

Consultation paper
21 September 2021



Supporting reform to efficient distribution pricing: a refreshed Distribution Pricing Practice Note

To replace the Distribution Pricing Practice Note, published August 2019





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Documents related to this consultation paper

This consultation paper should be read in conjunction with the appended 2021 Distribution Pricing Practice Note (draft for consultation) which once finalised will be an updated version of the 2019 document of the same name.

The following documents are also relevant and available on the Electricity Authority's website's distribution pricing pages:¹

- The 2019 Distribution Pricing Principles
- The Distribution Pricing: Practice Note August 2019 (for ease of reference this is appended to the 2021 draft Practice Note)
- Distribution Pricing Scorecard - Interpretation Guide (2021)
- The 2021 scorecards and the Overview report (2021) – released in parallel to this consultation paper

¹

See the Authority's website at <https://www.ea.govt.nz/operations/distribution/pricing/>

Supporting reform to efficient distribution pricing: a refreshed Distribution Pricing Practice Note

Foreword

The Electricity Authority guides the electricity system on behalf of all New Zealanders. Our primary function is to regulate New Zealand's electricity systems and markets, actively monitoring behaviour, enforcing the rules and holding the industry to account.

There are 29 distribution companies in New Zealand providing and maintaining the local power networks that carry electricity via power poles and lines from the national transmission grid to homes and businesses. In the context of technological changes and the substantial role that electrification is set to play in the very near term of New Zealand's low emissions future, the Authority believes that distribution pricing reform is moving too slowly.

Supporting reform towards more efficient distribution prices is a priority for the Authority. The benefits of pricing reform are substantial across all consumers - residential, commercial and industrial - as efficient distribution pricing plays a critical role in reducing network upgrade and expansion costs; offering more choice and flexibility for consumers; enabling consumers to make prudent technology investment decisions, and helping to deliver New Zealand's target of a low emissions future.

How technology, social and political influences will change customer demands is uncertain, and how fast that will change the use of distribution networks we cannot be sure – but we do know that there is no time to waste for the sector to reform the way it manages its pricing structures. Future change is built upon the foundations we have now – if those structures promote the 'wrong' patterns of use or incentivise an inefficient direction of investment, then pricing may be responsible for making the nation's efforts to achieve a better low emissions future more costly. **That will impact every New Zealander, so action must be taken now.**

In June 2019 the Authority published distribution pricing principles, and since 2019 the Authority has carried out a 'scorecard' assessment of distributors' pricing methodologies and plans for reform. Most distributors have established actionable roadmaps, many have undertaken pricing trials and implemented reforms to their pricing structures that indicate progression towards more efficient and cost-reflective pricing structures. But other distributors have made little real progress, and for many there appears to be no urgency towards reform. We've sought and heard feedback – that refreshed guidance would be useful.

The refreshed Practice Note aims to provide more detailed guidance to support faster reform, to clarify the Authority's view of 'what good looks like', and expectations for the timing of reforms. This will allow distributors to be enablers of the low emissions future, best prioritise network investments, and provide appropriate signals for non-network investments to further enhance the use of distributors' networks. This work is in addition to, and was referenced in the Updating the Regulatory Settings for Distribution Networks consultation (July 2021).

The Authority recognises that distributors face challenges to substantially shifting their pricing structures, such as restrictions created by the low fixed charge (LFC) regime. Whilst substantial shifts towards efficiency may have to wait until the LFC phase out begins in 2022, our assessments show that recent efforts - to prepare for the phase-out and start some pricing reform - have been insufficient. **More and faster progress towards efficient pricing is possible now.**



The Practice Note isn't designed as a blueprint for how every distributor must implement pricing reform. Rather this guidance aims to assist distributors on the Authority's view of what 'good looks like', and our expectations on good practice for pricing reform, and on timing for reform.

Now it's time for you to have your say - we are looking forward to receiving your feedback.

Rob Bernau, Director Network Pricing
The Electricity Authority

We are the **kaitiaki**
of electricity.
Our purpose is to **enhance**
New Zealanders' lives,
prosperity & environment
through electricity.

The Electricity Authority's purpose statement



Have your say and next steps

Have your say

1. Everyone has a stake in electricity being supplied at the right price. The refreshed Practice Note aims to better support the distribution sector in progressing pricing reform.
2. We welcome all views on this refreshed guidance and wish to hear from distributors, retailers, consumers and wider industry stakeholders. Themes and questions for consultation responses are proposed in the final section of this document – to guide (but not limit) consultation responses.
3. The Authority's preference is to receive submissions in electronic format (Microsoft Word) using the response template that is provided by the Authority. Submissions in electronic form should be emailed to distribution.pricing@ea.govt.nz with 'Consultation paper – Distribution Pricing Practice Note' in the subject line. Please contact the Authority if you wish to provide your submission in a physical format.
4. Please deliver your submission by 5pm on 3 November 2021.
5. The Authority will acknowledge receipt of all submissions electronically. Please contact distribution.pricing@ea.govt.nz if you do not receive electronic acknowledgement of your submission within two business days.
6. Please note that the Authority wants to publish all submissions it receives. If you consider that we should not publish any part of your submission, please indicate which part should not be published, explain why you consider we should not publish that part, and provide a version of your submission that we can publish (if we agree not to publish your full submission). If you indicate that part of your submission should not be published, we will discuss with you before deciding whether to not publish that part of your submission.
7. Please note that all submissions we receive, including any parts that we do not publish, can be requested under the Official Information Act 1982. This means we would be required to release material that we did not publish unless good reason existed to withhold it under the Official Information Act. We would normally consult with you before releasing any material that you said should not be published.
8. Please see our website and Market Brief for information about opportunities for engagement throughout this consultation period. The Authority will hold a workshop (via zoom) on this topic during the consultation period.

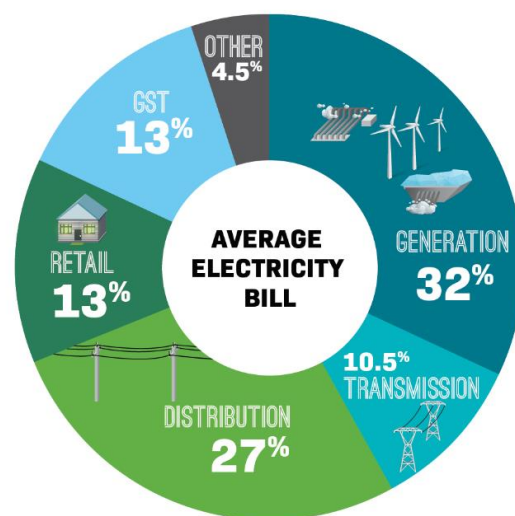
Next steps

9. The Authority will carefully consider all submissions received, and following analysis of feedback, may make further revisions to the proposed guidelines. Stakeholder engagement will be ongoing during the consultation period, and the Authority may undertake further targeted engagement to shape the final guidelines.
10. It is proposed the Authority's Board will consider the new Practice Note for approval before the end of 2021. Following approval, the new Practice Note will be published.

Supporting reform to more efficient pricing

Distribution pricing matters

11. There are 29 distribution companies in New Zealand providing and maintaining the local power networks that carry electricity via power poles and lines from the national transmission grid to homes and businesses.
12. The Commerce Commission sets and enforces minimum network reliability standards and determines the maximum amount of money each non-exempt distributor² can charge consumers in its region through distribution charges.
13. Distribution pricing methodologies are required by the Electricity Distribution Information Disclosure Determination 2012. Every distributor must publish an annual pricing methodology that describes how prices are calculated, the changes in prices, and the extent to which the pricing methodology is consistent with the Authority's distribution pricing principles. These pricing methodologies can be found on every distributor's website.
14. Distribution pricing matters: this component makes up approximately 27% of the average electricity bill. Pricing affects how consumers use electricity, how distributors and others manage load, when distributors invest in new (or replacement) network assets, and the timing, level and location of investments in new technology by consumers and sector participants.
15. Managing load is a fundamental task of distributors, and with the proposed Transmission Pricing Methodology removing the Regional Coincident Peak Demand mechanism, distributors will face an urgent need to address how the loss of this pricing signal should influence their own distribution pricing.
16. The benefits of faster improvements in the efficiency of distribution pricing fall into two broad camps: benefits to consumers (lower costs over the long-term) and supporting a low emissions economy by enabling electrification. In the context of technological changes and the substantial role that electrification is set to play in the very near term of New Zealand's low emissions future, distribution pricing reform is now critically urgent in shaping the success of achieving these goals.
17. As described in our *Updating the Regulatory Settings for Distribution Networks* discussion paper, "Consumers will use more distributed energy resources (DER) such as solar panels, electric vehicles and batteries and there will be more connections to the grid. Empowered consumers will take control of their energy and participate in the electricity system in new ways". Distributors will need to ensure they understand the impact of these changes, and set prices efficiently to support this future.
18. The Authority has a role monitoring distribution pricing. Supporting reform towards more efficient distribution prices is a priority for the Authority. In June 2019 the Authority published distribution pricing principles, and since 2019 the Authority has carried out a 'scorecard' assessment of distributors' pricing methodologies and plans for reform.



The proportion distribution takes up of your bill.

²

Non-exempt distributors are those that are not 'consumer-owned' see here for a list of consumer-owned distributors: <https://comcom.govt.nz/regulated-industries/electricity-lines/commissions-role-in-electricity-lines/consumer-owned-electricity-distribution-businesses>

19. Distributors are implementing the pricing principles to varying degrees. Most distributors have established actionable roadmaps, many have undertaken pricing trials and implemented reforms to their pricing structures that indicate progression towards more efficient and cost-reflective pricing structures, but others appear to have made little progress. The 2021 scorecards indicate that for many distributors there is no, or limited, urgency being applied to reform progress.
20. The Electricity Networks Association (ENA) has maintained a focus on moving to more cost-reflective and efficient prices for many years. Its Guidelines on Pricing Reform finalised in August 2017³ is a comprehensive description of the need, types of pricing and implementation steps required to move the reform of pricing. It is striking however that four years after that paper was finalised, overall progress has been so slow.

Efficiency is an enabler

21. The distribution sector provides a lifeline service that supports the lives, wellbeing and prosperity of New Zealand’s multifaceted communities. It has done this for many decades, in a relatively stable environment of technology and largely predictable demand growth. The future will not follow this stable path, and the sector is a key part in shaping the success of New Zealand’s low emissions journey.
22. Widespread and more intense electrification are highlighted by the Climate Change Commission as contributors to deliver a low emissions future. This is a significant opportunity for the sector to build on the investments made over the past decades and to utilise the expertise and innovation already evident across New Zealand’s distribution networks. Efficient pricing structures are a part in ensuring this is done well.
23. Intensification of electrification will put more pressure on networks to deliver the investment, capital works and maintenance required. As the size of the ‘problem’ becomes larger, it becomes more important to ensure that ‘who pays and when’ is understood and implemented well.
24. The future holds great uncertainty, both in how technology will change the distribution sector, how societal and political influences will shape customer demands, but most especially in how fast significant change will occur.
25. This uncertainty is the key reason that there is no time to waste for the distribution sector to reform the way it manages its pricing structures. Future change will build upon the foundations we have in place now – if those structures promote the ‘wrong’ patterns of use or incentivise an inefficient direction of investment, the sector will effectively have caused New Zealanders to pay too much for their electricity, and risks losing its status as a trusted enabler of peoples’ lives.
26. Having a clear set of targeted, localised and appropriate cost-reflective and efficient prices is a simple way to support a prudent energy future. Many in the sector do not see the ‘burning platform’ of inefficient pricing structures that necessitates action now, but this view ignores that the pace of change is already accelerating from what we have been used to.
27. Reforming prices now with a gradual change is the right way to start, to reduce the shock of change on customers, to allow trials and small mistakes to be made, to allow customers to display greater

We want distribution pricing to send the right signals about the cost of the electricity that’s being fed to homes and businesses – small and large.

When these signals are correct, we should see better use of the electricity network. This means distributors will build new assets only where they are needed. They’ll also consider adding new technologies to manage congestion when the network is fully used (like in the evening during the middle of winter).

Over time, this means distributors will spend less in total on new investments and grid maintenance, keeping overall distribution costs lower for consumers. We call pricing that results in these outcomes ‘efficient distribution pricing’.

³

Electricity Networks Association, *Guidance on Pricing Reform, 2017*, <https://www.ena.org.nz/news-and-events/news/final-pricing-guidance-report-published/document/151>

choice in their energy use, and to prepare everyone for a faster pace of change that will come in the near future.

28. Our expectation of observing gradual change in the coming years should not, however, be interpreted as condoning an ongoing lack of urgency, or a period of inactivity as distributors wait to begin making change. We expect that the journey to reform prices will take many years: it needs to be underway now to best support the accelerating work of the sector to meet New Zealand's future low emissions targets. Waiting to begin the reform process will simply allow inefficiency to build up when it could potentially be the most damaging to progress, or require even greater future speed in reform that adversely affects customers and the sector.
29. Pricing reform is a journey, not a destination. We illustrate some stylised 'what good looks like' examples and scenarios in our proposed new Practice Note, but they are based on our current knowledge of what the future may look like, and we expect that will change and evolve as we and the sector become more experienced and practiced. What will not change is that cost-reflective prices are an enabler of the most effective transition to a low emissions future for all New Zealanders.



Why we're refreshing the Practice Note

30. The purpose of the refreshed Distribution Pricing Practice Note is to provide further guidance to assist distributors with applying the Distribution Pricing Principles (published in June 2019).
31. In 2019 the Authority also published a first Distribution Pricing Practice Note. This was developed to assist distributors with the consistent, practical interpretation and application of the Distribution Pricing Principles. The 2019 Practice Note signalled that it will be updated from time-to-time to ensure it reflects evolving, leading practice, and to address matters raised by the sector and our monitoring activities. This 2021 guidance is the first update.
32. The Authority understands from distributors that the theory of the Distribution Pricing Principles is now clear in its intent, and the potential options for implementing them are widely understood. The guidance published by the ENA, collaboration supported by the ENA and knowledge sharing between distributors has also assisted pricing reforms to date.
33. Feedback from distributors also includes that:
 - a. understanding what is required by good price-signalling is less clear, and the specific reform activities expected by the Authority are unclear
 - b. the pace of reform that the Authority expects is also unclear.
34. The proposed refreshed 2021 Distribution Pricing Practice Note aims better explain 'what good looks like' and our expectations for pricing reform, and for the pace of reform.

A more detailed Practice Note

35. The updated Practice Note describes:
 - a. expectations on the application of the distribution pricing principles
 - b. expectations on pricing structures
 - c. expectations on the timing of reform
 - d. descriptions of what good pricing evolution will look like, for different network circumstances.
36. We are seeking feedback on:
 - a. whether the expectations laid out in the updated Practice Note on what 'good looks like' for efficient pricing are a useful guide
 - b. whether the expectations laid out in the updated Practice Note on timing for reform are achievable.
37. See the section 'Consultation themes for feedback' on page 14 for consultation questions.
38. The proposed refreshed Practice Note appends the Distribution Pricing: Practice Note August 2019, as the guidance in the original document remains relevant.
39. As reform of distribution pricing evolves, we expect to again review and update this Practice Note regularly – we aim for this to be a 'living document' for the industry to reference in implementing efficient distribution pricing. This Practice Note therefore contains parts that are relevant for the current time and may become outdated or superseded as pricing reforms and conditions develop.



Acknowledging constraints and looking ahead

40. Distributors, retailers and others have highlighted a number of issues that they see as limitations to implementing cost-reflective pricing and sending effective pricing signals. We acknowledge that these limitations and concerns exist now, however we believe that most are surmountable if the will exists to find workable solutions. We address some below.

