Economic review of problem definition

A report for Vector

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1. Introduction

This report has been prepared by Axiom Economics (Axiom) on behalf of Vector. Its subject is the analysis of connection pricing contained in the Electricity Authority's (Authority's) *Distribution connection pricing proposed Code amendment, Consultation paper*.[1] Specifically, we have been asked by Vector to provide our thoughts on question 2 in the Consultation paper; namely: "do you agree with the problem statement for connection pricing?"

The Authority's problem statement spans approximately three pages[2] and describes the shortcomings it claims to have identified with the existing connection charging arrangements. It is supported by a more detailed report prepared by CEPA.[3] The Authority highlights a variety of perceived deficiencies with the existing regulatory pricing and revenue cap arrangements. However, by way of broad summary, it appears to be concerned primarily that:[4]

The Authority has proposed major reforms. It is therefore important to ensure they are based on a sound problem definition.

- Under the Part 4 price paths,[5] electricity distribution businesses (EDBs) have an incentive to take advantage of their 'market power' by charging too much for connections and demanding payment upfront via capital contributions.
- Connection charges can be inefficient. Sometimes this is said to be because prices are 'too low' but, plainly, the Authority's more pressing concern is that they are more frequently 'too high' and have been increasing over time.
- Those prices are thought to be causing connection rates to be 'too low', with new customers being prevented from connecting when it would be efficient for them to do so. This is claimed to be hampering electrification.

On the basis of this problem definition and the supporting analysis, the Authority has proposed a package of fast-track measures that it plans to implement in the near-term. It has also foreshadowed a collection of more extensive reforms it may look to introduce subsequently. The fast-track proposals alone represent major reforms that would be highly disruptive for EDBs. It is consequently important to ensure they are predicated on a sound problem definition.

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1 Electricity Authority, *Distribution connection pricing proposed Code amendment, Consultation paper,* 25 October 2024 (available: here; hereafter: 'Consultation paper'). The preceding paper in the consultation was: Electricity Authority, *Distribution Pricing Reform: Next steps*, 7 May 2024, pp.10-29 (available: here; hereafter: 'Next steps document').

2 Consultation paper, pp.26-29.

3 CEPA, *Regulation of distribution connection charges in New Zealand, New Zealand Electricity Authority*, 14 October 2024 (available: here; hereafter: 'CEPA report').

4 For the avoidance of doubt, this does not represent an exhaustive account of all the potential issues raised in the Consultation paper and the accompanying CEPA report.

5 The price-quality path regime is contained in Part 4 of the *Commerce Act 1986*. The default (and customised) price-quality paths are regulatory mechanisms set by the Commerce Commission that apply to (amongst others) electricity distribution businesses (EDBs). The regime determines the maximum revenues that businesses may earn whilst maintaining specified quality standards.

1.1 Robust solutions require robust problem definition

Effective regulatory policy reform begins with a clear and robust problem definition. Without a coherent understanding of the issue at hand, a regulator is unlikely to develop solutions that enhance consumer welfare. In fact, poor problem definition can inadvertently lead to reforms that harm overall welfare, despite a regulator's best intentions. For example, an inadequate or incomplete problem statement may lead a regulator to:[6]

Inadequate problem definition can lead to poor regulatory decisions that harm consumers.

- Intervene when there may in fact be no problem to address, or where the magnitude of the issue at the hand does not warrant the recommended solution, i.e., the regulator may intervene when it is neither necessary nor appropriate.
- Diagnose the *wrong* policy option, i.e., it could be that there *is* a significant problem, but because it has not been defined or assessed clearly and succinctly the regulator may mistakenly recommend a sub-optimal reform option.
- Intervene when others are better placed to do so, e.g., inadequate problem definition and analysis may cause a regulator to miss the fact that other entities may have superior options at their disposal.

An opaque or misguided problem definition can also serve to compromise the policy consultation *process*. Affected parties may be forced to expend more time, money and internal resources than necessary engaging.[7] This may detract from other important work they could be doing instead. In the case of EDBs, time spent unnecessarily engaging in prolonged regulatory processes could detract from crucial efforts to facilitate electrification.

1.2 The problem statement is flawed

The Authority has clearly invested significant time and effort into identifying and articulating the perceived issues with the current connection charging frameworks. Unfortunately, those endeavours notwithstanding, it appears to have fallen into several of the common pitfalls described above – perhaps even all of them. For example, our review has identified the following weaknesses with the Authority's problem statement:

6 An opaque or misguided problem definition can also serve to compromise the policy consultation *process*. Affected parties may be forced to expend more time, money and internal resources than necessary engaging. This inevitably detracts from other important work they could be doing instead. In the case of EDBs, time spent unnecessarily engaging in prolonged regulatory processes may detract from efforts to facilitate electrification.

7 The Authority's transmission pricing methodology (TPM) review provides a sobering illustration of what can happen when insufficient attention is paid to the initial problem definition. Opinions differ on whether the TPM review ultimately culminated in a welfare-enhancing reforms. Yet few would dispute that the review itself was needlessly prolonged and complicated by an inadequate initial problem specification – at considerable cost.

There are several significant shortcomings in the problem definition.

- The analysis is purely theoretical, with no empirical evidence provided to substantiate the claim that connection rates are being constrained to inefficiently low levels. Furthermore, many of the alleged 'incentive' problems seem to overlook the practical realities of how connections are actually carried out, suggesting that these issues may be largely illusory, in practice.
- Even if connection rates are being unduly constrained by the incentive properties of the Part 4 framework, it is unclear why radical pricing reforms would be the optimal solution. A more effective approach might involve the Commerce Commission addressing any underlying issues within the price-quality path framework, provided these issues are genuinely pressing.
- The proposal to base charges on net incremental cost[8] does not recognise the vital distinction between revenue received up-front via connection charges (with certitude) and revenue earned subsequently via usage charges (without certainty[9]). The Authority has therefore mischaracterised this supposed underlying problem and arrived at a 'solution' that is, at best, incomplete.

It has not been established that there are substantial problems that would be best addressed via the proposed reforms.

- Even if one hypothetically accepts that connection charges are inefficient and that the Authority's proposed pricing revisions would address this, the purpose of the proposed 'reliance limit' remains unclear. If capital contributions are efficiently costed/priced, the resulting aggregate levels should also be efficient—or at least not problematic.

