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Settlement Residual Allocation Methodology: principles, options and pass-through

This is Vector's submission to the Electricity Authority (Authority) consultation on the Settlement Residual Allocation Methodology (SRAM).

The consultation paper notes loss and constraint excess (LCE) arises due to price differences in the wholesale market and that "these price differences mean consumers pay more for electricity than generators receive."

Accordingly, ensuring LCE is returned to end consumers should be the key principle in designing the SRAM.

This submission makes the following key points:

- The Authority appears to take without question that the scheduling, pricing and dispatch model (SPD) that gives rise to the LCE is the most efficient and effective means of coordinating resources. Even if that is the case, it is further assumed that the LCE is as accurate, and calculated as efficiently, as possible. The linear DC approximation of the transmission grid used in SPD has not changed fundamentally since the market started in 1996. The way in which losses on transmission assets are calculated can lead to overestimates of losses, increases in marginal prices, and overpayments by consumers.
- We are strongly opposed to the proposal to mandate distributor pass-through of LCE to retailers. Distributors have developed different methods of pass-through based on customer and business needs. For the regulator to mandate a change in approach would increase administrative costs without providing any additional benefits to consumers.
- We would support regulation to ensure LCE is passed to consumers that is agnostic as to the method of pass-through. A requirement that distributors disclose their methodology and method of pass-through would achieve this.
- The SRAM should not allocate any LCE to generators. The Authority's preferred approach (the simple benefits-based method) would result in windfall gains to generators in the short term and provides no guarantee that consumers would benefit through lower wholesale (and retail) prices in the long term. We do not consider this approach would promote the Authority's statutory objective.
- We think the Authority has confused itself as to whether the LCE should provide a partial hedge to volatility, or should be allocated in a non-distortionary manner. We recommend the SRAM allocate LCE solely to load, for example, through the residual charge, which is designed to be non-distortionary. This allocation methodology, combined with a requirement that distributors pass the LCE to consumers (while maintaining distributor discretion as to the appropriate method of pass-through), would best promote the long-term benefit of consumers.

The Authority should have begun by questioning the existence and accuracy of the LCE

The Authority appears to have taken without question that grid-connected and distributed resources in the wholesale market are being coordinated as efficiently and effectively as possible, in a way that delivers long-term benefits to consumers.

At its core, the market solver, SPD, has fundamentally not changed since the market started in 1996, and neither the Authority nor system operator appears to have questioned since that time whether new technology has enabled a more sophisticated and effective means of coordinating resources than the traditional SPD model. It seems implausible that, with all the technological advancement over the past 25+ years, there are not more effective means of coordinating resources than a linear program. After all, it is the use of marginal pricing in the linear program that creates the LCE, and therefore the question of how to allocate that LCE, in the first place.

Even assuming that a 26-year-old linear program is the most effective means of coordinating resources, the linear DC approximation of the grid in use has only been enhanced incrementally since 1996. The way in which losses on transmission assets are calculated can lead to overestimates of losses, increases in marginal prices, and overpayments by consumers. While the number of loss tranches in SPD was increased in 2015, advances in computing power must now have made it possible to develop a non-linear formulation for SPD, which could model line losses more accurately.

The first best solution would be for the Authority and system operator to review the way in which New Zealand's resources are coordinated and optimised at the wholesale level. Failing that, there should be a first-principles review of the formulation of SPD to determine whether a more efficient and effective means of modelling the grid would be possible. At the minimum the Authority and system operator should review whether the way in which transmission losses are modelled currently is impacting the accuracy of the calculation of the LCE, and whether there is any risk that consumers are overpaying for their electricity as a result.

Ahead of changes to the SRAM, to best promote the long-term benefit of consumers, we consider the Authority's focus should be on ensuring losses are calculated accurately and eliminating any overpayment by consumers.

LCE payment to wholesale purchasers should not be mandatory

The Authority should not mandate distributors pay LCE to wholesale purchasers. This is not an appropriate regulatory response to ensure LCE is returned to those whose payments resulted in the LCE (ultimately consumers).

