Treatment of prudential offsets in the wholesale market

Decision Paper

15 June 2018

Contents

1 Decision

1.1 The Electricity Authority (Authority) is an independent Crown entity responsible for promoting competition in, reliable supply by, and the efficient operation of, the electricity industry for the long-term benefit of consumers.[1]

1.2 We have been considering the potential to integrate clearing and settlement for exchange-traded derivatives and other wholesale market transactions cleared and settled by the clearing manager. After a thorough investigation, we have decided at this time not to pursue further developments in this area.

1.3 We made this decision because:

(a) Integrating clearing and settlement would not appear to materially reduce costs for participants, and therefore seems unlikely to have significant net benefits in terms of competition, reliability and efficiency.

(b) The resources required to develop and operate integrated clearing and settlement arrangements are likely to be significant. There are also significant risks involved. It would involve issues beyond our jurisdiction, which creates the risk of development road-blocks. It could also create ongoing resilience risks by complicating the systems and processes that ensure the reliability of payments in the wholesale market.

1.4 There are parties currently providing commercial services that make it easier for participants to meet separate clearing and settlement requirements. We consider these services present the most efficient solution to a complicated problem. We will support participants in accessing these services where and how we can. In particular, as resource allows, we will work with the industry to consider the value in developing standardised contracts for over-the-counter hedging, and opportunities to improve the use of hedge settlement agreements (HSAs).

1.5 It may be appropriate to reconsider developments to integrate clearing and settlement in future. We will monitor developments in the hedge and financial markets and reactivate the work if new information or opportunities come to light.

2 Background

2.1 Exchange-traded derivatives are cleared and settled by the relevant exchange and its clearing participants, while the clearing manager clears and settles:

(a) the markets for spot and ancillary services,

(b) financial transmission rights (FTRs),

(c) over-the-counter derivatives that are lodged as HSAs (other over-the-counter derivatives are cleared and settled bilaterally).

2.2 HSAs provide a way to have the hedging effect of over-the-counter derivatives reflected in prudential security requirements with the clearing manager. However, it is not currently possible to recognise the hedging effect of exchange-traded derivatives under the separate clearing and settlement arrangements.

---

[1] This is the Authority's statutory objective. Refer to section 15 of the Electricity Industry Act 2010.

2.3 Rather, participants have obligations to pay cash and collateral to clear and settle their exchange-traded derivatives, and separate obligations with the clearing manager to clear and settle their other wholesale market transactions. They must meet both sets of obligations in full and on time, even though they might expect to owe money from one set of transactions, and concurrently be owed money from the other. This means:

(a) the amount of cash/banking facilities they need to settle their transactions may be higher than is efficient

(b) the collateral they need to provide to secure settlement may be excessive relative to their combined risk exposure across all the markets

(c) there may be greater administrative overheads than if the arrangements were better integrated.

2.4 Participants can require significant cash and collateral to meet their clearing and settlement obligations. The separate arrangements may affect whether and how a participant hedges, and their ability to establish and grow their business. This issue may therefore have consequent effects for hedge market development and retail competition.

2.5 In 2012-13, we undertook a broad review and made subsequent changes to the settlement and prudential security arrangements in the wholesale market, which are covered in Part 14 and 14A of the Code. Those changes resulted in significant improvements to the ability to clear over-the-counter derivatives.

2.6 We have also made additional improvements to prudential offsetting capabilities. Specifically we:

(a) increased the range of recognised hedge settlement agreements to include caps, floors and option contracts

(b) extended the range of parties that could lodge hedge settlement agreements to include banks and other intermediaries

(c) legally restructured hedge settlement agreements to provide greater certainty of their effectiveness when one party becomes insolvent

(d) allowed the Authority to approve an alternative form of hedge settlement agreement—which we did in 2014 at the request of a party wishing to provide flexible credit support

(e) improved the ability to move money back and forth between a futures account and an account with the clearing manager, by:

(i) shortening the delay in the clearing manager returning funds owed to participants from 3 days to 1 day

(ii) encouraging brokers to allow traders to access variation margin gains from futures contracts, prior to final settlement of those contracts.

2.7 We consider that hedge settlement agreements now provide an effective solution to the issue of separate clearing and settlement for over-the-counter derivatives. In addition, there are now parties providing commercial services that can also reduce the issue of separate clearing and settlement for exchange traded contracts.

2.8 This combination of improvements has greatly improved prudential offsetting capability.

2.9 Since 2015, we have been investigating whether there might be a net benefit in undertaking further changes to improve offsetting by integrating the clearing and

settlement of exchange traded products with products cleared and settled by the clearing manager. We anticipated the potential for efficiencies, benefits for hedge market development, and reduced barriers to retail entry and growth.