Consequently, we believe it has not been demonstrated that there are significant issues with the status quo that warrant the Authority's proposed reforms. To be clear, we are not claiming that the status quo is without flaws or that other proposals or parties could not bring about improvements.[10] Rather, we are simply saying that the problem statement does not provide a sufficiently robust foundation for the *current* proposals.

1.3 Structure of this report

We elaborate in the remainder of this report, which is structured as follows:

- **section two** explores the supposedly problematic incentives created by the current structure of the Part 4 price paths;
- **section three** explains why it is not self-evidently problematic for EDBs to be requiring higher up-front capital contributions;
- **section four** describes why is has not been shown that connection charges exceed an efficient level and discusses the treatment of incremental revenue;

8 Initially this would be via a 'reconciliation requirement', but this is intended only to be a stepping stone towards a 'full reform' where formal requirements would be introduced compelling the application of such a methodology.

9 A connecting customer might disconnect/exit at any time. Hence, there is no guarantee that 'usage' revenues will be ongoing, all other things being equal.

10 We have not examined that issue and express no opinion on it. We have simply considered whether *the Authority* has identified any significant shortcomings.

- **section five** demonstrates why the proposed reliability limit does not serve any obvious efficiency-enhancing purpose, i.e., it does not address a problem; and
- **section six** addresses several other matters raised in the Consultation paper, including 'first mover' and 'last straw' issues, and inconsistencies across EDBs.

For the avoidance of doubt, the opinions expressed throughout this report are our own and do not necessarily reflect the views of Vector.

2. The level of connection costs

The Authority suggests that the existing Part 4 regime, as administered by the Commission, creates several undesirable incentives. Specifically, it claims that EDBs hold 'market power' due to their control over network access, potentially allowing them to charge excessive prices for connections. Additionally, the Authority suggests that EDBs may exploit their connection pricing to shift expenditure in or out of their regulated asset bases, effectively 'gaming' the Commission's framework.

While these concerns may have some theoretical foundation, little attention has been given to their practical feasibility. The reality of connecting thousands of customers annually (as is the case for many EDBs) may render such strategies impractical. Notably, no evidence or case studies have been provided to substantiate fears of overbuilding or gold plating. Furthermore, even if these incentive issues were valid, it does not necessarily follow that radical pricing reform by the Authority is the appropriate or proportionate solution.

2.1 Distributors are largely facilitators

It is true that the capital expenditure associated with connection costs is not subject to forensic scrutiny by the Commission. It is also undoubtedly the case that EDBs have market power in the provision of connection services on account of their natural monopoly positions. The Authority and CEPA have each suggested that these factors mean EDBs may not have sufficient motivation to keep a tight rein on connection costs, and may have incentives to over-provide connection assets, i.e., to build assets that are bigger than necessary. However, those concerns may be overstated – or largely illusory – in reality.

Distributors largely pass on connection costs that have been incurred by other parties.

We have been advised that for most connections an EDB is largely a facilitator that outsources a large proportion (or all) of the process to third parties. The work itself (e.g., the trenching, construction of connection assets, traffic management, etc.) is typically performed by contractors who specialise in such tasks. Those parties will then bill the EDB who simply passes-on those charges to the customer. In doing so, the EDB may apply a margin to cover any administrative costs that it incurs performing this facilitatory role. In other words, connection charges are often little more than a 'pass-through' of costs incurred by other parties.

There is nothing intrinsically problematic about connection costs becoming almost akin to a pass-through cost. Provided there is sufficient competition in the supply of connection services and EDBs are not adding unreasonable margins (i.e., well in excess of the underlying administrative costs) the resulting connection charges will reflect appropriately the underlying cost of supplying them. In any event, if there *was* a problem with a lack of competition in the downstream market, the solution would not lie in reforming distribution connection pricing.[11]

[11] Specifically, the problem would lie in the downstream market for the supply of connection services, i.e., in the apparent lack of rivalry.

Many costs are determined by external factors beyond the control of contractors or distributors.

As a more general point, many of the more significant costs of connection that add to the 'final bill' are determined exogenously by factors largely outside the control of the parties performing the works. For example, many of the more onerous health and safety requirements (e.g., traffic management rules) are imposed by local councils and unavoidable. It is also worth mentioning that EDBs may offer connecting parties the option of making many of the connection arrangements themselves if they believe they can get better deals.[12]

As we explain subsequently (in section 6), the additional observations the Authority and CEPA have made in relation to 'first mover' and 'last straw' issues ('overbuild') may have some validity and may warrant some attention. However, addressing those narrower issues – assuming they are significant in practice – does not appear to require radical reforms of the entire pricing framework. More generally, those issues aside, it is not obvious that EDBs are exercising their market power and earning super-normal returns by inflating connection costs.[13]

2.2 Incentives to shift expenditures are purely theoretical

Under the Part 4 regime, a price path is set that assumes a forecast volume of connections and a certain level of capital contributions. Any outperformance *vis-à-vis* these benchmarks results in a financial reward via the IRIS mechanism.[14] CEPA points out that EDBs may have an incentive to 'game' the existing arrangements. It describes various ways an EDB might be rewarded for reducing its net connection capex (i.e., net of capital contributions) that are neither virtuous nor efficient.[15] For example, it notes that an EDB could theoretically:[16]

Little consideration has been given to whether these incentives are a problem in practice (rather than simply in theory).

- increase the upfront capital contribution (CC) required for each connection above the level assumed in the initial 5-year price-path forecast; and/or
- delay or resist connections where the CC will be smaller than the incremental cost and encourage or speed up connections when the opposite is the case.

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12 For example, we understand that Vector allows customers to facilitate their own trenching works, civil works, reinstatement and laying of duct. It also customarily provides a connecting customer with three quotes when engaging with contractors.

13 To that end, the Commission concluded recently that: "Overall, local lines companies are not collectively making excessive profit because profitability has been generally lower than our estimate of a reasonable return on investment." *See:* Commerce Commission, *Trends in local lines company performance,* 25 June 2024, p.4 (available: here).

14 The 'incremental rolling incentive regime' is a mechanism that allows EDBs to keep the benefits of outperformance relative to benchmarks ('efficiency gains') beyond the end of a regulatory period.