Data

41. We are asking distributors to make evidence-based decisions and use collected evidence to confirm the efficacy of trials before widespread implementation.
42. Internal data: We acknowledge that there is a range of capabilities internally for some distributors to collate their own asset and network information in a form that supports pricing analysis. Our understanding is that data capture or recording in a form to make useful modelling about network usage is fairly high and while some will require additional resource or attention to make it more applicable, this is a process that has widespread support and attention and serves the purpose of lifting asset management planning.
43. External data: Access to timely and accurate consumption data from outside the organisation is foremost in mind for pricing reform. The Authority is currently consulting on the ability for interested parties to access this data, collate and combine it, and use it to produce the necessary modelling to accelerate pricing reform.
44. Accuracy: While the penetration of smart meter data continues to spread, we are aware that not all smart meters are equal and the data they produce can sometimes be incomplete or questionable in accuracy. We see this as an evolution exercise where meter replacement and penetration will become more widespread, and therefore will reduce the inaccuracies or loss of information. We understand that in some forms of granularity this may impede or reduce the certainty of pricing reform efficacy, but we expect this to be a minor and reducing issue over time.
45. Data access is under consideration by the Authority, and we encourage stakeholders to engage fully in that project's consultation processes. See the consultation paper: *Updating regulatory settings for distribution networks* for which the period for submission runs to 28 September.⁴

46. **Where questions of data access or use do not fall into that consultation, we want to understand specific pricing-relating concerns that the Authority should know, or be involved in.**

Customer contact

47. The interposed model between retailers and distributors has created concerns in the past over who 'owns the customer' and therefore the customer's data, including contact details.
48. The use of customer contact information by distributors for the purposes of pricing reform, or to aid early advice of future price signalling (such as peak pricing) may be in the customer's, retailer's and distributor's best interests.
49. We expect that retailers will work in good faith with distributors to support necessary customer contact, and that distributors will respect the obligations that retailers have as custodians of customer data. Controls and liability protection provisions can be readily formed and agreed. The important aspect we stress in this area is that all parties should be working for the customer's best interests, which includes customers (or someone acting on their behalf) receiving pricing signals, and

4

See the Authority's web pages supporting that consultation: *Updating regulatory settings for distribution networks*
<https://www.ea.govt.nz/development/work-programme/evolving-tech-business/updated-regulatory-settings-for-distribution-networks/>

working in trust that all concerned will operate accordingly. If this is not the case, then we are prepared to take further action to re-align these interests.

50. Customer data is also an area being considered by the Authority in the above-mentioned *Updating regulatory settings for distribution networks*, and we encourage stakeholders to engage fully in that consultation process.

51. Where questions of customer contact data access or use do not fall into that consultation, we want to understand specific pricing-relating concerns that the Authority should know, or be involved in.

Engaging more with consumers on price signals

52. How engaged customers are with some forms of price signals and cost-reflective pricing is the subject of ongoing research and study. To summarise, engaged customers are more likely to respond and in a more predictable manner than disengaged customers.
53. There are views that as the ‘new energy’ future evolves and the impact of pricing reform intensifies, that customers will naturally engage more, however this is unlikely to create a situation where a majority of customers are engaged at all times.
54. Technology will certainly improve the response to price signals by automation that interacts with pricing signals, but this cannot be relied upon solely. By the same token, the role of flexibility traders is likely to increase in the coming years and this will further improve the responsiveness to price signalling.
55. We expect that engaging customers in the changes that reform brings is a combined effort of distributors, retailers, other parties and the Authority. This includes responding when customers tend to be at their most engaged – when they feel a change is unfair or unwarranted. We have seen this handled well by distributors and retailers in the past and use these interactions to lift wider engagement and customer experience.

56. We are interested to understand what role the industry sees the Authority has in supporting this further.

Pass-through of price signals

57. The issue of whether price signalling is muted by not having a direct pass-through by retailers has been an ongoing topic of debate. In a competitively operating retail market, the argument should in time be moot⁵. We accept that the value of a distributor applying resources and effort to finely tune price signals can be lost in certain circumstances. Distributors’ clear view is that changes to distribution pricing will be more effective if clearly reflected in retail prices. The Authority is interested in how retailers respond to distribution pricing changes. This might mean that distribution price structures are passed through into retail prices; but not necessarily: we also envisage other potential ways distribution pricing could be efficiently reflected in retailers’ offerings⁶. As noted above, the critical concern the Authority has is for the ultimate decision maker, or someone acting on their behalf, to be influenced by pricing signals being sent from the distribution sector.

⁵ If the issue is significant enough for customers then a retailer would emerge that passes through distribution price signals directly, and if sufficiently demanded then would enjoy a competitive advantage.

⁶ For example, instead of passing through a peak distribution price into retail pricing, a retailer could keep its customers on a flat rate, but contract with them (potentially via a flexibility trader) to control some of their load remotely (water heating, space heating, etc). The distribution price signal could then effectively do its job (via the actions of the retailer) without the end-user needing to see any change to its retail prices. In future, distribution congestion might be managed, to an extent, by demand flexibility, utilising emerging technology and business models. This is consistent with IPAG’s work on efficient demand response: <https://www.ea.govt.nz/assets/dms-assets/28/Transpower-DR-programme-review-draft-memo.pdf>

58. With the expectation that pricing reform accelerates we are cognisant of the risk that early trials and implementation are not producing the desired effect by the signal being muted in the interposed model.

59. **We would like to consider ways forward that will ensure important and targeted pricing signals are not so muted that they cannot be effective in signalling to consumers and affecting future investment decisions.**

Complexity

60. As a largely unseen and relied upon service by many customers, there has been an expectation built up that pricing should be simple. Research shows that simplicity is desired by customers. However, while the fairly stable history of distribution services means simplicity is an understandable corollary, the same cannot be expected of the future.

61. Increasing complexity in the market and the offerings available to customers will become more complex, and there will be a need to have a 'fit-for-purpose' pricing response. Increased complexity will again be accommodated by technology and the potential rise of flexibility traders to fill a gap between customer desires and suppliers needs, and we expect that the level of complexity and range of applicable pricing structures will rise and fall over time.

62. We expect there will be trade-offs made in matching pricing to a problem. For example, the most effective price signal 'on paper' may be met with confusion due to its complexity or difficulty in engaging with it easily, and so we acknowledge that there will be circumstances where a less-than-ideal theoretical pricing structure is put in place because it is the most likely to generate an effective response.

63. We do not expect complexity for the sake of complexity, but that a move away from a simple 'one-size-fits-all' will need to be accepted. To simplify outcomes and impacts on customers, distributors and retailers need to work together to provide clarity for customers. This is an area that is often encountered and responded to well when a pricing change creates a significant impact for a customer and they then make a complaint. Extending this good work addressing 'outliers' to a norm for the bulk of customers is encouraged.

64. The use of data modelling to identify more impacted customers and retailers matching demand patterns to more appropriate price signalled tariff offerings will assist customer acceptance.

65. **We would like to come to a common understanding of 'how complex is too complex' and seek feedback on how industry and the Authority can strike the correct balance.**

Bill shock

66. Bill shock is a strong motivator to customer's acceptance of change, and we do not wish to create a quick solution to moving to cost-reflective prices that attempts to remedy decades of inaction within an unreasonably short time period.

67. The Pricing Principles address this: *(d) Development of prices should be transparent and have regard to transaction costs, consumer impacts, and uptake incentives.*

68. Time has been allowed for progressively implementing changes, but in our view thus far there has been too little change and therefore not enough change to customer's bills. We again acknowledge the influence of LFC regulations here, but also expect that there will be increased changes to pricing structures over the coming years as this impediment diminishes.

69. We acknowledge that modelling undertaken by some distributors shows that sometimes the lowest socio-economic groups could be impacted the most by price rises, and this raises important equity and welfare issues to be addressed. Managing energy poverty and hardship is a role to be taken

seriously by the whole energy sector, with each playing a part that matches their strengths and reach of influence. We expect distributors to be transparent on modelling that causes potential short-term welfare issues to customers and to work with retailers, the EA and welfare agencies to respond to these issues.

70. We do not wish to see such a rapid correction of the inaction of the past that substantial increases occur, and we are aligned with the Commerce Commission's views on price changes (ie, limiting price shocks). We do however, expect to see steady progress to smooth bill changes over progressive years to move closer to an acceptable level of cost-reflectivity.
71. To reiterate the reason that efficient cost-reflective pricing is important to all customers, is that the counterfactual, of unrestrained inefficient network investment will simply increase the total costs of the system and the costs potentially would fall on those that do not benefit from the investment. This inequity and the potential for costs - that continue to rise - being passed on, must be avoided.
72. As mentioned in paragraph 69 above, there are steps that distributors and retailers can work on together to reduce bill shock by ensuring customers are directed to the more appropriate pricing structure to match their needs.

73. We would like feedback on how bill shock can be managed by industry and the Authority, to support ongoing reform of prices and not unduly disadvantage groups of customers.

Rural versus urban pricing

74. The Authority notes that there are no regulations that stop distributors reflecting higher per connection costs for rural or remote consumers.
75. An assumption that distributors must avoid locational cost differences in pricing is, we believe, based on concern around s113(1)c of the Electricity Industry Act. This section allows the Minister to make regulations to protect rural customers from unfair rates of change in the prices charged to them. However, there are no current regulations in force that prohibit geographical pricing differentials.
76. Our understanding from MBIE officials is that a previous Minister may have written to distributors setting an expectation of no urban/rural pricing differential.
77. The Authority considers that better guidance on this matter is likely to be useful, and providing this is on our forward work programme.

Low Fixed Charges

78. Many distributors have undertaken reform work to be ready to implement changes when there is clarity on the future of the LFC regulation. We applaud this readiness and accept that the LFC regime has to an extent hampered the ability for distributors to reform prices.
79. The impact of LFC is evident in scorecards as it is difficult for a distributor to score at the top end of the range in the efficiency category with the LFC regulations in place. With the Government's announcement of the phase out of the LFC over five years we expect that distributors will honour their stated intentions to implement their pricing reforms. Also, we do not accept that it would be appropriate for a distributor to await the end of the LFC phase-out before they undertake any further work on cost-reflectivity. To delay in this manner would simply add years to the reform process, and leave those distributors falling far behind their peers and our expectations, when changes will be able to be made during the phase out period.

80. We are interested to understand if there any aspects of LFC phase out that the sector sees as an ongoing impediment to pricing reform.

Technology

81. Distributors have expressed some concerns to us about their ability to monitor performance on the low voltage (LV) network that will become more important as the spread of EVs, PVs and DER widens.
82. Our understanding is that LV monitoring investment is a trade off in a distributor's expenditure planning, and that for some it is a lower priority than renewal and replacement investment.
83. Finding alternative means for gaining insight into the performance of the LV network at a sufficient level for pricing to target congestion has been undertaken by some distributors with good results.
84. We acknowledge that more widespread visibility would improve the granularity of pricing and maximise efficient investment decisions, but that this is a trade-off for distributors to make. We expect however that this can be adequately explained when viewed in the context of scorecards and roadmaps.

85. We are interested to better understand what ongoing limitations LV visibility issues might have, that could constrain future pricing reform, and how industry can respond to them.

Behind the meter devices

86. Installation of energy intensive devices, such as EV fast chargers are currently not required to be notified to distributors. Some distributors have expressed the view that having greater knowledge of some of the more energy intensive devices would aid managing network performance, and with a view to managing future congestion, understanding the source of significant changes in usage patterns would aid pricing response.
87. There are instances of installations that require notification to the distributor, for safety and performance management reasons, and we are interested to understand if the sector and consumers see a role for the Authority in assisting with increased visibility of behind the meter devices, and how this could be done in a manner that is not onerous.

88. We are interested to better understand whether stakeholders believe that Authority involvement in this area would improve outcomes, and how this could be done.

Internal resources

89. Implementing pricing reform can be a resource intensive exercise, and smaller distributors may not have access to much internal capability to advance their pricing methodology.
90. As distributors are natural monopolies there is essentially no competition between them, and this encourages information and expertise sharing. The ENA performs a good supporting role for the industry and its working group is a useful resource for members to obtain advice and direction from other experienced professionals.
91. The ENA has also produced the aforementioned *Guidance on Pricing Reform*, which is a good 'how to' guide. It can be viewed here: <https://www.ena.org.nz/news-and-events/news/final-pricing-guidance-report-published/document/151>



The Authority is considering how it can provide wider support to accelerate pricing reform

92. When the Authority initiated the pricing scorecards assessments, we believed they would do two things: help distributors to better understand our assessment of prices against the pricing principles and provide regular guidance on what is currently good and what needs further development and focus.
93. The scorecard rating process is resource intensive for the Authority, and we are examining the usefulness of them, whether changes are needed to make them more useful for stakeholders, and how distributors could use them more to shape their pricing reform.
94. As mentioned, the Authority assesses that while most distributors have established actionable roadmaps, many have undertaken pricing trials and implemented reforms to their pricing structures that indicate progression towards more efficient and cost-reflective pricing structures, it appears that for many distributors there is no urgency being applied to reform progress.
95. The Authority proposes to undertake a programme of work to support pricing reform. At this point we are considering what options are available to us to accelerate pricing reform, including immediate 'no regrets' activities to enhance our annual assessment process and improve our engagement with distributors on pricing.

96. As we develop our thinking on further initiatives, tools or regulation, we will engage appropriately with the sector. We welcome any immediate suggestions you have regarding how we could better promote faster pricing reform.



Consultation themes for feedback

97. The Authority wants to hear sector views on how we can continue to support accelerated pricing reform.
98. In addition to the questions raised in the sections above (which are repeated below) we have specific questions on the this updated Practice Note.

A more detailed Distribution Pricing Practice Note

Q1. Do expectations laid out in the updated Practice Note on what ‘good looks like’ for efficient pricing provide a useful guide?

Q2. Do you consider any of the material to be incorrect, subjective or superfluous?

Q3. Are there edits or further explanation that you’d suggest to improve clarity?

Q4. Is there material missing that would also be useful?

Note: Where you are asking us to include more material in the Practice Note, we would appreciate you explaining what you are seeking in as much detail as possible, to ensure that any further changes we make meet the need identified.

Please also consider whether any additional material is best developed and agreed with industry, or if the Authority is best placed to provide the directive solely.

Q5. Are the expectations laid out in the updated Practice Note on timing for reform achievable?

Q6. Do you believe it is useful for the Practice Note to become a ‘living document’ that is refreshed regularly to update for the Authority and industry’s understanding?

Note: Considerations include, the frequency of updates and the associated consultation with stakeholders being most useful; the level of detail that provides useful guidance, and what focus future iterations could have.

Collaboration to better understand and resolve constraints

Q7. Where questions of data access or use do not fall into the Updating regulatory settings for distribution networks consultation, is there any specific pricing-relating data concerns that the Authority should know, or be involved in?

Q8. Where questions of customer contact data access or use do not fall into the Updating regulatory settings for distribution networks consultation, is there any specific pricing-relating data concerns that the Authority should know, or be involved in?

Q9. Engaged customers are more likely to respond and in a more predictable manner than disengaged customers. What role do you see the Authority has in supporting consumer engagement on pricing?

Q10. Ensuring that targeted pricing signals impact decision makers is important in distribution pricing reform. What role do you see the Authority has in supporting an industry

discussion on ensuring price signals reach consumers, taking into account the need to comply with the Commerce Act 1986?

Q11. Complexity in pricing structures could slow reform efforts. How do you see the Authority working with the sector to strike the correct balance?

Q12. Can you provide feedback on how bill shock can be managed by industry and the Authority, to support ongoing reform of prices and not unduly impact on groups of customers?

Q13. Are there aspects of LFC and its announced phase out that you see as an ongoing impediment to pricing reform?

Q14. We are interested to better understand what ongoing limitations LV visibility issues might have that could constrain future pricing reform, how industry can respond to them and what, if any, role you see for the Authority in addressing this area?

Q15. Currently, installation of energy intensive devices such as EV fast chargers are not required to be notified to distributors. Do you see this as an impediment to advancing pricing reform, and what role do you see the Authority having in this area, and how this could be done?

Q16. As we develop our thinking on further initiatives, tools or regulation, we will engage appropriately with the sector. We welcome any immediate suggestions you have regarding how we could better promote faster pricing reform.

Q17. Do you consider that the Authority has not properly understood any of the constraints listed in this paper, or has missed other issues that constrain efficient pricing reform progress and how they could be addressed?

Note: Where you provide further issues, please provide as much detail as possible.

Please also consider whether any additional issues are best addressed by industry, or if the Authority is best placed to address the issue solely.

Authority engagement to assist pricing reform

Q18. Please do not limit your feedback to the above questions - we also welcome feedback on any other ways the Authority could work constructively with industry and consumers to support and drive accelerated pricing reform.

Q19. Please consider the role that you see appropriate for the Authority to be proactively involved in pricing evolution.

Q20. How the Authority could engage more with industry, either individually or through structured channels, and in formal and informal ways.