2.10 Integrating clearing and settlement is an inherently difficult issue. If improperly managed, default risk can create cascade effects that lead to financial shocks and liquidity risks. An exchange needs standardised systems to manage default risks across many different products traded by many different participants. Given their purpose and importance, clearing and settlement systems are highly regimented and regulated.

2.11 Our investigation has benefited from the insights of the Australian Energy Market Operator (AEMO) and ASX, who undertook a study into the potential to better integrate clearing and settlement for the National Electricity Market in Australia. That study determined that net benefits from integrated clearing and settlement were unlikely in that market.

2.12 In October 2017, we published an issues and options paper that identified seven developments that could theoretically recognise offsetting transactions that are currently being cleared and settled separately. The paper outlined our understanding of the potential benefits available. Based on this, we made a preliminary evaluation that developments were unlikely to support our statutory objective because:

(a) there are existing ways that participants can gain efficiencies in meeting separate clearing and settlement requirements (though we recognised there are costs and limits to using them)

(b) direct cost savings for participants appear low, and any resulting dynamic benefits, while uncertain, are also unlikely to be substantial

(c) the potential developments we identified are likely to:

(i) be high cost to design and implement relative to the benefits

(ii) have practical challenges because of the involvement of financial institutions and regulators

(iii) come with significant implementation risks and potential for unintended consequences.

(d) some participants would be relatively insensitive to a reduction in the amount of collateral they need to provide, which would further limit the benefits achieved.

2.13 The issues and options paper sought feedback from stakeholders on this preliminary evaluation. Our assessment of the costs and benefits was high-level, and we noted that we may not have fully appreciated the impact the developments could have on participants' activities. We therefore asked stakeholders for any information we may not have considered in making our evaluation.

3 The Authority considered the following issues in making its decision

Feedback from stakeholders

3.1 We received four submissions in response to our issues and options paper, from the following parties:

(a) Mercury Energy

(b) Meridian Energy

(c) NZX

(d) Pioneer Generation.

3.2 The submissions are available on the Authority's website.[2] We have summarised the key points made in submissions in this decision paper, but have not summarised submissions in a stand-alone document because there are only four, three of which are brief.

3.3 Given the small number of submissions, we sought further informal feedback after the submission period had closed. This involved brief discussions with several smaller and independent retailers, OM Financial (a broker of electricity hedge contracts), an intermediary, and a follow-up discussion with NZX.

3.4 We drew on submissions and this informal feedback in making our decision.

The apparent cost savings for participants would be small

3.5 We have decided to not pursue developments at this time, having not received any information that alters our understanding that cost savings to participants would be small. These cost savings represent a productive efficiency gain that could trigger dynamic benefits, which we discuss in the next section.

3.6 We recognise that participants can find their payment obligations in the wholesale market demanding and can limit their growth and activities. Two submitters touched on this issue, stating:

"…clearing and settlement requirements faced by independent retailers (without generation assets) may be limiting growth." – Pioneer Generation

"It is important to note that the current prudential arrangements are a barrier to entry that is higher for small players than large players." - NZX

3.7 However, we do not consider that cash and collateral requirements are ordinarily an *inefficient* barrier. We reviewed the efficiency of the level of collateral required for transactions in the spot, FTR and ancillary services markets during our 2012-13 review of Part 14 and Part 14A of the Code.[3] Collateral requirements for exchange-traded contracts are primarily determined by clearing participants and clearing houses with the oversight of financial regulators. This project's scope was limited to identifying whether there are inefficiencies from having two different clearing and settlement systems that we could address.

3.8 Based on our work to date, it appears that the scale of inefficiency across the market is relatively small.

3.9 Table 2 and Appendix C of our issues and options paper outlined our understanding of the potential savings to participants from more integrated clearing and settlement. We identified five savings that could potentially arise and estimated that collectively, they

---

2 See https://www.ea.govt.nz/development/work-programme/risk-management/hedge-market-development/consultations/#c16642

3 The Authority is currently undertaking a post-implementation review of our 2013-14 review of Part 14 and 14A, which will consider the benefits achieved. That review may result in broader learnings in this space.

could have a net present value of between $740,000 and $4.0 million—depending mostly on the assumed cost of collateral.[4]

3.10 The major source of savings—contributing 85 per cent of these totals—could only possibly accrue to net generators. These savings would accrue because net generators have 'credit' with the clearing manager from their outstanding and expected spot market sales, which could theoretically offset their initial margin requirements for exchange-traded contracts. Large net generators are more likely to have a low cost of collateral and are less likely to be sensitive to changes in collateral requirements. This suggests our lower savings estimate may be more realistic than the upper estimate.