15 CEPA report, p.18.

16 CEPA also points out that if an EDB can reduce the 'average incremental cost' (AIC) of each connection, i.e., reduce the average cost of new connections below the level assumed in the original forecast it will be rewarded (See: CEPA Report, p.18). Of course, this would not be the least bit problematic – quite the opposite, in fact. There is also another possibility that CEPA does not raise in its report. Namely, EDBs might seek to unduly influence or distort the forecasts contained in the 5-year price paths. For instance, EDBs could theoretically try and convince the Commission to adopt a forecast that artificially understates the likely level of CCs. However, this is a foundational issue with *any* forecast and regulators – including the Commission – are well-accustomed to testing the veracity of these price-path inputs.

Each of these 'strategies' is conceivable in *theory*. The question is: how likely is it that an EDB would adopt them in *practice?* For the first strategy to be effective, any change would need to be made *after* the CC forecast had been set and designed to produce an outturn sum *below* the baseline level.[17] Yet neither the Authority nor CEPA have presented any examples of EDBs changing their charging approaches 'after the fact' and/or any estimates of the supposed financial benefits derived from doing so. That is not to say no such case studies exist – they simply have not been presented. Therefore, it has not been established that this is a problem in practice.

Successful implementation of the second strategy would require EDBs to take a highly 'hands-on' approach in either promoting or hindering connections, depending on the magnitudes of the applicable CCs and incremental costs. It is hard to see how such a strategy could work in practice. No EDB is likely to have an explicit policy along the lines of: "accelerate valuable connections and delay the more costly ones." As such, any such practice would need to be informal and unwritten. However, no explanation has been provided as to how this practice would be established and executed.

Indeed, many EDBs may be singularly focused on managing the steady flow of new connection requests, including those from new housing developments. For instance, Vector connects around 15,000 customers annually, largely on a 'first come, first served' basis. Given this, EDBs may lack both the inclination and the capacity to engage in the types of manipulation outlined in the CEPA report. To be clear, this is not to deny that such incentives exist in theory—they do. However, they may not be problematic in practice, considering the practical realities of connecting thousands of customers for many EDBs.

2.3 No clear link between problem and proposed solution

The analysis presented so far highlights the potential disconnect between the theoretical concerns raised in the Consultation paper (and the accompanying CEPA report) and the practical realities of connecting customers. While the Part 4 arrangements may, in theory, allow for various forms of 'gaming' in connection processes, it is far less clear whether EDBs have the inclination or capability to pursue such strategies in practice. But suppose for the sake of argument they do – what then should be done?

If these issues are indeed material, the Commission would seem to be the appropriate party to address them via the Part 4 regime.

The Authority's proposed solution is to fundamentally reform the connection pricing framework. This proposal would have enormous ramifications for the 29 EDBs, all of which would have to spend considerable time and effort modifying their pricing methodologies. In our opinion, this prescription is not at all intuitive. If the 'root cause' of the alleged problem is the incentives provided via the Part 4 price paths, one might expect the optimal solution to be found in addressing the issue via the Commission's input methodologies (IMs) or the reset methodology.

17 Namely, to increase the sum being recouped via upfront capital contributions (and therefore outside the RAB) and reduce its *net* connection capex.

Similarly, if EDBs are not adequately controlling connection costs and/or are over-providing connection assets (as discussed in section 2.1), it is far from clear that the Authority is the right entity to address these issues. These concerns appear to stem primarily from the characteristics of the regulatory arrangements managed and enforced by the Commission.

Simply put, it seems counterintuitive to address alleged issues with the incentive properties of the *revenue cap* through a complete overhaul of *pricing*. Ergo, even if the initial diagnosis is accurate (which is questionable), the prescribed 'cure' (connection price reform) and the party proposed to administer it (the Authority) do not appear to be optimal. While considering alternative solutions is beyond the scope of this report, we believe it is highly likely that the Commission would be the more appropriate entity to develop and implement such solutions.

Summary

The Authority suggests that the existing Part 4 regime administered by the Commission incentivises EDBs to gold-plate and strategically shift connection capex in and out of the RAB. While these concerns may have some theoretical basis, little attention appears to have been given to their practical feasibility. The realities of connecting thousands of customers annually (for many EDBs) may simply prevent such manoeuvring.

Even if these incentive issues were genuinely problematic (which has not been clearly demonstrated), it does not follow that radical reforms to connection pricing are the appropriate response. It seems more likely that the optimal solution would involve the Commission adjusting the IMs or the reset methodology. In other words, there does not appear to be a clear and direct link between the alleged problem and the proposed solution.

3. Prevalence of capital contributions

The Authority devotes a significant portion of its paper to highlighting the upward trajectory in capital contributions. It says EDBs have an incentive to use high upfront funding because this shifts the funding burden from *themselves* (and, by extension, existing customers) to newly-connecting parties (exacerbators) and reduces cost recovery risks.[18] While this is presented as problematic, it is not obvious to us why this would inherently be the case.

EPA further explains that the increased prevalence of capital contributions likely means that newly connected customers (who make higher capital contributions) end up paying more for equivalent services than those who connected earlier and paid lower or no capital contributions. It claims that this creates a welfare loss by deterring connection investment decisions. In our opinion, there are several significant problems with these analyses.

3.1 All businesses seek to reduce cost recovery risks

When a connecting party makes an upfront capital contribution towards the costs of a new connection, the EDB has, by definition, covered that portion of its incremental costs. In contrast, the ongoing revenue control arrangements offer only partial protection, especially if the connecting party exits prematurely. It is unclear why it would be concerning for EDBs to account for these cost recovery risks when setting their connection charges – particularly when facing a significant wave of new investment. Any business in any market would be mindful of such risks.

It is unclear why it would be worrisome for EDBs to be mindful of cost recovery risks when designing their connection charges.

Any incremental connection costs (and/or share of common sunk costs) not covered by connecting parties (i.e., exacerbators) upfront will, by definition, need to be recovered through usage charges. This could lead to those costs being 'smeared' across existing users – particularly if the newly connected customer exits before the initial costs are fully recouped. Such a situation could have negative implications for both efficiency and fairness, since it will result in costs being recovered from customers who did not contribute to their incurrence.

Any reduction in upfront capital contributions would also increase financing costs for EDBs. Businesses must incur connection costs upfront so, if connecting parties do not pay upfront, the resulting mismatch in cashflows must be managed through financing. This would come at a time when EDBs are already facing significant financing challenges due to the large investments needed to enable electrification. Those additional costs would all be passed on to existing customers (who are not responsible for those incremental imposts).