Appendix: A refreshed Distribution Pricing Practice Note (draft for consultation)

99. This refreshed 2021 Distribution Pricing Practice Note (draft for consultation) appends the 2019 Distribution Pricing Practice Note. Because, that document's substantive advice on interpreting the distribution pricing principles remains relevant.

DRAFT for SECTOR FEEDBACK
21 September 2021

Distribution Pricing: Practice Note

Second Edition, 2021

Once final, this will replace the
Distribution Pricing Practice Note, published August 2019





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Wider information relevant to this Practice Note

The following relevant documents are available on the Electricity Authority's website's distribution pricing pages:¹

- The 2019 distribution pricing principles
- Distribution Pricing Scorecard - Interpretation Guide
- 2021 scorecards and the covering reports.

This 2021 guidance builds on the advice in the *Distribution Pricing: Practice Note August 2019*. For ease of reference this is included as Appendix B.



Part 1: Purpose

This Part lays out the purpose of the updated Practice Note and its expected future updates.

Purpose and overarching Principles

1. The purpose of this updated Practice Note is to provide further guidance to assist distributors with applying the 2019 Distribution Pricing Principles.
2. This Practice Note retains sections from the *Distribution Pricing: Practice Note August 2019*, and is refreshed to also provide:
 - a. further guidance on the application of the Pricing Principles;
 - b. additional guidance and illustrations on the future course expected for distribution pricing;
 - c. timeframes expected for reform of distribution pricing; and
 - d. more detail on what the Authority considers ‘good looks like’: outcomes driven by pricing reform from different stakeholders’ perspectives.

Future updates

3. As reform of distribution pricing evolves, we expect to review and update this Practice Note regularly for it to become a ‘living document’ for the industry to reference in implementing efficient distribution pricing. This 2021 version contains parts which may be superseded as pricing reforms and conditions develop.

2019 Distribution pricing principles

- a. Prices are to signal the economic costs of service provision, including by:
 - i. being subsidy free (equal to or greater than avoidable costs, and less than or equal to standalone costs);
 - ii. reflecting the impacts of network use on economic costs;
 - iii. reflecting differences in network service provided to (or by) consumers; and
 - iv. encouraging efficient network alternatives.
- b. Where prices that signal economic costs would under-recover target revenues, the shortfall should be made up by prices that least distort network use.
- c. Prices should be responsive to the requirements and circumstances of end users by allowing negotiation to:
 - i. reflect the economic value of services; and
 - ii. enable price/quality trade-offs.
- d. Development of prices should be transparent and have regard to transaction costs, consumer impacts, and uptake incentives.

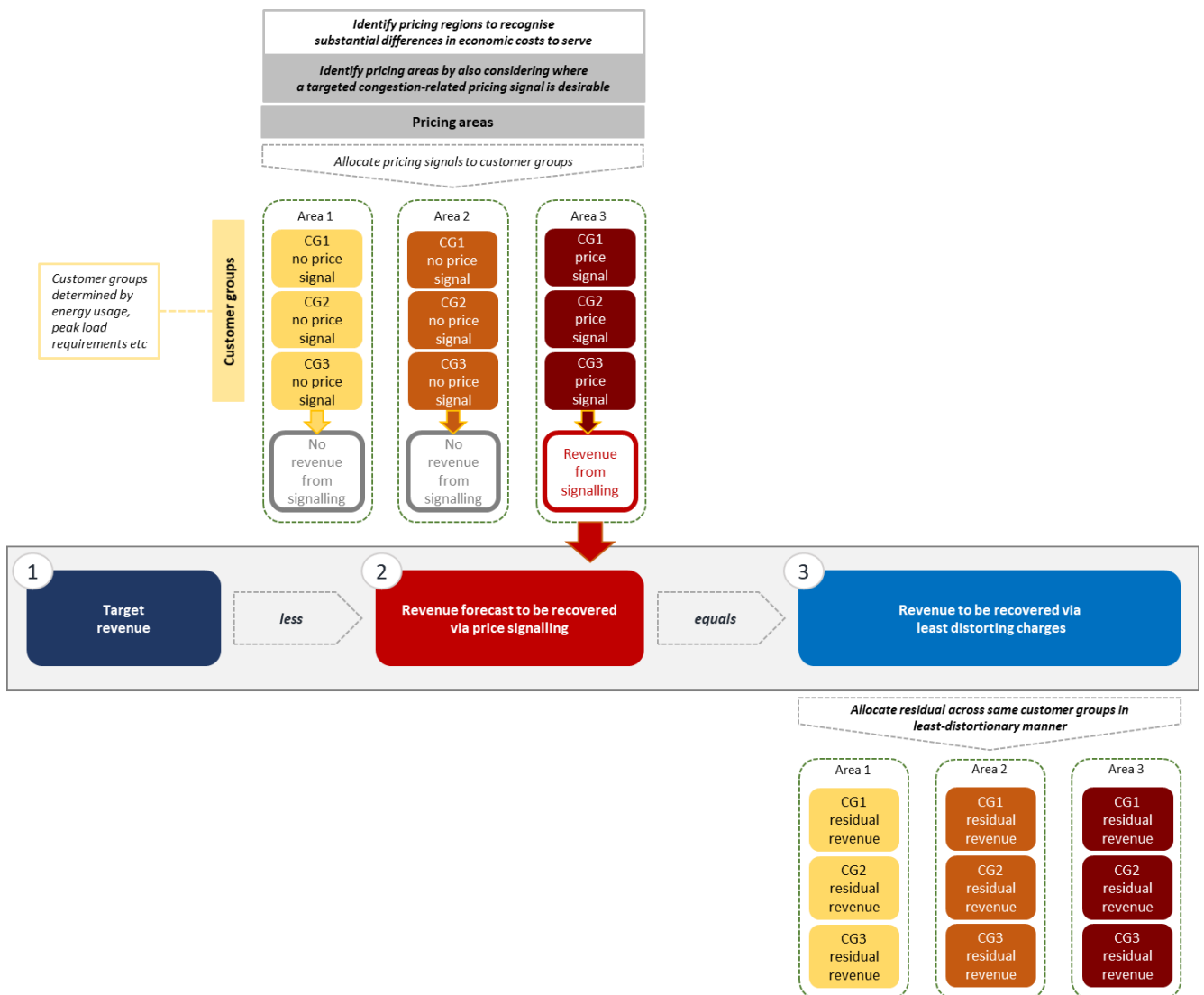
Part 2: Expectations on the application of the distribution pricing principles

This Part sets out the Authority’s expectations for how the Principles work to send appropriate pricing signals, how they work with Asset Management practices, Capital Contribution policies and lead to efficient pricing outcomes that benefit customers.

Pricing Signals

- The primary role of cost-reflective pricing is to correctly signal the most efficient use of the existing network, future network investments and application of non-network investments – the latter either by the distributor¹, its end-users or other participants.
- The *Distribution Pricing: Practice Note August 2019* signalled that cost-reflective pricing requires a different approach to price-setting. Traditional price-setting allocated target revenue to consumer groups then developed prices for each group. Cost-reflective pricing operates differently: using a process to develop economic cost-signalling prices, then considering target revenue to identify, then allocate, residual costs (see Figure 1).

Figure 1: Price-setting methodologies



¹ Distributor investments in non-network alternatives is being considered as part of the *Updating the Regulatory Settings for Distribution Networks* consultation (August 2021).

6. The above diagram supersedes the version in the *Distribution Pricing: Practice Note August 2019* as we believe this version better illustrates the price signalling and price setting approach.
7. Since April 2020 all distributors under Default Price-Quality Path and Customised Price-Quality Path regulation have had their revenue set via a revenue cap rather than a price cap. This approach removes the uncertainty associated with demand fluctuations interfering with calculating target revenue, and so provides more latitude for how distributors set prices and progress their reforms towards efficient distribution pricing.
8. The Commerce Commission noted in its Reasons Paper supporting the latest Default Price-Quality Path setting, “[i]mplementing a revenue cap (as opposed to the previous price cap) will give distributors the flexibility to price in ways that offer more choice to consumers and that enhance incentives for energy efficiency and demand-side management.”² Distributors can now undertake more active price signalling to consumers to both encourage usage in times of low network congestion or demand, and to discourage usage during times of network constraint. This also applies to signals to suppliers of energy (via localised generation activity or distributed energy resources) where prices can signal when and where it is efficient for the network to receive energy, and when it is not.

What is expected of price signalling?

9. A price signal is intuitively understood as the most visible input to the question ‘am I willing to consume now at this given price?’. Common price signals that people often deal with are hotel prices and airline tickets. With low supply and high demand we expect a higher relative price, and *vice versa*. A price signal creates a situation where choice can (usually) be exercised - do I consume now, do I change my consumption pattern, or do I find an alternative? It incentivises (rather than instructs) consumers, retailers, and flexibility traders to determine their willingness to be active in shifting demand.
10. A well-designed price signal provides a cost-reflective measure of the impact that an additional marginal unit of energy has on the network. Across a system or network the various price signals work to balance supply and demand. There is a continuum of people exercising their choices of how they value their marginal energy: as price rises, fewer people will keep consuming. These decisions are invisible to the distributor and often intuitively made by the consumer, or on their behalf, according to a multitude of individual preferences. As technology evolves demand shifting may become more invisible to the end consumer. Why someone values the energy they use is not necessary for a distributor to understand in order to provide efficient price signals.
11. Price signalling must match the state of the network and will therefore range from sending no signal, to a signal that incentivises a particular action. Its core aim is to signal physical loading on the network relative to capacity. When there is no (actual or anticipated) congestion the price signal should not be influencing how consumers use the network.³ A peak signal could create a distortion that is inefficient and harms customers (eg, if it incentivises people to turn down, or off, heating) if there’s actually no congestion.
12. Instead, efficient pricing for a network with a flat or falling demand and no constraints would be a fixed daily charge that simply recovers the invested capital without influencing network use. If recovery via fixed

Illustration: For a feeder that is congested every weekday evening, the distributor sets higher prices during that time. If this doesn’t ration demand the distributor could:

- keep sharpening the signal
- work to remove any barriers that are causing the signal to not ‘get through’, including considering if the cause is lack of pass-through or other response from retailers, in which case the distributor could seek to agree a solution with those retailers or flexibility traders
- consider if the customers are simply not responsive to price. In the long term, if consumers’ willingness to pay for a network upgrade exceeds the cost of the upgrade, then it would be efficient to upgrade the network.

² *Default price-quality paths for electricity distribution businesses from 1 April 2020 – Final decision*, Commerce Commission, 27 November 2019

³ Network congestion means that network capacity is not adequate to meet demand at a particular network location at a particular time. It does not mean the same thing as peak demand on the network.

charge is not available, a second-best option may be a completely flat tariff structure that does not vary by time or amount of energy consumed. By contrast, a network with congestion could address this by increasing prices during constrained periods. The increase needs to be enough to incentivise enough demand reduction to bring the system back to balance, or to signal that investment in infrastructure or generation is needed.⁴

13. Getting the right outcome for all customers, distributors and other participants requires that those who stand to benefit should shoulder the bulk of the cost, and those that are most able and willing to adjust their demand in response to price changes have an opportunity to monetise their choice by changing their consumption.
14. By using prices to balance the system, distributors can ensure its network design is appropriate for customers' needs and avoid or delay investment in new capacity until necessary. Price signalling is a key component of good asset management.

Good price signalling operates differently in the short and long term

15. Appropriate price signals better manage usage of the network across the short and long term. Pricing can help ensure networks make the right investments at the right time, leading to lower overall costs to consumers in the long run: a clear consumer benefit.
16. Efficient short-term price signalling means charges rise to ensure consumption reduces until congestion is no longer an issue on that part of the network, in the short term. A simple example of this is where a feeder is becoming congested for a short period each year, eg, for a few nights during the coldest part of winter, for a few hours per night. Prices don't have to rise to be sending a signal. A distributor can offer a 'first off' option or demand response option to help it control network congestion, usually in return for a payment or a discount to charges.
17. It is efficient for such price signals to delay network investment by the distributor, or a non-network provider, until the cost of a network upgrade becomes economically justifiable (ie, the value to consumers exceeds the cost). In this way, price signals lead to efficiency in the long-term. Once an investment is made to relieve congestion, pricing signals designed to limit use on that part of the network could likely be removed. The cost of the investment could be allocated across the whole network, or efficient pricing could mean a more granular cost-reflectivity approach that allocates long-term costs of a new part of the network to the customers connected to it.⁵
18. The connection between short term efficiency and long-term efficiency is an interplay of price signalling and efficient cost allocation. We believe distributors understand this concept - and are managing short- and long-term pricing and investment decisions via their asset management planning systems and tools which assess project investment viability. Our concern is that pricing signals need to sharpen in order to be confident the long-term decisions are in the best interests of customers.

Good price signals are different for different locations and customers

19. An efficient price signal may vary across the network's footprint, and across time (over a day, week, month, or season). Depending on who is connected where, efficient price signals may also vary across customer groups. In contrast, a network with no congestion may not need price signals to shift demand across a day.
20. Time-of-use (TOU) tariff structures can be effective in reducing congestion on a specific part of a network during times of peak load. But because consumers differ, a peak signal to some consumers might be very effective, and the same signal could have zero effect on other consumers. So, balancing a network in the short-term may mean a different price for different

⁴ The Authority recognises that some consumers are not responsive to price and so price signalling can exacerbate affordability issues. The pricing principles include considering impacts on consumers. The Authority also supports MBIE's work on energy poverty.

⁵ This could be recovered as a fixed charge that is not intended to influence use of electricity, comparable to a benefit-based charge (in the transmission pricing context).

parts of the network at different times. A blunt TOU pricing structure applied across a whole network (including parts with no congestion) may not be a useful signal. It could incentivise inefficient demand reduction or encourage inefficient investment in DER.

21. Appropriate consumer groupings require judgment by each distributor - sufficiently granular to price-signal congestion to the right consumers, but not so many that it becomes overwhelming for the distributor, retailer, flexibility traders and the wider market to understand and implement. Future technology may enable individualised price structures, but that is some way off and going to that granular level may not actually be desirable in other ways.
22. Distributors must trade-off between finely targeting price signals and pricing that is implementable. Whether the balance is right can be measured by how effective the price signalling is at achieving its intended goal.
 - a. At times it may be appropriate to send a price signal where no current congestion or network need is evident, but the distributor's network understanding and trend analysis suggests that it will be required in the coming years. We acknowledge that some distributors consider that this advance signalling has an additional benefit of helping customers to get accustomed to responding to signals.
 - b. These signals, sent in anticipation of a future need, must be implemented carefully and we expect them to be monitored closely and assessed for undesirable or distortionary outcomes.
23. We do not expect to see one size fits all 'cookie-cutter' price signals, but rather distributors working to deeply understand both network conditions and customer demand patterns – now and over time. This process, we acknowledge, can take many years, and so reform progress is assessed on a distributor's willingness to take appropriate actions now, and build its information base and understanding to inform future pricing.
24. A distributor should understand its assets, and which assets serve which consumers, if pricing is to avoid cross-subsidies from one part of a network's consumers to other consumers.

Bad price signals need to be avoided

25. We try in this Practice Note to identify and illustrate what 'good looks like' and so for completeness we can also illustrate 'bad' (inefficient) price signalling. In the simplest terms, a bad price signal is sending one when it is not required, the signal does not meet a determined need⁶ or it's the wrong signal.
26. Bad price signalling involves implementing any signal without an associated need. Examples include, but are not limited to:
 - a. using a high variable charge component when no congestion is evident
 - b. using a peak charge across parts of the network that are not congested and/or which applies at times when no congestion occurs
 - c. implementing TOU when there is no regular daily discernible congestion
 - d. leaving a pricing signal in place after network investment has been completed and congestion is no longer an issue.

Pricing signals in summary

27. By way of summary, pricing signals come at the end of a broader process that seeks to recoup the distributor's allowed revenue, and needs to follow a process where distributors need to understand the following:
 - a. their network design: what assets do they have, and where?
 - b. flows relative to capacity: where is congestion occurring, or expected?

⁶

For the avoidance of doubt, any time in this paper we refer with approval to a peak charge or TOU pricing (or any other price signal), we are referring to such a price signal that is required due to actual / imminent network congestion.