3.11 Both Meridian and Mercury are net generators at times, and hence despite being primary potential beneficiaries, both submitted that they agreed with our preliminary evaluation.

3.12 However, in its submission, Pioneer Generation stated it was disappointed with our preliminary evaluation, commenting:

"new retailers that are attempting to stimulate competition face higher costs than the vertically integrated incumbent gentailers"

3.13 Based on our work to date, it appears that more integrated clearing and settlement would do little, if anything to address Pioneer's concern. Independent retailers would likely place the most value in a reduction in their cash and collateral requirements. However, the savings we estimated would be available to independent retailers were small—not just because independent retailers are a small proportion of the market—but because:

(a) Collateral requirements can only be offset where default risk is genuinely reduced. Generally, this is only feasible during the small cross-over in time between exchange-traded contract periods (which mostly relate to the future) and the prudential period for the spot and ancillary services markets (which mostly relate to the past).[5]

(b) Exchange traded contracts are settled each day through variation margins, which means there is minimal unrealised value owing to the parties holding them. (Conversely, this is how a lot of the value arises for HSAs, which are typically only settled once a month.)

(c) A reduction in cash or collateral generally only achieves cost savings equivalent to the funding costs for that cash or collateral. It may reduce barriers to growth if a party has difficulty accessing collateral, which is addressed in the next section.

Points (a) and (b) are demonstrated in Figure 1, which shows whether transactions in the spot market, under HSAs, and for exchange-traded derivatives have been settled, are yet to settle, or are future transactions secured by collateral. HSAs are very closely aligned to spot market transactions—they relate to the same transaction periods and settle on the same timeframe. The same is not true for exchange traded derivatives. This

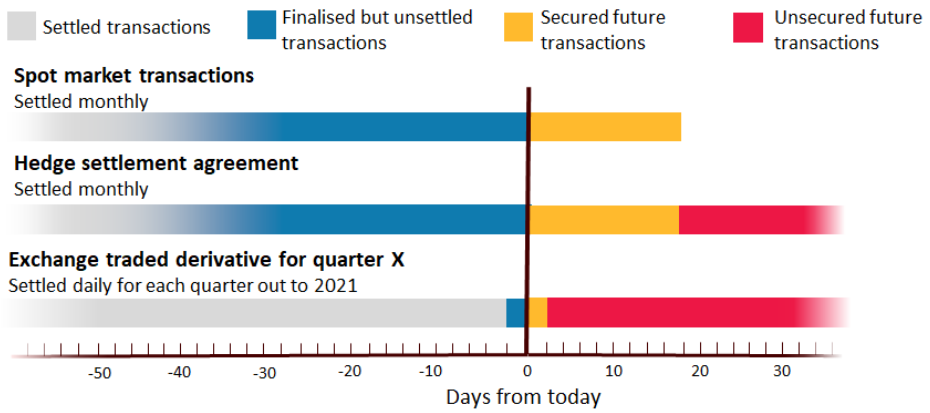
---

4 The lower estimate is based on a funding cost for a bank guarantee of 0.5%. The higher estimate is based on a funding cost of 2%. Both estimates were calculated over 10 years and used an 8% discount rate.

5 Retailers could additionally benefit from an offsetting effect between FTRs and futures contracts relating to all future periods (not just the prompt period). While this could be a reasonable source of benefit, we determined in the issues and options paper that there appears to be a low incidence of parties holding offsetting positions in both products. Furthermore, the parties known to trade FTRs are sophisticated traders for whom integrated clearing and settlement may not address a material barrier to participation or growth.

is because HSAs were specifically designed to integrate with the clearing and settlement systems for the spot market, whereas the approach to clearing and settling exchange traded contracts is based on very different drivers.

Figure 1: Transaction status for spot transactions, HSAs, and exchange traded derivatives[6]



3.14 To frame our estimates another way, they suggest that independent retailers might only realise cost savings of around $6-30 per year for every 0.1 MW of exchange-traded derivatives they had for the prompt period.[7]

3.15 We did not receive any new information from submissions or our subsequent discussions that suggests we should revisit our cost-saving estimates. Further, none of the independent retailers we talked to after the submission period had closed suggested that this issue would have a significant impact for their business, or that these developments would be worth investing significant resources when compared with other ways the resources could be used.

3.16 Furthermore, the potential savings we identified might not be achievable due to specific legal or practical challenges that might arise under a specific development approach. For example, our estimates include the potential for a participant to have a futures contract reflected in the calculation of their prudential security for the exit period. However, under some development approaches, it might not be practical to allow this saving. This might be because in the event of a default, a futures contract—or any margins owing under it—may be intercepted by a higher-priority creditor such as the defaulting party's bank. A lot more work would be required before we could determine the savings available in practice, under any development approach.