None of that is to say that capital contributions cannot be problematic if they are *excessive*, i.e., if they are above an 'efficient' level (a matter we explore in section 4). However, there is nothing inherently problematic about EDBs being incentivised to recoup connection costs via capital contributions *per se*. Indeed, there are sound

[18] Consultation paper, paragraph 5.3(b).

efficiency and fairness reasons for them to adopt this practice. Consequently, that should be the starting point for any problem definition.

3.2 The welfare calculus is incomplete

Higher connection prices are not a problem in and of themselves. It is the overall impact on welfare that matters.

CEPA is correct that the upward trend in capital contributions has led to newly connected customers paying more in total (i.e., for both connection and usage) than older customers. However, this is not inherently problematic. Any change in pricing typically results in both winners and losers.[19] The relevant question is whether this shift leads to any undesirable outcomes for overall welfare. o that end, CEPA has suggested that:[20]

> *"The newly connecting customers can in principle avoid the high charges (in present value) by delaying or deferring connection until all of the existing connection assets have been depreciated out of the RAB – but this could take several decades. The delay or deterrence in taking up new connections is a real economic harm. The previously-connected customers face a small reduction in their ongoing charges so they are better off (they experience a windfall gain), but their connection decision is sunk so there is no welfare gain."* [footnote omitted]

In other words, CEPA claims that the significant growth seen in capital connections (and the resulting higher prices for 'newly-connected' customers *vis-à-vis* older customers) may have:

- had an adverse impact upon the efficiency of new investment by unduly deterring or deferring new connections (i.e., a dynamic inefficiency); and
- had no effect on the efficiency of past connection decisions by existing customers, since those costs have already been sunk.

CEPA has not considered the impacts upon allocative efficiency in its welfare calculus. This is a crucial omission.

However, this overlooks a crucial aspect of the overall welfare equation: allocative efficiency. As CEPA acknowledges, higher upfront capital contributions lead to lower use-of-system charges. These lower ongoing prices contribute to a static efficiency improvement by increasing demand from existing customers (as most EDBs still incorporate volumetric charging). After all, the price elasticity of demand for electricity distribution network usage is not perfectly inelastic.

The potential trade-off between achieving higher allocative efficiency and fostering greater dynamic efficiency is widely recognised. This trade-off is especially significant when pricing services provided by long-lived infrastructure assets. It is therefore surprising that CEPA has neither acknowledged nor accounted for this well-understood aspect of regulatory pricing in its efficiency assessment.

19 There is no regulatory principle that says that prices must always be the same across all generations of customers.

20 CEPA report, p.16.

Instead, CEPA has implicitly assumed that the welfare gain from lower use-of-system charges is zero.[21] This is clearly not the case. While examining the size of that welfare effect is beyond the scope of this report, we can confidently say that it exists and has not been explored. This is a significant omission, because it means it has not been demonstrated, even at a conceptual level, that the observed increase in capital contributions has negatively impacted overall efficiency.[22] In short, the welfare analysis is incomplete.

3.3 More connection is not always virtuous

As noted earlier, the primary alleged 'economic harm' from the rise in capital contributions is a supposed chilling effect on new connection investments. However, it is not inherently problematic if a customer is discouraged from connecting by the prevailing charges. The key consideration is whether those charges are providing efficient signals, which we explore in Section 4. One cannot automatically assume that a failed connection is a negative outcome and, therefore, indicative of a significant problem.

More connection is not necessarily virtuous – it all depends on the efficiency of the price signals.

If a customer decides not to connect, it could be because the required capital contribution was 'inefficiently high' – that is certainly a possibility. However, it is not the only potential explanation. It may be that the price was efficient, but the connection itself was not. For instance, the connection might not have proceeded because the business case did not stack up – the projected revenue may have been insufficient to cover the efficient costs of connection (the components of which we discuss in Section 4).[23]

In other words, the charging framework may have simply prevented a 'bad investment' from occurring. If the connection price is set too low and a newly connected customer's business fails and it exits before the incremental costs are recouped, those costs must then be spread across other users. Therefore, more connections are not inherently beneficial. Whether they are virtuous depends entirely on whether they are being driven by efficient pricing.

As we explain in Section 4, the pricing 'efficiency benchmark' outlined by the Authority is both imprecise and incomplete. As a result, it is difficult – if not impossible – to determine whether most EDBs' connection prices are 'too high' (as suggested) or, consequently, whether the rates of connection are 'too low'.[24]

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21 Or, alternatively, they have assumed that the demand for electricity distribution network usage is perfectly inelastic, which is incorrect.

22 This depends ultimately on the relative impacts on connection investment decisions (which the Authority and CEPA have suggested might have been unduly deterred) and the efficiency of network usage (which has not been examined).

23 Another possibility is that the price of connecting in a particular location was prohibitive *vis-à-vis* the option of connecting in other places where the charges would have been lower (e.g., because the costs to the EDB or EDBs differed).

24 There is a separate issue of whether connection processes are too slow, due to matter such as transaction costs. However, we have not explored that matter in this report.

Furthermore, no empirical analysis of connection rates has been provided, as discussed below.

3.4 No data have been presented

Even if the prevailing capital contribution requirements are 'too high' or 'too onerous' (a possibility we explore in Section 4), it does not necessarily indicate a substantial problem with parties deciding not to connect or delaying their decisions. It could be that most (or even all) parties ultimately proceed with the connection, however begrudgingly, and pay the higher price. If that is the case, then the main concern raised by the Authority and CEPA – electrification demand not connecting – would be purely theoretical and, in practice, illusory.

Almost no evidence has been presented to support the claim that connections are actually being prevented, let alone that those connections would have been efficient. The *Next Steps* document released by the Authority in May included a few anecdotal references to connection costs 'hampering' private sector investments in EV charging stations. However, these assertions were not backed by any quantitative evidence. For example:

No data have been presented to support the proposition that connections are being prevented.