The Authority could take a less heavy-handed regulatory approach and still ensure distributors pass on LCE to consumers – for example, by requiring distributors to publish their methodology and method of distributing LCE.

Distributors will have different methods of passing LCE to their customers developed in line with their particular customer and business needs. Vector - through its majority shareholder Entrust - has a direct relationship with end consumers in the Entrust catchment area and therefore returns LCE directly to these consumers, ensuring 100% pass-through of LCE. For consumers outside the Entrust catchment area, Vector returns LCE via a rebate on retailer bills with a request that these are passed on to consumers.

For the regulator to mandate a change in approach would increase administrative costs without providing any additional benefits to consumers. Accordingly, we consider this approach is more likely to reduce efficiency in the electricity market rather than promote it.

We would support a mechanism to ensure distributors pass on LCE to consumers that is agnostic as to the method of pass-through. A requirement for distributors to disclose their methodology and method of passing on LCE would be a less administratively burdensome and therefore lower cost method than mandating pass-through to retailers.

The SRAM should not allocate LCE to generators

The Authority's current preferred SRAM option appears to be Option B: simple benefits-based allocation. This would see a larger share of LCE allocated to generators.

As recognised in the consultation paper, LCEs arise because, due to the use of marginal pricing in the calculation of nodal pricing, payments by consumers exceed the total cost of generation. Accordingly, we see no justification for allocating any LCE to generators who have already been fully compensated for electricity generated.

The effect of this approach would be to provide an unnecessary - and unjustified - windfall gain to generators. These gains by generators would not translate into any benefits for consumers. Rather, it is likely this proposal would have the following effects:

- **In the near term:** generator total costs would drop, while the short run marginal costs of operating their plants would not. LCE allocations would be in the form of periodic 'lump sum' payments (based, in turn, on 'lump sum' TPM charges). Accordingly, these cost reductions would be highly unlikely to impact the SRMC - and hence the offers - of existing generators, and then flow through to nodal prices (and, in turn, retail prices)..
- **In the long term:** allocating more money to generators would reduce the long-run marginal costs of new entry and expansion (due to a reduction in net transmission charges) so long-term wholesale prices may be lower than they would otherwise have been. However, full pass through of these costs is highly unlikely. In contrast, entities on the load side can be easily compelled to pass 100% of these costs through (and distributors such as Vector already do).

We have expanded on these points below.

Short term effects of reallocation

While generator total costs would drop, the short run marginal costs of generating would not change. Accordingly, these cost reductions are unlikely to flow through to consumers in the form of lower prices.

It is worth noting that recent history indicates 'short term' can be a long time in the New Zealand wholesale electricity market. The Authority's Wholesale Market Review revealed that recent prices in the forward market have been significantly above the long-run marginal cost (LRMC) of entry for an extended period (and remain there today).

Accordingly, we recognise standard economic theory suggests that in the longer-term any 'lump sum' wholesale cost reductions would reduce the cost of entry/expansion and eventually flow-through to wholesale prices (at least to some degree). However, we consider the practical experience of recent years suggests that this could take a significant amount of time.

These potential short-term ramifications of reallocating settlement residues should therefore give the Authority pause before recommending such a course of action. As discussed below, we consider long-term effects are unlikely to provide any benefits to consumers that would outweigh these issues.

Long-term effects of allocation

In the longer run, allocating a greater proportion of settlement residues to generators would reduce the LRMC of new entry/expansion. This should, in time, result in forward and nodal prices that are lower than they would otherwise have been. However, it does not follow that 100% of the LCE allocated to generators would be passed through to nodal prices, and from there to retail prices and, therefore, to end consumers.

It is only in very limited circumstances that a reduction in input costs (in this case, a drop in generators' net transmission charges) can be expected to be fully passed through to the resulting prices. Specifically, if an input cost reduction is industry wide and there is perfect competition, full pass through can be expected either if demand is perfectly inelastic, or if supply is perfectly elastic. Of course, the distinguishing characteristics of perfect competition are seldom, if ever, seen in markets.

