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Review of the Electricity Authority's proposed distribution pricing Code amendment

A report for Vector

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Executive summary

Our report focuses on the economic reasoning underpinning the Authority's full reform proposal. The economic merits of the full reform proposal are critical to understanding whether key elements of the Authority's fast-track proposals should be pursued at this time, since they amount to stepping stones towards an end-point that is derived from this economic foundation.

The Authority's rationale for intervention is limited to a range of potential economic 'inefficiencies' that it identifies at the level of principle, absent any empirical evidence of inefficient outcomes under the current arrangements. Almost all these potential inefficiencies trace back to the Authority's preconception that connection charges are currently 'too high'. Underlying the Authority's proposed reform appears to be a focus on a problem that is confined to supporting the connection of large electrification projects.

The Authority's economic framework is founded on its definition of three conceptual points at which connection charges might be set – the 'neutral point', 'bypass point' and 'balance point'.

The neutral point, which represents the lower bound of the Authority's preferred range of connection charges, reflects pricing below the incremental cost of connection services, which in turn can be expected to:

- inefficiently transfer risks away from connection applicants by deferring the recovery of connection costs by up to thirty years and providing for outstanding costs to be recovered from other customers if the connecting party disconnects earlier than was assumed; and
- deter competition for connection services by allowing connection charges to fall below levels that could be sustained in a competitive market, such that alternative service providers would be unable to match these charges.

Given these concerns about the economic merits of the Authority's full reform, elements of the Authority's fast-track proposals that reflect intermediate steps towards this full reform may raise similar concerns. We find that:

- the Authority's proposal to limit distributors' reliance on capital contributions is not directed at the key elements of economically efficient pricing because:
  - it does not place any lower bound on connection charges, let alone a lower bound based on the incremental cost of facilitating a connection; and
  - the upper bound that it places on connections charges reflects concerns regarding equity as between existing users and new users of the network, rather than efficiency considerations; and
- the Authority's proposal to require reconciliation of connection charges to the neutral point gives rise to unclear and uncertain benefits, while imposing potentially costly reporting requirements for every connection request.

The conceptual point that lies at the heart of the Authority's proposed direction for reform – the balance point – contains no information about economic efficiency. Although the Authority's consideration of this 'balance point' references *efficiency*, the key principle motivating the role of the balance point in the Authority's framework for connection charges is not efficiency and appears to be *equity*. This central consideration is difficult to reconcile with the Authority's statutory objective, which refers to economic concepts of efficiency and competition.

These shortcomings reflect that key elements of the Authority's proposal draw inspiration from the framework for connection charges in Australia, but that framework differs in material respects from how the Authority represents them, as well as how they are reflected in its proposal.

These shortcomings are not necessary features of reforms that would achieve the Authority's objectives. In particular:

- if these objectives include the provision of support to electrification projects, then achieving this through targeted, lower ongoing distribution tariffs is a materially preferable approach;
- if these objectives include the promotion of competition in connection services, then options that provide for connection charges based on incremental costs, rather than the neutral point, would best support this goal; and
- if these objectives include the promotion of economic efficiency, then the potential concerns raised by the Authority about distributors' incentives to fund capital expenditure through connection charges can most directly be resolved through modest amendments by the Commerce Commission that ensure net capital expenditure is unaffected by increases in connection charges, rather than through the Authority changing an entirely different element of the regulatory framework and thereby creating additional concerns.

1. Introduction

The New Zealand Electricity Authority Te Mana Hiko (the Authority) is proposing to change the regulatory arrangements for electricity distribution connection pricing by amending the Industry Participation Code (the Code).

The Authority has published a package of documents on its proposed Code amendment, including:

- a consultation paper in which the Authority sets out the problem that it seeks to address and identifies its 'preferred option' for distribution pricing reform;[1]
- a draft of the proposed Code amendment;[2] and
- a report prepared by CEPA Australia (CEPA) for the Authority that reviews the regulation of electricity connection charges.[3]

The Authority's reform pathway comprises:

- a 'full reform' proposal, which is set out only in broad terms and represents the ultimate destination of the Authority's reform agenda for connection pricing; and
- a 'fast-track' proposal, which is the subject of the Authority's proposed Code amendment and is intended to take some immediate steps towards improvements for connection pricing, as well as providing stepping stones towards the Authority's vision for full reform.

Although the proposed Code amendment relates only to the 'fast-track' proposal, the Authority is also seeking consultation on its full reform. Both the fast-track and full reform proposals are founded on the same conceptual framework.

We have been engaged by Vector to review and comment on the Authority's consultation paper. The focus of our review is the economic reasoning that underpins the Authority's full reform proposal. In our view, an assessment of the economic merits of the Authority's ultimate objective is critical to understanding whether elements of its fast-track proposals that are stepping stones to this objective should be pursued at this time.[4]

The remainder of this report is structured as follows:

- in section two, we explain the nature of and relationship between economic efficiency and competition, which form the bedrock of the Authority's statutory objective;
- in section three, we describe the economic framework established by the Authority's statutory objective and evaluate the problems or 'inefficiencies' by reference to which it seeks to justify regulatory intervention;
- in section four, we describe and assess the conceptual framework that underpins the Authority's full reform proposal;
- in section five, we assess the further implications of this review for elements of the Authority's fast-track proposals that lay the groundwork for its full reform;
- in section six, we discuss elements of the regulatory framework for connections in Australia from which the Authority has drawn inspiration, but that appear to be poorly understood; and

[1] Electricity Authority, *Distribution connection pricing proposed Code amendment*, Consultation paper, 25 October 2024 (hereafter 'consultation paper').

[2] Electricity Authority, *Proposed Code amendment*, 25 October 2024 (hereafter 'proposed Code amendment').

[3] CEPA, *Regulation of distribution connection charges in New Zealand*, 14 October 2024 (hereafter 'CEPA report').

[4] In contrast, the substantial majority of CEPA's report addresses the Authority's fast-track proposals, with only limited consideration of the full reform.

- in section seven, we suggest alternative reform options that could better address the problems that appear to have instigated the Authority's reform agenda.

We assess the Authority's proposed fast-track proposal and provide further context on the framework for connection services in Australia in appendix A.1 and A.2, respectively.

2. Economic efficiency and competition

In this section we describe key economic concepts that are invoked by the Authority's statutory objective and that we therefore draw upon in our assessment of the Authority's problem definition and proposed reforms in sections 3 and 4, respectively.

We focus on the concept of economic efficiency and its implications for efficient pricing, before explaining the relationship between competition and economic efficiency.

2.1 Economic efficiency

In this section, we set out what is meant by economically efficient pricing. We later draw on this discussion to illustrate that the Authority's proposal to limit reliance on capital contributions is primarily drawn from concerns about *equity*, rather than *efficiency*.

Economic efficiency is commonly understood to have three dimensions, comprising:[5]

- **allocative efficiency** – whereby resources are allocated to their highest value use;
- **productive efficiency** – whereby goods and services are produced at the least possible cost; and
- **dynamic efficiency**– whereby innovation and investment take place in response to changing customer preferences and technologies.

In the remainder of this section, we explain how each of these dimensions of economic efficiency exerts influence on the economically efficient pricing of electricity connection services.

For the reasons that we discuss further in sections 3 and 4, the Authority's connection pricing framework is ostensibly, but not in substance, focused on the promotion of efficient connection, which is mostly closely related to the promotion of allocative efficiency. We also explain the relevance of productive and dynamic efficiency to connection pricing, and draw on this material in our presentation of alternative reform options in section 7. Dynamic efficiency plays an important role in the Authority's statutory objective, which we describe in section 3.1.

2.1.1 Allocative efficiency

Allocative efficiency in the provision of connection services is promoted through prices that are set:

- at least equal to the **incremental cost** of providing the connection service to a customer; and
- no more than the **opportunity cost** of the connection service to a customer, whether through bypassing the connection service, obtaining an alternative source of energy or ceasing its economic activity.

Allocative efficiency may also be promoted by allowing the service provider discretion to discriminate on prices within this range.

We explain the basis for this range of prices in more detail below.

Allocative efficiency for the pricing of electricity connection services requires that each party who connects to the network derives a value on the connection service that is greater than the incremental cost of that connection. By implication, other parties do not connect to the network because their connection would place greater costs on the network than the value that they derive from that connection.

[5] Australian government, *National competition policy review (The Hilmer report)*, August 1993, pp 3-4.

In economic principle, allocative efficiency is achieved by setting prices at **marginal cost**. When prices are set at marginal cost, then customers who value the service at more than the resource costs of providing the service will choose to consume it, giving rise to an allocatively efficient outcome.

In the context of electricity connection pricing, where the economic activity involves a decision to connect (or not to connect) to the network, this marginal cost concept is applied as **incremental cost**, being the additional costs that the distributor would incur to connect the customer.

However, the setting of prices at marginal cost or incremental cost for infrastructure services is not common. One important reason for this is the presence of **common costs**, which are not directly attributable to any individual customer or group of customers, but which must be incurred to provide the service. Where common costs exist, then the setting of all prices at marginal cost or incremental cost will not make any contribution to these common costs and will therefore not recover the overall cost of providing the service.

Where such common costs exist, every customer may need to make some contribution to their recovery, for example through the setting of prices at incremental cost plus a contribution to common costs.

It may not always be efficient for all customers to make the same contribution to common costs. If some customers value the service at more than incremental cost, but not enough to make the same contribution as other customers, then an approach that seeks the same contribution from all customers may inefficiently prevent this group of low valuation customers from accessing the service. In these circumstances, **price discrimination** may promote allocative efficiency by ensuring that customers who can contribute to common costs are able to access the service.

Although price discrimination may promote allocative efficiency, there exists an upper bound on allocatively efficient prices. No customer will be willing to pay more than its **opportunity cost** of accessing the service. The opportunity cost is the value to the customer of their next best option, which may involve:

- an alternative means by which the customer can access an electricity supply, such as by providing itself the connection service or by connecting directly to the transmission network;
- an alternative source of energy such as gas or other fossil fuels; or
- the option not to proceed with the economic activity that gives rise to its need for an electricity connection.

If a price is set above the opportunity cost then the customer will choose not to connect to the network and to pursue one of these alternative options instead. If this opportunity cost exceeds the incremental cost of the connection, then this outcome is allocatively inefficient because the customer values the ability to connect at more than incremental cost, and could therefore contribute to the recovery of common costs.

2.1.2 Productive efficiency

Productive efficiency concerns the provision of goods and service at least cost. In the provision of connection services it can be promoted either by:

- providing some degree of disconnection between price and cost, such that service providers face profit-based incentives to reduce their costs; or
- opening the provision of connection services up to competition, whereby customers can seek to contract to install their own connection assets if they are not satisfied with the costs that would be incurred by their distributor.

In competitive markets, firms are presumed to have strong incentives to seek productive efficiencies so that they can produce output at least cost. These incentives arise out of profit maximising conduct. Specifically, a firm in close competition with other businesses cannot sustain productive inefficiencies over an extended period, since this would affect its ability to sell its output at the market price for a profit.

Economic regulation often seeks to mimic this 'price taker' feature of competitive markets by disconnecting revenues and prices from costs, at least for some period of time. This provides for the prospect of economic profit, through incentive payments, to regulated businesses that can reduce their costs below the regulatory allowance.

For example, the Commerce Commission operates an incremental rolling incentive scheme (IRIS) under the Input Methodologies that it applies to non-exempt distributors and to Transpower.[6] This scheme allows service providers to retain the benefit of achieving actual expenditure below the regulatory allowance, or bear the cost of incurring actual expenditure above the regulatory allowance:

- in relation to operating expenditure for distributors and Transpower, for a period of five years before these benefits or costs are passed onto customers;[7] and
- in relation to capital expenditure for distributors, by a retention factor that will be 32.16 per cent in relation to the forthcoming regulatory control period.[8]

2.1.3 Dynamic efficiency

Dynamic efficiency in the provision of connection services may be promoted through:

- providing incentives to pursue technical innovations that would reduce the costs of providing connections over time; and
- providing incentives for distributors to innovate in connection pricing, such as through the use of price discrimination and/or flexible connection offers, so as to increase the use of shared network assets and reduce charges for existing customers.

The Authority has stated that its primary focus is to promote dynamic efficiency in the electricity industry.[9]

If appropriate incentives are provided for productive efficiency, then this will tend also to promote some aspects of dynamic efficiency, since a business will face incentives to seek out technology improvements to reduce the costs of providing services over time.

However, some aspects of dynamic efficiency, such as innovating to serve changes in customer preferences, are difficult to promote in the context of regulatory frameworks that link prices closely to costs (whether actual or benchmarked), rather than value delivered. Such frameworks may not provide strong incentives for businesses to seek out innovative opportunities that deliver new sources of benefits for customers.

2.2 Competition

Competition is a dynamic process of rivalry, whereby firms seek to maximise their profits by offering price-product-service packages to customers that are more attractive than their rivals, whilst minimising their costs. Descriptions of competition often quote Stigler's definition, ie:[10]

> [Competition is] rivalry between individuals (or groups or nations), and it arises whenever two or more parties strive for something that all cannot obtain.