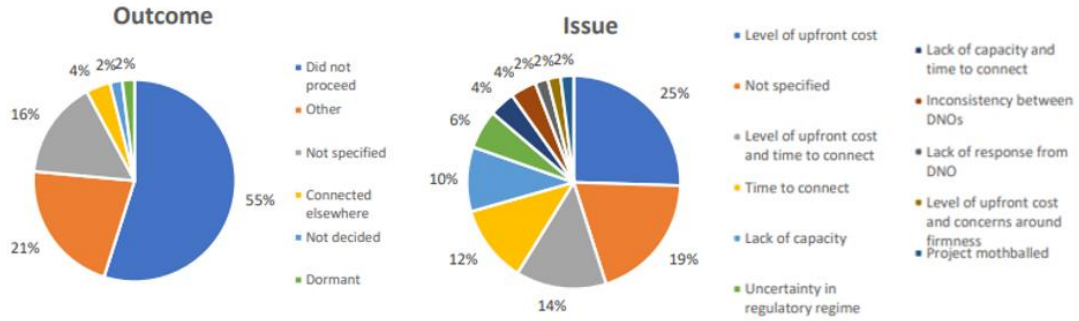
- No *empirical* evidence has been provided regarding the number of projects where parties experienced difficulties connecting (unlike, for example, the analysis contained in Ofgem's recent connection boundary discussion note, which is detailed below[25]).
- Similarly, no quantitative data have been supplied on the reasons behind any such difficulties (e.g., whether they were caused by high up-front charges or other factors) or, importantly, the proportion of projects that proceeded versus those that did not.
- There is also limited analysis of the *types* of parties facing connection issues, although the Authority seems to suggest that these difficulties primarily affect 'electrification demand' projects, such as EV charging stations.

Ofgem's reforms were informed by empirical evidence of impacts upon connection rates.

In contrast, when Ofgem sought to determine whether there were issues with the UK's distribution connection charging arrangements, it explicitly called for empirical evidence. Respondents were asked to provide examples where the connection charging arrangements had caused problems, detailing what happened in each case (e.g., whether the connection proceeded) and the factors driving each outcome. Ofgem received information on 51 projects, which informed its problem statement and policy recommendations. Figure 3.1 below summarises the results of this empirical exercise.

[25] Ofgem, *Distribution connection boundary – discussion note*, pp.10-12. Ofgem provides a breakdown on the number of connection projects that did not proceed as planned and the main reason, e.g., whether it was the upfront cost, lack of capacity, time taken, and so on. The Authority has either not undertaken a similar assessment or, if it has, it has not published the results.

Figure 3.1: Summary of Ofgem's empirical analysis



Source: Ofgem, *Distribution connection boundary – discussion note*, p.11

The Consultation paper lacks the type of analysis conducted by Ofgem. It is possible that the Authority has similar data but has not published them. If that is the case, it is unclear why this information was not made available, since it would have better clarified the problem definition for stakeholders. However, if the Authority has *not* gathered these data, it arguably lacks a solid basis for assessing whether there is a significant issue with connection rates and, consequently, with the underlying connection prices (including capital contributions).

Summary

The Authority suggests that EDBs have an incentive to use high upfront funding because it shifts the funding burden from themselves (and, by extension, existing customers) to newly connecting parties, thereby reducing cost-recovery risks. However, upfront charging is consistent with an 'exacerbators pay' approach to pricing. It is also reasonable for businesses to be mindful of cost-recovery and financing risks. Therefore, there is no *a priori* reason to assume that the widespread preference of EDBs for upfront charges is problematic.

CEPA also claims that the increased prevalence of capital contributions has raised prices for newly connected customers compared to earlier connectors, thereby reducing welfare by deterring connection investment decisions. However, this analysis is incomplete because it fails to account for the allocative efficiency gain arising from the subsequent reduction in usage prices. More broadly, it is important to recognise that not all new connections are inherently beneficial – it depends on the efficiency of the underlying price signals.

Finally, the principal source of alleged economic harm – namely, a chilling impact on electrification demand – is examined purely at a theoretical level. No empirical evidence is presented regarding the effects on connection rates, such as case studies showing where connection charges caused problems and what happened in each instance (e.g., whether the connection ultimately proceeded). This contrasts sharply with the problem definition presented in Ofgem's recent boundary discussion note, which relied heavily on such empirical analysis.

4. Level and structure of connection charges

The Authority has raised the concern that the level and structure of connection charges may be inefficient. While at times this is attributed to prices being 'too low', the Authority's primary concern appears to be that they are more often 'too high', i.e., supposedly exceeding an efficient level. However, the Authority's 'efficiency benchmark' is inherently imprecise, making it challenging to determine whether current prices are truly problematic.

The proposal to base charges on net incremental cost[26] also fails to account for the crucial distinction between revenue received upfront via connection charges (with certainty) and revenue earned later through usage charges (without certainty). If the Authority decides to proceed with its reforms, any incremental revenue adjustment should therefore be restricted to specific customer types, or EDBs should be allowed to require bank guarantees.

4.1 Incremental and sunk costs

When a customer connects to the distribution network, new or 'incremental' costs are incurred. These may include the construction of new connection assets, the employment of labour, road traffic management and other associated expenses. Conventional economic theory holds that it is appropriate for the connecting customer (the 'exacerbator') to bear these incremental costs (with some exceptions[27]). If the customer is unwilling or unable to cover these costs (or arrange financing), it suggests that the connection is not efficient and should not proceed.[28]

There is a multitude of economically orthodox ways in which sunk costs can be recovered.

Next, there is the issue of the sunk costs associated with the existing network that the new customer will use. These costs may include existing 'connection' assets, which are shared by multiple identifiable parties, as well as 'interconnected/grid' assets, where individual users cannot be specifically identified. There are various economically orthodox methods for recovering these sunk costs. Ideally, these costs should be recovered in a manner that minimizes distortions to demand, such as through 'Ramsey Pricing'.

However, pure Ramsey Pricing is rarely feasible, since there is typically insufficient granular information available on the willingness to pay of different customers. Consequently, any pricing methodology that generates revenues between incremental and standalone costs can potentially be efficient, or at the very least, cannot be presumed inefficient. In other words, the economic concept of efficiency cannot, on its own, determine a unique set of prices or revenue levels that should be

[26] Initially this would be via a 'reconciliation requirement', but this is intended only to be a stepping stone towards a 'full reform' where formal requirements would be introduced compelling the application of such a methodology.

[27] We discuss 'first mover' and 'last straw' issues subsequently. In these scenarios is may be appropriate in some cases to recover a portion of the incremental costs from other users (including, in the former scenario, future users).

[28] We explained earlier why 'more connection' is not a laudable objective in and of itself.

recovered from specific customer groups, including distinctions between 'new' and 'old' customers.

There is a wide range of cost allocation approaches that might be considered economically 'efficient'.