We also note the Authority's Wholesale Market Review did not rule out the possibility that an exercise of substantial market power was a reason for a sizeable proportion of the large uplift in spot prices that has been observed since 2018. If substantial market power does exist – or, even if the wholesale market is simply less than workably competitive – then, almost by definition, less than 100% of any LCE payments made to generators would be passed down the supply chain to load customers (and, in turn, end consumers).

Another key determinant of the rate of 'pass-through' is whether a cost-reduction is industry-wide (versus one that affects only a sub-set of firms) and whether it is symmetric across firms. For example, broad-based cost changes that affect all market participants equally (e.g., reductions in GST) are far more likely to be fully passed-through than changes with divergent effects across different suppliers. Here, the idiosyncratic nature of the BB charge means it is very hard to predict how different generators would be impacted over time. What does seem clear is the outturn effect of the reallocations would not give rise to anything remotely comparable to a symmetric, industry-wide cost reduction. This also would reduce the rate of pass-through.

That is, pass-through by generators is theoretical and dependent on the strength of competition. Moreover, the uncertain nature of the LCE coupled with the uncertain way benefit-based allocations are determined would make it difficult for a new entrant generator to factor into their investment decisions and therefore for it to impact long-run spot prices.

There is consequently good reason to doubt whether any sums reallocated to generators would, in time, find their way back to direct connects and retailers and, most importantly, to end consumers. Instead, generators are likely to be the ultimate recipients of a significant share of those payments – even in the longer-term.¹

In contrast, it would be a relatively simple matter for the Authority ensure distribution businesses pass on 100% of their LCE. As described above, we are not opposed to a requirement for distributors to pass LCE to end consumers as long as it is agnostic as to the method of pass-through (such as a requirement that distributors disclose their methodology and method). That predictable 'causal nexus' is simply lacking when it comes to generation customers.

The SRAM should be focussed on allocations to load

In its efforts to avoid options that might risk undermining nodal price signals, the Authority appears to have inadvertently proposed an approach that would produce a rather different suite of problems. Namely, its 'Simple BB' methodology (which appears to be its preferred approach at this preliminary stage) risks delivering an inequitable and inefficient windfall gain to generators. There is no good reason to be confident that any additional sums paid to generators would, eventually, find their way to end consumers. That would seem to be inconsistent with the Authority's statutory

¹ Further support for this conclusion can also be found in the extensive *empirical* literature spanning many areas, including pass-through of exchange rate fluctuations, cost reductions arising from mergers, and changes to tax rates.

objective, which focusses closely on consumers.

We recommend the Authority considers alternate options for the SRAM to allocate LCE solely to load. If the Authority considers the SRAM should be designed using the TPM, the residual charge is the best option to promote the Authority's statutory objective.

The residual charge, by design, is intended to have a minimal impact on incentives for grid use, investment and price signals. Accordingly, it is the least distortionary option in line with the Authority's principle concern to maintain the integrity of the nodal price signal. It is also the simplest option and therefore likely to be lowest cost. By introducing a selection criterion based on the ability of the allocation to provide some dampening of wholesale market volatility (i.e. a partial locational hedge), the Authority appears to have muddied the waters between whether it wants the allocation to be non-distortionary or to serve some useful purpose. We suggest the Authority reviews the usefulness and efficiency of this particular criterion, and note that these options were canvassed at length in the initial development of the FTR market over 2010-12.

In addition, allocation solely to load through the residual charge is the simplest option. For a generator to pass LCE through (hopefully) to consumers would always involve at least two steps (i.e. the generator would adjust its offers, and its decisions on new investment, based on the LCE, which would hopefully flow through to a decrease in spot prices paid by retailers, who could then determine how that flowed through to retail prices paid by consumers to retailers to pass on to consumers. Alternatively, distributors could pay the LCE either directly to consumers or through a credit on retailer bills). This would therefore be the lowest cost approach.

We consider designing a SRAM that allocates LCE through the residual charge, combined with a requirement that distributors pass LCE to consumers in a transparent manner (e.g. by requiring the distributors disclose the method of pass through) will best promote the Authority's statutory objective. This option would be simple, low cost, maintain the integrity of the nodal price signal, and ensure 100% pass-through of LCE to consumers.

Yours sincerely



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