifying customers about planned electricity outages, or processes that must be followed when disconnecting or reconnecting a customer's electricity supply.

A summary of some of these provisions involving customer protection are described as follows:

- **Life support customers:** The code regulates how distributors engage and manage life support customers. For example, the code prohibits disconnection of electricity supply to a life support customer. Distributors are also required to register information about life support customers and regularly maintain this information.
- **Guaranteed Service Level (GSL) scheme:** The code outlines the GSL scheme that requires distributors to make payments to individual customers when certain service levels are not met. The GSL scheme covers service levels such as:
 - the reliability of supply, including the duration and frequency of an outage
 - the failure to connect a customer to the network, or
 - adhere with scheduled appointments with customers.
- **Disconnection and reconnection:** The code sets out processes and conditions when distributors may disconnect and reconnect a customer's supply only after a written notice has been provided (and only within a prescribed timeframe and not before weekends), and the timeframe when a distributor must reconnect power supply. The exception would be in emergency situations.
- **Supply outage notification:** A distributor must notify a customer of any planned outage with the prescribed notification period of four business days.
- **Complaints and dispute resolution:** Distributors must also have processes in place to handle complaints and resolve disputes. Distributors must also inform the customer's right to access the Energy and Water Ombudsman Victoria services.

Technical standards

The operation of the distribution system requires management of various system level technical matters in the effort to deliver safe and efficient electricity supply to customers. In this regard, the code defines and places obligations on distributors to manage the network within certain technical standards.

The quality of supply

The code sets out a range of technical standards that aim to help govern the planning and operation of the electricity network. These standards work together to provide protections for customers, limit undesirable effects on customers, and provide technical boundaries when operating the network. The standards currently in the code are focussed on specific electrical characteristics, such as:

- **Voltage** is like the pressure in a water pipe – when the water tap is turned on, it flows with a certain pressure. Similarly in electricity, when a switch is turned on, electricity is supplied with a certain amount electrical ‘pressure’ or voltage. Voltages within the electricity network must be managed within an optimal range. Voltage levels that are too high or low may prevent equipment from working properly or have other undesirable effects, such as damage to equipment.
- **Harmonics** describes the level of distortion in shape of Alternating Current (AC) power. High levels of harmonics means that the electricity supply is highly distorted and can result in increased electrical losses as well as the potential to interfere with the normal operation of electrical equipment. Harmonics can arise from various sources, such as lightning strikes, normal distribution system operation (e.g. turning on large utility scale switches), as well as how customers may use electric power (e.g. non-linear usage of electricity such as train system, spa pool motors).
- **Negative sequence voltage** describes the level of voltage imbalance in the distribution system.¹² The distribution system is primarily designed as a three phase (circuit) system, but most customers are typically supplied as single phase from one of the three phases. It is impractical to fully eliminate voltage imbalance and the code sets out the acceptable levels for the system.
- **Power factor** is a measure of the effective use of power and is the ratio of active power to apparent power. The closer this ratio is to one, the more effective is the use of power.

¹² One way to picture voltage imbalance is to consider a three bladed fan spinning around a single hub. If the weight, shape or profile of one or more blades differ and are not symmetrical to the other blades, then the fan may wobble with imbalance when it spins.

These are only some examples of electrical characteristics that need to be managed together for the safe and reliable operation of the distribution network. Changes to standards in our code will have real effects to the way customers might experience the grid. We will consider whether and how these standards may need to be revised in our current context.

Embedded generation

The code includes provisions focused around synchronous type machines (e.g. traditional rotating machines such as a diesel generator) when seeking to connect a generator to the distribution system. In this sense the code includes requirements for such systems above 1MW to manage its voltage and frequency, and how generators should behave when disturbances occur. The code also requires generators to manage where it abnormally contributes power to the distribution system – this is known as generator fault contribution.