- c. who's using the network and how: do assets support all or some customers, and which customers will benefit from new investments?
- d. whether a price signal is useful, to influence users, or if prices should simply seek to recover costs in a manner that does not influence network usage (eg, a fixed daily charge) and/or reflects who is benefiting from specific parts of the network: a least distortionary cost recovery exercise.

Why? Because efficiency lowers prices for customers in the long-term

- 28. The purpose of cost-reflective pricing, and effective price signalling is to provide efficient outcomes. Efficiency is shorthand for what it produces: long-term benefits for customers.
- 29. The electricity sector is seeing rising prices across all facets of traditional generation, transmission, and distribution. As the backbone of the electricity industry the distribution sector has a large ongoing investment programme already, to maintain, grow and replace existing networks; many with creeping age profiles and pressures to remain within regulated reliability and quality of supply requirements. Investments add costs to consumers.
- 30. The 2019 Electricity Price Review found that there was no reason now to target distributors to fundamentally reduce their costs or review their prudent operation. However, if distributors overlook the pricing part of their toolkits, they risk over investing in capital to lift capacity. Effective price-signalling can help delay or avoid additional investment.⁷
- 31. Right-sizing of investments for efficient network performance is a hallmark of the sector's engineering objectives, and most distributors are keenly aware of the forthcoming 'new energy future' that will see their networks utilised more fully and by a wider range of participants than currently seen. This was a key component of the ENA's 2017 *Guidance on Pricing Reform*.
- 32. Efficient pricing supports innovation. If pricing is cost reflective this also allows distributors (and consumers) to target traditional network and non-network solutions. It allows for other participants, such as flexibility traders, to be involved and help shoulder the burden of delivering a low emissions future. In the context of technological changes and the substantial role that electrification is set to play in the very near term of New Zealand's low emissions future, distribution pricing reform is now critically urgent in shaping the success of achieving these goals.

The goal of efficient cost reflective prices is that over the longer-term consumers will obtain the greatest value from their consumption of electricity, new investments will be at the right time in the right places, and consumers will pay less than they would have if prices were not efficient.

It will not mean lower prices immediately, but will lower prices in the long-term, for all

- 33. Cost reflective pricing will not lower the price to all customers in the short-term. Managing the increases and decreases in network charges as they are re-balanced involves distributors engaging with customers. Retailers too will face concerns from customers affected by pricing reform, and we see that this will strengthen the partnership between distributors and retailers in delivering satisfactory outcomes to their shared customers. The Authority also has a role to assist distributors, retailers, and customers with this transition, and we expect that a collaborative approach will accelerate reform of distribution pricing.
- 34. Allocating the costs of the existing network will have different challenges to the allocation of additional costs and price signalling of future investments. Changes to existing allocations may create a sense of unfairness by customers who face higher charges due to location, economic costs of the part of the network they are on, and for some the simple fact that prices have changed when they have a history of expecting price stability.⁸ There are options available to distributors to mitigate this impact. The target in any case is not necessarily to remove all cross-

⁷ The Authority recognises that this is a balance: if consumers' willingness to pay for a network upgrade exceeds the cost of the upgrade, then it is more efficient for the network upgrade to proceed.

⁸ Although these prices are mediated by retailers so some customers may not see these changes.

subsidisation, but rather to provide customers with the ability to respond to price signals in their most valued manner.

35. Allocating future investment is likely to be more easily and effectively done. Estimates of the capacity needed to deliver New Zealand's low emissions future means we can expect substantial investments over the next decades. It is imperative that efficiency is at the core of future investment decisions. We expect that those who benefit directly by increased electrification are required to pay the related costs.
36. We do not expect that providing welfare support to customers is the primary role of distributors and retailers, although we acknowledge this is often done by both. Energy hardship is a growing concern and cost reflective pricing and good price signalling will assist with keeping prices as low as they can be, overall and in the long-term, by ensuring that the right investments are made at the right time.⁹ It will also provide greater visibility to allow better targeted support from Government agencies managing welfare outcomes.
37. Price shocks are not a desired outcome of pricing reform, and the Authority is cognisant of the need for prices to evolve on a journey towards efficient outcomes, rather than rush to an endpoint. We will have some patience with price reform once it is clearly underway, to allow customers to adjust, technology to assist, and distributors and retailers to manage good customer engagement and to learn and evolve towards what is best for their networks and customers.

Pricing is part of the Asset Management toolkit

38. Good price signalling is expected to be a well-used tool in the distributor's toolkit for managing its network. It should form a part of, utilise and feed into, the Asset Management Planning process. In a strong Asset Management framework customer choices and ability to influence future investment are key parts of understanding the context of the network. Consultation on network developments and choices for alternative investments (network and non-network) have a clear pricing component and we expect they are part of discussions both internally and externally for efficiently and prudently managing investments.
39. We expect to see that options analysis of future investment include alternative pricing structures to delay or avoid investment. Given the long lead time of many network investments, there is ample opportunity for pricing to be more localised and trials and consultation undertaken with affected communities to inform the choices that distributors make. Currently this practice appears to be very infrequent.

Capital contribution policies need to align

40. How expansion or upgrade of networks is funded is often the nexus of asset planning and pricing, as expansion and upgrade investments indicate that customer needs of the network are currently not being met. Capital Contribution¹⁰ policies are a disclosure requirement under Commerce Commission regulation.¹¹
41. Currently there is no regulatory oversight of the content, design or intent of these policies which has led to distributors having a wide range of approaches. Without a single overarching goal of contribution policies – such as to recover the proportion of costs directly related to the beneficiary - there is the scope for significant cross-subsidisation and inefficient investment.
42. The role of contribution policies is another relevant question connected to the Authority's distribution pricing reform work. We expect to see all distributors bringing their contribution policies within the scope of their pricing structures and aligning with the Pricing Principles.

⁹ That is, networks invest in the extra capacity at the point at which consumers are willing to pay for it, compared with poorly targeted or early upgrades that result in relatively low benefits for the consumers that ultimately pay for them.

¹⁰ Otherwise known as a Customer Contribution, Customer Connection policies

¹¹ Section 2.4.6 of *Electricity Distribution Information Disclosure Determination 2012*, Commerce Commission

Part 3: Expectations on pricing structures

This Part sets out the Authority's expectations for how distributors segment their networks for pricing purposes – in location and time and how different approaches to pricing structures can apply.

The optimal level of pricing granularity will change over time

43. The level of granularity with which a distributor chooses to segment its network by time (temporal), geography (spatial) and customer grouping will require an evolution of pricing structures that keeps pace with technology, trade-offs between efficiency and customer acceptance¹², and the responsiveness of customers.
44. The need to improve granularity now is clear – price changes currently happen annually (albeit they could be changed more frequently, and in time this may become desirable) and so delaying segmentation and trialling or implementing new pricing structures costs time. The pace of change in technology and demand pattern changes is accelerating, and time is not something that distributors may have the luxury of.
45. We expect to see distributors undertake 'no regrets' work now - from understanding the flows on their networks, and the context of current prices on their networks, to trialling the efficacy of reformed price structures. We acknowledge that for distributors that do not face congestion now (and don't expect it soon), reform may simply mean moving to higher fixed charges and reducing variable charges, once LFC regulations allow.¹³
46. For other distributors, increasing the granularity of network segmentation is an important first step to ensure that price signals become better directed. As noted in MIT's *Utility of the Future* paper "*Granularity matters. The prices and regulated charges for electricity services vary significantly at different times and in different locations in electricity networks. Progressively improving the temporal and locational granularity of prices and charges can deliver increased social welfare; however, these benefits must be balanced against the costs, complexity, and potential equity concerns of implementation.*"¹⁴
47. Economic cost-price signalling takes a degree of judgement - to segment the network based on an evidence and data-driven assessment of what is practical and implementable, and implement pricing signals appropriate to each group. Access to relevant and accurate data to identify both congestion and consumption patterns can be difficult, but we are observing distributors retailers and meter owners making headway in reaching agreements¹⁵. We expect this challenge to decrease over time as access to information improves.
48. In reforming distribution pricing there is a necessary feedback loop that the Authority expects to observe as it is a necessary part of continual pricing reform: analysis, understanding, trialling, implementation, observation, and adjustment.

Locational pricing?

49. Geographical segmentation ranges from viewing the network as a whole through to considering individual ICPs. It is well understood that the cost-to-serve of each ICP is different, and the most

¹² While customer acceptance is not part of the Authority's mandate, we acknowledge that it plays a role in distributor and retailer pricing decisions.

¹³ The impact of the LFC regulations is understood to be a significant block to some distributors in their work to accelerate reform. In terms of efficiency outcomes for price signals, as measured through the Authority's annual scorecards, it is difficult for a distributor to score at the top end of the range in this category with the LFC regulations in place. Understanding specifically how LFC restricts implementing better price signals is individual to each network and we expect that distributors are clear with the Authority where these limitations occur and how they expect to respond as the LFC regulations are phased out.

¹⁴ *Utility of the Future*, MIT, 2016, <https://energy.mit.edu/research/utility-future-study/>

¹⁵ This area is being considered as part of the *Updating the Regulatory Settings for Distribution Networks* consultation (August 2021).

granular, theoretically efficient cost-reflective pricing would allocate to that level (ie, real-time locational marginal pricing).¹⁶ However, it is currently impractical and might ultimately be undesirable (in terms of overhead efficiencies and consumer impacts) to attempt such precision. Some form of segmentation is therefore required.

50. Many distributors have established geographical pricing regions reflecting significant differences in cost to serve in the long run. These are sometimes a result of historical acquisitions (a distributor buying networks in other regions), reflect an historical engineering view of the network, reflect a group around a GXP or a zone's substations, or reflect network density (ie, a rural area and an urban area). Practical segmentation of a network for efficient price signals is likely to be achievable at a zone substation level. Usually these may not be too different from existing pricing regions, but for some distributors zone-substation-regions may be more granular than presently used. If distributors have systems and data to segment to a deeper level, and if this seems useful for an efficient cost-reflective price signal, this should be done.
51. Distributors are expected to be able to sum the invested capital in each segment, along with recording the ongoing maintenance of it. This financial cost view of the network then sits alongside network performance standards and usage patterns to produce an economic cost of each segment's energy use.
52. We understand that currently there is a wide range of abilities across distributors (and sometimes within a distributor's network) to understand footprint granularity. Reform towards cost-reflective pricing requires this understanding to improve for many. How far segmentation should go will vary but should be to a point where the materiality of differences in price signalling or cost-reflectivity between segments is small enough to warrant no further segmenting. Footprint granularity is not a one-off exercise, as usage patterns evolve material differences could open up between previously similar segments, warranting further fine-tuning of pricing.
53. Building a segmented economic cost view of energy use and utilisation on their network is expected to be a foundational piece of progress that distributors should be demonstrating in their pricing roadmaps.

A time dimension to pricing?

54. Distribution networks have traditionally been built to largely allow ongoing consumption during peak periods: aiming to deliver all the energy customers want, when they want it. Whilst ripple control does dampen peak consumption down a little, during a few cold winter evenings per year, for most of the year large parts of New Zealand's 150,000 km of distribution network are unconstrained.
55. As energy consuming devices have changed and demand for energy has evolved, the peaks have tended to rise to match the habitual patterns of peoples' daily lives. As demand increases and technology such as EVs become more widespread, we could see more congestion peaks. Higher peaks may drive distributors to build more capacity for a network that for the bulk of the time is underutilised. This could be inefficient – if customers must pay for something that they mostly do not use. Or it could be efficient if customers' value for the extra energy is high.
56. Where congestion exists, correctly timing price signals to reflect the cost to the network and incentivise people to value their usage will reduce costs for everyone and lift welfare. Two of the most striking examples of habitual consumption that have been proved to be readily influenced are:
 - a. load control of hot water heating: New Zealand has a long history of 'ripple control' to allow distributors to control hot water heating to reduce evening peaks. A discounted

¹⁶

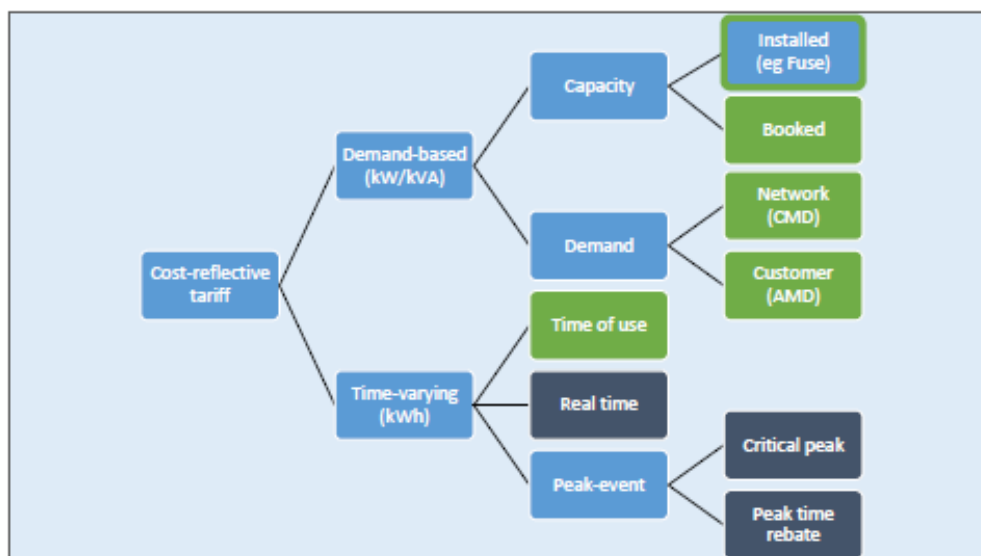
Distribution network level locational marginal pricing has been investigated globally and some research has been undertaken in New Zealand to understand its potential reach and efficacy, especially in the widespread penetration of decentralised DER. The role of distribution locational marginal pricing is not a current consideration for the Authority.

price paid by the customer for giving occasional control to the distributor benefits both, with a barely noticeable life change from the customer, and potentially large investments by the distributor avoided

- b. home charging of EVs: This market is growing quickly and government policies to encourage further take up will exacerbate the potential for people to plug in when they return home. Adding to the evening peak risks requiring new capacity to be built, when a simple price signal could achieve a shift in charging that avoids the need for new investment.

- 57. Effectively pricing the time of use of energy to signal when (and where) congestion exists lifts efficiency of network use. However, assigning a time of use price signal to time periods when no congestion is present could send the wrong signal and create a worse outcome than a flat charge. One caveat here is that good price signalling by a distributor takes account of trends that could see congestion arising, and so pre-emptively signalling to customers to become accustomed to a future price structure is prudent and encouraged by the Authority if the future congestion is sufficiently proximate.
- 58. Without a link between congestion and increased prices, a distributor risks reducing the welfare of customers, encouraging actions (defection, reduced consumption) that it does not desire, distorting behaviour unnecessarily and causing harm to all parties.
- 59. The ENA’s *Guidance on Pricing Reform* helpfully lays out a view of pricing structures in the figure below. It focussed attention on the types of cost-reflective pricing highlighted in green. We have focussed attention on the Time of Use and Peak Event tariffs.

Figure 2: Price structure options



Source: Guidance on Pricing Reform, Electricity Networks Association¹⁷

Time of Use

- 60. Time-of-Use (TOU) pricing has been the first stepping-stone for many distributors’ pricing reforms. The key to using TOU effectively is to understand and signal when in a period – an hour, day, week, month, or season – network congestion is occurring (or expected) and so when the costs to deliver energy are highest, and to lift prices in those periods appropriately. Distributors should consider using TOU pricing where they can demonstrate that there is a need for it, for example a rapidly growing penetration of EVs in a particular area of the network, resulting in actual or imminent congestion.