[6] Commerce Commission, *Electricity distribution services input methodologies determination 2012*, 23 April 2024, Part 3, Subpart 3; and Commerce Commission, *Transpower input methodologies determination*, 23 April 2024, Part 3, Subpart 6.

[7] Commerce Commission. *Amendments to input methodologies for electricity distribution services and Transpower New Zealand*, Incremental rolling incentive scheme, 27 November 2014, 5.2.2.

[8] Commerce Commission, *Electricity distribution services default price-quality path determination 2025*, 20 November 2024, schedule 2.2 (4).

[9] Electricity Authority, *Interpretation of the Authority's statutory objective*, 14 February 2011, para A.11.

[10] Stigler G.J. (2008) *Competition*. In: Palgrave Macmillan (eds) The New Palgrave Dictionary of Economics. Palgrave Macmillan, London. Vickers, J, *Concepts of Competition*, Oxford Economic Papers, vol. 97, 1995, p 3 refers to this definition.

There are many ways in which firms engage in the process of competition, including by choosing product characteristics, investment levels, prices, levels of output, allocations of risk, quality, brand development, and types of inputs.

Competition is widely understood by economists to be a process that brings about benefits for consumers and society in the form of economic efficiencies, ie, the attainment of more and better products and services, at a lower cost, for the benefit of consumers. Workably competitive markets are often presumed to deliver economically efficient outcomes.

Where competition does not exist or is weak, policymakers may seek to design a framework of economic regulation to deliver similar outcomes.

Although distributors are natural monopolies, this is not always the case for connection services, which have the potential to be provided in a competitive environment. The effects on competition – and the benefits for consumers it may bring – are an important consideration for regulatory reform of connection charges. We discuss the implications of the Authority's proposed reforms on the promotion of competition in section 4.2.3.

3. Problem definition

In this section we describe and comment on the problems or 'inefficiencies' by reference to which the Authority seeks to justify regulatory intervention.

Problem definition is a foundational element of any regulatory reform process. A precise articulation of the observed outcome to be addressed, along with its shortcomings, lays the platform for regulatory reform that is measured and targeted to the problem at hand.

3.1 Authority's statutory objective

The Authority's statutory objective is important context to its problem definition, since it is the reference point against which it assesses the need for reform.

The Authority explained that its:[11]

> …main objective is to promote competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.

This main objective refers to the promotion of:

- competition, which is the process through which efficient outcomes are promoted in circumstances where there is rivalry between potential suppliers;[12]
- the efficient operation of the electricity industry, which appeals to the least-cost provision of services, ie, productive efficiency;[13] and
- reliable supply by the electricity industry, which reflects and invokes consideration of the tension between productive efficiency and short term allocative efficiency, eg, that a narrow focus on the lowering the cost of supply could reduce reliability below the level for which customers are willing to pay.[14]

That their promotion is for 'the long term benefit of consumers' clarifies that benefits are measured over the long term, thereby appealing and placing a balance of emphasis on the dynamic element of economic efficiency.[15]

It also clarifies that these long term benefits are 'for consumers', as distinct from any other societal interest group. This clarification likely reflects that, absent qualification, the pursuit of efficiency generally goes to the benefit of society as a whole, ie, measured as the sum of the economic surplus or benefit derived by both consumers and producers.[16]

[11] Consultation paper, para 3.2.

[12] For example, the Authority notes the importance of competition in delivering lower prices and in delivering allocative, productive and dynamic efficiencies. See: Electricity Authority, *Interpretation of the Authority's statutory objective*, 14 February 2011, paras A.20-A.24.

[13] For example, the Authority focuses on taking into account incentives for efficient investment and innovation in the electricity industry. See: Electricity Authority, *Interpretation of the Authority's statutory objective*, 14 February 2011, para A.59.

[14] For example, the Authority identifies the potential trade-offs over and optimisation of reliability. See: Electricity Authority, *Interpretation of the Authority's statutory objective*, 14 February 2011, paras A.37-A.40.

[15] This is consistent with the Authority's view of its statutory objective. See: Electricity Authority, *Interpretation of the Authority's statutory objective*, 14 February 2011, para A.27.

[16] Again, this is consistent with the Authority's view of its statutory objective. See: Electricity Authority, *Interpretation of the Authority's statutory objective*, 14 February 2011, para A.6.

The Authority also has an additional objective that serves further to narrow its focus on consumers by placing a balance of emphasis on domestic and small business consumers, and only in their dealings with industry participants. Specifically, the Authority explained that:[17]

> Its additional objective is to protect the interests of domestic and small business consumers in their dealing with industry participants

We conclude from our assessment that the Authority's statutory objective:

- has a strong focus on the promotion of economic efficiency; and
- invokes consideration of equity only insofar as it refers to 'consumers' and, in particular circumstances, the further subset of domestic and small business consumers.

These characteristics add colour to the Authority's representation of a wide range of considerations as matters of economic efficiency in its subsequent analysis, which we discuss in section 4.

They are also reflected in a problem definition that seeks to identify a wide range of potential inefficiencies.

3.2 Authority's problem definition

The Authority's problem definition identifies the issues that, in its view, invoke the need for regulatory intervention to promote its statutory objective.

In reflection of the focus of its statutory objective on efficiency, the Authority identifies a range of inefficiencies that it says have arisen from the current approach to connection charges. These proposed inefficiencies include:[18]

- a trend towards higher connection charges;
- inefficiently low connection charges;
- inconsistent approaches across distribution businesses;
- poor co-ordination;
- wealth transfers due to methodology changes; and
- difficulty resolving disputes.

3.2.1 Trend towards higher charges

Core aspects of the Authority's proposal are shaped by the outcomes that it says could be arising from an observed trend towards higher connection charges. The Authority identifies a range of 'influences' or incentives that could underpin the trend towards higher connection charges.

Of the incentives identified by the Authority, the most marked is likely to be an incentive to reduce net capital expenditure and improve incentive payments using the Commerce Commission's incremental rolling incentive scheme (IRIS).[19]

The Authority observes that:[20]

> For non-exempt distributors, increasing connection charges reduces net capital expenditure, which generates an incentive payoff. Because all regulated capex can be substituted, distributors can also increase connection charges to offset cost overruns in any part of their capex programme.

[17] Consultation paper, para 3.2 and footnote 7.

[18] Consultation paper, para 5.1 and 5.4

[19] Consultation paper, para 5.3(c)(i).

[20] Consultation paper, para 5.3(c)(i).

> At the margin, this amounts to the same outcome, which is increasing connection charges improves incentive outturn.

The Authority provides no evidence that this incentive has been acted upon by distributors. Such evidence could be gleaned from the extent to which outturn connections and connection expenditure exceeded the forecast values that underpinned its regulatory proposal. A general increase in connection charges through time is not sufficient evidence to conclude that, once a regulatory period commenced, distributors are increasing connection charges above the level that was previously forecast so as to generate an incentive payoff.

The Authority also points to limited incentives for distributors to control capital expenditure on connections when they are funded with capital contributions, since these expenditures typically fall outside the scope of the IRIS and may be passed onto access seekers at cost.[21] However, it presents no evidence that inefficient expenditure has contributed to the rise in connection charges.

The Authority explains that a trend towards higher connection charges:[22]

> …risks deterring new connections and weakening distributor incentives to ensure costs are efficient.

However, the Authority identified no evidence of connections that, in its view, are efficient but are not proceeding under the existing arrangements.

3.2.2 Inefficiently low connection charges

Although the Authority's proposed regulatory intervention does not include any explicit measures targeted at addressing this problem, it does note that some distributors have extremely low connection charges.[23]

The Authority observes that extremely low connection charges can risk cross-subsidy from existing users to new users, ie, inefficient connection. However, it does not provide any empirical examples of connection charges that are less than the incremental cost of connection.

3.2.3 Inconsistency across distributors

The Authority observes that there is significant variation across distributors in how they set and communicate connection charges.[24]

It acknowledges the reasons for which different methodologies may be appropriate, buts says that the existing differences are 'excessively high'.

It is unclear by reference to what level of consistency the Authority deems the current variation to be excessive, but it could be by reference to its view that there is significant consistency in jurisdictions such as Australia, which we explain is not an accurate representation of the Australian landscape in section 6.1.

The Authority asserts that this results in:[25]

- barriers to staff mobility between distributors; and
- increases costs for access seekers, their advisors and suppliers associated with 'learning, uncertainty and unpredictability'.

[21] Consultation paper, para 5.4(c)(iii).
[22] Consultation paper, para 5.1(a).
[23] Consultation paper, para 5.4(b).
[24] Consultation paper, para 5.1(b).
[25] Consultation paper, para 5.4(a).

The Authority does not present any evidence in support of these potential implications, or their materiality.

3.2.4 Poor co-ordination

The Authority also cites more complex efficiency concerns, namely:

- 'position in queue' dynamics, whereby connection charges vary depending on the timing of an application, giving rise to unpredictable and uncertain pricing, demand being turned away by high charges and/or encouraging costly conduct to gain a better position in the queue;[26] and
- 'piecemeal network development' arising from reliance on connection activity to fund investment, which the Authority states raises barriers for a distributor to proactively invest in capacity ahead of demand and could therefore increase network costs over time.[27]

Again, the Authority does not present any evidence of 'piecemeal network development' under regulatory framework administered by the Commerce Commission, or that 'position in queue' dynamics have precluded efficient connections.

3.2.5 Wealth transfers

The Authority says that methodological changes that increase connection charges, but without offsetting reductions to ongoing distribution charges for those new customers, result in 'wealth transfers'.[28] It does not explain from where or by reference to what counterfactual this transfer occurs.

It says that these wealth transfers compound the problem associated with the trend towards higher connection charges, which appears to be a reference to how connections could be discouraged by higher total costs – ie, connection costs and ongoing distribution charges – rather than as a consequence of some wealth transfer.[29]

3.2.6 Difficulty resolving disputes

The Authority says that due to variation in approaches across distributors – which it also highlights as a distinct inefficiency – access seekers may find it difficult to understand connection offers and:[30]

> …may not always have clear and complete requirements against which they can raise a dispute, and often do not have access to low-cost dispute resolution outside bilateral negotiation with the distributor.

No evidence is presented in support of insufficient access to dispute resolution, or that it has any effect on efficient connection.

3.3 Our observations

In this section we comment briefly on the problems or 'inefficiencies' by reference to which the Authority seeks to justify regulatory intervention.

3.3.1 No evidence of inefficiency

The identification of problems at the level of principle – or in theory – is a defining feature of the Authority's justification for regulatory intervention.

[26] Consultation paper, para 5.4(d)(i).
[27] Consultation paper, paras 4.24 and 5.4(d)(ii).
[28] Consultation paper, para 5.1(e).
[29] Consultation paper, para 5.1(e).
[30] Consultation paper, para 5.4(e).

We agree with many of the in-principle observations set out by the Authority, eg, inefficiency can arise from connection charges that are:

- too high – but specifically, above opportunity cost for the access seeker; or
- too low – but specifically, below the incremental cost of connection.

However, absent from every aspect of the Authority's problem definition is empirical evidence of any inefficiency, ie, that new connections are inefficiently high or low.

By way of example, the potential source of inefficiency that is most consequential for the Authority's proposed regulatory intervention is that increases in connection charges have prevented, or will prevent, efficient connection.

As a matter of principle, we agree that as connection charges increase above the incremental cost of connection, so too does the risk of preventing efficient connection, ie, by increasing the risk of exceeding the opportunity cost faced by the access seeker. However, we note also that similar, in-principle risks arise from reductions in connection charges, which increase the risk of falling below incremental cost.

Nevertheless, the Authority has not identified – nor apparently sought from distributors – any evidence of connections that may have been efficient, but that did not proceed.

The only empirical evidence presented by the Authority illustrates increases across the sector over time in:[31]

- the total value of capital contributions; and
- the value of capital contributions relative to other categories of capital expenditure.

That capital contributions are higher (or lower) than in prior years falls significantly short of establishing inefficiency or, more specifically, that efficient connections are not proceeding.

Further, the Authority has no regard to the reasons for which it might be appropriate for connection charges to increase, eg, to protect existing customers from bearing the risks associated with recovering the connection costs of risky new customers through distribution charges that are recovered over an extended period. We discuss these risks in section 4.2.2.

In our opinion, regulatory intervention justified by reference to casual, in-principle observation, absent any evidence of inefficiency, falls significantly short of establishing grounds for material regulatory intervention by reference to the Authority's statutory objective.

We note also that the Authority identifies potential 'transfers of wealth' between new and old customers as sources of 'inefficiency'.[32] Matters to do with the distribution of wealth reflect equity considerations and are not reflected in the Authority's statutory objective.

[31] Consultation paper, paras 4.26, 4.27 and 4.28.

[32] Consultation paper, para 5.1(e).

