



**Submission on the Input Methodologies:
Treatment of Emerging Technologies
Unison Networks Limited**

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1. INTRODUCTION AND EXECUTIVE SUMMARY

1.1 Opening comment

1. Unison welcomes the opportunity to comment on the treatment of the revenues and costs associated with emerging technologies in the Input Methodologies (IMs). Unison has contributed to the development of Electricity Networks Association's (ENA) submission and agrees with its recommendations.
2. Unison also wishes to acknowledge the Commission's efforts in setting out relevant issues and scenarios in the *Input Methodologies Review: Emerging technology pre-workshop paper* and facilitating the workshop on 14 December, 2015. Such approaches are useful in raising the level of awareness and understanding of the Input Methodologies, particularly among non-EDB stakeholders.

1.2 Executive Summary

3. The Commission has posed the question:

Is there a current or future problem with the regulatory treatment of the revenues and costs associated with emerging technology investments in the electricity distribution sector? If so, what changes to the current IMs appear likely to:

5.1 promote the Part 4 purpose more effectively;

5.2 promote the IM purpose in 52R more effectively (without detrimentally affecting the promotion of the s 52A purpose); or

5.3 significantly reduce compliance costs, other regulatory costs or complexity (without detrimentally affecting the promotion of the s52A purpose)?

4. In Unison's view the treatment of revenues and costs under the current IMs, in particular, the cost allocation and asset valuation rules are sufficient to ensure the Part 4 objectives are met, whereby EDBs:
 - a) can make beneficial investments in emerging technologies that are cheaper than conventional network investments;
 - b) have appropriate incentives to do so (subject to comments on IRIS and related party transaction rules below); and
 - c) would share the benefits of non-regulated revenues provided by emerging technologies with consumers, through the triggering of asset/cost allocation rules when material levels of unregulated services are achieved.
5. Unison submits that the related party transaction rules should be reviewed to ensure that there are not undue barriers to efficient business structures being used to procure/provide the unregulated services. As they stand, the related party transaction rules are inconsistent and

not easy to apply in all circumstances. The rules would benefit from a more general review to ensure that the value of transactions between related parties is efficient. For example, the value of battery storage to a network is likely to vary over time and by location; driven by such factors as the cost of alternatives. The related party transaction rules, at this point in time, would not permit a network business to pay the 'avoided cost of network investment' to a related party as the basis for transaction value. Restrictively the rules focus on cost-based methods which may not always be appropriate or workable, or evidence of market-based transactions, where these may not exist.

6. The IRIS IMs may have an impact on whether EDBs chose to invest in emerging technologies directly (costs recognised as capex) or through a related party (costs recognised as opex). The IRIS rules may affect incentives for structuring investments in emerging technologies if there are different retention rates applied to opex and capex "efficiencies/inefficiencies" relative to DPP forecasts. Unison has not examined the materiality of this as a potential issue, but recommends that the incentives for opex/capex substitution should be considered in evaluating the efficacy of the IRIS IMs.
7. At the Commission's workshop on emerging technologies (specifically focussed on battery storage and electric vehicle charging) retailer-generators and their advisors indicated that the Commission may consider using the IMs to, in effect, impose structural regulation. It was suggested that EDBs might be prohibited from owning emerging technologies or might have to provide emerging technologies through a ring-fenced affiliate. Unison's submissions are that:
 - a) It is not appropriate to use the IMs to impose structural regulation outcomes on EDBs. There are numerous activities that EDBs undertake, which could potentially be outsourced to third-parties including contracting services, network management services, fault calls etc. The cost allocation and asset valuation IMs appropriately take a neutral view of whether EDBs provide these services in-house or out-source (including to related parties). Such a position recognises that there are a multitude reasons why an EDB might take different approaches, with no particular structure a clear "winner" given variations in risk appetite and local circumstances;
 - b) The same neutral view should apply to the provision of emerging technologies. For example, an EDB may prefer to provide battery storage solutions in-house because of the degree of control, coordination and integration necessary to achieve desired network outcomes. Alternatively such services could be provided via a related party as part of a nation-wide offering, or procured from a third-party demand-response aggregator because the business does not want to, or is unable to establish, such a business competency. It would be inappropriate for the Commission to take a view now on what structure would be best, before any emerging technologies have matured to commercial viability;
 - c) Structural regulation of the electricity market already exists under the Electricity Industry Act 2010. EDBs, retailers and generators are subject to vertical separation rules that permit some cross-involvement in other parts of the supply chain up to certain limits before activities must be placed in arms-length affiliates with separate management structures. If the involvement of existing market participants in new

markets creates competition or efficiency concerns, it is policy-makers that should consider reforms of the Electricity Industry Act 2010, rather than the Commission through setting IMs;