Rather, the conventional concept of efficiency allows for a considerable degree of discretion in determining which costs can reasonably be recouped from different customers (or customer groups) before prices exceed the boundaries of efficiency. Economic theory does not provide a clear-cut 'bright line' test. Instead, there is a broad range of common cost allocation approaches that could be deemed economically efficient, or at the very least, not obviously inefficient.[29]

As such, one cannot simply point to the increased prevalence of capital contributions in recent years and assume that those prices are inappropriate or inefficiently hindering the uptake of new connections. As explained in the previous section, this is ultimately an empirical question that requires weighing both dynamic and static efficiency considerations and examining the real-world impacts on connection rates. As we have already noted, this analysis has not been conducted, which constitutes a significant gap in the problem definition.

4.2 Treatment of incremental revenue

The Authority's implicit benchmark for efficient pricing also accounts for the 'incremental revenue' that an EDB is expected to receive through ongoing usage payments. The rationale behind this bundling is that a connection party wants access to the network to use it, meaning it will contribute revenue both through upfront payments and ongoing usage fees.[30] As a result, the Authority's calculation of the 'efficient' capital contribution is lower than the incremental cost of providing access, along with a share of common sunk costs.[31] However, this analysis is incomplete, as we elaborate below.

4.2.1 Guidance from competitive markets

It is true that in competitive markets, the price of an upfront 'connection' service is sometimes discounted below the incremental connection costs if the seller anticipates receiving ongoing revenue or margins from usage. For instance, a pay TV company might offer its set-top units (STUs) at a steep discount or even for free.

[29] Put another way, the efficient pricing benchmark specified in the Consultation paper is not a 'bright line' test. As noted earlier, there are many ways in which EDBs might recoup the sunk costs of existing assets that might broadly be characterised as efficient (or, at least, not inefficient).

[30] In other words, by incurring the incremental costs of connecting the access seeker an EDB can, in principle, recover revenue from both upfront charges and from usage charges. In this way, the Authority does not look at connection services in isolation. It instead lumps upfront connection services together with ongoing use-of-system services to, in essence, create a combined offering encompassing both (essentially an 'access' service)

[31] Mathematically, the Authority's efficient pricing benchmark can be expressed as follows: $CC = (IC - IR) + NC$, Where: CC = connection charge; IC = incremental cost; IR = incremental revenue; and NC = network contribution. *See:* Consultation paper, paragraph 7.59.

These STUs allow customers to connect to the service, enabling them to watch and pay for content.[32] However, in such cases, there is always a *quid pro quo*.

Sellers recognise the difference between revenue earned upfront (which is certain) and revenue earned subsequently (which is not).

Whenever upfront charges are discounted below the incremental costs of providing access, the customer is typically required to commit to using the service for a duration long enough to allow for the recovery of those initial outlays.[33] Importantly, if the customer fails to honour this commitment (e.g., by exiting or disconnecting before the costs are fully recouped), there are consequences. For example:

- the supplier may charge an exit fee (or 'early termination fee') that will enable it to recoup any unrecovered connection costs; or
- the supplier may repossess the assets provided to connect (and potentially redeploy them to connect other customers).

The seller will not assume that there is no distinction between revenue earned upfront (i.e., before delivering the service) and revenue earned subsequently. That would be naïve. Instead, the seller will recognise that subsequent revenue from ongoing usage is *not guaranteed* and take appropriate steps to mitigate the risk of being left shortchanged. This crucial distinction has not been addressed in the Authority's proposed reform. This represents a significant omission.

4.2.2 Application to electricity distribution

Upfront charges are often the only way of ensuring exacerbators pay and costs are not smeared across existing users.

In the context of electricity distribution, if a customer exits before the incremental costs of connection have been fully recouped, exit fees are frequently ineffective. That is because customers often disconnect because their businesses have failed, leaving them unable to pay such a fee. Additionally, opportunities to repossess or redeploy assets are entirely dependent upon the situation:

- In some cases, it may be possible to 'redeploy' connection assets for other uses. For example, another customer might come along shortly after and use the same connection for the same or a similar purpose.[34]
- However, in other cases, redeployment may not be feasible. For instance, if an EV charging station proves unviable in a particular location, it is unlikely that a subsequent customer will connect at that same spot.

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32 The STU may even be provided at zero upfront cost.

33 By way of simple example, a pay TV provider will not provide a complimentary $250 digital decoder to a customer unless it has some assurance that it will recoup that sum (and ideally significantly more) via monthly subscription payments.

34 For example, a connection built to electrify a new residential housing development can usually be expected to deliver a fairly reliable ongoing stream of revenue (e.g., there are few examples of 'ghost towns' in New Zealand).

This means that in the absence of instruments such as bank guarantees, very often the only effective means of ensuring connecting customers pay 100% of the incremental connection costs for which they are responsible (i.e., that they have caused to be incurred) is via up-front capital contributions. The Authority has neither recognised nor attempted to address these complexities. It has instead assumed implicitly that:

The Authority has ignored these factors and assumed all forms of revenue are the same and premature exit costs are zero.

- there is no substantive difference between revenue that is recovered up-front via connection charges (with certitude) and revenue earned subsequently via usage charges (with materially less certainty, given the non-zero risk of exit); and
- the unrecovered costs of premature disconnection will be zero,[35] i.e., it assumes that other customers (who do not disconnect) will not have to bear those inevitable costs.

The analysis is therefore incomplete and potentially misleading.

Neither assumption is reasonable. In our opinion, it would be neither efficient nor equitable for 'stranding' costs to be smeared across customers who have not caused them to be incurred. Consequently, if the Authority ultimately opts to implement its reforms, its proposed treatment of incremental revenue should be modified to account for these important factors. Because exit fees are likely to be ineffective in many cases, only a few alternatives remain, which we describe below.

4.2.3 Potential modifications

The first option would be to allow EDBs to *not* net off incremental revenue when setting connection charges (and capital contributions) for customers that pose a particularly high risk of premature disconnection. For instance, we imagine that a connection built to electrify, say, a new residential housing development can generally be expected to deliver a fairly reliable ongoing stream of revenue (e.g., there are few examples of 'ghost towns' in New Zealand).

In contrast, we understand that EV charging companies often lease a new site for a period of, say, two years, to 'test the waters'. If the site proves viable and profitable, the operator will remain and continue to generate an ongoing revenue stream for the EDB. If not, the operator will exit, and realistically, it is highly unlikely that another customer will take over the site. If the location proves uneconomic for one EV charging company, it is likely to be uneconomic for others as well.

The incremental revenue test should be limited to certain customer types or EDBs should be permitted to require bank guarantees.