3.3.2 Transaction costs

The Authority says that transaction costs[33] are another source of inefficiency.[34]

The Authority proposes that transaction costs arise from excessive inconsistency in how distribution businesses set and communicate connection charges and that, in turn, this creates costs for access seekers, eg, as associated with 'learning'.[35]

Again, the Authority presents no evidence in support of the existence, materiality or consequence of these transaction costs.

It also has no regard to the transaction costs likely to arise from regulatory intervention that spans multiple years[36] and precipitates:

- a process of standardisation across non-exempt distribution businesses, eg, to overhaul their internal processes; and
- the potential reopening of distribution price paths administered by the Commerce Commission.

On the Authority's in-principle logic, regulatory intervention should also be instigated to prevent potential transaction costs associated with inconsistency in pricing elsewhere in the electricity sector, eg, as between its proposed reforms and Transpower's connection charge methodology, since large customers will likely also be contemplating transmission connection as an alternative.

It is unclear on what basis the Authority determined that those customers that would engage with connection price methodologies from multiple distributors – who are very likely to be large, sophisticated customers – are not capable of understanding differences between those methodologies. It is also not clear why this problem is only now emerging on the Authority's radar, particularly given that it is reasonable to expect that the rise in electrification projects likely involves relatively sophisticated proponents.

The Authority also proposes that transaction costs for connection applicants could arise because they:[37]

> …may not always have clear and complete requirements against which they can raise a dispute, and often do not have access to low-cost dispute resolution outside bilateral negotiation with the distributor.

Again, the Authority presents no empirical evidence of this problem or that, even if it was made out, it prevents efficient connection.

3.3.3 Electrification and decarbonisation

Decarbonisation of the New Zealand economy through electrification receives relatively little attention in the Authority's formal problem definition. However, in contrast, this process receives significantly more focus in the Authority's framing of its proposed reforms.

[33] Perloff (2012) explains that transaction costs are 'the expenses of finding a trading partner and making a trade for a good or service other than the price paid for that good or service. These costs include the time and money spent to find someone with whom to trade.' See: Perloff, J M, *Microeconomics*, Addison-Wesley, Boston, 2012, p 36.

[34] Consultation paper, paras 5.4(a) and 5.6.

[35] Consultation paper, para 5.4(a)

[36] Consultation paper, Figure 6.1.

[37] Consultation paper, para 5.4(e).

The Authority explains that the current arrangements: [38]

> …risk slowing down New Zealand's electrification; and businesses and consumers, the economy and the environment lose out on the benefits it brings.

The Authority says that its proposed reforms, in turn, therefore:[39]

> …aim to facilitate the timely and efficient investment in electrification of businesses, transport and industrial processes, which over time, benefits all New Zealanders.

This implied focus on electrification may also be balanced towards large-scale projects, in reflection of the Authority's observation that:[40]

> Many households (and smaller businesses) can electrify without needing to alter their connection...
>
> For most other electrification investments, network costs are a material input cost component that can alter the viability of decarbonisation. This includes electrification of public transport and shipping, public EV charge-points, fast charging at depots and workplaces, and process heat electrification.

It follows that there is a significant disconnect between the Authority's:

- underlying focus on a problem that is confined to the efficient connection of certain electrification projects; and
- its conclusion that connection charges are too high, generally, and its proposed reforms targeted at bringing down connection charges across-the-board.

The latter is likely to be an outworking of the Authority's sweeping assessment of 'potential' problems at the level of principle. It may also reflect the bounds of the Authority's statutory objective, which include no apparent remit to consider externalities such as decarbonisation.

The abovementioned disconnect is important context to the Authority's proposed reforms, since they improve the commercial viability of electrification project connections, but also all other connections, while at the same time inefficiently imposing risks on existing customers and driving inequities between existing and new customers.

In section 7 we discuss alternative tools available to the Authority that have the potential to improve the commercial viability of electrification projects without these shortcomings.

[38] Consultation paper, p 2.

[39] Consultation paper, p 2.

[40] Consultation paper, paras 10.7 and 10.8.

4. Authority's proposed full reform

In this section we describe the Authority's vision for full reform of distribution connection pricing by reference to three concepts, being the 'neutral point', the 'bypass point' and the 'balance point'. The Authority considers that prices between the neutral point and the balance point are likely to be 'most efficient'.

We explain that the Authority's specification of the neutral point involves bundling together the revenues from and costs of connection and distribution services, which has implications for efficient pricing and competition in the provision of connection services.

We also explain that the Authority's consideration of the balance point does not draw from any economic consideration of efficiency, and that there is no 'bright line' that establishes that connection charges above the balance point defined by the Authority would be inefficient. Rather, the Authority's consideration, and that of its consultant CEPA, in relation to the balance point, focuses principally on issues of horizontal equity as between connection applicants and existing customers.

4.1 Connection charges between the neutral and balance points

The full reform package canvassed by the Authority in its consultation paper has been developed with the aim of addressing the proposed problems described in section 3.2 above, in which the Authority asserts the existence of inefficiencies in distribution connection pricing.

The Authority's proposed full reform package is underpinned by its definition of three conceptual points at which connection charges might be set, ie:

- a '**neutral point**', where the combination of connection charges and ongoing distribution charges is equal to the incremental cost of providing the connection;
- a '**bypass point**' that is equal to the standalone cost of providing network services to a connection applicant; and
- a '**balance point**'; where the network costs recovered from a connection applicant over the life of their connection is similar to that from other customers within the same 'customer group'.

Of these terms, only the 'bypass point' concept is well understood in economics in terms of standalone cost – the terms 'neutral point' and 'balance point' appear to be entirely of the Authority's own innovation. Although the 'neutral point' is not a term of art to economists, its definition by the Authority does incorporate relevant economic concepts, such as incremental cost.

Each of the neutral, bypass and balance points can potentially be assessed for an individual connection. Indeed, we explain in Appendix A1 that the Authority's proposed fast-track measures require distributors to undertake a reconciliation for each connection that would involve an assessment of its neutral point and the extent to which connection charges exceed that level.

The Authority considers that the 'most efficient' charges are likely to be between the neutral point and the balance point.[41] It also explains that, if it proceeds to full reform, then it would adopt:[42]

> …a formula-based approach that provides for the setting of connection charges based on net incremental cost (ie, incremental cost less incremental revenue) plus a contribution to network costs, with the contribution required to be within a permitted range. This provides cost-reflective

[41] Consultation paper, para 7.66(c).

[42] Consultation paper, para 6.6(a).

pricing for connection applicants, while ensuring the benefits of connection growth are shared between newcomers and existing users.

Our understanding of the Authority's approach to full reform is that the 'permitted range' of contributions to network costs would be limited so that connection charges could not exceed the balance point.

We explain in more detail below the principles underpinning each of these points, as set out by the Authority in its consultation paper.

4.1.1 Neutral point

The Authority describes the 'neutral point' as the level at which connection charges plus the present value of expected future revenues from ongoing distribution charges equal the incremental cost of connecting a customer.[43] The Authority expresses this concept as 'net incremental cost', or:[44]

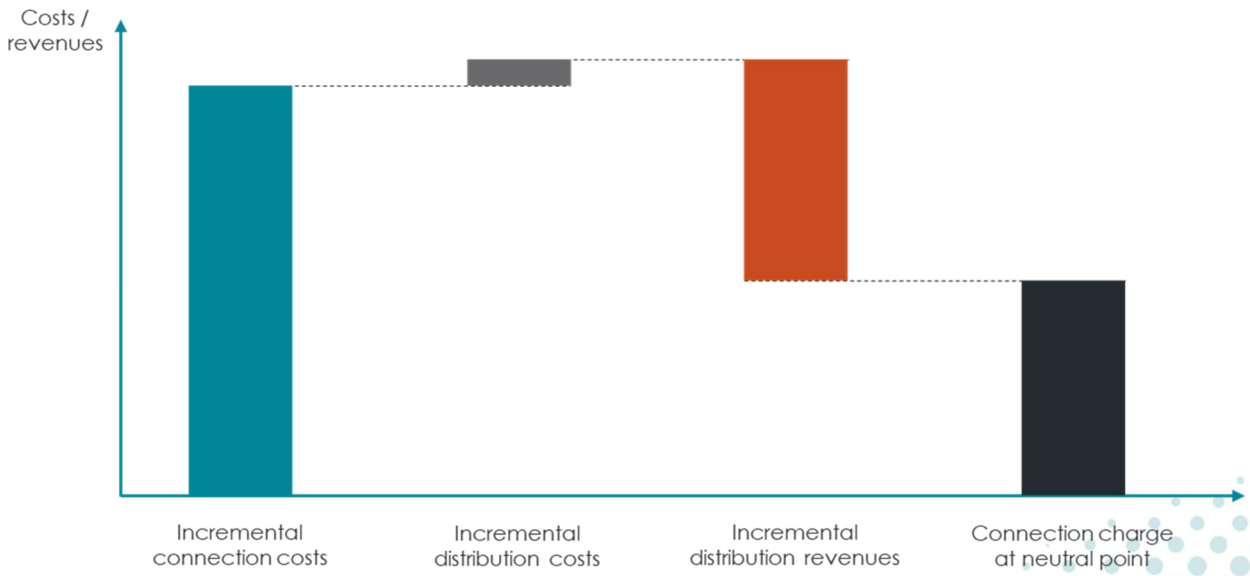
$$Connection\ charge\ =\ Incremental\ cost - Incremental\ revenue$$

In this equation, incremental cost and incremental revenue are defined as follows:

- incremental connection cost includes both:
  - the direct costs of constructing or upgrading a connection (ie, the extension costs); and
  - any required upgrades to the shared network capacity to facilitate the connection (ie, the capacity costs); and
- distribution revenue is the present value of expected revenue from ongoing distribution charges over the life of the connection, reduced by 10 per cent to reflect that new connections drive some incremental maintenance expenditure.[45]

Figure 4.1 demonstrates the elements entering the calculation of the neutral point, expanding on the equation above.

Figure 4.1: Demonstration of calculation of the neutral point



[43] Consultation paper, paras 7.57-7.60.

[44] Consultation paper, paras 7.57, 7.59 and 7.60.

[45] Consultation paper, para 7.75(d).

In figure 4.1 we have drawn the incremental connection costs as being larger than the present value of incremental distribution revenues. However, there may be a range of potential scenarios, including:

- low cost connections in which the incremental connection costs are small compared to the present value of incremental distribution revenues, so that no connection charge could be levied at the neutral point; or
- high cost connections in which the incremental connection costs are substantially greater than the present value of incremental distribution revenues, so that a material connection charge could be levied at the neutral point.

The Authority explains that, when connection charges are set at the neutral point, existing customers are made neither better nor worse off from a new connection, since the combination of upfront and ongoing charges exactly covers the costs imposed by that connection.[46]

4.1.2 Bypass point

The Authority describes the 'bypass point' as the level at which the payments a connection applicant will make over the life of their connection would exceed the standalone cost for that connection applicant.[47] The standalone cost refers to the cost of establishing a dedicated connection to the transmission grid or implementing a self-supply solution.

The Authority notes that:[48]

- for smaller users connected at the fringe of the network, the standalone cost is typically very high;
- for large users located near a grid exit point, the standalone cost can become a more relevant consideration; and
- where self-supply solutions like solar and batteries are considered, some adjustment must be made for inevitable trade-offs in flexibility and reliability compared to network-based solutions.

4.1.3 Balance point

The Authority describes the 'balance point' as the level at which the total contribution to network costs that a connection applicant will make over the life of their connection (through both upfront charges and ongoing distribution charges) is similar to that made by existing customers in the same consumer group.[49]

In other words, the network contribution over and above the net incremental cost of the connection, is similar to the network contribution over and above net incremental costs made by similar types of users (eg, residential and small commercial, commercial, or large commercial/industrial).[50]

It follows that the balance point depends on a range of network and consumer group-specific factors, including:[51]

- historical contribution policies;
- average incremental costs;
- network age;
- the residual revenue allocations used in tariff setting; and

[46] Consultation paper, para 7.58.
[47] Consultation paper, para 7.62.
[48] Consultation paper, para 7.62.
[49] Consultation paper, para 7.61.
[50] See Consultation paper, para 7.68, footnote 55.
[51] Consultation paper, para 7.68.

- variations among individual consumers within a consumer group.

4.2 'Neutral point' raises challenges for efficiency and competition

The Authority's use of the 'neutral point' as the lower bound for its range of preferred connection charges raises challenges for both economic efficiency and competition. We explain in this section that pricing connection services at the neutral point reflects pricing below the incremental cost of connection services, which in turn:

- transfers risks to from connection applicants to existing customers; and
- deters competition for connection services.

We explain the basis for these findings below.

4.2.1 Neutral point reflects pricing below the incremental cost of connection services

The Authority's implementation of efficiency principles through the lens of the 'neutral point' results in its lower bound for connection charges being below the incremental cost of connection services.