---

6 There are further differences between spot, HSAs, and futures that are not reflected in this diagram. Specifically, a day of transactions in the spot market and under HSAs relates to prices and quantities for that day only. Conversely, a day of transactions for exchange traded derivatives relates to a change in the average price of all transactions through-out the contract period.

7 This benefit potentially arises from:

a) the clearing manager using a participant's derivative price to calculate prudential covering the 'exit period', rather than a formulated price based on ASX prices plus an 'adder'

b) participants being able to avoid some additional collateral funding costs by having variation margins automatically credited to their prudential account—assuming it might otherwise take a day to do this manually.

These were benefits (a) and (d) in Table 2 of the issues and options paper respectively. The assumptions underlying the estimates were discussed in Appendix C of that paper. The same assumptions have been used for this calculation, but they've been applied to a single 0.1MW quarterly contract.

3.17 Therefore, based on our understanding, even in a best-case scenario it appears that integrated clearing and settlement would only have a modest impact on participants' costs.

The modest cost savings don't appear likely to produce substantial dynamic benefits

3.18 Our decision to not pursue developments at this time reflects our assessment of the lack of dynamic benefits that would flow from the small cost savings. Dynamic efficiency benefits were a key point discussed in submissions.

3.19 In its submission, NZX stated:

"The work has not yet been done to develop the quantification of benefits from increased competition, which NZX suggests could be large. Previous research indicates that a compelling case can be made by establishing the link between lowering barriers to futures trading, increasing participation in futures markets and driving greater competition in the retail market."

3.20 NZX went on to suggest that increased retail competition could provide benefits in the order of $44 million over 10 years, by allowing small retailers to undercut existing retailers by 1 cent per kWh, across 5% of the market.

3.21 Furthermore, Pioneer Generation stated:

"It is difficult to make a cost benefit analysis (even if it is qualitative) stack up when a maximum of 10% of participants are the main beneficiaries. We suggest the Authority should consider what weighting or value it places on vibrant competition from new entrant independent retailers."

3.22 Our issues and options paper recognised the potential for dynamic benefits from increased retail competition and more efficient hedge markets. While we characterised these potential benefits, we chose not to quantify them, because we thought any calculation would be highly speculative.

3.23 The Authority has always been a strong proponent of the concept that small retailers can have a significant impact on retail competition by applying competitive pressure at the margins.[8] In fact, the potential to promote that competitive pressure was a key driver for this investigation.

3.24 However, using our estimated cost savings as framed in paragraph 3.14, and simplistically assuming residential customers use 8,000 kWh a year at a constant rate, we estimate that developments would only reduce an independent retailer's cost-to-serve by around $0.06-0.27 per year for each customer hedged (i.e. 1-3 cents per MWh). It is not immediately obvious how a small retailer could meaningfully undercut a competitor on the back of that cost saving. This is particularly true if that competitor was a net generator seeing a larger (but still small) cost saving.

3.25 However, we recognised there may be potential for a small cost saving to have a significant impact for independent retailers. The issues and options paper stated on page 19:

---

[8] Interpretation of the Authority's statutory objective, https://www.ea.govt.nz/dmsdocument/9494

"The existence of net benefits would probably rely on the comparatively small cost savings to purchasers reducing a significant barrier to hedging or growth, resulting in significant benefits for retail competition and hedge market development"

3.26 Therefore, before we committed to our preliminary evaluation, we asked stakeholders for specific information to help us understand the potential effect of developments for their business.

3.27 Neither Mercury, Meridian or Pioneer Generation provided information that would help us to draw a link between the small savings we calculated and significant dynamic benefits. Our follow-up discussions with smaller retailers variously suggested that:

(a) integrated clearing and settlement was not a priority for them and they did not expect it to materially benefit their businesses

(b) if it could be achieved easily it may be worthwhile, but there are more valuable changes we could make in the hedge market

(c) they are happy to rely on commercial arrangements to address these issues, noting some participants work with brokers or intermediaries to rationalise their dual cash and collateral requirements.

3.28 In its submission, NZX suggested that the $44 million in benefits it calculated would arise because of reduced barriers to using exchange traded contracts. It stated:

"NZX contends that additional benefits arise from a change in behaviour, particularly from participants who currently have difficulty accessing the hedge market or, more precisely, face additional costs of prudential requirements overall compared to vertically integrated generator retailers."

3.29 It is difficult to determine whether developments would materially lower barriers to trading futures contracts without determining the specifics of how any developments would work. However, we have drawn on previous hedge market surveys to identify the key barriers to trading futures, as reported by survey respondents. We have then considered whether NZX's preferred development options are likely to address them, based on the key features of the options as it outlined in its submission.[9] This is summarised in Table 1.