Information provision and processes

The code requires distribution businesses to provide certain information about the planning and operation of the electricity network to the public. This includes, but not limited to:

- Distributors are required to publish an annual report on the planning and management of the distribution system.¹³ The report highlights network constraints, as well as other requirements not found elsewhere such as information on future plans and operation of bushfire mitigation technology known as Rapid Earth Fault Current Limiters.
- Distributors are required to report on the performance of the supply and service reliability of its networks.
- Distributors are required to inform the Victorian government during specific events, such as emergency situations. Distributors are also required to have emergency management plans prepared and in effect.
- Upon request by a customer, the distributor must provide information on the reliability of its network, the quality of electricity supply to the network, and a copy of the code.
- Distributors must provide certain information on an on-going and regular basis, including annual notification of its customer charters, including information on customers' rights during disputes and access to Energy and Water Ombudsman Victoria services.
- Within a three-year cycle, distributors must provide reminder notices to customers who have embedded generators, such as solar panels, of their responsibilities in owning such equipment.

Distributors are also required by the code to have certain processes in place to facilitate the management and operation of the distribution system. The code also outlines processes that

¹³ This is a similar obligation to the National Electricity Rules where distributors must provide a similar report called the Distribution Annual Planning Report.

distributors must follow in certain situations involving a customer or another business, such as (but not limited to):

- Providing connection services within a prescribed timeframe either involving a retailer or directly by a customer.
- Having a system in place which allows a retailer to undertake the timely transfer of electronic information involving connection, disconnection and reconnection in line with the applicable laws and codes. The code also includes the conditions and processes around when the supply of a customer may be disconnected or reconnected.

Appendix B: Summary of recent changes and reviews of the code

Voltage standards for bushfire mitigation (2018)

In 2016, the Electricity Safety (Bushfire Mitigation) Regulations 2013 were amended requiring major electricity companies to increase the safety standards of their networks in order to reduce bushfire risk. This mandated the roll out of powerline bushfire mitigation equipment, known as Rapid Earth Fault Current Limiters (REFCL) across Victoria.

To support this initiative and enable the compliant operation of REFCLs, we amended the code in 2018 that included the following changes:

- Introducing new voltage variation limits that apply when a REFCL responds to distribution system faults, such as electrical infrastructure faults during bushfire events.
- Introducing new obligations for the provision and exchange of information between distributors and customers related to the installation and operation of REFCL technology.
- Introducing consequential changes to the code to support the new voltage variation limits, such as modifying existing definitions, and expanding monitoring requirements for distributors.

Guaranteed service level payment scheme (2015)

In 2015, the Guaranteed Service Level (GSL) was reviewed. This is an obligation for distribution businesses to compensate a customer when their service level becomes diminished and exceeds the prescribed threshold, such as the duration and frequency of power outage, and a distributor's failure to keep their appointment with a customer. In December 2015, we updated the code to restructure the threshold and classification of the compensation framework, and increased the compensation value to align with more recent information on the operation of the network.

Harmonisation with the National Energy Customer Framework (2014)

The National Energy Customer Framework is a package of legal instruments at the national level to regulate the sale and supply of electricity and gas to retail customers. Victoria has yet to fully adopt this framework due to having in place other instruments such as our Energy Retail Code. However, where appropriate, harmonisation with the National Energy Customer Framework was undertaken with the code being updated with consequential changes. These consequential changes relate to conditions around supply disconnection and reconnection, and minor updates to definitions relating to the prohibition of disconnecting customers with life support service needs.

Inquiry into the value of distributed generation (2015)

In 2015, the commission received terms of reference by the Victorian government to conduct an inquiry to explore what potential benefits may be derived from technology-neutral forms of distributed generation which may add value to the networks.

More information can be found here: <https://www.esc.vic.gov.au/electricity-and-gas/inquiries-studies-and-reviews/distributed-generation-inquiry-2015-true-value#tabs-container2>

Review of connections (2018)

In May 2018, the Government requested advice from us with regard to issues around connecting power to new estate developments. To work through the issues, a governance committee consisting of distribution businesses, real estate industry representatives and the commission was formed. The governance committee will be in effect for a period of 24 months to identify and implement ongoing improvements.

More information can be found here: <https://www.esc.vic.gov.au/electricity-and-gas/inquiries-studies-and-reviews/electricity-connections-process-review-2018#tabs-container1>