An important distinction between the economic principles that we discuss in section 2 above, and the Authority's application of similar economic principles, is that the Authority applies this theory not to connection services, but to the combination of connection and distribution services. For example, the Authority's application of the incremental cost concept, which it calls the 'neutral point', is based on incremental connection costs, less the present value of expected future distribution revenues. In this calculation, the expected future distribution revenues are reduced by 10 per cent to reflect the concept that new connections drive incremental maintenance expenditure.[52]

The purpose of defining the incremental cost this way appears to reflect the Authority's implicit view that the incremental cost concept should be applied across the combination of connection and distribution services, rather than just to the connection service. That is, the Authority effectively defines the neutral point as occurring where:

$$\begin{aligned} &Revenue\ from\ connection\ services + Revenue\ from\ distribution\ services \\ &\quad = Incremental\ costs\ of\ connection\ services \\ &\quad + Incremental\ costs\ of\ distribution\ services \end{aligned}$$

The Authority does not directly explain the basis for this approach – other than by reference to an observation that existing customers are not made worse off at the neutral point.[53] However, it has significant implications for the pricing of connection services and for competition in connection services.

The Commerce Commission's approach to the regulation of distributors tends to allow revenues from distribution services that are substantially higher than their incremental costs. This reflects the Commission's approach to the setting of revenue allowances, which includes a return on and of sunk distribution assets. This observation is consistent with the Authority's suggestion that the incremental cost of a new connection on distribution services is, on average, 10 per cent of revenue.

It follows from these facts that the Authority's approach to combining revenues and costs from these services in its definition of the neutral point allows the connection charge to be materially below the incremental cost of providing the connection service. This can be demonstrated by rearranging the equation for the neutral point, ie:

[52] Consultation paper, para 7.75(d).

[53] Consultation paper, para 7.58.

$$\begin{aligned} &Revenue\ from\ connection\ services \\ &\quad = Incremental\ costs\ of\ connection\ services \\ &\quad - (Revenue\ from\ distribution\ services - Incremental\ costs\ of\ distribution\ services) \end{aligned}$$

That is, because revenue from distribution services exceeds the incremental costs of distribution services, the revenue from connection services at the neutral point can be commensurately below the costs of connection services.

The pricing of connection services materially below their incremental costs has significant disadvantages for economic efficiency.

Pricing connection services at less than their incremental cost, when these incremental costs are almost entirely incurred as upfront payments, may result in a substantial transfer of risk from connection applicants to existing users of the distribution network. Further, because the ability to price connection charges below their incremental costs is only achievable by the distributor, this will be likely to eliminate the prospects for competition in relation to services priced on this basis. We explain the basis for these observations in more detail below at sections 4.2.2 and 4.2.3.

We also explain that there are potential allocative efficiency advantages from the use of price discrimination in setting total charges. However, these efficiency advantages will be better achieved, with fewer negative implications, with price discrimination on distribution charges, rather than connection charges, which we discuss in section 7.1.

An advantage is that this approach to pricing may allow a distributor to offer total charges (connection and distribution charges) closer to their incremental costs than would otherwise be the case. In principle, if the neutral point is set as a floor, giving a distributor the flexibility to set prices at that level, then it allows potential to provide an electricity service to a larger number of customers than would otherwise be the case. However, we explain in 4.2.4 that these allocative efficiency gains can also be achieved with price discrimination on distribution services, without pricing connection services at less than their incremental cost.

4.2.2 'Neutral point' transfers risk to existing customers

We understand that the incremental cost of providing connection services (whether these costs are extension costs or capacity costs) are almost entirely upfront. Similarly, connection charges are also upfront.

Where connection charges fall below the incremental cost of providing a connection service, the residual upfront cost of providing the connection service must be recovered by some other means.

The Authority's approach to defining the neutral point indicates that this residual upfront cost can be recovered from the connection applicant through expected future distribution revenues, which are assumed to be much higher than the incremental cost of providing the distribution service. The Authority proposes that the expected future revenues would be discounted to a present value:[54]

- over a connection revenue life of 30 years for residential connections and 15 years for other connections; and
- at a discount rate based on the Commission's most recent annual cost of capital determination.

In effect, this present value of expected revenues acts like a rebate for expected future revenues, payable in advance. That is, the Authority envisages that for connection charges that fall between the neutral point and the incremental cost of connection:

- the connecting party's connection charge will reflect a discount from the incremental cost of its connection that is based on its expected future distribution charges, but applied *before* these charges are payable to the distributor; and equivalently

[54] Consultation paper, para 7.75(c).

- the distributor will incur the incremental costs of connection *before* being able to recover the residual part of these costs in distribution charges from the connecting party.

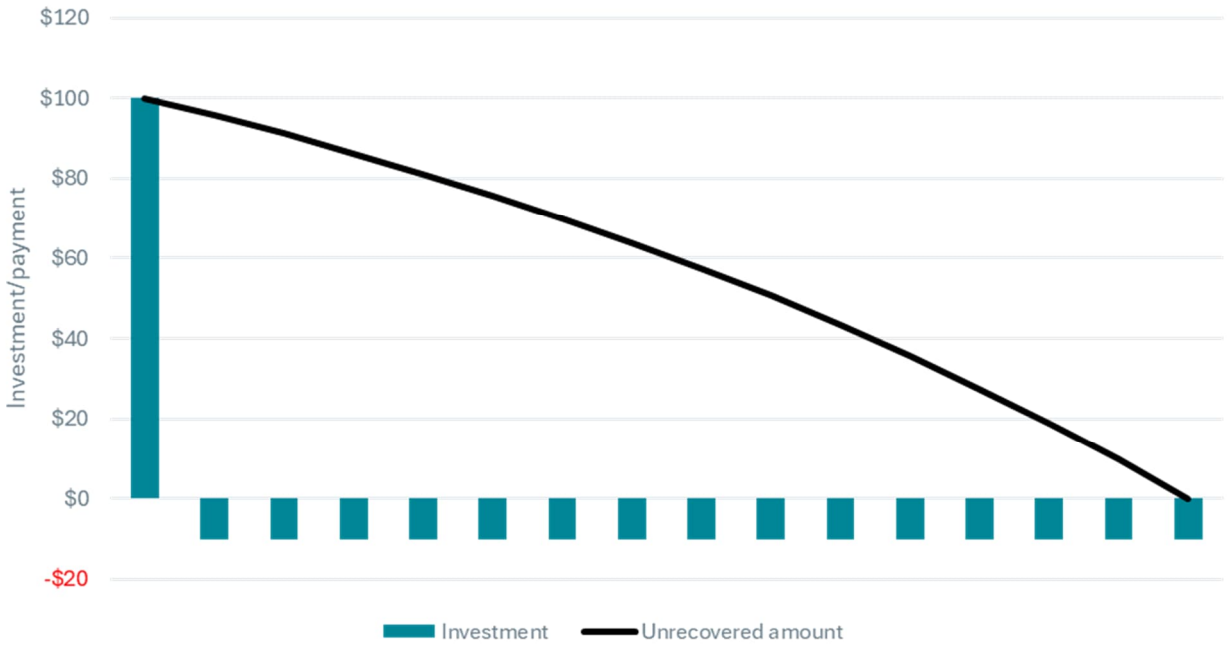
For example, figure 4.2 illustrates the recovery profile of an upfront connection cost of $100, recovered over an assumed connection revenue life of 15 years at a rate of return of six per cent. With these parameters, an annual contribution from distribution charges of $10.30 would be required to pay back the connection cost over this period.

The cashflows to the distributor are shown with the teal bars, indicating:

- the upfront payment of $100 to provide the connection for the applicant; and
- the receipt of annual payments of $10.30 through ongoing distribution charges on the applicant.

The black line shows the unrecovered cost of the connection over time, beginning at $100 and falling to zero over 15 years.

Figure 4.2: Recovery profile of upfront connection costs over time



This profile of recovery imposes a transfer of risk from the connecting party to existing customers of the distributor, relating to the tenure of the connecting party as a customer of the distribution network. If the connecting party discontinues its electricity distribution service before the assumed connection revenue life, then:

- the revenues collected from the connecting party may not be sufficient to return the residual part of the upfront cost that it did not pay for in its upfront connection charges; and
- any unrecovered costs would either be borne by the distributor, or socialised and recovered from other users through higher distribution charges.

This transfer of risk reflects connection charges that are inefficiently low. This is particularly the case for commercial or industrial customers who face a very uncertain business proposition, such that there is a significant prospect that they may not continue to operate over the assumed connection revenue life.

Offering such connection applicants a discount below the incremental cost that their connection imposes on the network, based on the expectation that their business will remain successful over a period of 15 years, amounts in substance to a form of unsecured capital funding, similar to debt, provided by customers of the distribution network. It mitigates the upfront capital investment that shareholders must provide, in return for ongoing payments over 15 years, with these payments assessed at the regulatory rate of return.

However, the risk faced by such connection applicants is likely to be much greater than the risks that are compensated for by the regulatory rate of return. In a competitive market to provide funding to such businesses, it appears very unlikely that they would be able to source debt funding at the regulatory rate of return. The opportunity to pay connection charges that are lower than incremental costs, and as low as the neutral point, would therefore be commercially very attractive, particularly for connection applicants for whom the cost of their electricity supply is a substantial part of their overall costs.

It follows that connection charges set below the incremental connection cost in the manner proposed by the Authority may give rise to two forms of inefficiency, ie:

- inefficient connection decision-making by connection applicants, who may decide to connect when it is not efficient for them to do so, because connection pricing below the incremental connection cost artificially lowers their risk profile; and associated with this
- inefficient business decision-making by connection applicants, who may proceed with an investment that delivers profits only because of the transfer of risk onto distributors and other electricity customers.

We explain in section 6.4 how the Australian regulatory system addresses the prospect for risk transfers when applying the conceptually similar 'cost-revenue test'.

4.2.3 Pricing below incremental cost deters competition for connection services

The promotion of competition in the electricity industry is one of the limbs of the Authority's statutory objective that we discuss at section 2 above.[55]

Competition in the provision of electricity distribution services is presumed to be infeasible because of the natural monopoly characteristics of electricity distribution networks. However, competition can take place for the provision of electricity connection services. Competition in the provision of connection services occurs when third party service providers can compete against distributors to install connection assets.

In some jurisdictions, such as Australia, there is robust competition for the provision of connection services. We understand that competition in the provision of electricity connection services in New Zealand is nascent, but does occur across some distribution networks, such as Orion's. On Vector's network, we understand that competition may take place to some degree, for example in relation to civil works on a customer's premises, which a customer may undertake at its own expense, or potentially within embedded networks.

Competition in the provision of connection services is promoted where third party service providers can compete against distributors on their own merits, so that customers can select the provider that undertakes these services at least cost.

In our opinion, the Authority's current vision of its full reform would significantly reduce the scope for competition in connection services to develop in New Zealand. This effect would arise where the Authority allows or requires distributors to set connection charges at levels below their incremental cost.

Prices below incremental costs are not consistent with outcomes that would be achieved in a competitive market for connection services. Connection charges below incremental cost can only be sustained by distributors where lower connection charges for a connecting party are either:

[55] Electricity Industry Act 2000, cl 15(1).

- part of a bundle of connection and distribution services, with the difference being made up in higher distribution charges; or
- funded by higher connection or distribution charges on other customers.

The ability to cross-subsidise connection charges through ongoing distribution charges is not available to third party service providers. A third party service provider cannot charge some customers more than incremental cost to fund connection charges that are lower than incremental cost, since this approach will see it retain the low-priced customers and lose the high-priced customers to competitors.

The Authority concedes that there may be circumstances in which its proposal could raise barriers to competition, ie:[56]

> …connection works that include vested assets are more likely to result in a negative connection charge – ie, where the incremental revenue exceeds the incremental cost and contribution to network costs. To support contestability in such cases, distributors should make a payment to the applicant (or their contractor).

In our view, the harm to competition will arise in a wider range of circumstances than contemplated by the Authority. It does not require a negative connection charge to raise barriers to competition – only for the connection charge to fall below incremental costs, being those that are achievable by a third party service provider.

The Authority's proposal to address the potentially harmful effects of competition resulting from the pricing of connection services below incremental cost appears to be for distributors to make payments for the difference to the connection applicant or their contractor.[57]

It is unclear to us whether this proposal is a fundamental component of the Authority's full reform. The concept of distributors making upfront payments to connecting customers (or their connection service providers) to reflect the present value of future distribution revenues appears to be one that is theoretical and untested. This proposal would raise many practical considerations as to its implementation, including how these payments would be or should be treated by the Commission's regulatory framework.

For the reasons that we set out in section 4.2.4 below, there are other ways to achieve similar outcomes, but without harm to competition, through the use of discrimination in distribution pricing rather than connection pricing.

4.2.4 Improve allocative efficiency through distribution pricing

One potential view of the Authority's proposal to allow connection prices as low as the neutral point is that it allows the total of connection and distribution charges to be as low as their combined incremental cost, consistent with our explanation of the neutral point in section 4.2.1.

Allowing the pricing of services as low as incremental cost can give rise to allocative efficiencies for the reasons that we discuss in section 2.1.1 above. This may be allocatively efficient if:

- it is necessary to charge as low as incremental cost to some customers is required because their opportunity cost is very low; and
- it is feasible to set higher charges for other customers such that the overall allowed revenue set by the Commerce Commission is still recoverable.