Table 1: How NZX's preferred developments might impact barriers to trading futures

Reported barrier	Impact	Explanation
Covering the collateral requirements	Small	As per our estimates discussed above, potential for small reduction in collateral from contracts covering prompt period only. Also potential for some offsetting between futures and FTRs.
Meeting daily variation	Small	Daily margin calls still required but made by and paid to the clearing manager. Rationalising the

[9] For reference, NZX's preferred option would effectively allow the clearing manager to act as an intermediary for clearing and settling futures contracts. Participants would execute trades with a clearing participant or broker. Those trades would then be allocated to an account that the clearing manager held with a clearing participant. The clearing participant would ask the clearing manager to meet initial and variation margins for the futures contracts. The clearing manager would then pass on calls for cash or collateral to the trader of the futures contract, taking account of other funds they'd provided to cover spot, ancillary service and FTR market transactions.

margin calls		number of parties to whom payments are made may have some benefit.
Establishing a back-office function to meet calls	Small	Daily margin calls still required but made by and paid to the clearing manager. Rationalising the number of parties to whom payments are made may have some benefit.
Estimating load, and exposure to volume risk	None	A result of the standardised nature of futures contracts.
Limited price locations	None	Futures will still only trade at two locations
Complex products	None	No change to fundamentals of futures products or market.
Requires Board sign-off	None	No change to the risks involved.
Lacking expertise	None	Still requires good understanding of futures market.
Low liquidity on ASX	Uncertain	Could improve if other barriers are reduced enough to encourage greater participation.
Competing business priorities	None	No influence.
Satisfaction with other products	None	Many participants will continue to prefer the simplicity and protection of fixed-price variable-volume products and over-the-counter trading.
Intermediary costs too high	None	Still need to trade through a clearing participant or broker.

3.30 Table 1 suggests some barriers may be slightly reduced, but most reported barriers would be unaffected. It seems unlikely that a minor change in barriers to trading futures would allow independent retailers to substantially change their behaviour, triggering a significant impact for retail competition. Furthermore, we did not receive any feedback from stakeholders that suggests it would.

3.31 To compare, $44 million over 10 years is equivalent in scale to our 2011 estimate of the retail competition benefits that could be available over 15 years from reducing the bid-offer spread from 10% to 5%.[10] We estimated that at $27-81 million. The futures market has developed significantly since the bid-offer spread was reduced to 5%, facilitating participation by several new-entrant retailers. Based on what we have come to understand more integrated clearing and settlement would achieve, it seems highly unlikely that it could provide further benefit of a scale similar to the reduction in bid-offer spread.

3.32 Furthermore, exchange trading is unlikely to be the most appropriate hedging option for all participants and consumers. We have always been of the view that one of the primary benefits of the futures market is that it provides a transparent and robust forward price curve, which provides a benchmark for negotiating prices over-the-counter. Furthermore, the invitation that exchange-trading provides to intermediaries gives independent

[10] This was addressed in a cost benefit analysis we performed in 2011, which can be found on our website at: https://www.ea.govt.nz/development/work-programme/risk-management/hedge-market-development/development/information-paper-cba-market-making-obligations/

retailers more options for attracting a fair price over-the-counter—and we understand intermediaries are being increasingly utilised.

3.33 Participants that trade over-the-counter contracts can have those contracts reflected in their cash and collateral requirements with the clearing manager by lodging an HSA. The utilisation of HSAs for over-the-counter contracts provides a useful reference of the value that participants place on rationalising their clearing and settlement requirements. Furthermore, HSAs provide a commercial alternative to more integrated clearing and settlement, as intermediaries can repackage exchange-traded derivatives into products that can be lodged as HSAs.

3.34 HSAs can be beneficial to both parties to an over-the-counter contract:

(a) generators selling an over-the-counter contract can benefit because it allows them to leverage their unused credit with the clearing manager, and spread the default risk more broadly

(b) purchasers of an over-the-counter contract can benefit because their prudential security requirements—for outstanding and estimated future transactions—is determined based on the contract price, rather than the varying spot price.[11] As is suggested by Figure 1, HSAs can have a much bigger impact on a purchaser's cash and collateral requirements than what we'd achieve by integrating clearing and settlement for exchange traded contracts and other wholesale market transactions.

3.35 By and large, the informal feedback we sought after submissions closed suggested that the HSA product itself is well designed and provides valuable functionality. Parties that do use them suggest they meet their needs well.

3.36 Our issues and options paper sought feedback on barriers to using HSAs for over-the-counter transactions, to which we received no response. Responses to the 2017 hedge market survey suggest that none of the generators/retailers that responded to the survey had encountered problems lodging HSAs, suggesting the barriers to using them are not substantial.