- d) It is unreasonable to assume that EDBs would not seek the efficient procurement and management of emerging technologies. For example, an EDB seeking demand response in an area (e.g., through control of consumer-level battery storage and other energy management services) might approach third-party aggregators or tender for firm demand response capability, rather than develop the competency in-house. Alternatively, an EDB may determine that because of local presence and the aggregated information it has on its consumers load profiles, it may work with its consumers to incentivise installation of battery storage and other demand-management solutions. Under this scenario an EDB might still sell off residual rights to third parties to use the storage capability for energy/reserves market trading rather than develop a 24/7 trading function internally;
- e) The ENA, through its Distribution Pricing Working Group is seeking to develop a standardised approach to implementing more cost reflective pricing approaches, or “service-based pricing” as the Electricity Authority has recently coined. Service-based pricing approaches, including time-of-use structures or capacity/demand-based pricing, would create value opportunities for retailers and other parties to manage consumers’ demands, including through battery storage and other emerging technologies; and
- f) Different parties in the electricity value chain are likely to have different comparative advantages. For example, a national scale solar PV/battery retailer might have access to scale economies that a local EDB would not. In workably competitive markets, parties with particular advantages are not required to make available their advantages to competitors.

1.3 Unison’s recommendations

8. Based on our analysis, Unison recommends the following:

- a) The current cost allocation and asset allocation IMs remain fit-for-purpose. They allow for modest investments in emerging technologies before sharing with consumers the benefits of receiving unregulated income, or common costs become significant. An unregulated revenue IM is unnecessary given the existence of the cost allocation and asset allocation IMs;
- b) As part of the review of related party transaction rules in the IMs (capex) and in ID regulation (opex) the Commission should ensure the rules are sufficient to recognise the value of emerging technology services that may be provided by an EDB related party; and
- c) The Commission should investigate whether the IRIS rules are neutral as to whether emerging technology services are provided by way of a related-party (opex) or recognised as an asset directly in the regulated business (capex).

2. UNISON'S ANALYSIS

2.1 Emerging technologies

9. Over the last six months Unison has undertaken significant research into the role that emerging technologies such as solar PV, battery storage and home energy management systems may play. Our analysis of installed costs indicates that technologies such as solar PV and battery storage are currently uneconomic in most situations. Solar PV is only made commercially viable because industry tariff structures unduly encourage consumers to invest. Our analysis also indicates that battery storage (grid-scale and consumer-scale) is both uneconomic and commercially unviable even if all potential value streams could be accessed to defray the cost of the batteries. [

.] Unison Confidential Information

10. Nevertheless, given significant global research and development initiatives to reduce costs and improve efficiency, Unison expects that within 10-15 years, emerging technologies to provide economically viable alternatives to grid supplied electricity. It is this element of emerging technology development that concerns Unison the most. We therefore continue to advocate that the Commission should examine the merits of faster depreciation of assets to ensure inter-generational equity between consumers and to promote efficient use of EDBs' assets over time. This would be a least-regrets policy approach, because by the time emerging technologies become viable, it would be too late to recover EDBs' costs more quickly, or would have punitive impacts on consumers who are unable to use or access emerging technologies.
11. Unison's key point, however, is that, with respect to cost allocation and asset valuation IMs that would apply in the 2020 to 2025 period, the Commission can adopt a monitoring approach. This is preferable to making pre-emptive decisions about the merits of EDBs' use of emerging technologies to defer or avoid network investment. New Zealand is likely to be a "follower" in the deployment of emerging technologies. Accordingly, the Commission, policy-makers and industry have the opportunity to learn from the experience of emerging technology deployments in other markets before making regulatory and policy decisions in New Zealand. This is particularly important in relation to structural regulation of involvement in emerging technology markets.