This is price discrimination, which is well-accepted by economists as promoting allocative efficiency where common costs exist.

[56] Consultation paper, para 7.160(b).

[57] Consultation paper, para 7.160(b).

However, the Authority casts doubt on the capability of distributors to achieve these allocative efficiencies through effective price discriminate. In particular, the Authority asserts that:[58]

> In practice:
>
> (a) distributors cannot tailor charges to each newcomer's willingness to pay. Distributors do not have this information, this approach would be unpopular as it would exacerbate coordination challenges and reduce transparency, and make pricing inefficiently difficult to predict and administer
>
> (b) likewise, distributors cannot assess the relative elasticity of newcomer connection demand versus existing user demand

In our opinion, the Authority fundamentally understates the achievability and desirability of price discrimination in setting charges for connection and distribution prices. Distributors do not have perfect insight into their customers' willingness to pay, but through negotiations develop an understanding of the commercial position of their most significant customers. This understanding would be sharpened still further where distributors' profitability depends on their ability to connect customers and to discriminate effectively on price – see our alternative reform option at section 7.3 below.[59]

Instead, the Authority proposes the application of a form of regulated price discrimination, whereby new connection applicants are required to receive connection charges that are at or below the balance point and as low as the neutral point.[60] This amounts to price discrimination because existing customers will be paying connection charges that are, on average, consistent with the balance point. Further, the ability of distributors to discriminate within this range will still determine the extent to which this proposal can promote allocative efficiency.

If price discrimination is achievable, then economic principles better support its application to distribution charges rather than connection charges. This is because:

- connection costs are wholly comprised of incremental costs; whereas
- distribution costs exhibit significant economies of scale, with incremental costs likely to be much lower than typical distribution charges.

These characteristics suggest that discrimination in relation to distribution charges can be achieved without the setting of prices below incremental cost, which gives rise to the shortcomings that we discuss at sections 4.2.2 and 4.2.3 above.

Figure 4.3 below illustrates this situation, by way of comparison between:

- the cost structure for connection and distribution services, indicated in the teal and grey bars at the top of the chart by reference to their incremental and average costs; and
- the charge structure for connection and distribution services, as proposed by the Authority and in the alternative where price discrimination is on distribution charges, rather than connection charges, indicated in the black and tan bars at the bottom of the chart.

Figure 4.3 highlights that the Authority's proposed charge structure seeks to reach the neutral point by setting connection charges that are set lower than the incremental cost of connection. However, the neutral point can also be reached by setting connection charges and distribution charges respectively that are in line

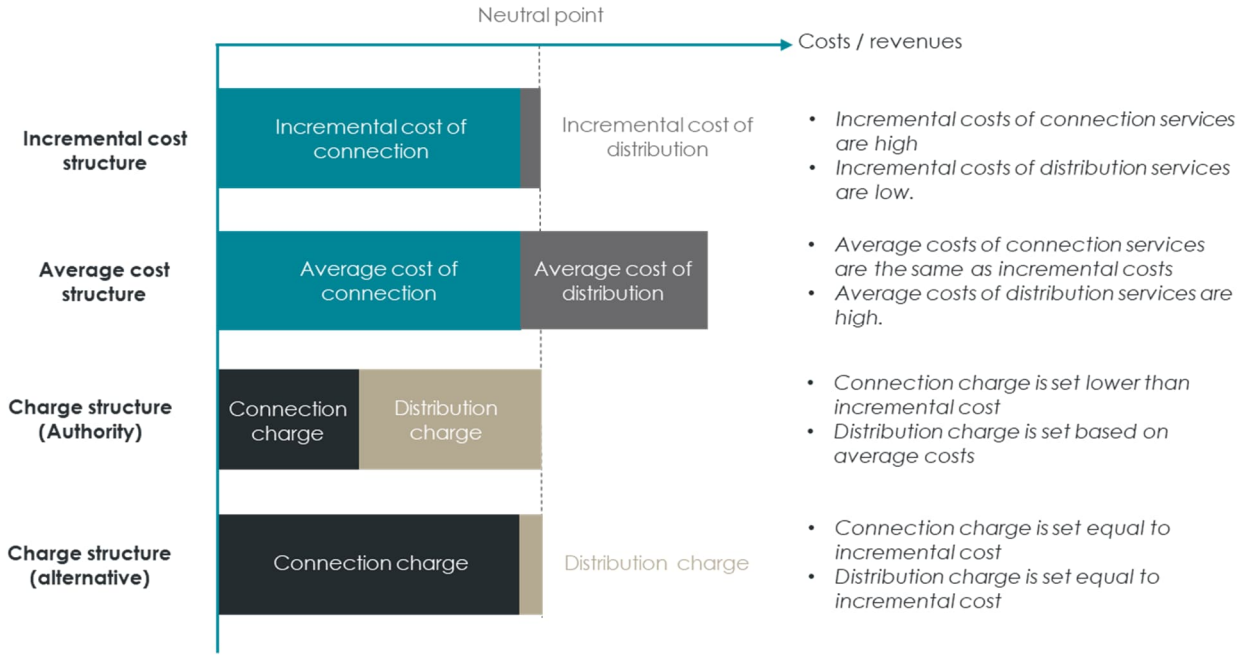
[58] Consultation paper, para 7.66(a)-(b).

[59] For example, we have observed this understanding in our work for both electricity and gas distribution businesses in circumstances where such businesses face commercial incentives to connect new customers.

[60] Consultation paper, para 7.66(c).

with their incremental costs – an outcome with much better efficiency properties than the Authority's proposal.

Figure 4.3: Alternative approaches for the implementation of price discrimination



4.3 'Balance point' does not reflect efficiency considerations

The Authority's approach to the consideration of economic efficiency focuses principally on the issue of allocative efficiency, reflected in its use of the 'neutral point' and the 'bypass point' as bookends of the range of efficient prices.

In its May 2024 paper on distribution pricing reform, the Authority expressed a preliminary view that the 'most efficient upfront charges will be toward (or at) the neutral position'. This reflected the Authority's opinion that connection applicants might be more sensitive to connection and distribution charges than existing customers are to changes in their ongoing distribution charges.[61]

The Authority's introduction of the 'balance point' concept in its consultation paper represents a change in approach. The balance point is introduced as being where:[62]

> …the contribution a connection applicant will make to network costs over the life of their connection is commensurate with other users from the same consumer group.

The balance point is central to the Authority's views about connection pricing that it expresses in the consultation paper. In this section, we review the Authority's use of these terms and the conclusions that it reaches about economic efficiency. We explain that the Authority's preference for the balance point as the ceiling of a reasonable range of connection charges does not reflect efficiency considerations, and instead reflects a preference for equity as between connection applicants and existing electricity customers.

[61] Electricity Authority, *Distribution pricing reform: next steps*, 7 May 2024, p 15.

[62] Consultation paper, para 7.61.

4.3.1 Authority's propositions about efficient connection pricing

The Authority makes a number of propositions about efficient connection pricing, which are summarised at paragraph 7.63 of its consultation paper, ie:

> The Authority considers:
>
> (a) connection charges below a connection's neutral point are inefficient, because existing users are subsidising the new connection.
>
> (b) connection charges above a connection's bypass point are inefficient, because the connection applicant would be better off inefficiently bypassing the network.
>
> (c) connection charges between the neutral and bypass points are within the subsidy-free range for that connection.
>
> (d) connection charges above the balance point can be inefficient as they allocate connection applicants a higher lifetime cost than existing users from the same consumer group. This may in turn suppress connection growth.
>
> (e) connection charges between the neutral and balance point are beneficial to existing users, without inefficiently penalising connection applicants.

When referring generally to 'efficiency' or 'inefficiency' in these points, the Authority appears to refer to allocative efficiency, not other dimensions of efficiency that might also be affected by connection pricing.

We agree with the Authority that conventional economic theory holds that prices below incremental cost and above the bypass cost are inefficient, and that prices within this range are subsidy-free.[63] However, we disagree with the Authority's apparent view that the 'balance point' occupies a role in determining the prices within this range that are efficient.

Specifically, as the Authority explains, the balance point reflects a connection charge that results in the connection applicant bearing a similar lifetime cost for its combined connection and distribution services as existing users from the same consumer group. The balance point is not defined by reference to the willingness to pay or the opportunity cost of members of that consumer group.

The Authority's propositions (d) and (e) suggest otherwise, raising the concept of the balance point as a tipping point, above which connection growth may be inefficiently suppressed, and below which existing users benefit without such inefficiency. The balance point does not have any such role.

To the extent that distributors are required to set connection charges and distributions charges on the same basis to all members of a customer group, then any connection charge above the neutral point *could* potentially cause some connections to be supressed. The higher that such charges are set, the more connections may potentially be supressed. These considerations again highlight the importance of price discrimination to the achievement of allocative efficiency in distribution pricing.

There is no 'bright line' at the balance point that determines this as the logical boundary for such considerations.

4.3.2 Balance point reflects equity considerations

Our responses to the Authority's propositions about efficient connection pricing highlight that although the Authority's consideration of the balance point references *efficiency*, the key principle motivating the role of the balance point in the Authority's framework for connection charges is not efficiency, and appears to be

[63] We explain in section 4.2that the formation of a lower bound for connection charges by reference to the combined incremental costs of connection and distribution services, implied by the Authority's 'neutral point', give rise to potential inefficient risk transfers and raises barriers to competition for connection services.

equity. This is reflected in various statements made by the Authority in its consultation, which highlight the consequences of setting connection charges above the balance point.

For example, the Authority explains that setting connection charges at the neutral point may be optimal but that:[64]

> …this involves newcomers avoiding costs or underpaying for costs that are covered by existing users, which may be unpopular and unsustainable.

This statement highlights that the Authority's rationale for allowing connection charges above the neutral point appears to extend beyond considerations of efficiency, and embraces considerations such as 'popularity'.

The Authority identifies the range as between the neutral point and the balance point by reference to a range of factors reflecting broader societal needs and equity considerations:[65]

> …setting charges somewhere between the neutral and balance points is likely most efficient, with the lower end better supporting electrification, housing growth and business growth, and the upper end better supporting affordability for existing users.

Although the Authority cites economic efficiency in the quote above, it introduces no concepts that support its use in this context.

The Authority also cites CEPA as indicating support for its vision for full reform, including the role of the balance point.[66] CEPA states that:[67]

- connection charges should be set between incremental cost and standalone cost, where incremental cost is the Authority's 'neutral point'; and
- the balance point arises because for fairness and horizontal equity reasons it makes sense to treat similar customers similarly.

Although CEPA goes on to state that connection charges between the neutral point and the balance point will help to ensure that connecting customers only pay an efficient price for connection, it does not otherwise explain the particular role of the balance point in capping this range.

[64] Consultation paper, para 7.64.

[65] Consultation paper, para 7.66(c).

[66] Consultation paper, para 9.15.

[67] CEPA report, p 30.

5. Implications for Authority's fast-track proposals

The Authority's vision for its full reform is supported by its fast-track proposals, some of which provide 'stepping stones' towards the full reform, in particular:

- the Authority's proposal to place reliance limits on capital contributions that distributors may seek from connection applicants; and
- the Authority's proposal to require reconciliation of its charges to the net incremental cost (or neutral point) of each connection service.

To the extent that these elements of the Authority's fast-track proposals are included to underpin or reinforce its vision for full reform, it is important that the assessment of these elements also considers this overall context. Although the Authority's vision for full reform is not well defined at this time, there is enough information available from the Authority's consultation paper to raise significant concerns about the economic merits of this end goal, as we set out at section 4 above, and therefore for these intermediate steps.

In this section, we explain how these elements of the Authority's fast-track proposals are linked to the concerns that we raise about the economic merits of the full reform.

5.1 Reliance limits on capital contributions

The Authority's proposal for reliance limits would place restrictions on the extent to which a distributor can seek capital contributions from load customers to fund connections and system growth. The reliance limit is expressed as a ratio of connections and system growth expenditure.[68]

The reliance limit applying to a distributor would be the lesser of:[69]

- its reliance on capital contributions for the year ended 31 March 2024; or
- 47 per cent, which is the Authority's estimate of average capital contributions across New Zealand distributors for the year ended 31 March 2024.[70]

This reliance limit would apply only to typical connection activity. It would exclude consideration of connections that are outliers and which have a material impact on the distributors reliance on capital contributions.[71]

A distributor must make its best endeavours to ensure that its policy or methodology for determining capital contributions is unlikely to result in exceedance of its reliance limit.[72]

The Authority describes its reliance limit as a 'safeguard against distributors increasing their reliance on up-front charges' and preventing distributors from 'setting inefficiently high connection charges'.[73]

These comments appear to draw from the Authority's views that high or increasing reliance on capital contributions is inefficient, and that connection charges below the balance point are more likely to be

[68] Proposed Code amendment, s 1.1(1), definitions of 'capital contribution reliance', 'capital contribution reliance for load' and 'capital contribution reliance limit for load'.