3.37 Our analysis suggests around six per cent of wholesale purchases from the clearing manager are covered by an HSA.[12] This figure has grown from around four per cent three years ago.

3.38 However, we understand that, despite the potential benefits, parties trading over-the-counter do not often ask to have their contracts lodged as HSAs. The 2017 hedge market survey asked participants to rate various elements of over-the-counter contracts for their importance. Being able to lodge the contract as a HSA was rated third lowest by all buyers—with an average rating of 5.7 and 4.8 out of 10, for purchasers and generator retailers respectively. This compares to price, term, location, force majeure clauses and credit arrangements, which were all rated over 7.5 out of 10 by both categories of buyer.

---

11 This is effectively the benefit that led to this investigation, because participants had expressed value in being able to lodge futures contracts in a similar way to over-the-counter contracts. However, as we outlined in our 2015 information paper and 2017 issues and options paper on this topic, and summarised in paragraph 3.13, futures contracts work in a sufficiently different way that they cannot provide the same benefits as are available for over-the-counter contracts.

12 Based on HSA data provided to us by the clearing manager.

3.39 This suggests that the benefits of offsetting collateral requirements are currently second order. It may be that there is low awareness or understanding of HSAs and the benefits they can provide. To the extent more integrated clearing and settlement could achieve dynamic efficiency benefits, it may be that much of those same benefits could be achieved at virtually no cost by improving understanding and utilisation of the arrangements we already have in place (including by supporting use of intermediaries).

3.40 In conclusion, we do not expect the dynamic benefits from more integrated clearing and settlement to be substantial.

The time and cost involved in developments are likely to be substantial

3.41 We have decided to not pursue developments at this time because the necessary changes to clearing and settlement arrangements are complex and will take considerable time and resources to design, implement and operate. Furthermore, there is a high risk of unintended consequences, redundancy, and of road-blocks being identified part-way through the process.

3.42 The issues and options paper outlined seven potential ways to better integrate the separate clearing and settlement arrangements. These were:

(a) having all wholesale market transactions cleared by a licensed central counterparty (CCP) of exchange-traded derivatives

(b) the clearing manager becoming a clearing participant—who are the only parties able to clear directly with a CCP. Electricity market participants could then clear exchange-traded derivatives through the clearing manager

(c) the clearing manager becoming a client of a clearing participant. The clearing manager could then be an intermediary for electricity market participants wanting to trade exchange-traded derivatives

(d) the clearing manager entering into an agreement with a CCP of exchange-traded derivatives. Both the clearing manager and CCP could agree to share losses in the event of a default, so that collateral requirements could reflect a participant's overall position

(e) the clearing manager entering into an agreement with a clearing participant, agreeing to share losses in the event of default, so that collateral requirements could better reflect a participant's overall position

(f) the clearing manager acting as an agent to net payments, but with no effect on the need for collateral

3.43 In its submission, Pioneer Generation questioned whether we had considered an approach where the NZX clearing house clears ASX NZ electricity derivatives, and also becomes clearer of the spot market. This is effectively a variation of option (a).

3.44 NZX outlined two approaches it supports, both of which relate to option (c). One of its approaches would involve the clearing manager becoming a client of ASX clearing participants. The other would involve NZX developing an electricity derivative, and the clearing manager becoming a client of NZX clearing participants.

3.45 Of the available options, we consider that having the clearing manager become a client of a clearing participant appears the most viable at face value. It minimises the disruption to existing arrangements relative to the other options, does not require the clearing manager to meet the financial standing and risk management requirements of becoming

a clearing participant, and may limit the contractual complexity between the parties involved.

3.46 However, it would not be straight-forward to implement, and there could be considerable hidden costs. We summarise some of the issues that would need to be addressed in Table 2.

Table 2: Summary of issues that would need to be addressed in developing integrated clearing and settlement

Issue	Explanation
Specific effects on collateral requirements	The identified development options potentially provide a way for the risks from exchange-traded and spot/ancillary/HSA/FTR market positions to be considered together. However, the approach and extent to which positions could be offset and cash/collateral requirements reduced would still need to be analysed in detail. AEMO and ASX undertook an investigation into the potential for integrated clearing and settlement in the National Electricity Market in Australia. AEMO expended considerable effort modelling the potential extent of offsetting, before concluding that net benefits were unlikely.
Design specifics and changes to the Code	Allowing exchange-traded and spot/ancillary/HSA/FTR market positions to be considered together would require changes to Part 14 and 14A of the Code. Based on a high-level examination, the changes could be substantial. For example, under option 3.42(c), specific issues to address may include: • The order of priority for payments in the event a party defaulted on any payment owed to the clearing manager. • Which parties would take on the risk of default for exchange-traded products, and whether they would be willing. • Whether the clearing manager could be given authority to liquidate a party's futures position in the event of a default. • How the clearing manager would meet a need for cash and collateral to meet its obligations with a clearing participant. For example, the clearing manager would need cash to meet daily variation margins, but most of the funds it typically holds are in the form of a bank guarantee, and are held in a participant's account. • Who would benefit from any netting of all futures positions allocated to the clearing manager. Netting positions would tend to reduce the clearing manager's need for cash / collateral relative to its margin requirements from participants holding those positions at an individual level. • Who would benefit from any interest earned on cash the clearing manager held with a clearing participant. Addressing these issues would likely mean that integrated clearing and settlement introduces another layer of process for the clearing manager to deal with, further complicating the role, and introducing greater operational risks.