2.2 Scope of regulated assets

12. Unison notes and agrees with the points made in the ENA submission that assets beyond the point of supply legally may be treated as network assets. Regardless, Unison submits that the scope of *electricity lines services* and the definition of an *electrical installation* are not critical in the context of how the costs, asset values and revenues from use of emerging technologies beyond the point of supply are treated. As the Commission has identified, what is important is that there is an objective nexus between the provision of an emerging

technology and the ability to provide network services. For example, a consumer-side battery owned and controlled by an EDB to enable the provision of a 24/7 lines service, should clearly be capable of being incorporated into the cost structure and therefore prices charged by an EDB.

2.3 Retailer-generator concerns about distributor involvement in emerging technologies

13. Emerging technologies, such as battery storage, home energy management and some forms of distributed generation, have the ability to provide valuable services in multiple markets, including regulated and unregulated services. For example, as the Commission has observed, battery storage can provide both services to the network (reliability benefits and network investment deferral) and energy markets (wholesale price smoothing). The ability to access value from different markets may be necessary to ensure an emerging technology solution is deployed as the best solution. In Unison's view, in light of the Purpose of Part 4, and the scope of the regulation in promoting the long term interests of consumers in the regulated service, it is a requirement that the Commission set IMs that allow for efficient deployment of emerging technologies by EDBs.
14. At the Commission's recent workshop on emerging technologies, some retailer representatives indicated a concern that EDBs would not make available value streams arising from avoided network cost savings, so that third-parties may not be able to compete to provide emerging technologies. Tentative proposals were advanced that potentially EDBs should have to make available value streams via competitive tender processes (such as Transpower's Demand Response programme), and/or that ring-fenced EDB affiliates would need to compete with third parties to win the value stream.
15. Unison submits that it is beyond the scope of the IMs for the Commission to consider structural regulation. For example, by setting cost allocation or asset valuation rules that have the purpose or effect of preventing EDB self-provision of emerging technologies. Unison notes that there is already structural regulation of EDB participation in generation and retail electricity markets under the Electricity Industry Act 2010, whereby EDBs, are permitted to generate/retail up to certain thresholds, before ring-fencing arrangements are mandatory. Unison submits that public policy decisions have already been made in this arena. It would be inappropriate for the Commission to impose different structural regulations (directly or indirectly) that conflict with existing public policy.
16. Unison also submits that it is important to recognise that the primary value in emerging technologies in the New Zealand market, especially battery storage, is in avoiding network investment. Our analysis indicates that the ability to smooth intra-day variability in wholesale electricity prices would provide only minimal benefits to a battery owner.
17. In respect of batteries in substations, EDBs are likely to have ownership and procurement advantages in this area. EDBs would need to control or set standards for charge/discharge cycles to ensure optimal battery use and network management. Clearly, health and safety requirements and security issues would make it impractical for third parties to access substations to inspect or maintain the batteries, so it unclear what benefits would be achieved through EDBs out-sourcing ownership of battery storage at a network scale.

18. Even if EDBs own the batteries, there is reasonable likelihood that they would sell the rights to any wholesale market use of batteries to third party traders, as occurs currently with reserves market trading. Such a service provision is unlikely to be a comparative advantage for an EDB, and additionally it is costly to maintain a 24/7 trading function. Unison submits that there are natural drivers on EDBs to efficiently procure (just as they do with any other network equipment) and to make available to third parties the energy market services that could potentially be provided from network level battery storage. Accordingly, so long as the IMs are conducive to EDBs investing in non-network alternatives, Unison submits that there should be no reason that efficient outcomes would not occur in regulated and unregulated markets.
19. Unison acknowledges that behind the meter solutions (such as consumer scale battery and solar PV bundles) may have greater potential for innovative product offerings and competition benefits to consumers. Again retailers raised the issue that unless they can access the value stream associated with network investment deferral, non-EDB providers may effectively be shut out of this market.
20. In response, Unison observes the following:
 - a) Home battery costs would need to fall by around 80% for them to be viable in most circumstances. Therefore the market is unlikely to be large in the short to medium term. Battery storage costs are not falling at any great rate given the chemical limitations that prevent Moore's law-type cost reductions;
 - b) EDBs are in the process of developing more cost reflective tariffs through the Distribution Pricing Working Group. As smart meters become ubiquitous, tariff approaches that incentivise peak load reductions are expected to become more prevalent, particularly on networks where capacity constraints exist. Avoiding such price signals (e.g., high peak-based charges) would provide third parties with access to value streams that would justify investment in peak-opping technologies such as batteries;
 - c) Some EDBs face more localised issues where high rates of emerging technology penetration would be required to effect network investment deferrals. The challenge of New Zealand's competitive retail electricity market is that diffusion of retailers in any given area increases the costs of achieving a coordinated, geographically-targeted investment in battery storage. There may be situations where a singular EDB-led roll-out of battery storage in a defined region is more effective than multiple retailers or and/or third parties carrying out that function. It would not be appropriate to set IMs that prevent an EDB from undertaking such activity as it would create a risk that deployment of new technologies does not proceed at all.
21. Overall, Unison submits that retailer-generator concerns about competition to provide emerging technologies are over-stated and that structural regulation of EDB involvement in those markets is not relevant for the Commission in reviewing the IMs.