[69] Proposed Code amendment, s 6B.7(2).

[70] Consultation paper, paras 7.84-7.90.

[71] Proposed Code amendment, s 1.1(1), definition of 'typical connection activity'.

[72] Proposed Code amendment, s 6B.7(1).

[73] Consultation paper, p 5.

efficient. That is, the proposed reliance limits appear to draw their conceptual foundation from the Authority's views about efficient connection pricing that underpin its vision for full reform.

However, these views are not well-founded, either in fact or in economic principle.

We explain the basis for economically efficient pricing in section 2.1. The reliance limit is not directed at the key elements of economically efficient pricing because:

- it does not place any lower bound on connection charges, let alone a lower bound based on the incremental (or 'avoidable') cost of facilitating the connection; and
- the upper bound that it places on connections charges has no relationship to either the standalone cost of facilitating a connection or the opportunity cost of a connection, rather it reflects concerns regarding equity as between existing users and new users of the network.

We explain in section 3 above that the Authority's problem definition asserts concerns about the efficiency of connection charges, but does not substantiate these by reference to examples of inefficient connection decisions. Although the Authority observes that connection charges may be too low or too high in principle, it offers no well-reasoned basis against which to conclude that the connection charges applied by any distributor might be inefficiently high, because:

- no evidence is presented that any distributor is setting connection charges at inefficient levels and the Authority's proposed reliance limit is not linked to any measure relating to economically efficient connection charges; and
- the balance point concept proposed by the Authority provides no information about efficient connection charges.

It follows from these observations that there is no clear economic underpinning for the Authority's proposed reliance limits.

Despite this, the Authority contends that relance limits will prevent distributors with high reliance on capital contributions from further increasing capital contributions, potentially to inefficient levels.[74]

The Authority also contends that reliance limits will preserve scope for increases in up-front charges on networks with low reliance levels.[75] We agree that it may be efficiency enhancing for such networks to increase reliance if connection charges are currently set below incremental costs. However, it is not clear why the proposed reliance limit is necessary to achieve this objective, or how it would contribute to it.

The Authority's proposal appears to recognise that rapid changes in reliance on capital contributions may lead to similarly rapid price changes that could be undesirable from an allocative efficiency perspective (for example, customers may not have the opportunity to plan their best response to large changes in price signals in a short space of time). The proposal appropriately considers that distributors may have limited ability to reduce their reliance in the near term.[76]

5.2 Reconciliation of connection charges to the neutral point

The Authority proposes that distributors must provide, on request by a connection applicant or the Authority, a reconciliation between the connection charge and the net incremental costs of providing the connection service.[77]

[74] Consultation paper, para 7.101 (a).

[75] Consultation paper, para 7.101 (b).

[76] Consultation paper, paras 7.90 and 7.103.

[77] Proposed Code amendment, ss 6B.12 and 6B.13(1).

The reconciliation requires the distributor to break down its connection charge into the components on the right-hand side of the following equation:

$$CC = (IC - IR) + NC$$

In the equation above:

- CC is the connection charge;
- IC is the incremental cost estimate, calculated in line with the connection enhancement cost requirements and the capacity costing requirements;[78]
- IR is the incremental revenue estimate, calculated based on:[79]
  - estimated revenue from electricity lines services that the distributor will receive over the first 12 months of the connection;
  - extrapolated forward in constant dollar terms over a period of 30 years for a residential connection and 15 years for non-residential connection,[80] based on expected changes in demand, revenues or tariffs;
  - discounted to present value terms using the most recent mid-point estimate of real vanilla WACC determined by the Commerce Commission; and
  - multiplied by 0.9 to account for incremental operational expenditure costs; and
- *NC* is the contribution to shared network costs (ie, the difference between the connection charge and the net incremental cost, where the latter is defined to be equal to IC less IR).

The primary outcome of the reconciliation appears to be identification of the network contribution, being the extent to which any one customer is contributing to shared network costs through connection prices.

The reconciliation fast-track proposal is unlikely to have any significant efficiency implications given that its purpose is for monitoring. However, the Authority explains that the proposed reconciliation requirement provides a stepping stone towards the implementation of the full reform package, under which network contributions would be capped below the 'balance point'. The Authority argues that the calculations involved in the cost reconciliation (ie, the calculation of the incremental cost and incremental revenue associated with each new connection) are 'an essential step in setting charges with reference to the neutral or balance points'.[81]

We explain in section 4 that:

- the neutral point raises challenges for economic efficiency and competition; and
- the balance point is not a relevant concept for efficiency.

In the interim, the Authority argues that the reconciliation requirement will, among other things:[82]

- improve consistency and clarity for distributors, connection applicants and other interested parties;
- provide a reference point to inform capital contribution policies, connection negotiations and dispute resolution;
- improve transparency in the level of connection charges, providing applicants with greater certainty; and

[78] Proposed Code amendment, s 6B.13(2).

[79] Proposed Code amendment s 6B.13(3).

[80] Proposed Code amendment, s 1.1(1), definition of 'connection revenue life'.

[81] Consultation paper, para 7.78.

[82] Consultation paper, paras 7.78-7.79.

- potentially influence how distributors set connection charges, leading to fewer charges that are inefficiently low or high.

It is unclear how the Authority proposes that greater transparency, consistency and clarity will lead to changes in allocative, productive or dynamic efficiency. Consistency through time may enhance horizontal equity as between new and existing users.

Whether the reconciliation requirement will influence how distributors set connection charges is likely to depend on the conduct of individual distributors, and the extent to which they and their customers are aware of network contributions. Greater transparency around network contributions could influence some distributors to alter those contributions if the network contributions are found to be inconsistent with the distributor's connection policy or if customers make complaints regarding the network contribution level. However, some distributors and more sophisticated customers may already be aware of the nature of network contributions and the value of connection charges.

If the reconciliation requirement does influence how distributors set connection charges, it may lead to fewer charges that are inefficiently low. This is because it will make explicit to distributors where charges are below the net incremental cost. This may, in some cases, encourage distributors to raise connection charges to an efficient level.

It is less likely that the reconciliation requirement will lead to fewer inefficiently high charges, given that it does not assist distributors or connection applicants to discern if charges are above the opportunity cost of the connection service to a customer (ie, the upper bound for efficient pricing – section 2.1.1. Given that the reconciliation requirement is not set with reference to an efficient range of prices as described in section 2.1.1, this proposal is unlikely to be a vehicle for the achievement of efficiency gains.

The costs incurred by distributors in identifying the network contribution for every connecting customer is also a relevant consideration in an overall assessment of efficiency. Given the certain costs associated with calculating the network contribution estimate and providing it to each connecting customer, the proposed reconciliation requirement must provide a realistic prospect of efficiency improvements to be justified.

6. Lessons from the Australian context

In this section we describe elements of the framework for connection services in the national electricity market (NEM) in Australia from which the Authority appears to have drawn inspiration, but that differ in material respects to both the Authority's representation of them and how they are reflected in its proposal.

The Authority says that it has developed its proposal by examining arrangements in other jurisdictions, with a focus on Australia and the United Kingdom.[83] However, the rationale for this framework and the way it is applied is very different in Australia – differences that do not appear to be well understood or well explained by the Authority.

By way of example, there is:

- significant diversity in connection pricing in the NEM, including as facilitated by the Australian Energy Regulator (AER) – whereas the Authority says there is moderate consistency in Australia and that such inconsistency in New Zealand is a source of 'inefficiency';
- where connection services are provided in a contestable market, the incremental cost of the connection service is recovered upfront, in its entirety, from the access seeker – which is not mentioned by the Authority;[84] and
- the incremental cost revenue test in the national electricity market, from which the Authority draws much inspiration and puts at the centre of its proposed economic framework:
  - is applied only in certain circumstances, and that are not consistently defined across distributors;
  - is not applied when there is the prospect of competition in connection services; and
  - is accompanied by mechanisms that protect existing customers from the risks associated with deferment of the recovery of the incremental cost of connection.

Important context to the discussion that follows is that connection charges in Australia reflect the classification of the service in a regulatory determination, which in turn determines the form of regulatory control applied to the service and, therefore, how connection charges are calculated.

We describe this service classification process in appendix A.2.

6.1 Significant diversity in connection pricing

There is significant diversity in connection pricing across Australia, including as between:

- the NEM and Western Australia;
- the states, territories and jurisdictions that comprise the NEM;
- between individual distributors, including those located in the same state; and
- between different types of customers for a particular distributor; and
- for the same type of customer but with different circumstances applying to their connection application, eg, whether or not an asset is likely to be used by other customers within a certain timeframe.

These differences reflect different frameworks for the contestable provision of connection services and the degree of discretion available to distributors in the classification of connection services, which in turn determines whether and what form of regulatory control applies.

[83] Consultation paper, para 6.2(b).

[84] Consultation paper, para 6.6(a).

By way of the most granular form of example, the same connection service provided by Energex in Queensland is classified differently – as an alternative or standard control service, each with different implications for connection charges – depending on:[85]

- whether the customer is a small customer (standard control) or a large customer (alternative control); or
- whether there is a reasonable likelihood that the asset will be used by other customers (standard control) or won't be used by other customers (alternative control).

In contrast, the Authority says there is only moderate consistency in Australia and that such inconsistency in New Zealand is a source of 'inefficiency'.[86]

In our opinion, it is incorrect to conclude that there is moderate consistency in connection pricing in Australia. The longstanding diversity in connection charges overseen by the AER in Australia calls into question the Authority's assertions that inconsistency in connection charges in New Zealand is a source of inefficiency.

6.2 Full incremental cost charged for some connection services

Despite the attention given to the cost revenue test, neither the Authority nor CEPA explain that, for contestable connection services in Australia, the incremental cost of the connection service is recovered upfront, in its entirety, from the access seeker.

Connection services provided in competitive markets, such as in New South Wales are unregulated and typically left as 'unclassified' services by the AER. For example, in New South Wales, almost all connection services are contestable and provided by accredited service providers (ASP) that are engaged and paid by a connection applicant, ie, the customer pays the ASP directly, upfront and in full for the incremental cost of connection.

We explain in section 4.2.3 that the ability of a distributor to price a connection charge below the incremental cost of connection, such as by offsetting future years of distribution revenue, could not be matched by third party providers and would therefore present a material barrier to competition, without some offsetting adjustment mechanism.

Similarly, the full cost of a connection service that is classified as an alternative control services is recovered from an access seeker, typically upfront, eg, the incremental cost revenue test does not apply to connection services that are classified as 'alternative control'.

It follows that there are a range of instances in which the cost of connection is, or may be, recovered upfront in its entirety from the access seeker.

In contrast, the Authority incorrectly summarises the methodology applied in Australia as:[87]

> Connectors pay incremental cost net of incremental revenue.

The incremental cost revenue test in Australia is only applied to those connection services provided by a particular distributor that are classified as a standard control service, as summarised in the discussion that follows and described in more detail in appendix A.2.

[85] AER, *Draft Decision Energex Electricity Distribution Determination 2025 to 2030 (1 July 2025 to 30 June 2030) Attachment 13 Classification of services September 2024*, pp 13-14. See Standard connection services – premises connections and Standard connection services – network extension.

[86] Consultation paper, paras 5.4(a) and 6.2(b).

[87] Consultation paper, para 6.4, table 6.1.

6.3 Limitations of incremental cost revenue test

The Authority's assessment of the Australian landscape suggests that the cost revenue test is near-ubiquitous in Australia. However, it is only adopted in the NEM and only applied to those connection services offered by a particular distributor that are classified as standard control services, subject to certain exclusions.

The cost revenue test does not apply to connection services that are:

- 'unclassified', eg, almost all connection services in New South Wales;
- classified as 'alternative control', eg, typically where it is reasonable to expect that the asset won't be used by other customers; or
- for a network augmentation: [88]
  - required by a basic connection service that is classified as a 'standard control service'; or
  - where a relevant threshold set out in the distributor's connection policy is not exceeded, with this threshold being based on a measure of demand and fixed for the duration of the regulatory control period.

The latter two exclusions reflect that one of the overarching principles is to exclude deep system augmentation charges from connection charges for retail customers.[89]

Not applying the incremental cost revenue test to 'unclassified' connection services reflects the principle in the national electricity rules that the AER's guideline for connection policies should ensure that connection charges are competitively neutral, eg, for the reasons explained in section 4.2.3.[90]

The AER determined that its service classification process will result in connection charges that comply with the principles in the rules for connection services classified as alternative control, negotiated or unclassified.[91]

In contrast, it determined that a cost-revenue test should be applied to the components of connection services classified as standard control services because:[92]

> …standard control services, which are generally recovered through an average charge on electricity usage, do not always meet the principles of chapter 5A. In particular, they lack user pays signals with respect to the costs of the specific connection services required by connection applicants and may result in cross subsidisations of that connection applicant. The cost-revenue test is required to determine whether an additional upfront capital contribution is required in order to improve user pays signals and reduce the level of cross-subsidies between customers.