¹⁷

Guidance on Pricing Reform, ENA, August 2017, <https://www.ena.org.nz/news-and-events/news/final-pricing-guidance-report-published/document/151>

61. TOU may not necessarily be the end point. Our assessment is that many distributors have implemented TOU as a means to start the journey of pricing reform, but that the next step for them is not clear. Our concern is that TOU can be a blunt and often inefficient method of cost reflectivity especially if not matched to actual or impending congestion, and that after implementing TOU, distributors may reduce their focus on pricing reform.
62. We expect distributors to assess the effectiveness of their TOU pricing to determine if there has been a resulting change in retailer and customer behaviour, noting whether:
 - a. there has been a load shift of consequence, and
 - b. the load shift has met the desired need.
63. We accept that TOU has the advantage of being easily understood by customers and so may be a useful step in changing habits or focussing attention. When customers can respond well to TOU structures it allows for existing network capacity to be better utilised and delay or avoid additional capacity investment. However, if the congestion problem that TOU is trying to solve is not well targeted then TOU risks being a change for the sake of making change. This is detrimental to customers' acceptance and risks creating a backlash to reform that distributors will have to bear later when they better target price signals.
64. We are also cognisant that TOU can have an undesirable effect of simply shifting the congestion out, if customers or automatic controls ramp up as the peak period finishes. Determining if this occurs, and if it is important to managing congestion, is a learning experience that would warrant further action.
65. We expect distributors, over the coming year, to understand whether their TOU implementation has reduced network congestion and therefore had the effect of 'cooling' heat maps of utilisation and congestion, and whether this effect can be tied to an Asset Management Plan change that has delayed or avoided future network investment.

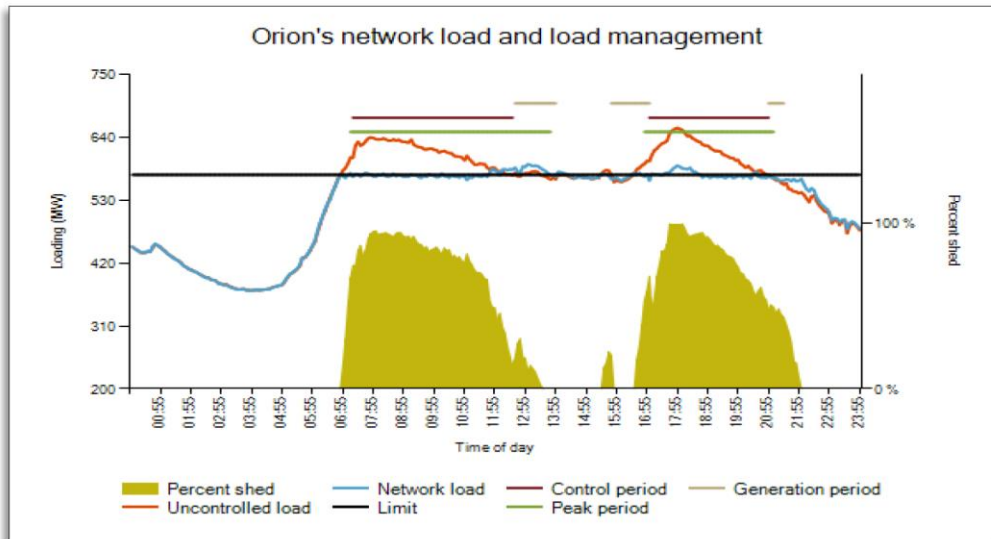
Peak event pricing

66. A further evolution of TOU pricing may be to factor in peak events on a network, sub-network or feeder and overlay an additional charge during these times. This will amplify a price signal of an existing TOU structure, and for some networks just a 'critical peak price' may be sufficient to manage time-bound congestion, eg, the coldest winter night in a season, or rural coastal areas with a high density of holiday homes over the December/January holiday season.
67. Research has shown that using critical peak pricing is highly effective in reducing peaks, especially when paired with technologies that automate the management of usage in these times. The size of the peak signal is clearly a significant factor in managing peak reduction, and the infrequency of the number of peaks allows customers to make an 'extraordinary' decision rather than change a 'sticky' consumption habit.
68. Ensuring any peak signal is communicated a reasonable period in advance is considered the most effective way to allow customers to respond and engage with the signal, but there are limitations. Firstly, distributors do not always have access to customer contact data so cannot communicate directly and would be relying on 'links in the chain' to communicate the signal. Secondly, to be effective customers need to be engaged in managing their consumption or have automation in place that allows a response. For a network that sees critical peaks, this form of pricing is a useful method for limiting the near-term impact of demand, and so can delay investment and therefore a critical peak pricing structure may be effective, albeit not wholly cost-reflective.

Controlled load

69. New Zealand distributors are advanced compared to overseas networks in managing the timing of their discretionary network load, mostly through the aforementioned ripple control. Distributors are practiced in managing these devices to reduce peaks, leaving themselves and customers better off, with little impact on their daily lives. The effect of good load management is illustrated by Orion's use of load control in the figure below.

Figure 3: Load control at Orion



Source: Guidance on Pricing Reform, Electricity Networks Association¹⁸

70. Load control for hot water heating is the common application at present and has proven to be effective for managing congestion. Envisioning a future of more widespread EVs, PV and other controllable DER means that there are opportunities for greater use of demand response. Further, flexibility in the load side – including control of hot water and EV charging - will play a key role in future in balancing fluctuations in supply of energy from intermittent renewable generation around the grid.
71. Technology is likely to assist in the load control of EV fast charger installation, and as it has a similar load profile to hot water, this is an area where we anticipate rapid development and for distributors to actively encourage uptake, either directly or via pricing structures and signals that support other control devices.
72. We understand that the penetration of traditional ripple control for hot water at new ICPs is reducing in some parts of the country and in the short term this may hamper efforts to control hot water load more broadly. Whether this is an economic decision (related to real or perceived value from the installation that could be addressed by more cost-reflective pricing) or there is some other barrier to more widespread uptake is not clear. In time, other communication and dispatch technologies may provide viable alternatives to ripple control.
73. We expect to see distributors, retailers, and flexibility traders active in providing the ability to increase options for customers to manage these ‘heavy’ loads in return for a discounted pricing structure and/or paying a third party for this control. The Authority envisages a future where distribution congestion might be managed, to an extent, by demand flexibility, utilising emerging technology and business models.¹⁹

Transmission charges

74. Distributors will need to pay attention to the impact of the proposed changes in Transmission Pricing Methodology, and within the bounds of regulation (ie LFC), the Authority expects that the structure of transmission charges should be passed through into distribution pricing unchanged:

¹⁸ Guidance on Pricing Reform, ENA, August 2017, <https://www.ena.org.nz/news-and-events/news/final-pricing-guidance-report-published/document/151>

¹⁹ We acknowledge the important work of the Innovation and Participation Advisory Group in the area of efficient demand response: <https://www.ea.govt.nz/assets/dms-assets/28/Transpower-DR-programme-review-draft-memo.pdf>

- a. fixed transmission charges, which are not intended to influence customers' network use decisions, should be passed through as fixed (daily) distribution charges²⁰
 - b. transmission charges that are intended to send price signals that influence network use should be passed through as distribution charges that send the same price signal (and influence network use in the same way) as the transmission charge.²¹
75. The current LFC regulation may not allow the above expectations to be met immediately, however we expect distributors to be forward looking in how their treatment of transmission charges are passed through as regulation change allows.

Recovering the residual

76. As depicted in Figure 1, the final step in the price setting process is to ensure that the revenue a distributor collects will match its allowed revenue (ie, the residual revenue). It is rare that the revenue collected from the price signalling step will match the revenue a distributor is allowed to earn. Most of the time the revenue collected from the price signalling part of the process will be less than the allowed revenue, but sometimes it could be more than the allowed revenue (especially if the distributor has a very strong price signal it needs to send to one group).
77. The difference between the revenue earned from the price signalling step of the process and the total allowed revenue is the residual. A share of this residual is allocated to each customer group. The price signal, plus the share of the residual, makes up a customer's distribution charge.
78. Because this residual amount has no need to send a price signal to any one group (because all the price signalling work is done in the first step) this residual recovery process should be done in a way that means a customer has no reason to change their electricity consumption use or pattern. This is what is meant by 'non-distorting'. To be non-distorting, the residual should be unavoidable, meaning that customers should not be able to take an action that means they avoid paying all or part of the charge (other than disconnecting from the network).
79. There are many ways that a distributor could allocate the residual across customers within a customer group, ranging from a simple per-ICP basis, to proportionately allocating the residual referencing a metric that reflects the size of that customer, and so it's overall effect on the network. For example, an allocation based on maximum demand could reflect the relative size of each customer's maximum usage of the network. Any metric referencing size or use would ideally be a historical reading of the metric, as this would create fewer possibilities for avoidance, making it a less distortionary allocator. As is the case for the other aspects of price setting, there is no one-size-fits-all solution, as differing methods can produce different outcomes that may be best applied by one distributor, but different for another.
80. In the 2020 Transmission Pricing Methodology guidelines the Authority decided that the residual portion of the transmission charge should be allocated using a customers' historical anytime maximum demand. Historical data is used because this is less distortionary than using more recent data, and the anytime maximum demand is a simple way of most likely reflecting a customer's size (as a proxy for their ability to pay).
81. In determining which is the least distortionary method for each distributor, we expect that distributors will balance the desire for simplicity with the outcomes produced by the different allocation methods. If the financial impact on customers from two methods is insignificant, then we expect that the simplest calculation method will be selected; however, we acknowledge that other methodologies fulfil other objectives, such as representing the relative use of the network and this may be appropriate. As with all pricing changes, considering impacts on consumers will be important.

²⁰ This would include the proposed benefit-based charges and residual charges, which are intended to be largely a fixed charge.

²¹ An example could be a transitional congestion charge (TCC). The current proposed TPM does not include a TCC; however, the TPM guidelines provide for a TCC in certain circumstances, and Transpower might propose to introduce one in future.

Part 4: What a good pricing evolution will look like

This Part aims to provide guidance on how pricing responds to the changing needs of a network, the pricing response options that align and why they are needed.

82. We have considered stylised hypothetical networks that illustrate the way that we believe good pricing reform should be conceived and implemented.
83. The networks derived are based on two defining characteristics:
 - a. density – urban and rural
 - b. geography – remote and non-remote (applies more commonly to the Rural network examples).
84. In considering these networks we are focussed on residential/mass market ICPs only. This simplifying assumption is reasonable as:
 - a. Residential ICPs comprise 85% of total national ICPs which predominantly affects the length and density of distribution networks
 - b. Commercial and Industrial ICPs are typically subject to non-standard individual contract negotiation that already, as we understand it, largely aligns with cost-reflective pricing principles
 - c. Medium sized commercial ICPs are typically subject to load/demand pricing.
85. We have proposed simplified examples of the types of networks, the changes they face in growth, demand for energy, and access to the network, and the resulting 'best practice' pricing structures.
86. In some situations we have offered a near-term view as well as a longer-term view on best practice.
87. We have used a shorthand for describing the state of congestion on the network, *Design* compared with *Demand*:
 - a. where a network is currently meeting the requirements of customers at their peak demand we describe it as $Design = Demand$. Such a network, in whatever configuration as it currently is in, is supplying connected customers with their electricity needs and faces no congestion
 - e. where a network faces congestion at times we describe it as $Design < Demand$. Such a network is currently insufficient to meet customers' demands at times of peak demand
 - f. where a network has significant spare capacity at times of peak demand, we describe it as $Design > Demand$.
88. The key distinction with this shorthand is that it describes the time of the day, week, or year where a network faces its peak demand, rather than an assessment of the all-year around demand requirements. It does not reference reliability or resilience standards, as these factors are part of a distributor's asset management planning that are considered as part of the Commerce Commission's Part 4 regulation.²²
89. The examples start with the 'What it looks like now' and then builds future scenarios from that base. This approach illustrates the way we believe that pricing should respond dynamically to changes in the network's use and demand, and reflects the iterative way that we believe good pricing practice evolves.

²²

Investment undertaken to improve reliability, resilience or growth would be form part of the total revenue a distributor can recover, and so would form part of the allocation of costs exercise, but for this set of simplified examples they are separate to the price signalling discussion

90. The pricing structure in the starting position of 'What it looks like now' is currently an aspiration for many distributors as it has a 100% fixed daily charge. This is a strong indication from the Authority of an efficient pricing signal, albeit one in which no network with a LFC customer grouping can currently achieve, but we expect that distributors who match these network conditions will reform towards as regulation allows.

How Capital Contribution policies apply

An important element in the forward view of a network's expansion from the growth of ICPs and new load/demand is how a distributor's Capital Contribution policy (otherwise known as Customer Contribution, Customer Connection etc) applies.

This is important as growth within the existing network and expansion of the networks is funded by both new customers and the existing customers (ie via the distributor's revenue recovery). The amounts that distributors invest are recovered by way of pricing (line revenue) in accordance with the size of the capital they have invested (RAB as defined in the Commerce Commission IMs). Amounts funded by customers/new connections are outside RAB, and no revenue applies to them, ie, they should have no bearing on pricing to the wider network.

While substantial differences exist between distributors' approaches to their policies and methodologies, and the amounts they require from customer-initiated works **they mostly attempt to charge new connections in a manner that does not impose additional costs on existing customers that do not benefit from the new connection.**

It is not within the scope of this Practice Note to consider the efficacy of the contribution policies and methodologies, but it is clearly signalled that some consideration should be undertaken to ensure that the economic costs of the connection/load growth are adequately and efficiently recovered and do not burden the wider customer base.

Urban network

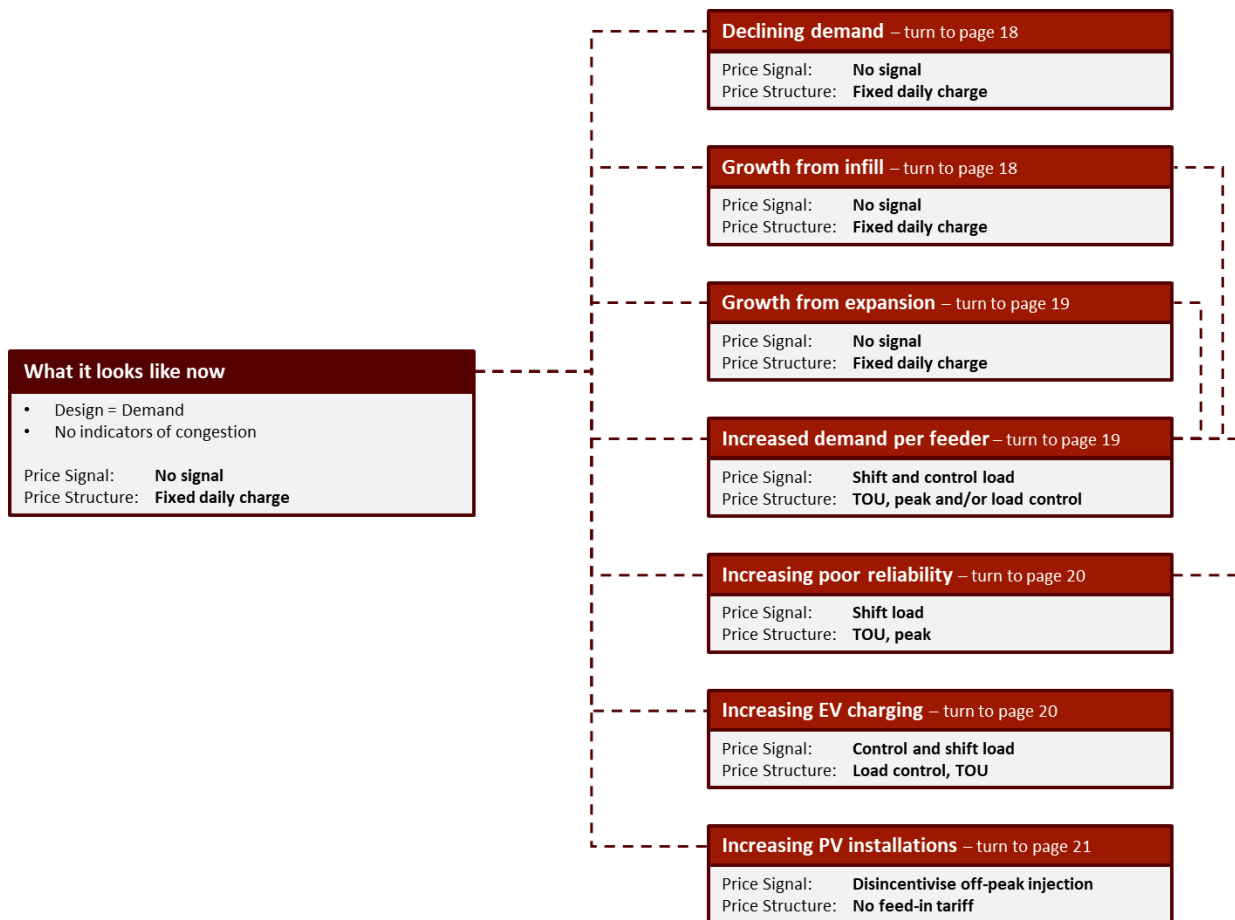
What it hypothetically looks like now

91. Design matches or exceeds Demand, with no indicators of congestion. Prices for services assist with Design = Demand such as load control (hot water ripple control) and 'first off' pricing options, and these are currently used in the congestion management of the network.
92. Network investment is predominantly historical, with renewal and growth expenditures within current and Asset Management Plan expenditure allowances.
93. Future investment is predominantly replacement capex, with any increased functionality planned to be uniformly installed. Where future service offerings do eventually differ, the allocation methodology would apportion costs appropriately.
94. **Pricing rationale:** No requirement to signal a change in customer behaviour, so pricing should recover the invested capital and ongoing maintenance of the existing network. With no capacity issues there is no reason to signal a price that influences consumption, therefore there is no rationale for a variable charge.
95. Controlled load manages congestion and avoids further investment, so can be zero-rated (ie \$0) for distribution pricing at peak, which should also aid customer uptake.
96. **Pricing:** Fixed daily charge

Network change scenarios

97. Using the above conditions for our hypothetical network as the starting point, we consider seven factors that may impact use of the network, and how we see pricing respond. Each scenario is expanded upon over the following pages.²³

Figure 4: Urban network scenarios map



Declining demand

98. The network is not constrained, spare capacity is increasing, therefore Design > Demand.
99. Opex & maintenance costs fixed with total line revenue unchanged (ie, derived from existing and replacement capex).
100. **Pricing rationale:** Design exceeds Demand. There is no capacity constraint signal needed, nor any need to change total usage or time shift usage.
101. **Pricing signal:** No change - Fixed daily charge

Growth from infill

102. Identified by an increased ICP count on feeder leading to increased total network demand.
103. Design <= Demand – ie, congestion may become evident or predicted on impacted feeders and there may be a short-term incentive to reduce the peak.