2.4 Asset valuation and cost allocation input methodologies

22. Unison submits that the Commission's pre-workshop paper accurately sets out the cost allocation and asset valuation rules as they relate to shared costs.

23. As set out in the ENA submission, the current rules were based on EDBs being required to share the benefits of shared costs/assets when they become material, which the Commission defined as when the impact on regulated revenues would exceed 1-2%. Unison submits that the principles and considerations under-pinning the original cost allocation and asset sharing rules remain valid. They were designed to encourage EDBs to leverage their assets to provide beneficial unregulated activities, but only up to a threshold where the Commission considered that workable competition would result in economies of scope being shared with consumers.
24. As noted in the ENA submission, the effect of the cost allocation and asset sharing rules, is that it is unnecessary and undesirable to have an unregulated revenue IM, because:
- a) By allocating costs or assets out of the regulated business, the unregulated activity needs to be sufficient to cover those costs. Regulated revenues fall as a result of allocating costs out of the regulated business;
 - b) If shared costs and assets were left in the regulated business, but unregulated revenues associated with those shared assets are recognised in setting regulated revenues, the Commission would then have to forecast unregulated revenues. This is challenging enough in setting the regulated price path and likely to be even more challenging in forecasting revenues associated with emerging technology. It may even discourage EDBs from pursuing unregulated revenues if there are greater risks associated with the predictability of those revenues.
25. Accordingly, Unison agrees with the ENA submission that the cost allocation and asset sharing IMs remain fit-for-purpose and that it is unnecessary and undesirable to introduce an unregulated revenue IM.

2.5 Related party transaction rules

26. One area where the Input Methodologies should be reviewed is with respect to recognition of assets/services provided by a related party. The following table sets out the related party transaction rules under the IMs and ID Regulation.

Approach	Capex work	Opex work
<i>Arms-length equivalents</i>		
Price is similar to substantially similar works in past three years adjusted for inflation	✓	✓
Competitively tendered	✓	✓
Market value	✓	x
Direct cost plus 17.2%	x	✓
Director certification that prices are as would be in arm's length transaction (as last resort)	✓	✓
<i>Cost-based methods</i>		
Inventory value	✓	x
Depreciated historic cost	✓	x
Direct cost (as if consolidated)	✓	(✓)
Nil value if no other option can be exercised	✓	✓

27. Unison's concern is that the related party transaction rules currently favour an EDB self-providing emerging technologies rather than through a related party, even if this may be an optimal business structure (for example, because the related party may provide such services to other EDBs or Transpower). The related party transaction rules are currently inconsistent between the treatment of opex and capex and may not allow for efficient charging approaches.
28. For example, suppose a related party provides battery storage as a service to the EDB. This would be treated as opex. But under the current ID rules, the opex could be determined as "direct cost plus 17.2%", but this would seem unsuitable for the provision of an asset-based service, where the costs to be recovered would predominantly be the return on and of capital.
29. Unison submits that the related party transaction rules require a more general review, as the problems with them are not just restricted to emerging technologies. A technical working group would seem the best approach to resolving issues with the related party transaction rules.

2.6 Incentives created by the IRIS IMs

30. The IRIS IMs aim to create incentives for EDBs to manage their costs below the capex and opex allowances used in establishing price paths under a DPP or CPP. Depending on the relative strengths of the IRIS capex and opex incentives, there may be incentives to favour one business model or the other. This is because self-provision of battery storage would be treated as capex, whereas provision of battery services by a related party would be treated as opex.
31. Unison recommends that the Commission review the IRIS rules to, as far as possible, ensure EDBs face no undue biases to favour opex or capex. Again, this is a more general consideration, not just restricted to how EDB's may consider investments in emerging technologies.