Issue	Explanation
Risk of unintended consequences for resilience of payments	Requirements around collateral exist to protect against the risk of default. An arrangement might seem feasible during the day-to-day when things are going smoothly. However, it is imperative that they operate smoothly, and provide the expected levels of security if a party defaults. A default is a rare event, and the circumstances of any default could differ each time, making them difficult to anticipate and test against. The more complicated it becomes to secure against, identify and manage a default, the greater the likelihood of unintended consequences. As an example, our issues and options paper noted that the rare instances of integrated clearing and settlement in financial markets had raised some concerns about the potential to introduce systemic risk.
Implications for competition amongst providers of services	Integrated arrangements could have significant implications for competition in service provision that we'd need to consider, and which could create significant costs. Specifically: • Providers of exchange services may compete to provide those services. The Authority would prefer not to "pick winners" for a competitive commercial service—doing so could create costs for consumers in the long-term. It is preferable if participants decide what exchange services they prefer, and any developments reflect those decisions. • The clearing manager role is a contestable service under the Code. There is a risk that the future contestability of the role could be affected by arrangements that created or relied on a relationship between an exchange and the party holding the clearing manager role. This would have costs for consumers in the long-term. • Clearing participants offer a competitive service. Costs would be higher if multiple clearing participants were involved. However, participants may have reduced choice if only some clearing participants were involved, and there could also be resilience risks from concentrating trading through fewer clearing participants—issues that also come with costs.
Risk of redundancy	Exchanges and clearing participants might change the products and services they offer over time. New providers might also enter. If developments could not accommodate those changes, there would be a risk that we could invest a lot of money designing and implementing arrangements, only to have them become redundant.
Regulatory and risk management issues beyond the Authority's jurisdiction	The Australian Securities and Investments Commission, Reserve Bank of Australia and Financial Markets Authority may need to be involved in any arrangements involving an exchange or clearing participants that it oversees. Financial regulators may be particularly concerned about the concentration of default risks within strategically important sectors. The Compliance and Risk departments of any clearing house involved may also have concerns that are difficult to overcome. There would be significant resources involved for the Authority in developing arrangements affected by regulations beyond its jurisdiction.

Issue	Explanation
Coordination of parties	All the options that have been identified require the involvement of clearing participants. At this point, no approaches have been made to test their interest or the costs involved.
Developing bespoke systems	There is no plug-and-play option for integrated clearing and settlement. Any developments we pursued would require pioneering solutions created from the ground up. Furthermore, the clearing manager currently provides a tailored service for the electricity market and is predominantly regulated by the Authority. Financial markets and financial regulators may not be familiar with these arrangements and willing or able to integrate with them readily.
Undertaking a detailed cost-benefit assessment based on the detailed design	Before pursuing any arrangement, we would need to perform a detailed cost-benefit assessment taking account of all the issues above, and those that have yet to be identified. NZX has advised that it would incur costs of $125,000 ± 30% to evaluate and design the options in detail. The Authority would expend considerable resources progressing the necessary changes to the Code (including the prudential security calculations), service provider agreements, and working through regulatory and legal issues. These would all be costs incurred before deciding whether to proceed with implementation.
Unknown risks	Our work on this investigation so far has been relatively high-level. However, for these sorts of arrangements, the 'devil is in the detail', as they hinge on the preferences of, and limits imposed by other parties beyond our jurisdiction. They also involve highly technical issues associated with financial risk, for which there is little flexibility.

3.47 We expect the time and resources involved in considering and addressing these issues would be substantial.

The resources involved could be put to better use

3.48 We have decided not to pursue developments at this time because we think there are higher priority demands on our limited resources, and more value-for-money ways to support our statutory objective.

3.49 We acknowledge that our analysis is high-level. This is out of practical necessity, given the scope and complexity of the issues. While a more in-depth analysis may uncover something new, we think that there are developments that are much more assured to provide net benefits to consumers. We give some examples in Table 3. Other projects are due to be outlined in our 2018/19 work programme.