Consequently, the likelihood of earning ongoing incremental revenues from a connection serving an EV charging site is, on average, lower than from a new housing development. This creates a seemingly compelling argument for treating these two types of incremental revenue streams differently when determining capital contributions. For example, it may be appropriate not to net off incremental revenues for customers deemed to be higher-risk.

An alternative approach would be to permit EDBs to require a bank guarantee from customers before connecting them. The guarantee could be designed to recoup any

[35] These additional costs do not feature in the equations or diagrams presented throughout the Consultation paper.

unrecovered connection costs from departing customers, using approaches employed commonly in the determination of early termination fees. We understand it is relatively common practice for EDBs in Australia to require bank guarantees from certain customer types to assuage the risks described above.[36]

Summary

The Authority has expressed concern that the level and structure of connection charges may be inefficient. While sometimes this concern is framed around prices being 'too low,' its more pressing concern appears to be that they are 'too high.' However, economic theory does not provide a precise criterion for determining when prices fall outside the bounds considered efficient. As long as prices fall between incremental cost and standalone cost, they can potentially be deemed 'efficient' or, at the very least, not obviously *inefficient*.

To demonstrate otherwise, an empirical assessment is needed to evaluate the effects on dynamic and static (productive and allocative) efficiency from transitioning between pricing structures. This analysis has not been conducted, meaning the Authority lacks a solid foundation for determining whether there is a significant issue with the current connection charging framework. As noted previously, the Authority has also failed to present any empirical evidence on the impact of existing connection charges on connection rates, such as the analysis performed by Ofgem.

The proposal to base charges on net incremental costs also overlooks the critical distinction between revenue received upfront via connection charges (with certainty) and revenue earned through usage charges (without certainty[37]). Should the Authority proceed with its proposed reforms, this incremental revenue adjustment should be restricted to specific customer types, or EDBs should be allowed to require bank guarantees, as is permitted in Australia.

[36] Australian EDBs must produce connection policies that are approved by the Australian Energy Regulator. We understand these policies permit bank guarantees to be requested.

[37] A connecting customer might disconnect/exit at any time. Hence, there is no guarantee that 'usage' revenues will be ongoing, all other things being equal.

5. Proposed reliance limits

The Authority has suggested that not only is the pricing of capital contributions problematic (i.e., the amounts charged to individual customers), but also the *overall proportion* of connection costs recovered through such contributions across *all* customers. As a result, it has proposed capping the total levels of capital contributions that EDBs can receive in the future. The Authority argues that without these 'reliance limits,' its other proposals would "not prevent distributors from continuing the historical trend of increasing connection charges."[38]

In particular, the Authority identifies several factors it believes will incentivise EDBs to continue raising capital contributions, such as expanding capital expenditure programmes and rising financing costs.[39] In our view, a robust rationale for these reliance limits has not been presented. Specifically, if the underlying issues are as the Authority describes, it is unclear why these would not be addressed by its other proposals – namely, the prescriptive pricing requirements outlined earlier. We expand on this further below.

5.1 The limits serve no clear purpose

The Consultation paper outlines a comprehensive set of proposed reforms to connection pricing, which would, in turn, affect capital contributions. As noted earlier, if implemented, these reforms would require all EDBs to set connection prices based on net incremental costs (i.e., less incremental revenues). The reforms would also establish prescriptive rules governing the components of the required calculation. The stated goal of these proposed reforms is to ensure that connection charges and capital contributions are set at efficient levels.

If the problems are as the Authority claims, it is not clear why its proposed pricing rules would not address them.

We have explained already why it has not been clearly established that the existing connection charges are in fact 'too high', or that the proposed pricing reforms would represent a material improvement. However, for the sake of argument, let us assume that the pricing proposals would work as the Authority intends and result in connection charges and capital contributions being set at 'efficient' levels. Why then would there need to be an *additional* limit placed on the *overall proportion* of connection costs recovered via capital contributions? It is unclear.

Consider an EDB that is facing a substantial forward-looking capital expenditure program to connect new customers. Suppose it connects those new customers by seeking capital contributions equal to net incremental costs plus a share of common costs, in line with the efficiency benchmark proposed by the Authority. And imagine this results in an *increase* in the overall proportion of funding the EDB receives via such instruments. According to the logic set out in the Consultation paper, such an outcome would be problematic. But why?

38 Consultation paper, p.52.

39 *Ibid.*

The reliance limits would appear to be pointless at best and distortionary at worst.

Provided capital contributions are priced efficiently, the overall level of funding generated by these instruments will also be efficient. This appears tautological. Logically, if the Authority is confident that the prescriptive pricing rules it has proposed will result in efficient connection charges, the additional reliance limits are neither necessary nor efficient.[40] By definition, these reliance thresholds would be superfluous at best, and at worst, distortionary.[41]

The best-case scenario would be if the applicable reliance limit was non-binding, meaning an EDB's capital contributions remained below the threshold. In this case, the limit would have no impact on the capital contributions collected from different customer groups. However, at worst, the limit could force an EDB to reduce the capital contributions from newly connecting customers below the levels suggested by the Authority's own efficient pricing benchmark. Such a situation would clearly be inefficient, according to the Authority's own logic.

5.2 The thresholds are arbitrary

As noted above, there appears to be no compelling reason to impose limitations on the overall level of capital contributions. However, for the sake of argument, let us assume there is some merit in capping the overall proportion of connection costs that EDBs fund through capital contributions. In defining such a limit, it would presumably be necessary to specify guiding economic principles to assess the relative efficiency of different potential threshold levels. However, the Consultation paper provides no such analysis. Instead, the proposed reliance limits appear to be relatively arbitrary.

The proposed thresholds are not based on any clear or coherent efficiency benchmark – they are arbitrary.

There is no basis in economic theory to believe that using a four-year historical average of capital contributions, or an EDB's current level, will produce an efficient benchmark. The primary merit of these numbers seems to be their mere existence. While adopting these limits would prevent the overall rate of capital contributions from increasing over time, as we have already explained, that is not a legitimate goal. As long as an EDB's capital contributions are priced efficiently, the total amount collected is irrelevant, regardless of whether it reflects an increase compared to previous years.

Finally, even if one accepts, for the sake of argument, that the reliance limit serves a legitimate purpose, the question remains: why is there only a *ceiling* on the total level of capital contributions? Why is there no corresponding *floor*? If the Authority believes there is a theoretically ideal *maximum* level of capital contributions, one might logically infer that there should also be a theoretically ideal *minimum* level.