²³

References to a peak charge or TOU pricing mean such a price signal that is required due to imminent network congestion.

- 104. Longer term, where an investment upgrade may be necessary, the network's Capital Contribution policy should apply to reflect the incremental impact on network costs.
- 105. Depending on the specifics of the contribution policy relating to new connections there may be costs associated with increased investment on the feeder to be shared.
- 106. **Pricing rationale:** Upgrades to a feeder may be fully recovered by the contribution policy, to balance Design = Demand. Where this occurs there is no need to signal a change in consumer behaviour across the network/feeder.
- 107. **Pricing signal:** No change – Fixed Daily Charge.
- 108. **Near-term pricing rationale:** Before an upgrade to a feeder can be completed, or if the upgrade investment is not sufficiently recovered through the contribution policy, there is an incentive to signal congestion to shift load in order to balance Design = Demand and delay or avoid investment.
- 109. **Pricing signal:** See 'Increased demand per feeder'.

Growth from expansion of the network

- 110. Identified by a new feeder or extension of an existing feeder.
- 111. The contribution policy recovers some or all of the network investment for the new development.
- 112. Upgrades before new expansion are not always recovered.
- 113. **Pricing rationale:** Additions to the network may be fully recovered by the contribution policy, to balance Design = Demand. Additional capex is (theoretically) recovered by the addition of new billing volumes. Where this occurs there is no need to signal a change in consumer behaviour across the network/feeder, pricing should merely recover the invested capital.
- 114. **Pricing signal:** No change – Fixed daily charge.
- 115. **Near-term pricing rationale:** Before an extension of a feeder can be completed, or if the upgrade investment is not sufficiently recovered through the contribution policy, there is an incentive to signal congestion to shift load in order to balance Design = Demand.
- 116. **Pricing signal:** See 'Increased demand per feeder'.

Increased demand per feeder/GXP

- 117. Increased demand could be for many reasons across different feeders, due to the source of the increased load, such as:
- 118. Changing household energy use. This could include EV connections (see also section below on EVs).
- 119. Historical infill or expansion of a feeder occurred but did not trigger an upgrade at the time.
- 120. Land use changes can also alter demand on a feeder - for example, a fringe rural area that has seen increased density to become more urban in density – ie, urban sprawl.
- 121. Feeder level heat maps (or a similar alternative) should be the reference for identifying the areas needing attention and for determining the target of sharper price signals and measuring the success of them.
- 122. Smart meter data may be required to better identify source, location, and timing of increased demand.
- 123. Monitoring of the load and changes will be required to determine whether the pricing response has been appropriate, and also if it is continuing to trend up and requires more action.

- 124. **Pricing rationale:** Design < Demand. Load shifting should be incentivised to avoid/delay capex. This comes in addition to existing load control measures. If demand holds up then it indicates capex may be appropriate.
- 125. Capex invested should be recovered from the affected feeder with the forward view of the investment and its price impact being part of customer engagement to provide fully informed decisions.
- 126. **Pricing signal (1):** Where congestion is regularly peaking one or two times a day – TOU. Vigilance will be required to ensure load shifting has not simply extended peak periods.
- 127. **Pricing signal (2):** Where congestion is peaking to critical levels during a season (such as over winter evening peaks), an enhanced seasonal component may be necessary to amplify the impact, ie TOU + Seasonal peak charge. This may involve a reduced off-season structure to stress the impact of the peak season pricing.
- 128. **Pricing signal (3):** Load control pricing may be strengthened to further incentivise controllability of load, ie EVs and hot water. This should be utilised in conjunction with TOU signals.
- 129. **Longer-term pricing signal:** TOU is a useful initial step for customers to get used to signals. Where congestion is managed as part of a short period within a year (say a few cold winter nights) transition to a further enhanced peak signal, either stand-alone or as part of a TOU structure.

Increasing poor reliability/security of supply

- 130. Worst performing feeders are identified through a distributor’s asset management planning process. The focus here is on feeders that are not seeing an increase in per-ICP demand, but rather diminishing performance with a stable load.
- 131. Opex may be the least cost remedy for some time and the only option for a period if capex is a multi-year exercise. Pricing can assist in relieving pressure on the assets for a time.
- 132. **Pricing rationale:** A pricing response is appropriate to assist managing load to temporarily assist reliability (within the scope of the regular pricing adjustment timeframes). The pricing rationale is likely to be similar to the above scenario, but for a shorter period and potentially more targeted and involve specific customer engagement to address and improve the pricing signal’s impact.
- 133. **Pricing signal (1):** Where congestion is peaking during one or two times a day – TOU. Vigilance will be required to ensure load shifting has not simply extended peak periods
- 134. **Pricing signal (2):** Where congestion is peaking to critical levels during a season (such as over winter evening peaks), an enhanced seasonal component may be necessary to amplify the impact, ie TOU + Seasonal peak charge. This may involve a reduced off-season structure to stress the impact of the peak season pricing.

Increasing EV charging

- 135. Installation of EV chargers can be at any point of a network, and experience thus far suggests it is not an urban-only phenomenon.
- 136. Increasing load during peaks is the main concern for all distributors, but as EVs are still a fairly new technology there is an opportunity to tune customer expectations early with an appropriate signal.
- 137. Unless a distributor has systems in place to ‘mark’ new installations of fast chargers that require customer line upgrades, and can match it to the ICP for metering, there is no visibility of the load that links it to a charger.
- 138. Controlling the load has marked benefits for distributors to manage existing networks and avoid increased investment.
- 139. Whether the load is controlled or not, having a signal that shifts the loads is desirable.

140. **Pricing rationale:** EV charging is sudden and burdensome and experience thus far shows it typically coincides with existing peaks. It is however, a very controllable load and as technology evolves, it will be increasingly 'shiftable'. Controlling the load in a manner similar to hot water heating is feasible and desirable at this stage.
141. **Pricing signal (1):** Load controlled, possibly with a distributor, retailer or flexibility trader provided smart charger if the cost can be justified to avoid other network upgrade costs.
142. **Pricing signal (2):** TOU where congestion trends suggest demand can be shifted to low demand times – vigilance will be required to ensure load shifting has not simply extended peak periods.
143. **Pricing signal (3):** Where a feeder upgrade is necessary, costs should be allocated to the feeder through an increase in fixed daily charges.

PV installation

144. PV installations on uncongested daytime networks provide no benefit to the distributor.
145. Where network prices using a significant portion on a variable charge PV can distort economic signals by reducing consumption (and therefore cost recovery) but does not reduce the ICP's reliance on the existing network.
146. **Pricing rationale:** With no daytime congestion evident, there should be no reward provided to PV installations for feeding into the distribution network.
147. **Pricing signal:** No feed-in tariff to reduce distribution charges – rely on fixed charges to send the appropriate network use signal.

PV installation with storage/other DER

148. If an installation is willing to inject when the distribution network requires it, then it is reasonable that a discount/feed-in tariff can be provided.
149. Having control of the injection is not currently common and so setting the price efficiently is difficult. This may change in the coming years, and distributors will need to be aware of developments to support this.
150. **Pricing rationale:** Distributors should err on the side of caution with DER pricing, and be sure that location aspects are well understood before setting prices. It is more likely that DER pricing will need more frequent updating than the current annual process, and this uncertainty is important to sending the correct efficient price signal.
151. **Pricing signal:** Distributors should exercise caution with sending pricing signals in the near-term to ensure they understand the impact on their network costs.

Rural networks

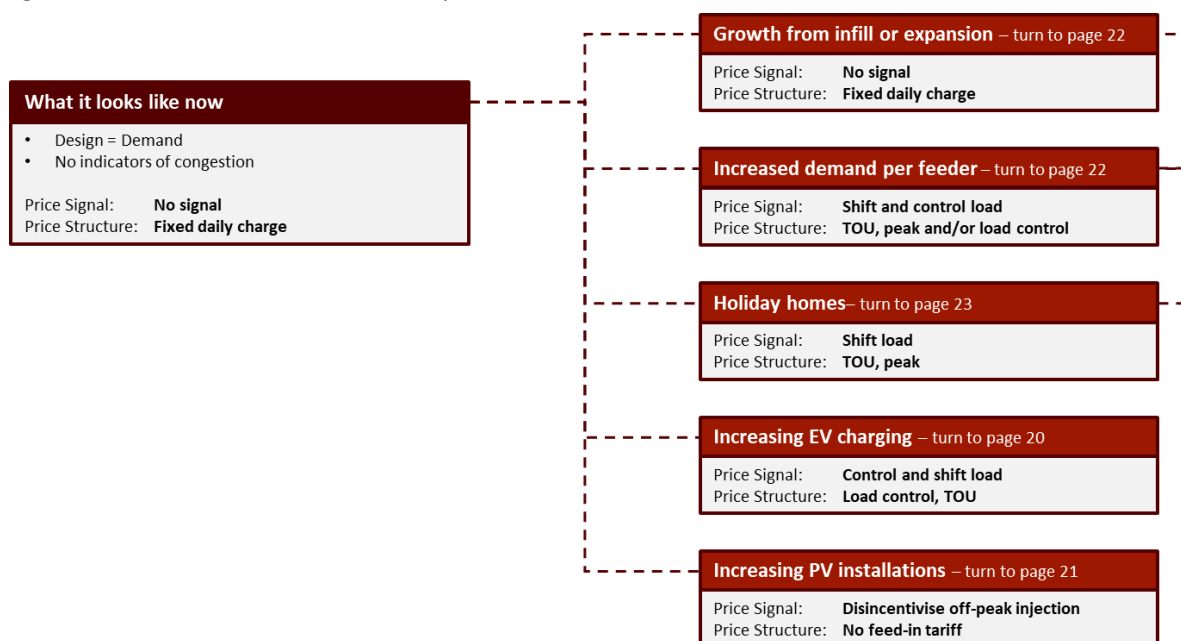
What it looks like now

152. Rural residential connections often have slightly different usage patterns than urban residential customers but are largely the same in how they interact with the network.
153. More likely to have reliability or resilience issues – mostly related to weather and asset-lifecycle issues.
154. Network investment is predominantly historical, but land use changes need to be watched for as changes often lead to different energy usage and demand patterns. This can lead to pockets of congestion.
155. Future investment is often replacement and resilience capex, with increased functionality a lesser priority than building in improved reliability.
156. For a network that also has a denser urban centre, there should be customer grouping in place that reflects that rural cost of supply/losses are greater than an urban network.
157. Cost of supply modelling for a rural network is likely needing to be more segmented than with an urban network to understand differences in costs and energy losses. This factor tends to make rural networks strong candidates for many non-network energy alternatives. Therefore, a distributor must be more conscious of the cross-subsidisation decisions they make in order to not disrupt technology competition.
158. **Pricing rationale:** Rural residential connections often have slightly different usage patterns than urban residential customers but are largely the same in how they interact with the network.
159. **Pricing:** Fixed daily charge. Rate should reflect the true cost of supply and therefore expose engineering design to good options analysis for non-network alternatives.

Network change scenarios

160. Rural networks have some features that set them apart from urban networks for pricing purposes and the signals that may need to be sent, and we have depicted them in the following pages. The influence of EVs and PV however, are the same as above.

Figure 5: Rural network scenarios map



Growth from infill or expansion of network

161. Largely the same as an urban network, with some distinctive features that may affect pricing.
162. Often infill growth is slower than on urban networks and therefore less likely that the incremental ICP growth will stress the existing network design (assuming it is currently matched).
163. Extensions of rural networks are typically not fully recovered from the beneficiary/exacerbator as the economic costs are significant.
164. Increasing density of rural networks is likely to reduce costs to serve, and so benefit the existing customer base, and this may affect the cost of supply modelling.
165. **Pricing rationale:** Pricing signal is the same as for an urban network.

Increased Demand per feeder/GXP

166. Land use changes are the dominant reason for substantial changes in energy demand and it is this which makes the most likely response in a rural network different from an urban network.
167. It is usual that there is even less visibility of the LV network in rural areas than in urban networks, but there is often a greater ability to 'eyeball' the reasons for changes in capacity and demand, so a distributor can usually fairly accurately target the capacity change costs to the source.
168. **Pricing rationale:** Design < Demand. Load shifting should be incentivised to avoid/delay capex. This comes in addition to existing load control measures. If demand holds up then it indicates capex may be appropriate. A move to capacity charging may best align with the cause of the increased demand, and better send the needed cost-reflective price signal.
169. **Pricing signal (1):** Where congestion is peaking one or two times a day – TOU.
170. **Pricing signal (2):** Where congestion is peaking to critical levels during a season (such as over winter evening peaks), an enhanced seasonal component may be necessary to amplify the impact, ie TOU + Seasonal peak charge. This may involve a reduced off-season structure to stress the impact of the peak season pricing.
171. **Pricing signal (3):** Load control pricing may be strengthened to further incentivise controllability of load, ie EVs and hot water. This should be utilised in conjunction with TOU signals.
Longer-term pricing signal: TOU is a useful initial step for customers to get used to signals. Where congestion is managed apart from a short period within a year (say a few cold winter nights) transition to a further enhanced peak signal, either stand-alone or as part of a TOU structure.

For some networks it may be appropriate for a move to a full demand charge. A demand charge structure would, based on experience, be most useful if the occasional peaks can be predicted and communicated to customers.

Increasing poor reliability/security of supply – holiday parts of the network

172. Peaks on networks may occur for only a few days in a year, with little elasticity of demand – eg long weekends and holiday periods in certain parts of the country.
173. Because the increase in demand in these areas is for such a short period it often doesn't meet the upgrade standards for many distributors (usually based on normally resident population, economic activity, quality of supply measures etc).
174. The costs to upgrade these areas come under scrutiny in certain times of the year, and often have a vocal customer base for a short period. A distributor's decision is always about where to apply its resources best.
175. Upgrade costs related to these parts of networks should be borne by these areas.

176. **Pricing rationale:** Design < demand – often only for a short period. The economic costs to lift supply security cannot be recovered through variable charges, given the often small volumes delivered.
177. **Pricing signal (1a):** Peaks are usually easily predicted but customers tend to have limited discretion/desire to manage load. A Network Peak Demand would best reflect the costs and usage, but will likely create a very large spike to monthly billing.
178. **Pricing signal (1b):** Increase in Fixed Daily Charge.



Part 5: Expectations on the timing of reform

This Part aims to make clear what the Authority expects of distributors in the coming years, as they accelerate the reform of pricing.