That is, the original purpose of the cost-revenue test was to introduce greater cost-reflectivity in connection charging, and to encourage capital contributions on some occasions so as to address inefficiently low connection charges.

[88] National Electricity rules, clause 5A.E.1.

[89] For the purposes of this principle a retail customer excludes a non-registered distributed energy resource (DER) provider, a real estate developer, a registered participant or an intending participant. See NER, cl 5A.E.1(b).

[90] National Electricity rules, clause 5A.E.3(b).

[91] AER, *Connection charge guidelines for electricity customers,* October 2024, p 8.

[92] AER, *Connection charge guidelines for electricity customers,* October 2024, p 7.

6.4 Mitigating risk for existing customers

In recognition that application of the incremental cost revenue test defers the recovery of the incremental cost of connection over a period of up to 30 years, the AER permits prepayments or financial guarantees to be sought from the access seeker.

For example, upon establishing its framework, the AER explained that:[93]

> Securities fees, whether by prepayment or financial guarantee, help to insure DNSPs against the risk of failing to collect the total estimated incremental revenue associated with a connection offer. In the absence of a security scheme, if the DNSP does not collect the total estimated incremental revenue, then the shortfall would eventually be recovered through higher network tariffs to all other network users.

In contrast, the Authority acknowledges neither the role of financial guarantees in Australia nor the significant risk for existing customers that is likely to arise from its proposed version of the incremental cost revenue test, as discussed in section 4.2.2.[94]

In particular, the Authority's proposed deduction of expected distribution revenue over a period of up to 30 years in the calculation of connection charges exposes existing customers to significant risks, particularly in the context of risky new investments associated with decarbonisation, support for which appears to be a key objective of the proposed regulatory intervention, as discussed in section 3.3.3.

[93] AER, *Connection charge guidelines for electricity retail customers*, Final decision, 20 June 2012, p 61.

[94] Consultation paper, para 7.59.

7. Alternative reform options

In this section we describe alternative reform options that could better address the concerns that underpin the Authority's proposed reforms.

7.1 Support electrification projects through distribution tariffs

In section 3.3 we observe that a key underlying driver of the Authority's reform appears to be supporting the commercial viability of large-scale electrification projects, which it suggests are not proceeding at the rate it deems efficient because connection charges are 'too high' and because such projects are 'sensitive to the total cost of electricity.[95]

The Authority's proposed reforms support the commercial viability of electrification projects by reducing the up-front component of their total network cost, ie, connection charges, rather than the ongoing distribution tariffs they face over the life of their connection.

However, its proposed reforms at the same time:

- transfer material risk from new electrification projects to existing customers, as discussed in section 4.2.2;
- provide support to all new connections, not just large-scale electrification projects, in the form of lower up-front costs; and
- create inequities between existing and new customers.

These shortcomings are not necessary features of the provision of support to electrification projects.

In our opinion, the provision of support to electrification projects through targeted, lower ongoing distribution tariffs is a materially preferable alternative. It would:

- support the commercial viability of electrification projects through lowering the total network cost of its operations – and if a project is commercial, there is no reason to expect that it would have problems raising capital to cover its upfront costs;
- ensure that the risk of new electrification projects lies with the party that is best placed to assess and manage that risk, ie, the connecting party;
- constrain the provision of support (from other customers) to those connecting customers that need it in the eyes of the Authority and/or distributor; and
- avoid inequities between the remainder of customers.

Importantly, a reform of this nature would facilitate transparent engagement with the community on the need for and extent of support that customers are willing to provide to electrification projects.

Finally, we note also that the discussion of this alternative is predicated on an assumption that a proper assessment of the current arrangements establishes that the provision of support for electrification projects is economically beneficial and promotes the Authority's statutory objective.

[95] Consultation paper, para 5.4(c)

7.2 Promote competition

If the Authority's objective is to promote competition in the provision of connection services, in line with its statutory objective, it would be best served by options that place distributors and third party providers on an equal footing when bidding for connection projects.

This could be most simply achieved by requiring distributors to recover the cost of contestable connection services (which might exclude certain services, eg, shared network augmentations) upfront in their entirety, consistent with the framework for contestable connection services in New South Wales.

Of particular relevance to the Authority's problem definition, promoting competition in the provision of connection services would address its concern that distributors face a lack of incentives to constrain connection costs to efficient costs only.[96] Specifically, competition would promote price and risk allocations between customers and connection providers that are in line with the outcomes of a workably competitive market.

7.3 Improve economic efficiency

One theme of the Authority's problem definition is the potential for the regulatory framework for distribution services to not provide appropriate incentives for distributors to facilitate efficient connections.

If this concern were to be substantiated, regulatory best practice would be to amend those elements of the regulatory framework from which the distortion or lack of incentives arise.

For instance, to the extent the Authority's proposed reforms are targeted at counteracting an outworking of an incentive mechanism administered by the Commerce Commission, it would be better simply to amend that mechanism, acknowledging that this onus would fall to the Commission, rather than the Authority. For example, this could likely be achieved through modest amendments that ensure net capital expenditure is unaffected by increases in connection charges.[97]

In contrast, the Authority's proposal seeks to counteract a proposed outworking of the regulatory framework administered by the Commerce Commission by amending an entirely different element of the regulatory framework, which introduces its own range of shortcomings, as discussed in section 4.

Another problem raised by the Authority is the lack of incentive for distributors to offer innovative connection services, such as flexible connections, which would promote dynamic efficiency. To the extent that there are economic benefits that connection applicants may draw from innovative connection offers, these benefits are more likely to be captured by harnessing the power of economic incentives than by mandating certain offers. Again, the consideration and design of such incentives is likely to fall within the power of the Commerce Commission, since the provision of such incentives would require changes to distributors' building block revenues.

[96] Consultation paper, para 5.4(c)(iii).

[97] Consultation paper, para 5.4(c)(i).

A1. Economic assessment of fast-track proposals

This appendix provides an overview and economic assessment of the Authority's fast-track proposals (to the extent that we have not covered them in section 5). We assess the fast-track proposals through the lens of the key economic principles set out in section 2, ie:

- allocative efficiency;
- productive efficiency; and
- dynamic efficiency.

We explain in section 3.1 that promoting these economic principles is part of the Authority's statutory objective along with promoting competition.[98]

The Authority's fast-track proposal, as set out in its proposed Code amendment, comprises:[99]

- **a capital contributions reliance limit for load**: the placing of an upper bound on each distributor's total annual connection charges, expressed as a percentage of annual capital expenditure on connections and system growth, that is equal to the higher of:[100]
  - the sector-wide average in recent years, ie, 47 per cent. and
  - the percentage that applied to the relevant distributor in 2024;
- **connection charge reconciliation requirements**: distributors are required to prepare a breakdown of future connection charges into incremental costs and shared network costs, to be provided to a customer upon request and used by the Authority for monitoring purposes;[101]
- **connection enhancement cost requirements**: introduction of the minimum scheme concept – being the least cost solution to provide an acceptable service level to the customer – as the default benchmark for connection charges, with distributors having the option to use published connection rates as an alternative;[102]
- **unit rates for capacity upgrades**: the requirement that any shared network capacity upgrade costs included in connection charges must be based on published per unit rates;[103]
- **pioneer schemes**: the implementation of a pioneer scheme for network extensions;[104] and
- **dispute resolution**: recourse to dispute resolution under part 6 of the Code in circumstances where a distributor and a connection applicant cannot find agreement in relation to connection issues.[105]

The capital contributions reliance limit for load and the connection charge reconciliation requirements are described in more detail at section 5 of this report. The remaining aspects of the Authority's fast-track proposals are described below, along with their implications for efficiency.

[98] We do not consider that any of the fast-track reforms are likely to have a material effect on competition.

[99] Proposed Code amendment, s 6B.3(2).

[100] Proposed Code amendment, s 6B.7.

[101] Proposed Code amendment, s 6B.12.

[102] Proposed Code amendment, s 6B.4.

[103] Proposed Code amendment, s 6B.6.

[104] Proposed Code amendment, s 6B.8.

[105] Proposed Code amendment, ss 6B.14 and 6B.15.

A1.1 Connection enhancement cost requirements

Authority's proposal

The Authority's proposed Code amendment defines the concept of a 'minimum scheme', as:[106]

> …the least-cost solution for any connection works provided by a distributor, including for security and firmness of capacity, in accordance with good electricity industry practice or a lower standard if agreed to in writing between the connection applicant and the distributor.

The Authority's proposed Code amendment employs this minimum scheme as a baseline on which a distributor must determine connection charges. The costs of improvements made to the minimum scheme:[107]

- must be allocated to the connection applicant only where these improvements are requested and agreed by the connection applicant; and
- otherwise, must not be allocated to the connection applicant.

The distributor may use posted connection charges, instead of calculating costs under the minimum scheme, where the connection is of the type and meets the requirements specified by the distributor for the posted connection charge.[108]

If a distributor publishes per unit costs for network extensions, then it must use those rates to determine the costs under a relevant minimum scheme or for any customer selected enhancements for relevant network extension works.[109]

The Authority also introduces the concept of a minimum flexible scheme, which is an alternative solution that relies on load control to deliver reduced security or firmness of supply (ie, a flexible connection) at a lower cost than the minimum scheme. Connections must be priced according to a minimum flexible scheme if this requested by the customer and if it is feasible for the distributor to do so.[110]

Implications for efficiency

In principle, pricing connections based on the least cost technically feasible design (ie, the minimum scheme) would lead to an allocatively efficient outcome. This must be weighed up against the cost of working out the appropriate minimum scheme charge for each individual connection.

Posted rates may reduce the resource cost and time associated with processing connection applications because the need to re-cost the minimum scheme for every connection is avoided. However, posted rates may mean that not every individual connection is priced at least cost.

Enabling distributors to apply published rates when the distributor considers it would be cost minimising to do so, and requiring the minimum scheme in other instances (as per the Authority's proposal) appears to provide an appropriate balance between these competing considerations (ie, the respective advantages and disadvantages of the minimum scheme and posted rates).

Published connection and extension rates also provide incentives for productive and dynamic efficiencies, whereby distributors will look to provide the same level of service at a lower cost wherever possible.

The requirement to develop a minimum flexible scheme where feasible and requested by a connection application may also encourage innovation and thereby promote dynamic efficiency. However, the resource

[106] Proposed Code amendment, s 1.1(1), definition of 'minimum scheme'.

[107] Proposed Code amendment, s 6B.4(1).

[108] Proposed Code amendment, s 6B.4(4).

[109] Proposed Code amendment, s 6B.5.

[110] Proposed Code amendment, s1.1(1), definition of 'minimum flexi scheme'; and Consultation paper, para 7.6 (b).

costs of designing and costing a minimum flexible scheme must be considered. Where a distributor can identify clear cost savings, then a minimum flexible scheme has the potential to deliver efficiency benefits that outweigh the costs of its design.

A1.2 Capacity costing requirements

Authority's proposal

The Authority proposes that, if a distributor intends to charge a connection applicant for the cost of expanding capacity on its shared network, then these charges must reflect posted per unit capacity rates across five tiers of its network, being:[111]

- sub-transmission lines;
- zone substations;
- high voltage feeders;
- distribution substation; and
- low voltage mains.

Posted capacity rates for a given network tier may vary across a distributor's service area, with each distinct region known as a 'network costing zone'.[112]

The posted capacity rate must be the average cost per capacity for an upgrade for a given network tier and network costing zone, and may be set to zero if there is no foreseeable need for such an upgrade.[113]

However, the distributor can set charges based on its estimated costs, rather than posted capacity rates, if:

- the capacity sought by the connection applicant exceeds 80 per cent of the upgrade used to determine the posted capacity rate;[114] or
- the estimated cost per unit exceeds 150 per cent of the posted capacity rate.[115]

Implications for efficiency

The proposed capacity costing reforms mean that all new connections must pay the average per unit cost of a network upgrade for the units of capacity that their connection needs. This means that network capacity charges for a new connection are independent of whether that connection triggers the need for any upgrade to the capacity of the shared network.[116]

The purpose of this reform is to remove any 'position-in-queue' dynamics, whereby otherwise similar connection applicants face different charges due to their position in the queue of connecting applicants. This is also referred to as a 'first-mover disadvantage'. In this case, the connection that triggers the need for a network upgrade faces a higher cost than earlier or later connections and thereby be deterred from connecting. This can lead to connection applicants attempting to manipulate when or whether they connect to avoid larger connection charges. These dynamics could occur under a project-based approach, whereby connection applicants are charged the costs triggered by their connection.

[111] Proposed Code amendment, s 6B.6(1)(a) and s 1.1(1), definitions of 'network tier' and 'network capacity cost'.
[112] Proposed Code amendment, s 1.1(1), definition of 'network costing zone'.
[113] Proposed Code amendment, s 1.1(1), definition of 'posted capacity rate'.
[114] Proposed Code amendment, s 6B.6(2) and s 1.1(1), definition of 'nominal capacity increment'.
[115] Proposed Code amendment, s 6B.6(3).
[116] Consultation paper, para 7.20.