Table 3: Developments more likely to provide net benefits

Category	Developments
Prudential security	• improving use of HSAs through education and awareness
Hedge market development	• introducing electricity price cap derivatives to support management of high prices • introducing standardised contracts for over-the-counter hedge contracts

Other initiatives	• settling the spot market based on real time prices

3.50 The number of submissions we received in response to our consultation paper was small relative to other issues we consult on. In the conversations we had with smaller retailers after the submission period had closed, the parties suggested that responding to our consultation paper had not been a priority for them. They also suggested that integrated clearing and settlement could be a "nice to have", but is not a pressing issue, and it would not be worth investing significant resources. Rather, they suggested that we should focus on measures that would:

(a) genuinely improve liquidity in the futures market—such as building on the existing market making arrangements

(b) address other issues of concern or value to them (which varied among the parties we talked to).

3.51 There are parties providing commercial services that can help participants meet separate clearing and settlement requirements. These services appear an efficient solution to a complicated problem. There may be ways we can support participants in accessing these services. For example, as resource allows, we intend to work with the industry to develop standardised contracts for over-the-counter hedging. Furthermore, we expect there are opportunities to gain benefits at low cost by improving the use of HSAs. To this end, we will work with stakeholders to identify and address any concerns regarding HSAs, and improve awareness and understanding of that product. We welcome any stakeholder feedback on the opportunities to improve use of commercial services for managing separate clearing and settlement requirements.

3.52 Overall, we appreciate that some parties find their cash and collateral requirements to be a barrier to participation and growth and consider themselves to be at a competitive disadvantage with vertically integrated participants. This was suggested by both Pioneer Generation and NZX in their submissions. However, we do not consider integrated clearing and settlement to be the most cost effective or valuable way to reduce barriers for independent retailers.

3.53 Our decision does not prevent integrated clearing and settlement being considered again in the future. Issues such as higher interest rates or increased margin requirements could give rise for us to reconsider the merit of the arrangements. We will monitor developments in the hedge and financial markets and reactivate the work if new information or opportunities come to light.

Glossary of abbreviations and terms

ASX	Australian Securities Exchange
ASX market	New Zealand electricity derivatives tradeable on the ASX
Authority	Electricity Authority
CCP or clearing house	Central counterparty. A financial institution that acts as a buyer to all sellers, and seller to all buyers (hence 'central counterparty'), and helps to ensure settlement of trades made on an exchange.
Clearing	All processes undertaken from the time a commitment is made for a transaction until it is settled. This includes reconciling purchases and sales, facilitating the transfer of funds between buyers and sellers, and ensuring the availability of funds for settlement.
Clearing manager	A market operation service provider responsible for ensuring that industry participants pay or are paid the correct amount for the electricity they generated or consumed and for market-related costs. The role is currently performed by Energy Clearing House Limited—a subsidiary of NZX—under contract with the Authority. For more information, see http://www.ea.govt.nz/operations/market-operation-service-providers/clearing-manager/.
Clearing participant	A party authorised to trade with a CCP, and acts as a clearer for other parties buying and selling exchange-traded products.
Client	A party that buys or sells exchange-traded products by trading with a clearing participant
Code	Electricity Industry Participation Code 2010
Derivative	A contract that derives its value from the performance of an underlying entity—in this case, being the spot price for electricity.
Exchange	A marketplace in which derivatives and other financial instruments are traded, and then generally cleared by a CCP
Exit period	The expected time that it would take to remove a participant from the market if they defaulted on their settlement and prudential security obligations with the clearing manager. For a retailer the exit period is 18 days. For a consumer that purchases electricity from the clearing manager, the exit period is 7 days unless otherwise agreed with the Authority. Participants must pay prudential security to cover their

	estimated transactions during the exit period.
FTR	Financial Transmission Rights
FTR market	Organised market for allocating FTRs, operated by Energy Market Services as the FTR manager
Future	A type of electricity risk management contract traded on an exchange, which has standard terms and conditions
Hedge contract	A financial risk management contract that protects against price risks associated with the spot price of electricity.
Hedge market	Market through which hedge contracts are bought and sold.
HSA	Hedge settlement agreement
Initial margin	Collateral required to manage default risk associated with an exchange-traded contract
Intermediary	an entity that acts as the middleman between two parties in a transaction—for example, between a buyer or seller and a clearing participant.
Prudential security	Collateral requirements that the clearing manager sets for participants to manage the risk of default on transactions in the spot, ancillary service and FTR markets, and for some over-the-counter transactions.
Settlement	The process for paying money that is owed under a transaction when it comes due, and—where relevant—delivering the product or service
Variation margin	Settlement funds required under an exchange-traded contract