The next two years, to 2023

179. The Roadmaps developed by distributors have been valuable for us to understand progress being planned by each distributor, and useful as a tool for distributors to hold themselves to account to customers, Boards, and regulators. The first steps for all distributors was to develop deeper understanding of what the pricing principles meant and how they should be applied. **We expect that this work is comprehensive and complete, then updated annually.**
180. The most recent steps that many distributors have taken has been to apply the principles to understand their own network needs for aligning prices to a cost-reflective structure. This should have included building knowledge of the varying economic costs across the network and understanding locations, timing, and sources of congestion. Discovering the nature of the congestion and how price signals can address it should be well under way. **We expect that after the past three years that enough of this work has been done to take substantive action now.**
181. Examination of pricing reform options revealed that under the LFC regime there was, at least across some pricing dimensions, limited ability for distributors to have a proportionate outcome change from the work required to implement pricing changes. However, reform in the interim is still possible, and LFC does not create a barrier to actioning critical preparatory steps such as better understanding network flows relative to capacity. The Government's announcement of a five year phase out of LFCs allows distributors to accelerate their implementation of reforms. Our understanding is that the modelling and trials work undertaken now would allow distributors to 'press the button' as LFC is being phased out. We would be disappointed if distributors decided to delay further progressing their reform work until after the LFC is fully removed, as this could waste up to 5 years in their reform process. **We therefore expect to see distributors have clarity on their optimal process and at a minimum undertake the first steps from the April 2022 pricing year, with this to be reflected in progress up the scorecards.**
182. Changes to pricing methodologies may appear to be slow, when undertaken annually, but ongoing customer engagement work and trials and modelling to finely tune the next steps in development can, and should, continue throughout the year.
183. We acknowledge that even in trials undertaken now LFC may have an influence, but we do not see this as an impediment to proceeding with them.

As the LFC is being phased out

184. During the LFC's phase-out we expect the first major tranches of pricing reforms to have been progressed. This will involve increasing the effectiveness of pricing signals and where appropriate will see improved cost allocation outcomes, increasing fixed charges as a proportion of pricing structures, and/or review of the responsiveness and customer engagement from the initial steps of pricing signals being used to address congestion.
185. We expect a robust feedback loop to aid continued advancement of reforms, in a manner that directly informs ongoing changes. This will include continued updating of network understanding and aligning pricing with network requirements, as well as increased customer engagement that helps distributors to align their pricing intentions with realised outcomes.
186. We would like to see distributors have a link between the scorecards and their roadmaps. We would like to see distributors have their own expectations on how the work they do in delivering their roadmaps and pricing reform will change their future scorecard ratings, as a way for distributors to hold themselves to account for their commitments and roadmap plans.



Appendix A Glossary

Authority means the Electricity Authority, being the Crown entity established under section 12 of the Electricity Industry Act 2010 to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers

Avoidable costs are those costs that can be avoided by not serving a customer or customer group. Examples of avoidable costs include billing and customer service costs, connection costs specific to the customer or customer group, and additional maintenance costs

Consumer groups means for pricing purposes, consumers grouped to have similar characteristics, similar network costs, and similar consumption profiles. Consumers within a group are typically subject to the same pricing plan

Customer means a person who has entered into a contract with a retailer for the supply of electricity, other than for resupply, and/or the provision of distribution services, where the electricity supplied to the customer's premises is used fully or partly for domestic uses

DER means distributed energy resources and refers to resources on the network that do not connect to the transmission grid, such as solar PV, energy storage systems and demand response

Distribution services mean the conveyance of electricity on lines, as defined in the Electricity Industry Act 2010, by a distributor

Distributor has the meaning given to it in section 5 of the Electricity Industry Act 2010.

Economic costs are costs of providing the service, and any additional costs (externalities) borne by others (but not the producer)

ENA means the Electricity Networks Association

ERANZ means the Electricity Retailers Association of New Zealand

EV means an electric vehicle, both hybrid and fully electric, and has a battery which has the ability to be recharged from the distributor's network

Fixed costs are invariant to the level of output, eg costs that are invariant to the amount of electricity sent down a network

ICP Installation control point – a point of connection at which the electrical installation for a retailer's customer is connected to a network

Locational marginal pricing is pricing at different locations in the network, reflecting local demand and capacity, and the cost of getting electricity to a particular location

Low Fixed Charge means the Electricity (Low Fixed Charge Tariff Options for Domestic Consumers) Regulations 2004 (LFC regulations)

Marginal cost is the additional cost of producing one extra unit. In the context of distribution, typically the additional cost of serving one additional customer to the network, or the additional cost of increasing network capacity

Non-network alternatives are alternatives to investments in transmission and distribution, often to manage capacity constraints. Examples include demand management, interruptible demand, distributed generation, batteries, etc.

Non-distorting is an action or price is non-distortionary if it does not change the behaviour of consumers or producers

PV means Photo voltaic, or solar panels

Residual revenue / residual cost is revenue that augments the revenue obtained from cost reflective pricing to ensure that fixed costs can be covered, so that firms do not make a loss. (Residual costs for consumers = residual revenue recovered by distributors.)

Retailer has the meaning given to it in section 5 of the Electricity Industry Act 2010

Revenue targets are the levels of revenue that distributors aim or are permitted to obtain, eg as determined by price-quality paths set by the Commerce Commission (where applicable)

Ripple control is demand management of consumer power consumption based on remote control of hot water cylinders

Standalone costs are the costs needed to replicate or bypass a network entirely. If electricity prices are greater than a consumer's standalone cost then the consumer is better off by disconnecting from the electricity network and, for example, generating their own electricity or sourcing it elsewhere

Subsidy-free prices are subsidy-free if they fall below standalone cost but are above incremental cost. A consumer paying a subsidy-free price makes some contribution to a distributor's fixed cost



Appendix B Distribution Pricing: Practice Note August 2019

This refreshed 2021 Distribution Pricing: Practice Note (draft for consultation) itself appends the *Distribution Pricing: Practice Note August 2019* – because the 2019 document’s substantive advice on interpreting the distribution pricing principles remains relevant.

The one place where this updated Practice Note overwrites the 2019 edition, is in Figure 1: Price-setting methodologies on page 3. We believe this updated diagram better portrays the methodology than the figure in the 2019 edition.

Distribution Pricing: Practice Note August 2019



1 Purpose of the Practice Note

- 1.1 The Authority has developed a Practice Note to assist distributors with the consistent, practical interpretation and application of the Distribution Pricing Principles.
- 1.2 The Practice Note will be updated from time-to-time to ensure it reflects evolving, leading practice, and to address matters raised by the sector and our monitoring activities.
- 1.3 We welcome feedback on this note from distributors and other parties.

2010 guidelines withdrawn and superseded

- 1.4 As noted in the June 2019 decision paper that introduced the pricing principles, the Authority withdrew the 2010 *Distribution Pricing Principles and Information Disclosure Guidelines* prepared by the Electricity Commission. Those guidelines are no longer needed given the Commerce Commission's detailed disclosure rules.

Outline of Practice Note

- 1.5 In the following sections this Practice Note provides:
 - the pricing principles and an overview of the price setting methodology
 - guidance on the application of pricing principles
 - notes on the subsidy-free test
 - considerations in selecting consumer groups
 - links between price-efficiency and pricing types
 - concluding remarks, and a glossary of terms.

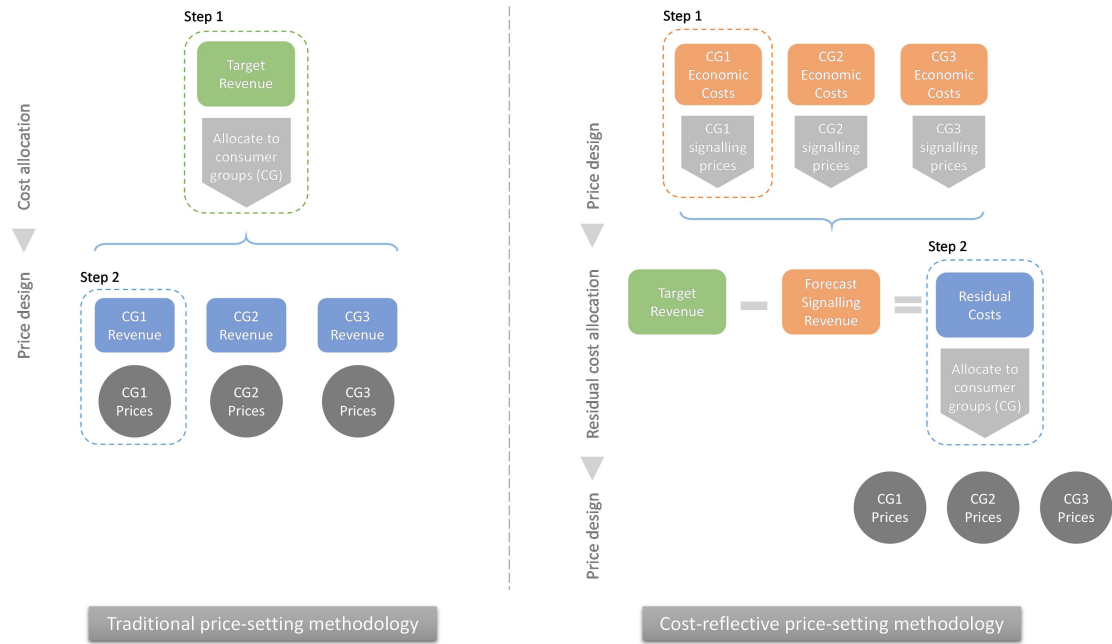
2 Distribution pricing principles

- (a) Prices are to signal the economic costs of service provision, including by:
 - (i) being subsidy free (equal to or greater than avoidable costs, and less than or equal to standalone costs);
 - (ii) reflecting the impacts of network use on economic costs;
 - (iii) reflecting differences in network service provided to (or by) consumers; and
 - (iv) encouraging efficient network alternatives.
- (b) Where prices that signal economic costs would under-recover target revenues, the shortfall should be made up by prices that least distort network use.
- (c) Prices should be responsive to the requirements and circumstances of end users by allowing negotiation to:
 - (i) reflect the economic value of services; and
 - (ii) enable price/quality trade-offs.
- (d) Development of prices should be transparent and have regard to transaction costs, consumer impacts, and uptake incentives.

3 Price-setting methodology

3.1 Traditional price-setting uses a process of allocating target revenue to consumer groups, then developing prices for each consumer group. Cost-reflective price-setting operates differently, starting with a process of developing economic cost-signalling prices before considering target revenue in order to identify and allocate residual costs (Figure 1).

Figure 1: Price-setting methodologies



Guidance on the application of the Principles

3.2 The following table provides specific guidance about each of these principles.

Table 1: Guidance on principles

Principle	Guidance
(a) Prices are to signal the economic costs of service provision ...	

Principle	Guidance
(a)(i) being subsidy free ...	<p>Forecast total revenue for a consumer or consumer group should fall between standalone and avoidable costs.</p> <p>To provide meaningful input to price-setting, this principle is best assessed at a consumer group level.</p> <p>In this form, the subsidy-free test helps guide allocation of residual revenue – ie, revenue (if any) in excess of that forecast to be recovered through cost-signalling price components.</p> <p>The test can also help guide the definition of consumer groups – eg, it may sometimes be necessary to target price signals to more tightly defined consumer groups to avoid exceeding standalone cost.</p>
(a)(ii) reflect impacts of network use on economic costs	<p>Prices should be used to signal economic cost as far as is feasible. Considerations include:</p> <ul style="list-style-type: none"> • materiality of the cost • ability to estimate the cost • ability to signal the cost • ability of downstream participants to respond to price signals. <p>In the near-term these considerations may favour continued focus on long-term investment costs.</p> <p>Over time it should become more feasible to consider other cost types, such as the costs borne by other parties as a result of network use (eg voltage problems).</p> <p>Pricing considerations include:</p> <ul style="list-style-type: none"> • which types of costs to signal • how granular any time- and location-specific price signalling needs to be. <p>The scope for increased granularity is likely to increase in future. For example, locational marginal pricing in the distribution network down to ICP level is clearly impractical at the moment, but may become possible as computational techniques and computing hardware improve.</p> <p>Changes in what is feasible and beneficial are why distribution pricing reform is best seen as an ongoing improvement process, not a one-off exercise.</p>

Principle	Guidance
(a)(iii) reflect differences in network service	<p>The principles have been broadened from a focus on <i>service capacity</i> to encompass any differences in the network service provided by or to a distributor.</p> <p>Connection capacity is the most common service differentiator, though differences in firmness of supply are also reasonably common, for example:</p> <ul style="list-style-type: none"> • some customers have ripple-controllable demand, and • other customers agree to be ‘first off’ if the network is congested. <p>There are many other ways in which differences in service could be conceived. The differences in the cost of supplying those services should be reflected in prices.</p>
(a)(iv) encourage efficient network alternatives	<p><i>Network alternatives</i> are measures that provide a (potentially lower-cost) alternative to investing in transmission or distribution networks directly. Examples can include:</p> <ul style="list-style-type: none"> • demand response • interruptible demand • distributed generation • distributed storage. <p>These alternatives are sometimes, but not always, more efficient than traditional network investment.</p> <p>Distribution prices influence the viability and profitability of network alternatives. In turn, these alternatives may affect transmission investment (eg, in new grid connection assets).</p> <p>Signals conveyed through posted prices sit alongside other initiatives, such as direct procurement, aimed at sourcing network alternatives to avoid more costly traditional network investment.</p>

Principle	Guidance
(b) ... shortfall should be made up ...	<p>Revenues need to be sufficient to pay for the provision of the distribution network. The revenue from cost-reflective pricing may need to be augmented to make up any shortfall relative to the revenue target.</p> <p>This is because the target revenue relates to current and historic expenditure, while economic costs can include:</p> <ul style="list-style-type: none"> • marginal cost of supply – for example, long-run marginal cost relates to potential future costs of expanding capacity • costs that need to be signalled, but are not borne by distributors (such as losses or curtailment). <p>As such, revenue from prices designed to signal economic costs can be higher or lower than a distributor's target revenue.</p> <p>Under-recovery of revenue is reasonably likely with prices designed to signal economic costs. In this case, residual costs can be met by dialling prices up or by adding new price components that do not distort the intended economic cost signals (see below).</p> <p>Although less likely, over-recovery could potentially occur. Over-recovery may be resolved with more targeted consumer groups or simply by dialling down price signals.</p>
...with prices that least distort network use.	<p>In contrast to cost-signalling price components, the intention with residual costs is to make up target revenue without influencing behaviour.</p> <p>In principle, it is efficient to allocate higher costs to consumer groups less likely to alter their consumption than those that are responsive. In practice, responsiveness may not be known (or may vary considerably within a consumer group).</p> <p>However, this insight can still provide some guidance when considering:</p> <ul style="list-style-type: none"> • the quantum of residual costs to allocate to each consumer group, and • the types of price components to use, eg, a fixed charge (\$ per day).