The Authority's proposed reform is likely to increase horizontal equity as between connection applicants with similar characteristics, by enforcing uniform charges.

There are competing considerations relating to allocative efficiency in this context.

The proposal may reduce allocative efficiency because it is efficient to signal the cost of connecting any given customer to the network – this is known as cost reflective pricing. This is efficient because the party making the economic decision that triggers the costs is forced to factor those costs into its decision (ie, to respond to price signals). Cost reflective pricing may enable a customer to make an efficient decision not to connect or to connect elsewhere if it avoids the need for expensive network upgrades. Further, some marginal customers who do not trigger the need for a network upgrade may be deterred from connecting if they are charged a per unit network capacity rate for costs that their connection does not trigger.

On the other hand, if a group of customers would all be willing to connect where they share the cost of a network capacity upgrade, but no individual customer would be willing to pay for a substantial share of the upgrade, then this proposal could promote allocative efficiency by enabling that group of customers to connect at a price that is, in aggregate, between the efficient pricing bounds.

Therefore, the overall impact of this proposed reform on efficiency is unclear. In this context, distributors may be best placed to determine the most efficient approach for different parts of their network, based on the types of customers expected to connect. The proposed threshold tests for setting capacity charges based on estimated costs provide an element of flexibility in some circumstances.

Pioneer schemes (discussed in more detail in appendix A1.5 below) present an alternative approach to the position-in-queue and first mover disadvantage issue. Pioneer schemes create different allocations of risk relative to posted per unit rates. This is observed by CEPA who explain that:[117]

> Under the pioneer scheme proposal, the first connecting customer is charged the full cost of the upgrade, but receives a rebate from any subsequent connecting customers which share the same assets. This reduces the first-mover disadvantage but still exposes the first connecting customer to some risk (the risk that subsequent connecting parties will not show up). An alternative approach is to charge each connecting customer just the average incremental cost of connection (reflected in 'unitised rates'). Under this approach the risk that subsequent connecting parties will not show up is socialised to all customers.

It is important to note that under a pioneer scheme, risks associated with the first mover disadvantage are borne by the party making the decision (the prospective 'first mover') whereas under the posted unit rate approach, those risks are transferred to the customer base of the distributor. Therefore, trade-offs exist with respect to efficiency when considering these alternative policy options.

A pioneer scheme may create a price signal that is closer to the true cost of connection, because the party making the economic decision bears the risk that no other customers will subsequently use these assets,. However, the first mover disadvantage and any associated inefficiencies may persist under this approach, albeit to a lesser extent than without a pioneer scheme. We note that in principle the pioneer scheme approach to extension costs described below could also be applied to capacity costs.

A1.3 Pioneer scheme

Authority's proposal

A pioneer scheme is a framework by which customers who make capital contributions towards connection assets may receive rebates for some part of these costs where subsequent connections also utilise these assets.

[117] CEPA report, p 19.

The Authority proposes that every distributor must establish a pioneer scheme policy by 1 April 2026.[118]

A pioneer scheme must apply to connection works amounting to more than $30,000 (in December 2025 dollar terms), the cost of which is met by a connection applicant who does not opt out of applying a pioneer scheme.[119] A scheme may have more than one pioneer, with subsequent pioneers being those who contribute more than $10,000 (in December 2025 dollar terms) to the scheme.[120]

Each distributor must set out pricing methodologies for every pioneer scheme that specify how it will:[121]

- administer and collect contributions to the scheme; and
- determine eligibility for, and the amount of, rebates to pioneers under the scheme.

Contributions to the pioneer scheme must be determined on the basis of actual costs, or estimated costs if these are not known. Subsequently, the distributor must depreciate these contributions on a straight-line basis over a period of 20 years.[122]

From the time that any other party connects to the scheme, the distributor must apply a rebate to apply to connection charges to the original pioneer under the scheme.[123] Rebates due to a pioneer under a pioneer scheme must be calculated so as to be proportionate to the extent that each pioneer has met the costs of connection works covered by the scheme.[124]

Implications for efficiency

A number of the allocative efficiency implications for pioneer schemes are covered by the discussion on implications for efficiency in appendix A1.4 above.

A pioneer scheme has the potential to reduce the 'free-rider' problem that may otherwise deter efficient connections. Under a pioneer scheme, the first connecting party (or 'pioneer') pays for the incremental cost of the connection assets but is aware that future new connections (if they subsequently use these assets) would be required to contribute to the cost of the assets. This removes a source of competitive disadvantage that the pioneer may have relative to future connections, and so may avoid some situations where that potential pioneer is deterred from connecting to the network.

The Authority's proposal may in effect require distributors to develop new pioneer schemes for each new dedicated connection asset on its network. The costs of developing these pioneer schemes, particularly for smaller distributors, should be considered alongside the potential efficiency gains. In some cases, a single template pioneer scheme developed by the policymaker could reduce administrative costs without significantly compromising the potential efficiency gains from pioneer schemes.

A1.4 Dispute resolution

Authority's proposal

The Authority proposes to extend existing dispute resolution procedures applicable to connecting generators to also apply to connections applicants who are load customers.[125]

[118] Proposed Code amendment, s 6B.8(1).
[119] Proposed Code amendment, s 1.1(1), definitions of 'pioneer scheme' and 'pioneering connection works'.
[120] Proposed Code amendment, s 1.1(1), definition of 'pioneer'.
[121] Proposed Code amendment, s 6B.9(3).
[122] Proposed Code amendment, s 6B.10(4)(a)-(b).
[123] Proposed Code amendment, s 6B.10(2)(b).
[124] Proposed Code amendment, s 6B.10(5).
[125] Consultation paper, para 7.119.

There is a distinction between connection applicants that qualify as market participants and those that do not. In the case of market participants, the dispute resolution procedures in the existing Schedule 6.3 of the Code applying to generation connections will apply, including:[126]

- a requirement to seek to resolve issues in good faith; and
- the option for the Authority to make a determination on connection charges applying pricing methodologies.

In the case of connection applicants who are not participants, the dispute resolution process set out in the Electricity Industry (Enforcement) Regulations 2010 will apply, along with a requirement on distributors to Act on good faith.[127] The Authority considers that this process is 'generally similar' to that which applies to participants, though there is not the option for the Authority to make a determination on connection charges in respect of non-participants.[128]

Implications for efficiency

A dispute resolution mechanism is likely to be necessary in order to give effect to the other fast-track proposals that the Authority has put forward.

We concur with CEPA's view that 'the dispute resolution mechanism should be able to tailor its efforts to the value of the issues in dispute'.[129] For example, mechanisms for smaller customers should be targeted to achieving timely outcomes, whereas for larger customers more extensive allocation of resources to dispute resolution may be desirable.

[126] Proposed Code amendment, s 6B.14; and Consultation paper, para 7.119.

[127] Proposed Code amendment, s 6B.15.

[128] Consultation paper, para 7.122.

[129] CEPA report, p 24.

A2. Connection pricing in the Australian National Electricity Market

A2.1 Classification of services

The classification of services is an important aspect of the regulatory framework that applies to distributors in the NEM since it determines the scope of regulation, the form of any control mechanism and the customers from which the cost of a particular service will be recovered.

In general terms, the network services provided by distributors can be classified into two broad categories:

- regulated services, being those services that distributors provide into markets not characterised by effective competition, and that therefore require some form of regulation to restrain the exercise of market power; and
- non-regulated services, being those services provided by distributors on a contestable basis, ie, into markets characterised by effective competition, and that therefore do not require regulation.

Regulated distribution services can be classified into two broad categories. These are:[130]

- direct control services, being those distribution services for which the Australian Energy Regulator (AER) determines a prescriptive approach to regulation is required – this may involve the AER directly setting the prices that distributors charge to customers or setting the revenues that distributors may recover from customers; and
- negotiated services, being those distribution services provided by distributors where the AER determines a less prescriptive approach can be taken, since all parties have sufficient market power to negotiate the provision of those services – these negotiations are undertaken in accordance with a framework established by the National Electricity Rules (NER), where the AER is available to arbitrate as required.

In determining whether to classify a service as either a direct control service or a negotiated service, the AER must have regard to the form of regulation factors, the form of regulation that previously applied to the relevant service, the desirability of consistency in the form of regulation of similar services and any other relevant factor.[131]

The form of regulation factors outline the circumstances where the market for a particular service may not operate efficiently. The AER generally should not classify a service as regulated where it is provided in a workably competitive market.

Direct control services are further classified by the AER into two subclasses, namely:[132]

- standard control services, which are direct control services provided by distributors for the benefit of all distribution network customers – the cost incurred in providing standard control services may be recovered from all customers; and
- alternative control services, which are direct control services provided by distributors that are either dedicated to, or requested by, a small number of distribution network users – the costs incurred in providing alternative control services may be directly recovered from those users.

The AER applies this framework to connection services by reference to three principal types of connection services, ie:[133]

[130] NER, cl 6.2.1.

[131] NER, cl 6.2.1(c).

[132] NER, cl 6.2.2(a).

[133] AER, *Electricity distribution service classification guideline,* August 2022, p 15.

- basic connections, being a simple connection of a customer to the network which involves no or minimal extension or augmentation;
- standard connections, being a connection to the network that is not a basic connection and may involve extension and/or augmentation; and
- negotiated connections, being connections that meet specific requirements of a customer and the distributor and may involve network extension or augmentation.

The different components of connections, ie, premises assets, extensions and augmentation are considered as cost components of these connection services.[134] However, the AER acknowledges that, under certain circumstances, these components may receive a different classification, or not be classified at all.[135] This reflects the various factors that the AER has regard to in assessing whether connection costs are attributable to a specific customer or all network customers. These include:[136]

- the extent to which a connection is contestable and may therefore be performed by an entity other than the distributor (noting that contestability is a jurisdictional prerogative);
- the specific nature (size and location) of a connection for a particular customer or group of customers; and
- operational and other jurisdiction specific requirements.

A2.2 Cost-revenue test only applies to standard control services

Chapter 5A of the NER and accompanying guidelines developed and published by the AER set out the principles that govern connection pricing in the NEM. One of the overarching principles is to exclude deep system augmentation charges for retail customers in their connection charges.[137] This principle is implemented through the requirement that a retail customer who applies for a connection service for which an augmentation is required cannot be required to make a capital contribution towards the cost of the augmentation (insofar as it involves more than an extension) if:[138]

- the application is for a basic connection service; or
- a relevant threshold set out in the distributor's connection policy is not exceeded, with this threshold being based on a measure of demand and fixed for the duration of the regulatory control period.[139]

Outside of this overarching prohibition, distributors in the NEM are able to incorporate a reasonable capital contribution towards the cost of the augmentation necessary to provide the connection service as part of its pricing.[140] The precise nature of these pricing arrangements is governed by the AER's guidelines, which were developed to ensure connection charges: [141]

- are reasonable, taking into account the efficient costs of providing the connection services arising from the new connection or connection alterations and the revenue a prudent operator in the circumstances of the relevant distributor would require to provide those connection services;
- provide, without undue administrative cost, a user-pays signal to reflect the efficient cost of providing connection services;

[134] AER, *Electricity distribution service classification guideline,* August 2022, p 15.

[135] AER, *Electricity distribution service classification guideline,* August 2022, p 15.

[136] AER, *Electricity distribution service classification guideline,* August 2022, p 14.

[137] For the purposes of this principle a retail customer excludes a non-registered distributed energy resource (DER) provider, a real estate developer, a registered participant or an intending participant. See NER, cl 5A.E.1(b).

[138] NER, cl 5A.E.1(b)(1)-(2).

[139] AER, *Connection charge guidelines for electricity customers,* October 2024, p 4.

[140] NER, cl 5A.E.1(c).

[141] NER, cl 5A.E.3(b).

- limit cross-subsidisation of connection costs between different classes (or subclasses) of retail customer; and
- if the connection services are contestable – are competitively neutral.

In applying these principles to develop the guidelines, the AER drew heavily on the service classification framework set out in the NER. In particular, the AER examined whether the service classification process and the associated form of regulation would lead to pricing outcomes consistent with the above principles.

By way of example, the AER determined that a cost-revenue test should only be applied to the components of connection services classified as standard control services. The AER explained that:[142]

> …The AER considers that standard control services, which are generally recovered through an average charge on electricity usage, do not always meet the principles of chapter 5A. In particular, they lack user pays signals with respect to the costs of the specific connection services required by connection applicants and may result in cross subsidisations of that connection applicant. The cost-revenue test is required to determine whether an additional upfront capital contribution is required in order to improve user pays signals and reduce the level of cross-subsidies between customers.

In contrast, the AER found in relation to connection services classified as alternative control, negotiated or unclassified, that:[143]

> …the service classification process will result in connection charges meeting the principles of Chapter 5A. Unlike standard control services, the AER does not consider a cost-revenue-test need be applied to these services.

[142] AER, *Connection charge guidelines for electricity customers,* October 2024, p 7.

[143] AER, *Connection charge guidelines for electricity customers,* October 2024, p 8.

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