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40 Conversely, if the Authority is *not* confident its recommended proposals would result in connection charges, then it is unclear why it would be proposing them.

41 It is for analogous reasons that no regulator would apply stringent price caps on regulated services in conjunction with a total revenue cap. This combination of regulatory instruments is illogical, since price and revenue caps are substitutes, not complements. At best, the revenue cap would be pointless (i.e., not binding) and, at worst, it would undesirably restrict the supply of efficiently priced services.

The application of a cap without a floor, therefore, reinforces the impression that the thresholds are arbitrary.

In short, there seems to be no solid efficiency rationale for imposing a reliance limit (without a corresponding floor) in addition to the prescriptive pricing rules. The mere fact that the Authority has proposed such a restriction risks creating the impression – however inadvertently – that its primary goal is simply to reduce prices for newly connecting customers. Naturally, that would not constitute a legitimate objective.[42] As a result, there appears to be no clear connection between the stated problem definition and the proposed reliance limit, let alone the arbitrary thresholds suggested by the Authority.

Summary

The Authority has suggested that both the pricing of capital contributions (i.e., the amounts charged to individual customers) and the overall proportion of connection costs recovered through these contributions across all customers are problematic. As a remedy, it has proposed capping the total levels of capital contributions that EDBs can collect going forward. However, there appears to be no compelling efficiency-based justification for introducing these additional 'reliance limits' – especially in the absence of a corresponding 'floor.'

Notably, these limits do not form a coherent part of the Authority's broader suite of recommendations. If the Authority is confident that its prescriptive pricing rules would result in efficient connection charges, then reliance limits are redundant and inefficient. At best, they would be non-binding and serve no purpose. At worst, they could compel EDBs to reduce capital contributions below the levels prescribed by the Authority's own efficient pricing framework.

The lack of a clear efficiency rationale for the reliance limits risks creating the impression – however inadvertently – that the Authority's primary aim is to reduce prices for newly connecting customers. Such a goal, of course, would not be legitimate. Consequently, there appears to be no meaningful link between the stated problem definition and the proposed reliance limits – let alone the relatively arbitrary thresholds suggested by the Authority.

[42] Incidentally, there would appear to be no reason why a new connector could not pay an 'efficient' capital contribution upfront. If financing is not available to a newly connecting customer in such circumstances the most logical explanation is that the connection *is not* efficient (i.e., financiers are unwilling to lend the money because the endeavour is not economically viable).

6. Other matters

The Authority also raises several other potential issues with the existing connection charging arrangements, such as the discrepancies in approaches across EDBs and 'first mover' and 'last straw' dynamics. Although we acknowledge that these could theoretically pose significant challenges, their practical relevance is ultimately an empirical question. As noted earlier, to date, no quantitative analysis has been provided to assess the actual impact of these factors on customers' connection decisions. As a result, there is no solid foundation to determine whether these issues warrant regulatory intervention.

6.1 Inconsistencies across EDBs

There are 29 EDBs in New Zealand, all with unique characteristics. The Authority has acknowledged that it may not be optimal for all EDBs to have the same connection pricing methodology due to these differences in circumstances and the cost of attaining complete alignment.[43] However, it has suggested that the current divergence in connection pricing across EDBs appears "excessively high" and spans differences in terminology, presentation, methodological approach and overall reliance on capital contributions.

The claims regarding inconsistencies across EDBs are unfalsifiable in theory and untested in practice.

The biggest problem with this contention is that it is unfalsifiable. There is no objective, principled standard for determining the 'efficient' or 'optimal' level of diversity across EDBs. As such, whether the existing differences genuinely constitute a problem is ultimately an empirical matter that requires quantitative assessment. For instance, Ofgem's review of connection projects in the UK found that only a small proportion (4%) failed to proceed due to inconsistencies in approaches across EDBs.[44]

The Authority does not appear to have conducted any analysis of the proportion of connection projects that failed to progress or the reasons why, including whether any were abandoned due to 'excessively high' divergences in approaches across EDBs. Without collecting and analysing such data, it cannot determine whether the current differences in EDBs' methodologies constitute a genuine problem. In the absence of evidence, assertions about inconsistencies in approaches remain unsubstantiated.

6.2 Position-in-queue dynamics

The Authority and CEPA also emphasise that the timing of a customer's connection can significantly impact the charges it faces. For instance, the first customer to connect in a location (the 'pioneer') might bear the cost of connection assets designed to accommodate future demand. Similarly, a newly connecting customer could represent the proverbial 'last straw,' triggering a substantial upgrade due to

43 Consultation paper, p.28.

44 Ofgem, *Distribution connection boundary – discussion note*, p.11.

the cumulative demand of previous connections, even if its own contribution to that demand is relatively small.

In both scenarios, the customer may end up paying for assets that significantly exceed its own individual requirements. The Authority and CEPA have suggested that this dynamic could create undesirable incentives for connection applicants to manoeuvre for a more favourable 'position in the queue'- either to avoid being the 'pioneer' or the 'last straw.' In our view, these could indeed be legitimate concerns if such incentives are causing customers to delay (or expedite, as the case may be) their connections solely to minimise their charges..

It has not been established that queueing dynamics are a material problem in practice or that the proposed reforms would represent the best solution.

Once again, this is fundamentally an empirical question. No evidence, examples, or case studies have been provided to demonstrate that these issues are significant in practice. Furthermore, if 'first mover' and 'last straw' dynamics are indeed material concerns, it is not clear that a comprehensive overhaul of the entire connection charging framework is necessary to address them. Presumably, these specific issues – if proven to be significant – could be resolved through more targeted measures that would be far less disruptive.

Summary

The Authority also highlights several potential concerns with the current connection charging arrangements, such as discrepancies in approaches across EDBs and the so-called 'first mover' and 'last straw' dynamics. While these could theoretically pose significant issues, determining their practical significance is ultimately an empirical question. No quantitative analysis has been provided to demonstrate the extent to which these factors influence customers' connection decisions.

Without such evidence, there is no sound basis to conclude that these matters warrant intervention. Furthermore, even if the 'first mover' and 'last straw' issues are indeed significant, addressing them is unlikely to require a comprehensive overhaul of all connection charging arrangements. These specific concerns – if substantiated – could likely be resolved through more targeted measures that would be far less disruptive for the 29 EDBs.