Principle	Guidance
(c) Prices should be responsive to the requirements and circumstances of end users by allowing negotiation to...	Distributors should have processes that allow end users to negotiate a departure from standard prices.
(c)(i) reflect the economic value of services	<p>This principle supports end users negotiating a lower price where they would otherwise inefficiently curtail demand (or disconnect or not connect in the first place) if faced with standard prices.</p> <p>This principle is often given effect through a prudent discount policy. Pricing should nevertheless ensure the end user still pays at least their individual avoidable costs.</p>
(c)(ii) enable price/quality trade-offs.	<p>Price/quality trade-offs may reflect various aspects of service quality, such as reliability, resilience, firmness, power quality, etc.</p> <p>This principle is to encourage distributors not to take a one-size-fits-all approach to service quality.</p> <p>In practice, the scope for price/quality trade-offs will depend on the realities of the network. For example, the reliability experienced by any single customer is almost always impacted by factors that will also impact the reliability experienced by other customers.</p>
(d) Development of prices should be transparent...	<p>This principle applies to both current and future prices.</p> <ul style="list-style-type: none"> • Transparent application – The methodology used to derive current pricing should be transparent. Transparency helps develop consumer acceptance and helps consumers manage their electricity consumption. • Strategic change in pricing – The evolution of future pricing and its relationship to evolving circumstance should be clear to enable consumers to make significant and often long-lived investment decisions in an informed manner.
...and have regard to...	<p>This clause lists practical considerations a distributor should turn its mind to as it develops prices.</p> <p>There should be evidence of the distributor having considered these issues, even if the result is no modification to intended pricing.</p> <p><i>Have-regard</i> issues warrant serious consideration but do not override economic efficiency considerations – ie, they should fine-tune rather than dictate the approach taken.</p>

Principle	Guidance
...transaction costs...	<p>Transaction costs refer to the operational costs for all parties in the supply chain (distributors, acquirers and end users).</p> <p>They include direct costs (such as billing systems) and less tangible costs, such as the cost of interpreting and understanding prices, and deciding on responses.</p>
...and consumer impacts...	<p>Impact assessment is an important part of price design.</p> <p>Analysis of bill impacts at the consumer group level, including worst impacted end users (outliers), should be used to inform fine-tuning, transition design, and design of any impact mitigation measures.</p> <p>Bill impact assessment should include stress testing of how usage changes in response to new price signals might impact consumer groups and outlier revenue/bills.</p> <p>Distributors can seek information on broader aspects of consumer impact through engagement, or by leveraging industry processes.</p> <p>Retailer-relevant impacts may include items such as standardisation across networks, or business process preferences.</p> <p>End-user impacts can relate to matters such as communications and change processes and billing arrangements.</p>

Principle	Guidance
<p>...and uptake incentives.</p>	<p>In developing new pricing plans, distribution businesses should consider how customers will transition from their current pricing plans. The uptake of new plans will depend on:</p> <ul style="list-style-type: none"> • pricing assignment policies • design attractiveness • eligibility hurdles. <p>Assignment policies can include (in roughly increasing order of effectiveness): opt-in, ratcheted opt-in (ie, cannot opt back out), opt-out (automatically assigned but can revert), event-based (eg, consumers are assigned new pricing plans when they move properties or install generation), and automatic assignment.</p> <p>A soft approach can work if moving to new prices is always favourable and there is a natural prompt – for example, electric vehicle pricing.</p> <p>Designs that adopt industry standard features are more likely to attract uptake.</p> <p>In other cases, a more active approach may be needed, and can be complemented by transition techniques such as phased introduction (eg, introducing a new price structure with small differentials that are rebalanced over time).</p> <p>Eligibility hurdles, whether for end users or acquirers, can significantly dampen uptake incentives and should be avoided if possible.</p>

The subsidy-free test

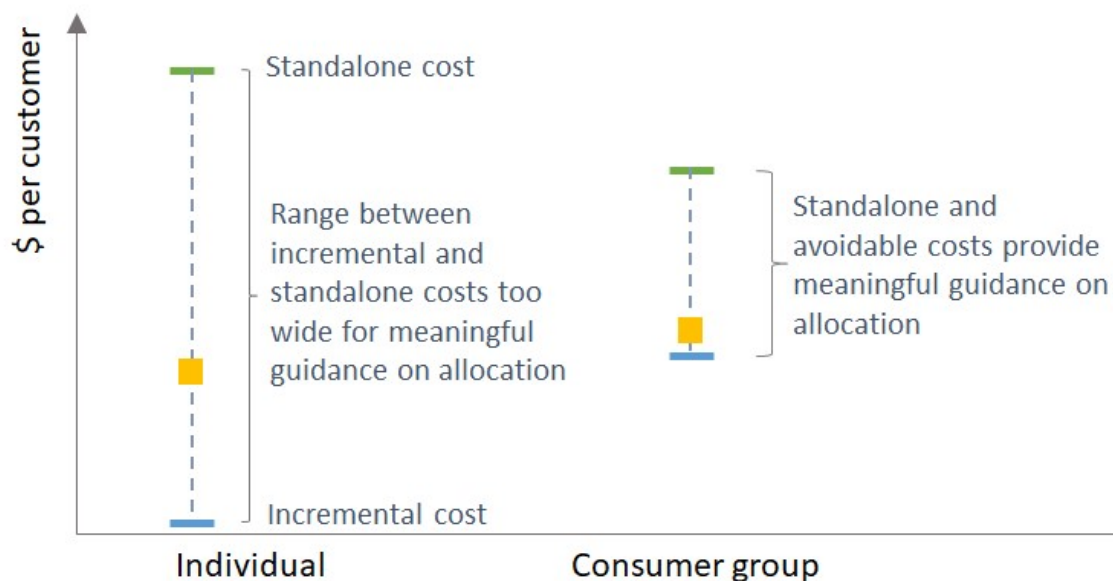
3.3 Distributors have adopted differing interpretations of how to apply the subsidy-free test:

- (a) individual level – in this version comparison is made between the prices paid by each customer and boundaries that reflect the cost of off-grid self-supply (standalone cost) and incremental costs from increased demand.
- (b) consumer group level – in this version comparison is made between forecast revenue for each consumer group and boundaries that reflect the standalone costs of serving that consumer group and the avoidable cost of serving the consumer group.

3.4 In many circumstances, individual-level analysis does not usefully inform the allocation of costs because the bounds are very wide, as illustrated in Figure 2. Applying the subsidy-free test at the level of consumer groups may provide more practical, informative bounds on subsidy-free network pricing. For example, a micro-grid or other network alternative for an entire remote community is likely to be a more relevant comparator to network connection than a standalone solution for an individual consumer.

- 3.5 The Principles align more clearly with a consumer group-level analysis, because this provides a more intuitive and useful guide to residual cost allocation.

Figure 2: Comparison of subsidy test methods



Estimating standalone and avoidable costs¹

- 3.6 Avoidable cost is estimated by considering how costs would reduce if a consumer group was not supplied with electricity. Examples of avoidable costs include:

- repair and maintenance costs
- customer service, billing, and metering costs, and
- transmission costs associated with contributions to peak demand (under the current transmission pricing methodology).

- 3.7 Standalone costs can be estimated by:

- investigating how individual consumers might generate their own electricity and/or their use of substitutes such as gas;
- allocating costs to different consumer groups based on estimates of their contributions to different network costs (such as their electricity use and the profile of their demand); or
- considering the costs of establishing hypothetical, standalone networks. For example, one could estimate the cost of separate rural-only and urban-only networks or hypothetical networks for residential-only and industrial consumers.

Defining consumer groups

- 3.8 The definition of consumer encompasses parties such as retailers, consumer agents and distribution-connected generators. As per the Electricity Industry Participation Code, consumers are supplied electricity for their own consumption.

¹ For further discussion see *Economic Concepts for Pricing Electricity Network Services, A Report for the Australian Energy Market Commission*, 21 July 2014, <https://www.aemc.gov.au/sites/default/files/content/f2475394-d9f6-497d-b5f0-8d59dabf5e1c/NERA-Economic-Consulting-%E2%80%93-Network-pricing-report.PDF>.

- 3.9 *Consumer groups* are defined by a distributor as part of the price-setting process. The considerations for defining consumer groups are not directly addressed by the Principles but the approach adopted is an important part of achieving consistency. Consumers might be grouped by their energy usage, their location, their peak load requirements, or other characteristics, such as their ability to moderate load.
- 3.10 The following table sets out where consumer group definition can have a role in assisting to meet the principles.

Table 2: Considerations when defining consumer groups

Principle	Guidance
(a)(i) subsidy free	Target consumer groups to avoid averaging across very large differences in standalone and avoidable costs.
(a)(i) above avoidable cost	If consumer groups are very tightly targeted, then the per-connection avoidable cost of serving that group can become high. Larger consumer groups can support more pragmatic or socially acceptable assessment of subsidies.
(a)(i) less than standalone cost	If a network has pockets with high marginal costs it may be inappropriate to send that high marginal cost signal to all members of a broad consumer group since it may push group revenue above group standalone costs. More targeted consumer groups can allow appropriate cost signalling while keeping group revenue below group standalone cost.
(a)(ii) reflect impacts of network use on economic costs	Consumers can be grouped according to the economic costs they drive on the network. For example: <ul style="list-style-type: none"> • daily profile • seasonal profile • interruptibility • location (geographic or network topology)
(a)(iii) reflect differences in network service provided	Consumers can be grouped according to service differences. For example: <ul style="list-style-type: none"> • connection capacity (peak demand limit) • network support (service back to network) • interruptibility

Principle	Guidance
(b) least distort network use	<p>Consumers can be grouped to minimize the residual costs that might otherwise distort price signals. For example, pricing plans may look to group:</p> <ul style="list-style-type: none"> • lower income households who are more likely to ration monthly expenditure • non-residential consumers who are more likely to respond to variable charge components
(c) Prices should be responsive to the requirements and circumstances of end users by allowing negotiation	<p>Consumer groups may be defined to minimise the need for idiosyncratic negotiation of terms and conditions.</p>
(d) transaction costs	<p>Narrowly defined consumer groups may increase the operating costs of distributor and retailer billing systems and can increase search costs for end users (or deter search altogether).</p>
(d) consumer impacts	<p>By consumer impacts we mean the transitional costs as consumers adapt to new pricing plans. Consumer groups can be defined to manage impacts (eg, bill shock from rebalancing to higher fixed prices) or to reflect specific retailer circumstances or requirements.</p> <p>For example, consumer groups might be defined in line with retail prepay plans, or could be standardised across distributors to reduce billing complexity for retailers, and offer end-consumers more choice.</p>
(d) uptake incentives	<p>Distributors need to consider how to encourage consumers to move to new pricing plans. Criteria that determine whether a customer is eligible to be a member of a particular consumer group could promote or deter retail and consumer uptake.</p> <p>Some pricing changes are attractive and will attract consumers on an opt-in basis (such as pricing plans targeting consumers with electric vehicles).</p> <p>Large-scale changes to pricing plans often will not work on a purely opt-in basis, because of consumer inertia and because the terms may be unfavourable for some consumers relative to their existing pricing plans. Consumer acceptance might be increased by preserving legacy plans but making legacy pricing plans unavailable when a consumer moves properties.</p>

3.11 In addition to the considerations above, consumer group definition may be driven by policy considerations, for example, to meet low-fixed charge regulation requirements.

Implications of price efficiency for pricing types

- 3.12 The Principles recognise that trade-offs are made in the pricing design. For example, the benefits of making prices responsive to location and peak load need to be weighed against the costs that arise from increased complexity.
- 3.13 Nevertheless, prices play an important role in allocating resources. We also expect pricing methodologies to improve progressively, prompting and accommodating changes to consumer behaviour and technology.
- 3.14 Price signals are more efficient if they are:
- targeted at the time periods that matter – distribution networks are under-utilised most of the time, so prices designed to signal losses, congestion, or future investment should target time periods when the network is most stressed
 - tailored to local costs – marginal costs can vary significantly across a network, so prices designed to signal costs should be tailored to avoid big mismatches between the price signal and local economic costs
 - reflect service differences – providing a price/service menu (eg, controlled vs anytime or 30A vs. 60A) is a powerful way to allow consumers to trade off service levels against cost of supply
 - actionable – prices are more efficient if they are communicated and calculated in ways that consumers can respond to
 - accurate – estimating economic costs is not straightforward and typically simplified methods are used that yield reasonably stable estimates over time. However, estimates should be reset (or more sophisticated methods used) when large divergences emerge between price levels and underlying economic costs
 - non-distorting when aimed at recovering residual cost – residual cost recovery has the opposite goal to price signalling and should not influence network usage
 - subsidy-free – the caveat for residual cost recovery is that total revenue recovered from each consumer groups should be within the bounds of avoidable and standalone costs, to avoid stimulating inefficient overall demand for service.
- 3.15 Table 3 compares the efficiency of prices for several commonly discussed pricing types. The discussion below mainly focuses on allocative efficiency. Distributors should also consider dynamic efficiency – how to transition pricing plans to adapt to changing technology, including increased use of demand management services, distributed generation, electric vehicles, and so on.

Table 3: Pricing types and efficiency considerations

Pricing type	Efficiency
Fixed daily charge	Efficient way to recover network costs when there is no need to signal economic cost of network use. Wholesale energy market prices give consumers a signal about the cost of energy.
Uniform variable (same \$/kWh rate applies throughout every day)	Not targeted by time period at all. Simple, but may deter use when plenty of network capacity; does not send a relevant signal when the network is constrained.

Pricing type	Efficiency
Time-of-use (ToU) (\$/kWh rate varies by pre-defined time blocks)	Provides a crude but actionable signal. More efficient in situations where network stress is consistent every day (in terms of timing and level). May require re-tuning as usage patterns adapt or economic costs change. High risk of deterring usage at times when economic costs are low.
Seasonal time-of-use (in blocks and/or rates)	More tailored than standard ToU. More scope to match signal to cost, and somewhat lower risk of deterring use at times when economic costs are low.
Customer peak or capacity (\$/kW rate applied to booked, installed or measured peak demand)	Better aligned with the characteristic that drives capacity costs (ie, peak demand rather than usage). However, may not (depending on price design and network profile) differentiate between demand at higher- or lower-cost time periods.
Static network peak (rate applied to measured peak demand during pre-defined network peak periods)	Better aligned with biggest driver of the share of capacity costs (peak demand across a network area). Pre-set peaks make pricing more predictable. This may enhance response, but may also increase the likelihood of a false signal (eg, if actual peak occurs outside pre-set period).
Dynamic network peak (rate applied to measured peak demand during network peak periods)	Further improves targeting of price signal. Challenge to balance accuracy versus effectiveness – ie, locking in and communicating charging periods in advance enhances responsiveness and risk of false positives.

4 Concluding remarks

- 4.1 The information disclosure requirements and the reporting undertaken in relation to pricing principles guide the baseline information that distributors make publicly available. Distributors should nevertheless feel free to exceed these baseline requirements.
- 4.2 We encourage distributors to report any difficulties that they face in providing this information and any difficulties – regulatory or otherwise – that stand in the way of achieving efficient pricing.

5 Glossary

Avoidable costs	Avoidable costs are those costs that can be avoided by not serving a customer or customer group. Examples of avoidable costs include billing and customer service costs, connection costs specific to the customer or customer group, and additional maintenance costs.
Consumer groups	For pricing purposes, consumers will typically be grouped to have similar characteristics, similar network costs, and similar consumption profiles. Consumers within a group are typically subject to the same pricing plan.
Economic costs	The costs of providing the service, and any additional costs (externalities) borne by others (but not the producer).
Fixed costs	Costs that are invariant to the level of output. Eg, costs that are invariant to the amount of electricity sent down a network.
ICP	Installation control point – a point of connection at which the electrical installation for a retailer's customer is connected to a network.
Incremental costs	Incremental costs are the variable costs that arise from an increase in production or from serving additional customers. (See also avoidable costs.)
Locational marginal pricing	Pricing at different locations in the network, reflecting local demand and capacity, and the cost of getting electricity to a particular location. Also referred to as nodal pricing.
Marginal cost	The additional cost of producing one extra unit. In the context of distribution, typically the additional cost of serving one additional customer to the network, or the additional cost of increasing network capacity.
Network alternatives	Alternatives to investments in transmission and distribution, often to manage capacity constraints. Examples include demand management, interruptible demand, distributed generation, batteries, etc.
Non-distorting	An action or price is non-distortionary if it does not change the behaviour of consumers or producers. (Desirable for recovery of residual revenue.)
Over-recovery	A situation in which cost-reflective prices result in revenue greater than the costs of the network. (See also residual revenue and under-recovery.)
Residual revenue / residual cost	Revenue that augments the revenue obtained from cost-reflective pricing to ensure that fixed costs can be covered, so that firms do not make a loss. (Residual costs for consumers = residual revenue recovered by distributors.)
Revenue targets	Levels of revenue that distributors aim or are permitted to obtain. Eg, as determined by price-quality paths set by the Commerce Commission (where applicable).

Ripple-controllable demand	Demand management of consumer power consumption based on remote control of hot water cylinders.
Standalone costs	The costs needed to replicate or bypass a network entirely. If electricity prices are greater than a consumer's standalone cost then the consumer is better off by disconnecting from the electricity network and, for example, generating their own electricity or sourcing it elsewhere.
Subsidy-free prices	Prices are subsidy-free if they fall below standalone cost but are above incremental cost. A consumer paying a subsidy-free price makes some contribution to a distributor's fixed cost.
Under-recovery	A situation in which cost-reflective prices result in revenue that is less than the costs of the network. (See also residual revenue and over-recovery.)